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A TRANSACTION COST ECONOMIZING APPROACH TO REGULATION: UNDERSTANDING GOVERNMENT RESPONSES TO THE NIMBY PROBLEM

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UNDERSTANDING GOVERNMENT RESPONSES TO THE NIMBY PROBLEM**

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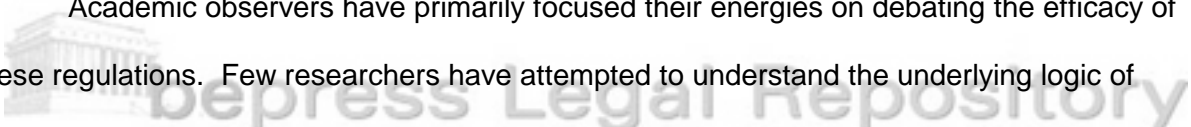
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Policy makers, local land use planners, and developers have long struggled with the NIMBY (“not in my backyard”) syndrome in their efforts to site locally undesirable but socially beneficial facilities. Because projects such as homeless shelters, prisons, airports, and waste disposal sites typically produce widely dispersed benefits but concentrated costs, these facilities have often provoked intense resistance from local residents. Since the mid-1970s, however, the NIMBY problem has become more than a common nuisance, as certain facilities thought to be essential to society have become nearly impossible to site due to organized and persistent public opposition. Some noteworthy illustrations include the growing inability to site hazardous waste treatment facilities in the U.S., the all but abandoning of nuclear power by U.S. utility companies, and the Department of Energy’s persistent difficulties in selecting a permanent site for high-level radioactive waste (DiMento & Graymer 1991, Cohen, McCubbins, & Rosenbluth 1995). For solid and hazardous waste facilities (hereafter, WFs), the siting problem has become so acute that one policy maker has suggested that the “NIMBY” syndrome is perhaps better characterized as “BANANA” -- “build absolutely nothing anywhere near anything” (Lambert & Boerner, 1997).¹

In an effort to facilitate the building of locally undesirable but socially beneficial facilities, states across the country have enacted numerous siting regulations. The specific nature of these reforms varies widely from relatively simple efforts to improve information exchange between developers and prospective host communities to more interventionist measures that give state officials the power to assume control over the siting of controversial facilities. Today, numerous states have in place detailed siting procedures whose primary purpose is to overcome NIMBY problems.

Academic observers have primarily focused their energies on debating the efficacy of these regulations. Few researchers have attempted to understand the underlying logic of



government regulation with respect to the NIMBY problem: what is the nature of the problem that prompts the necessity of siting regulations; what are the key attributes of these regulations that address the core of the NIMBY problem; and what factors (if any) constitute an efficient regulatory response for a given instance. The purpose of this paper is to begin outlining a model of regulation with respect to the siting of WFs, such as landfills, solid waste incinerators, and hazardous waste treatment, storage and disposal facilities.² The basic premises motivating this paper are threefold. First, the NIMBY issue can be formulated as a contracting problem in which a WF developer and a prospective host community negotiate over the terms and conditions under which a facility will be allowed to operate. Second, the very nature of these transactions introduces certain contractual hazards that preclude efficient bargaining. And third, this contracting problem can be understood through the lens of transaction cost economics (TCE), which predicts that hierarchical mechanisms of governance (e.g. contracts, the firm, government control, etc.) arise to support transactions burdened by hazards. The central argument is fashioned after TCE's "discriminating alignment hypothesis" (Williamson 1996): transactions (i.e. siting WF activities), which differ in their attributes, are aligned with governance structures (i.e. various regulations), which differ in their costs and competencies, in a discriminating way. We apply this model to WF siting regulations and argue that proper (i.e. transaction cost minimizing) alignment can help overcome the NIMBY problem and lead to siting Pareto improving facilities.

Section I of this paper presents an overview of the NIMBY scenario and specifies the political and economic problems that NIMBY disputes present. Section II reviews the current NIMBY literature and outlines how TCE analysis can inform our understanding of NIMBY regulation. Section III develops a TCE approach to the NIMBY problem and formulates TCE-

¹ For a general discussion of the problems siting WFs, see DiMento (1991) and O'Hare (1983).

² Waste and energy facilities were chosen for 2 reasons: First, these facilities have been among the most intensely opposed land uses; and second, this notoriety has led to a large body of literature upon which this paper could build.

motivated hypotheses for how certain types of regulatory mechanisms can efficiently minimize transaction costs for certain corresponding WFs. Section IV presents a preliminary empirical test of these hypotheses by introducing selected case studies, which, while incomplete, indicate that viewing regulation as a mode of governance can provide valuable insights. Section V discusses opportunities for future work and provides concluding remarks.

SECTION I: THE NIMBY PROBLEM

I.1 NIMBY AS A POLITICAL ECONOMIC PROBLEM

A NIMBY can be defined as a proposed land use that offers benefits to a broad group of people yet is difficult or impossible to site because of local opposition. While most often associated with polluting and waste facilities, NIMBY problems afflict a broad range of activities, including airports, prisons, sports stadiums, power plants, halfway houses, and low-income housing projects.

Two important characteristics make each of these facilities a potential NIMBY problem. The first is that the project, if implemented, will generate an overall increase to social surplus.³ We define NIMBY problems as projects that are difficult to site only because of inequalities in distribution. Consequently, a NIMBY project generates additional surplus such that efficient transfer payments could, in theory, distribute gains in a manner that will entice all actors to support it. All NIMBY projects are *potentially* Pareto improving.

Second, the nature of the costs and benefits associated with these facilities virtually assures the existence of local opposition. While the benefits of NIMBY projects, such as airports, prisons and low income housing, are typically dispersed among a relatively large population, the costs and risks of these projects are normally concentrated on a small group of residents in the host community. To residents who live close to these facilities, the costs are

almost always greater than their benefits, and they are usually better off if the project is either located elsewhere or not completed at all.

Even though NIMBY projects benefit more actors than they harm, and even though they generate an overall gain in social surplus, the nature of democratic institutions makes it extremely difficult for them to win political support. Consequently, they often succumb to a political process that favors concentrated costs over diffuse benefits. Citizens residing near proposed sites for NIMBY facilities can both experience nuisances associated with the facilities (e.g. noise from airports) and can also fear suffering from such nuisances (O'Hare 1997). Their actual and anticipated exposure to such concentrated costs provides strong incentives to organize, attend local hearings, lobby politicians and, if necessary, file legal challenges. In contrast, the benefits associated with these facilities are both broadly distributed (e.g. the benefits of an airport are spread to all travelers) and, compared to the local costs, diffusely allocated (the utility of the ability to travel is far outweighed by the disutility of constantly hearing airplanes overhead; it also is insufficient to induce an individual to volunteering in the political process and fighting on behalf of an airport project). Consequently, few individuals aside from a project's developer have an incentive to advocate that any given site under consideration is the best site (Bacow & Milkey 1982). Even the developer's attempts to argue that the overall gains outweigh the overall costs are often dismissed by opponents as self-serving. Consequently, widespread public support of locally undesirable land uses is generally lacking and is overcome by local opposition (Olson 1965). This opposition is frequently sufficient to defeat most locally undesirable facilities, including those that provide net social benefits (O'Hare, Bacow, & Sanderson 1983).

These two conditions – overall efficiency but prone to stifling political opposition – are particularly evident in the siting of WFs. Economies of scale resulting from the large fixed costs

³ One important qualification must be noted. Any of these facilities can be planned inefficiently – i.e. can be constructed and sited in such a manner that they generate a decline in total surplus. A project's qualification as a

associated with most WFs typically make it efficient to have one large facility servicing the waste needs of an entire region (Kunreuther & Kleindorfer, 1985). However, the actual and perceived costs to neighbors associated with these facilities increase with facility size, so larger (and more efficient) WFs often elicit stronger public opposition than would small facilities. Large regional facilities also encounter local hostility since residents perceive that they are bearing the costs of disposing of “other people’s” waste (O’Looney, 1995).⁴ Furthermore, unlike projects such as airports and various industrial activities that can spark additional investment, WFs normally provide few compensating benefits to their host communities. Most WFs, for instance, provide relatively few new jobs and only modest tax revenues (Popper, 1991; Bacow & Milkey 1982). With few concentrated benefits for local residents, it is difficult for a WF developer to rally host community support.

Chances for public support for siting WF facilities have been further injured by recent political developments. The industry’s past failures to use environmentally sound waste disposal practices and the public fallout associated with many of these failures (e.g. Love Canal, Times Beach, the Santa Barbara oil fires, etc.) have severely damaged WF developers credibility in the public eye.⁵ Moreover, a large, vocal, and well-funded environmental movement has heightened public anxiety about the dangers posed by WFs and has become an important force in challenging new developments (Bacow & Milkey 1982; Inhaber 1992; O’Looney, 1995). As a result, WFs are often perceived to pose greater risks to public health and safety than other locally undesirable facilities and are especially prone to NIMBY political problems.

⁴ NIMBY problem depends not just on the nature of the facility itself but also on contributing circumstances. Larger facilities also distort traditional, common-law approaches to solving land-use disputes. As the magnitude of a nuisance increases, the number of affected persons increases. With multiple parties, common-law approaches to solving nuisance disputes become less efficient. The transaction costs associated with negotiating agreements increases geometrically as the number of people involved in the process increases. For a more thorough discussion of how traditional approaches to solving NIMBY problems have become less efficient, see O’Looney (1995).

Combined, these features present WFs as a good vehicle to understand the NIMBY problem. While efficient siting of WFs encourages developers to build large facilities in one locale that service many other communities, the costs of siting large projects are shared unequally and create political dynamics that make them hard to attract the requisite public support. The challenge this NIMBY problem presents to policy makers is to create a political process that will site socially necessary facilities in an economically efficient way. As a result, a variety of public and private policies have emerged to respond to this political challenge.

I.2 RESPONSES TO NIMBY

Two key developments have emerged in an effort to counter the problems associated with siting WFs.. First, private developers fundamentally changed their approach to siting WFs. Traditionally, developers sited facilities using what has been termed the “DAD” paradigm: decide, announce and defend. Developers decided the best location for their facility, took out options on the land, announced to political leaders of the community their intention to site, and then defended their decisions from local opposition groups (Lambert & Boerner 1997). In the face of increasing NIMBY opposition, developers began voluntarily negotiating with representatives of prospective host communities in the hope of eliminating the causes of local opposition (OBS 1983).⁶ While the siting agreements that result from these negotiations vary, most agreements commit the developer to undertake certain actions to mitigate adverse impacts and compensate residents. These agreements also spell out certain compensation the community is to receive, plus particular obligations the community may assume regarding the sited project.⁷ The mixed success of these negotiations between developers and concerned

⁵ Civil rights activists have recently joined forces with environmental groups to oppose many SFs on environmental justice grounds. See Lambert & Boerner (1997).

⁶ Also, interview with William Ruckelshaus, CEO, Browning Ferris Industries. St. Louis, Missouri, April 28, 1995.

⁷ Among the mitigating activities that are often included in siting agreements are the creation of a buffer zone around the facility, providing necessary infrastructure, such as a transportation network or a sewer system,

local parties has motivated a second development to counter NIMBY problems, the promulgation of state siting regulations (OBS 1983, O'Hare & Sanderson 1993). This generation of regulations was fashioned to assist these negotiations and to encourage similar negotiation for situations where bargaining was otherwise difficult. Most of these regulations were directed toward (a) improving the exchange of information between developers of WFs and key constituents within prospective host communities, (b) altering the process by which developers and local community representatives negotiate, and (c) allowing the state to directly intervene in the siting process. As will be discussed in further detail in Section III, these regulations can arise to support siting WFs when simple (i.e. unaided by regulations or other institutional mechanisms) negotiations would be insufficient, and they can be understood as a hybrid form of governance that support certain transactions with burdening hazards. We will argue that these regulations are efficient – i.e. minimize transaction costs and support welfare-improving agreements – when they are appropriately designed to mitigate targeted contracting hazards. We first review the academic literature that has addressed the role of government regulation in administering siting disputes.

SECTION II: LITERATURE REVIEW – REGULATION AS A SOLUTION TO NIMBY

The rise of certain regulations as response to siting difficulties has attracted significant attention from academics. The resulting scholarly literature can be divided into three camps. One camp employs normative approaches that advocate assorted (mostly non-regulatory) resolutions to NIMBY siting problems, a second camp uses economic models of the political process to generate positive predictions of regulatory outcomes, and a third school uses

providing emergency response capabilities, and agreements to use cleaner technologies. Compensation payments may be direct cash payments to the community, financial assistance in the construction of various community projects, the provision of parks, as well as promises of jobs and job training. In return for these steps, the community often pledges to support the project and provide various support services (Interview with William Ruckelshaus, CEO, Browning Ferris Industries. St. Louis, Missouri, April 28, 1995).

economic principles to explain how regulations can economize on transactions and other costs. We review each in turn.

II.1 NORMATIVE APPROACHES

A common response to understanding solutions to the NIMBY problem is to formulate mechanisms that will be able to overcome inevitable political opposition and site socially necessary facilities in an economically efficient way. Two main approaches to the problem are evident. The first branch can be labeled the “mechanism design school” in which a number of researchers have directed their efforts toward critiquing existing government regulations and designing alternative siting mechanisms. Howard Kunreuther’s (1985; 1986) work on sealed-bid auction mechanisms for siting noxious facilities, Herbert Inhaber’s (1992; 1998) proposals to employ a reverse Dutch auction, and Michael O’Hare’s (1983; 1993) research on the use of compensation schemes are noteworthy examples of this approach. While critical of current siting processes, researchers in this branch maintain that appropriate government programs can reduce or eliminate current siting difficulties.

A growing literature within the field of negotiation can also fall into the mechanism design school. Resting on theories from an amalgam of fields, such as economics, psychology, and political science, this collection of research scrutinizes common bargaining strategies employed by developers and host communities. These works identify certain elements of the negotiation or mediation process that create gridlock, and they proceed to develop normative approaches to aid developers in negotiating with host communities. Many of these strategic recommendations include entering into a “consensual approach” that encourage participants to create a voluntary, ad-hoc discussion forum to resolve disputes (Suskind & Cruikshank 1987, Suskind, Levy, & Thomas-Larmer 2000). Other works encourage employing public mediators who can formalize an alternative dispute resolution mechanism (Carpenter 1991). Most of this

literature presupposes that negotiation strategies can arrive at Pareto-improving resolutions when one is theoretically possible, and the challenge is to encourage parties to commit to a negotiation process and collectively explore value-creating options.

The second branch of normative research, which could be called the “property rights” school, is far less optimistic about government siting solutions. According to these scholars, the siting problem is one of ambiguously specified property rights. Robert Cameron Mitchell and Richard T. Carson (1986), for instance, argue that under current siting regulations neither the developer nor the community holds clear property rights. While local communities have asserted the right to be free of these projects through strict zoning and safety regulations, state siting boards have typically countered these efforts by granting siting rights to developers. Mitchell and Carson suggest that states should officially recognize the de facto property rights assumed by local communities and allow prospective developers to freely negotiate siting terms with these communities. This argument is extended by law and economics scholars who focus on selecting a legal rule, usually assigning property rights or liability, in order to achieve optimal incentives. Most of these arguments presuppose that once property rights are specified, court adjudication is sufficient to identify when siting agreements have been violated, assess the behavior of the responsible actors, assign liability, and, where required, compensate victims (Landes & Posner 1987, Posner 1992, Shavell 1987).⁸

While both of these approaches provide important insights into the NIMBY problem, they are inadequate in a number of respects. First, many of the critiques of existing siting regulations appear to be making efficiency judgments in comparison to hypothetical or untested ideals. Many authors, for instance, describe existing siting mechanisms as “inadequate,” “ill-informed” or “inefficient.” However, it is not clear what comparisons are actually being made in these critiques: existing siting regulations are “inefficient” or “inadequate” compared to what? It is easy to point out how siting regulations, or any government intervention, would generate

inefficiencies in a perfectly efficient market with costless negotiations, chiefly because they directly interfere with any “invisible hand” that a free market may offer. But such neoclassical assumptions don’t consider the complex realities of negotiating certain transactions and overlook fundamental bargaining hazards that preclude laissez-faire efficiency. Thus, when explicit comparisons are made, existing siting regulations are normally compared to hypothetical or untested ideals to which few markets can aspire and against which no regulation can compete.

Perhaps the clearest illustration of the dangers of hypothetical comparisons is seen in Lawrence Bacow’s and James Milkey’s suggestion that traditional siting approaches are inadequate compared to incentive (e.g. compensation) schemes (1982). To bolster their case that an incentive-based approach produces better results, Bacow and Milkey appeal to a Massachusetts statute that requires hazardous waste facility developers to negotiate compensation packages with prospective host communities. Unfortunately, the purported improvements offered by these incentive approaches have not materialized. As Michael O’Hare and Deborah Sanderson (1993) point out, Massachusetts has not seen any improvement in the siting process since the negotiation statute was enacted. Indeed, no new hazardous waste facilities have been sited since the statute was passed in 1980 despite a significant demand (O’Hare & Sanderson 1993). Without discounting the contribution made by Bacow’s and Milkey’s article, it is clear in this instance that claims regarding the inadequacies of the traditional siting process are in need of qualification. They overlook the contracting hazards inherent in siting WFs, and the market-oriented incentive approach they advocate has apparently been inadequate in overcoming political opposition.

Second, it is not obvious that many alternatives to traditional siting approaches are feasible. Robert Cameron Mitchell’s and Richard T. Carson’s (1986) proposal to eliminate local opposition by establishing communal property rights, which would allow communities to accept

⁸ For a discussion of this approach and potential flaws in addressing environmental problems, see Menell (1991).

or reject a proposed WF, is a case in point. While the argument may have some theoretical appeal, precisely how does one provide a community with clearly defined and enforceable property rights with respect to a new development? A law specifying the use of referenda for the approval of new developments is one alternative. However, proponents of such a proposal must specify why communities and developers would desire such a referenda process and what, if anything, would prevent individual community members from engaging in various legal and extra-legal tactics to end-run the referendum process and stop an approved development. Another approach, as some negotiation literature suggests, could appoint neighborhood leaders to represent the interests and exercise the property rights of the host community. But this too is equally vulnerable to opportunities for defection and non-cooperation by smaller factions. Before one can assess the usefulness of a property rights approach, proponents must specify how their approach addresses such nontrivial issues as credibility and enforcement. Given the complexity of the political process, any effective mechanism must survive a microanalytic examination in which actors' incentives and opportunities for non-cooperation are considered at every stage. The academic pursuit for developing such a mechanism may involve beginning with a consideration of discrete structural alternatives rather than a hypothetical ideal.

Finally, most of the proposals to deal with NIMBY problems attempt to establish a one-size-fits all solution. However, as will be discussed below, the problems associated with siting an airport are not the same as the problems associated with siting a nuclear power plant. Asymmetric information, complexity, and other contractual hazards are at the heart of many NIMBY disputes, but these hazards vary significantly according to the type of facility in question. Recognizing these differences, policies designed to deal with one NIMBY dispute may be ill suited to deal with other disputes. Recognition of this variation in transactions, and subsequent variation in corresponding governance mechanisms, is central to the approach discussed in the following section.

In short, much of the normative literature dealing with NIMBY problems fails to recognize that all conceivable regulatory mechanisms designed to govern siting transactions will be flawed when compared to a hypothetical ideal. If the bargaining process is laden with contractual hazards, then the unregulated market (no matter how creative the negotiation process, and no matter how enlightened the governing legal doctrine) is unlikely to arrive at the Pareto frontier. In fact, the converse is a better formulation of the problem: there is a need for regulation precisely *because* the contracting hazards block the hypothetical ideal. A better approach is to evaluate distinct structural alternatives by a remediableness standard, where mechanisms must balance efficiency motives with the realistic hazards of political opportunism.

II.2 POSITIVE POLITICAL APPROACHES

A second approach to understanding the emergence of regulation in response to NIMBY disputes involves a positive, and perhaps slightly cynical, view of the political process. According to this approach, political interest groups organize to influence the development of regulatory rules, aiming to enact rules that would best meet their particularistic interests. This school has its roots in George Stigler's (1971) and Sam Peltzman's (1976) examinations of regulated industries, and it has burgeoned to study how numerous regulatory and political processes are shaped by institutional configurations and a political market for votes.⁹ Positive political theory would predict that WF siting regulation has emerged to meet the particularistic needs of developers and organized community interests (whether environmental groups, civil rights groups, or some organized combination thereof). It would further predict that the regulations would favor the organized groups that are endowed, and thus invest, the greatest amount of resources in the political process.

⁹ See, e.g., Kalt & Zupan 1984, Snyder 1990. This is a very large school of literature, and we intend only to introduce it briefly here.

We think that the positive political approach is a strong way to understand regulatory outcomes, and we anticipate that these hypotheses have strong explanatory value should be considered in a broader analysis of siting regulations. However, we do not focus on this approach in this paper. Our emphasis is on understanding regulation as an efficient governance mechanism that arises to support difficult contracting, and a positive examination of power and resources in the political process would obscure that objective. We further believe that putting aside positive political considerations will not heavily affect our analysis. First, as we discussed above, the political interests that are compelled to enter into a NIMBY dispute are developers and activists from the host community. Since these two groups arguably have opposed interests and arguably are both well endowed (in money and votes), there is reason to believe that their gridlock in the unorganized political process would translate into another political stalemate in influencing regulatory outcomes. In other words, the political impacts of these two organized interests may counteract each other. Second, these siting regulations are designed precisely to incorporate the political conflict into the siting process, so any political fight in lobbying policy makers will mirror the same dispute that is governed by the regulations we examine. Third, as we will explain below, our analysis does not assume ex-post efficiency. Consequently, even if the political process inhibits an efficient regulatory outcome, the regulation will still be subject to the same theoretical considerations and will not confuse our results. We will be able to measure the efficiency of all outcomes according to the theoretical criteria that we develop below.

While we agree that political power can explain a good portion of regulatory outcomes, we believe it deserves its own examination. Accordingly, we leave a positive political analysis of siting regulatory outcomes for future research.

II.3 TRANSACTION COST APPROACHES

Transaction Costs Economics (TCE) offers an alternative approach to understanding NIMBY problems and their regulatory remedies. While much of the research in TCE has focused on the firm-market boundary, the theory has broader applicability (Klein & Shelanski 1995, Boerner & Macher, 2000). TCE maintains that *any* problem that arises as or can be posed as a contracting problem can be examined in transaction cost economics terms (Williamson, 1996). Thus, to the extent that one can think of regulation as a response to a contracting problem, TCE analysis can be usefully brought to bear.

Works by Victor Goldberg and Oliver Williamson (1976) are credited for being the first to approach regulation as a response to transactions that were difficult to contract. Goldberg (1976) chastised critics of regulation (many of whom could now fall into the normative schools discussed above) for not appreciating the contractual complexity of private alternatives. Hazards inherent in the nature of commonly regulated activities make most private alternatives non-remediable, leading instead to "administered contracts" that often involve intervention from a public agency to provide long-term administrative supports. Williamson (1976) fleshes out these contracting difficulties in examining efforts to provide the city of Oakland cable television. The transactions involved in such a fixed-cost endeavor for a municipality were laden with contractual hazards motivated by both economic and political circumstances. Williamson concludes that the (comparatively) efficient mechanism to oversee such economic activity is through administrative contracts that allow for public intervention and renegotiation.

Levy and Spiller (1994) and others have since employed TCE analysis to glean various insights into the performance implications of regulation and regulatory design. The general approach has followed Goldberg (1976) and Williamson (1976), where specific hazards are identified within the microanalytic dynamics of specific transactions, and then corresponding governance mechanisms – whether regulation or other institutions – arise to address and mitigate those hazards. This literature has more recently been joined by Dixit (1997) and

Williamson (1999), who explicitly characterizes regulation as a governance mechanism. These efforts formulate the entire spectrum of public sector activity as an array of transactions, each with varied types and degrees of hazards. Regulation, along with other public institutions, arises as a transaction-cost minimizing response to govern certain political and economic activities.

This paper pursues the path set forth by the recent work of Dixit and Williamson by viewing regulation as akin to a hybrid mode of governance in the markets and hierarchies setup of traditional transaction cost theory (Williamson, 1999). In our formulation, different regulatory mechanisms can manifest in a diverse collection of public interventions in the private market, and consequently they can possess different governing attributes. Appendix Figure I, adapted from Williamson (1999), illustrates how regulation as a hybrid form fits into traditional TCE analysis. This paper focuses on the different administrative mechanisms that span from the regulation node, representing the regulation of a private firm, to the public agency, representing public ownership of the particular economic activity (we highlight this *Area of Interest* in Figure I). Utilizing this framework, one can begin to understand the logic of government regulation with respect to the NIMBY problem. Siting WFs is essentially a contracting issue in which a facility developer and local residents negotiate the terms and conditions under which a proposed WF will be located in a given community. By our definition, NIMBY projects are potentially Pareto improving, so under efficient bargaining (i.e. a world of zero transaction costs) such facilities should be easily sited. Various attributes associated with WFs, however, pose potential hazards to these negotiations. To overcome these hazards and facilitate the siting of these socially beneficial facilities, states around the country have enacted siting regulations as governance mechanisms. The analytical process of observing contracting hazards and identifying the corresponding governance mechanisms that consequently arise is the essential

exercise in TCE. This process is applied below to siting WFs and their corresponding siting regulations.

SECTION III: A TCE APPROACH TO NIMBY

Applying TCE to understanding siting regulations for WFs involves a three-step process. The first step is to articulate the exact nature and degree of the contractual hazards posed by WFs and how these hazards can prevent efficient facility siting. The second is to identify the regulatory governance mechanisms that have evolved to deal with these hazards and explain how these regulations can facilitate the siting of controversial WFs. The third step is to formulate a hypothesis that explains how a proper alignment of regulatory mechanisms with specific siting transactions generates efficient returns.

After formulating the siting process as a formal contracting problem, this section proceeds through each of these steps.

III.1 THE CONTRACTING PROBLEM

The agreement to site a WF requires an agreement between the developer and those others, mostly local residents, adversely affected. Lack of an agreement allows local residents to sue the developer and claim damages or invade the political process and create gridlock. Conversely, an agreement between the developer and those affected can include provisions that will avoid imposing costs to residents and appropriately compensating those residents who do experience costs.

WFs deemed to be NIMBY projects create additional social surplus so, theoretically, transfer payments may be made to appropriately compensate residents for the costs imposed by the facility. In a world of efficient bargaining and zero transaction costs, this is accomplished in a strait forward manner: a developer announces a planned facility, local residents will

demand compensation for the costs the facility will inflict, and the developer meets each resident's reservation utility through transfer payments.¹⁰

As was mentioned above, many developers now pursue this strategy through negotiation (OBS 1983, Suskind & Cruikshank 1987). Typically, the process of reaching a siting agreement begins with negotiations between a developer of a WF and representatives of the affected local municipalities, often represented by a citizens committee. Once the committee is established, negotiations over the terms and conditions under which a facility will be sited can take place. Virtually any subject is open for discussion. Items which have often come up in negotiations and are covered in final agreements include: direct payments between developers and the affected municipalities, property value protection, disposal privileges, availability of local roads and utility services, operation guidelines, creation of standing oversight committees and the provision of various community amenities, such as parks and playgrounds.¹¹ Final agreements can also spell out dispute resolution procedures, such as appeal to state agencies or the use of binding arbitration (O'Hare 1983). This simplified description outlines how private developers have attempted to address the causes of local opposition through negotiating siting agreements. A successful siting process will typically (1) enable the contractual parties to engage in bargaining over the specific terms under which a facility will be allowed to operate; (2) provide mechanisms to facilitate adaptation to changing conditions over the life of the facility; and (3) establish a means by which parties can enforce agreements.

III.2 HAZARDS

In a world of complete certainty and zero transaction costs, the above conditions are easily met. In such a world, all of the relevant parties are known in advance, all of the effects of

¹⁰ See Coase (1960).

¹¹ List compiled from a review of contracts filed with the Wisconsin Department of Natural Resources.

the facility are known and specified ex ante, and contractual performance is transparent ex post. Thus, fully contingent and binding agreements can be reached.

In reality, all contracts are unavoidably incomplete, and siting WFs are transactions laden with hazards. Faced with this incompleteness, efforts to guard against contractual hazards take on added importance. In the context of siting WFs, a number of potential contractual hazards appear to be important. This paper focuses on three: negotiating externalities, measurement problems, and asset specificity.

1. Negotiating Externalities. Efficient bargaining requires a solid definition of property rights (Coase 1960), but when a developer wants to negotiate with a community, it is not obvious who deserves standing, i.e. who can reasonably claim to be adversely affected by a facility at a specific site. Moreover, those whom the proposed facility genuinely will harm may have different interests and exhibit contrasting demands for compensation. Thus, one of the most important prerequisites to entering negotiations, and one of the first major hurdles facing a private developer in the siting process, is determining who represents the community in negotiations.

Individual parties within a community, however, have certain incentives not to enter into organized bargaining with the rest of the community. Any party who can claim legal standing and can file a legal suit may be able to halt construction of a facility and force direct negotiations with the developer. However, if a developer is confronted with the prospect of negotiating individually with each affected party – under the threat from each that a lawsuit could suspend the project – then bargaining costs may become insurmountable. Furthermore, some environmentally motivated interest groups may have ulterior motives to stop the project altogether, so direct negotiations with them would inevitably prove to be fruitless. These dynamics could be considered “negotiating externalities” since individuals have greater incentives to negotiate individually, but individual negotiations may impose insurmountable

obstacles to siting a facility that would actually increase overall welfare. Individual incentives alone, without the intervention of governance mechanisms to facilitate negotiations, would lead to Pareto-inferior outcomes.¹² Consequently, these externalities impose serious hazards siting transactions.

2. Measurement Problems. A critical point of contention in siting negotiations centers on the impact that the proposed facility will have on adjacent natural and human environments. Contracting around this issue requires that parties to the agreement (a) understand what effects are likely, (b) are aware of the safeguards that are available to remedy these effects, and (c) can discern when these safeguards have failed. However, measurement problems can introduce transaction hazards and deter bargaining from accomplishing these goals (Barzel 1982). According to Williamson (1975), all measurement problems are traceable to a condition of information impactedness, i.e., when information is asymmetrically distributed between parties and can be equalized only at great cost. Information can be similarly impacted if it is costly to apprise an arbiter of the true information condition if a dispute arises among equally well-informed parties.

In the context of WFs, measurement problems arise from the inability to effectively relate contractual performance and outcomes. The three conditions listed above that would enable contracts to internalize costs to local residents are likely to be absent (in varying degrees) in the siting of WFs for two reasons. First, information is not symmetrically distributed. Developers have much better information about the likely social, economic and environmental impacts of proposed facilities than do residents of prospective host communities. Public officials and community representatives involved in siting negotiations frequently complain that they lack sufficient information to make informed decisions. There is also a

¹² This is true even factoring the environmental groups into the social-surplus equation. We recognize that certain environmental groups would enjoy more utility if there no facility were built at all, but these preferences diverge from those belonging to the host community, who could be better off under transfer payments and a credible agreement.

general suspicion that the information which is provided is selective at best and intentionally misleading at worst, meaning that information asymmetry is exacerbated by unaligned incentives to share information (OBS 1983, Bacow 1982, Suskind 1996).

Second, the complexity and uncertainty associated with WFs makes leveling the information playing field very costly. WFs operate in a highly complex setting. Understanding and evaluating the risks that these facilities may pose to surrounding environments is a complicated process about which there is significant scientific disagreement (Wiener & Graham, 1995). Thus, the general public is frequently left unable to evaluate for itself the likely effects of a proposed facility or make sense of the technical and often contradictory analyses of others. Even if one could gather a scientific consensus regarding the potential effects of a given facility, long latencies, uncertainty regarding causation, and numerous potentially liable parties make it difficult to definitively link the activities of a WF with a particular outcome.

For transactions in which these two features are prominent, it is difficult to describe fully and accurately the responsibilities of each party in the contract ex ante and to assess whether these obligations have been fulfilled ex post. Consequently, parties to the contract have opportunities to engage in the strategic withholding of critical information or to engage in efforts to evade performance. A developer, for example, may fail to disclose information about adverse consequences of a proposed project or understate the probability that an adverse event will occur in order to decrease the compensation payments required to secure the support of a prospective host community. Likewise, host community residents may file false claims against a facility in order to extract compensation or achieve desired changes in the facility's operations.¹³ Furthermore, even if all parties dutifully fulfill their contractual obligations, the mere possibility of each party acting opportunistically gives negotiating partners reason to

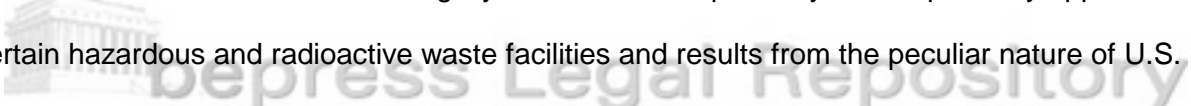
¹³ Aspects of environmental law make it easier for these superfluous suits to actually get to court. Under Section 107(a) of the Comprehensive Environmental Response, Compensation and Liability Act, for example, liability for the release of a hazardous substance is based on strict liability and requires no element of causation. See Sullivan (1995) for a discussion of the consequences of this provision.

worry and not to trust the bargaining process. In sum, the essential nature of the information that is critical to siting WFs creates hazards that hinder parties from making credible agreements and thus deter efficient bargaining.

3. Asset Specificity. A third hazard that appears to have important organizational implications in the siting process is asset specificity. These hazards arise because constructing WFs requires investments in assets that are nonredeployable, so developers will be hesitant to begin a project before safeguards can protect the specific investment.

Three types of asset specificity appear to be present. The first is traditional physical asset specificity that is common to the TCE literature (Klein, Crawford, & Alchian 1978). Investing in plant equipment for waste disposal may have few alternative uses, so local residents or other parties may perceive opportunities to extract quasi rents by threatening legal intervention or other hold-ups. Second, site specificity may be important for several of these facilities. Hazardous and solid waste facilities are often sited in a particular region in anticipation of taking most of their input from nearby local waste producers (Boerner & Chilton 1996). Once the investment has been made, the developer is essentially locked into a relationship. This resembles a “cheek-by-jowl” relationship that exists with certain coal-fired electric generation facilities which are sited next to specific mines from which the majority of their coal will be extracted (Joskow 1985, 1996). In these cases, local interests may attempt to capitalize on the inability of these facilities to easily relocate. Protestors can move to block either the facility’s operation or the flow of waste it needs to remain profitable, thus creating two serious credibility concerns that a developer would want to preempt during the early stages of negotiation.

A third type of asset specificity – though one not previously mentioned in the TCE literature – could be described as legally-induced asset specificity. This specificity applies to certain hazardous and radioactive waste facilities and results from the peculiar nature of U.S.



environmental law. Under Section 107(a) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), a current landowner is jointly and severally liable for environmental damages caused by facilities on the land. This liability is imposed regardless of whether the landowner had any involvement in handling solid or hazardous waste on the site or whether such substances were disposed at the facility during his period of ownership (Sullivan, 1995). As a result, once the treatment and disposal of hazardous substances has begun at a site, the site's owner will have difficulty finding new buyers who are unafraid of the threat of liability. In turn, the value of the property in its next best use is significantly reduced.¹⁴

Under each type of asset specificity, the scope of opportunism is expanded. Because their investments have discretely lower value in alternative applications, developers are effectively isolated from alternative trading opportunities and quasi-rents are thus created. Efforts to capture these rents are a source of contractual hazards. When asset specificity is combined with additional hazards posed by measurement difficulties and negotiating externalities, governance mechanisms that facilitate exchange take on added importance.

III.3 GOVERNANCE MECHANISMS

Regulatory strategies arise to address these hazards, and states have developed a diverse array of regulatory forms to address both the different elements of the siting process and the siting of different facilities. Consequently, a diverse assortment of regulations is available for review.

Critical to the TCE conception of governance mechanisms is the notion that institutions vary in their attributes, particularly along the dimensions of incentive intensity, administrative controls, and adaptation performance (Williamson 1996).¹⁵ Governing institutions can be

¹⁴ For a discussion of the difficulties posed by CERCLA liability for selling abandoned hazardous waste TSDFs, see Rubin (1997).

¹⁵ TCE also dimensionalizes governance according to contract law. Each of the regulatory mechanisms discussed here fall under the same contract law regime, neoclassic contract law. Faced with the prospective breakdown of

differentiated along a spectrum ranging from markets (with high incentive intensity, low administrative control, and autonomous adaptation) to hierarchies (with low incentive intensity, high administrative control, and coordinated adaptation). Equally as significant, this spectrum includes numerous hybrid governing mechanisms that employ both market and hierarchical elements. As was noted earlier, recent work by Williamson (1999) and Dixit (1996) has likened regulation to a hybrid mode of governance that lies within the market-hierarchy extremes. Moreover, regulations are not restricted to only one organizational form but instead embody a diverse collection of governing relationships.

Some scholars, consistent with TCE terminology, have differentiated among and between assorted regulations according to the degree of institutional intervention they impose, i.e. how comparatively “market” or “hierarchical” they are. These labels can be applied by applying traditional TCE distinctions: market regulation exhibits a greater degree of incentive intensity, less administrative control, and more autonomous adaptation as compared to hierarchical regulation. Such characterizations of regulation, for example, are akin to distinctions drawn between incentive regulation, where government intervention could be said to assist the operation of the market while market mechanisms remain the primary forces that organize exchange, and command and control regulation, where government intervention is more direct and bureaucratic power is the primary force that organizes exchange (Baron 1995, Weidenbaum 1995). State siting regulations for WFs likewise occupy this spectrum of variance, exhibiting both market and hierarchy attributes to varying degrees, and they accordingly range from comparatively market-oriented regulations to comparatively hierarchical regulations. We distinguish three broad categories of siting regulation -- information enhancing, process enhancing, and market substituting -- and we discuss each in turn according to their location along this market-hierarchy spectrum.

relations, additional governance structures (i.e. government regulation) are instituted to facilitate gap filling, dispute resolution and adaptation.

1. Information Enhancing Regulations. The purpose of information enhancing regulations is to mitigate the hazards brought on by the information impactedness and measurement problems that were discussed above. They are designed to facilitate a complete exchange of information between negotiating parties and to force the disclosure of private information when such information is deemed to be valuable to the opposing side. They also imbue the exchange of information with greater credibility since parties are disclosing knowledge to comply with regulatory standards and not for negotiation posturing.

These regulations are comparatively “market” oriented since they are intended to support or provide added structure to market interactions. Information enhancing regulations are designed to fully inform the market players or to alter the incentives that these parties face. The regulations do not dictate how firms or private parties should behave in a given instance, and the relevant exchange is still controlled by the market players themselves. Three important examples of information enhancing regulations that affect the siting process are:

- Environmental Impact Statements (EIS) -- The National Environmental Policy Act, enacted in 1969, requires that any federal action that significantly affects the human environment must be accompanied by an impact statement. Most states have enacted similar statutes that expand the number of projects that require an impact statement -- typically any project requiring a state subsidy or permit. The primary purpose of EISs is to increase the availability of information concerning new projects.¹⁶
- Determination of Need Statements -- A number of states require that developers provide a detailed statement of why a proposed facility is needed, alternative sites that were considered, and the justifications for picking a particular site.
- Demand and Supply Forecasts -- These statements, which may or may not be part of a determination of need statement, require that developers forecast the expected demand for a facility’s services and how the facility will meet that demand.

In addition to serving as vehicles for information exchange, however, these information enhancing regulations also serve as common tools of opposition, serving as effective means for delaying construction of an undesired facility. In other words, for some transactions, invocation

¹⁶ In addition to providing information to parties in siting negotiations, EISs have also become tools of opposition. EIS challenges are among the most effective means of delaying the construction of an undesired facility. This view of EISs lends support to the PPT view of regulation discussed in section II.

of these regulations may reflect intractable negotiating hazards instead of efforts to mitigate hazards. For such transactions, information enhancing regulations may be insufficient in supporting efficient negotiation, and more hierarchical regulations, such as those we review below, may be required.

2. Process Enhancing Regulations. Process enhancing regulations are rules that affect the process in which parties to a siting agreement negotiate. These regulations generally entail added state involvement in shaping how negotiations take place, thus making them more hierarchical than information enhancing regulations, but primary decision-making authority remains in the hands of the developer and the local negotiating parties, making these regulations largely market-oriented. Three prominent examples of this type of regulation are:

- **Formal Declaration of Parties** -- These regulations create local negotiating committees that represent parties affected by a proposed facility. They are designed to ensure comprehensive representation of local interests, and they grant legal standing to a representative body that is authorized to negotiate with a developer. These regulations can mitigate negotiation externalities by precluding the option of individual negotiations and forcing collective bargaining.
- **Public Participation Measures** -- These regulatory measures are designed to allow broad (beyond the local negotiating committee) public involvement in the siting process. Specific public participation measures include public hearings, public representatives on siting and oversight boards, and "public counsels," who are appointed by the state to represent the public in licensing and permitting proceedings.
- **Negotiation / Arbitration Regulations** -- These are regulations that provide added structure to the negotiations between developers and community representatives by specifying the timing of negotiations, penalties for refusing to negotiate in good faith, and specific dispute resolution mechanisms (such as binding arbitration before a state appointed arbitration board).

3. Market Substituting Regulations. The third broad category of siting regulations is market substituting regulations. These regulations are the most hierarchical of the three categories and, unlike information and process enhancing regulations, they provide the state considerable power to preempt negotiations between developers and the local siting committee or overturn decisions made at the local level. Regulatory measures in this category essentially substitute local decision-making with state mandates and, in TCE terminology, are

characterized more by administrative controls than by incentive intensity. Two important examples of market substituting regulations in this context are:

- State Overrides -- These measures provide a state agency with veto authority over decisions made at the local level. Overrides provide the power of reversal only after decisions have been made at the local level (OBS 1983; Morell & Magorian 1982).¹⁷
- State Inventories and Ownership -- Under these measures, state officials are given the authority to inventory sites that are suitable for socially desirable facilities and to complete as much of the review process as possible before a developer expresses interest. The goal is to complete a significant part of the siting process without provoking local opposition, thus protecting a developer from a political fight. In a few states, officials not only review and inventory acceptable locations but also purchase the properties. Developers then enter into negotiations with the state in order to purchase the land and begin construction.¹⁸

To summarize, the potential hazards posed in siting WFs have led to the development of a host of regulatory mechanisms. The primary purpose of these mechanisms is to facilitate cooperation in the siting of these locally undesirable but socially beneficial facilities. While a variety of different state regulatory instruments have been employed, it is analytically useful to categorize these measures as information enhancing, process enhancing, and market substituting. Our TCE analysis of these regulations places each category along a market-hierarchy spectrum: market substituting regulations are the most hierarchical of this group, information enhancing regulations are the least hierarchical, and process enhancing regulations occupy the intermediate place along the spectrum.

III.4. DISCRIMINATING ALIGNMENT

The fundamental hypothesis of TCE is that transactions, which differ in their attributes, are aligned with governance structures, which differ in their costs and competencies, in a

¹⁷ Exercising these regulations does not necessarily remove the developer's incentive to negotiate with the host community. These regulations certainly raises the developer's reservation option, and consequently may change the content of these negotiations, but developers may still find value in entering into negotiations with community leaders (thus giving concurrent roles to other, less hierarchical regulations),

¹⁸ It is important to point out that the use of state inventories does not imply that the local community is helpless to oppose undesirable facilities. Rather, these measures simply remove an important piece of the siting process from local control. Often overrides and inventories are combined with some form of negotiations between the developer and the local community.

discriminating (mainly, transaction-cost-economizing) way (Williamson, 1996). With respect to WFs, TCE predicts that siting transactions, the attributes of which pose differential hazards, will be accordingly aligned with regulatory mechanisms, which differ in their ability to remedy these hazards.

This paper identifies four types of WFs: solid waste landfills, solid waste incinerators, hazardous waste treatment facilities, and hazardous waste storage and disposal facilities. The siting of each of these facilities represents a unique transaction -- the problems and issues that arise in relation to siting a landfill are different in important ways from the issues surrounding the siting of a hazardous waste site. Each of these unique siting transactions has associated with it attributes that pose potential hazards to the relationship between the developer and the host community. These attributes, which include negotiation externalities, measurement problems, and asset specificity, differ across siting transactions.

After reviewing the literature associated with these various types of facilities, we attempt to quantify the presence of these hazards in each of the siting transactions noted above.¹⁹ First, siting each facility requires a developer to attempt to negotiate with a collective of different parties, so each project will experience negotiating externalities. There is, however, more differentiation in the degree of measurement problems and asset specificity that each of the different facilities exhibit. Solid waste landfills present measurement problems in that they pose threats of seepage into water systems, odor, and other environmental dangers, but landfills generally deal with non-hazardous materials, so the risks to human health and the environment are relatively low. In addition, those risks that do exist can be assuaged by using fairly simple technologies, and the transparency of the activities performed at landfills makes monitoring relatively simple. Solid waste incinerators pose a greater degree of measurement problems

¹⁹ The following sources were reviewed: Kirk-Othmer Encyclopedia of Chemical Technology 4th ed., 20 (1996), Albert (1996), Office of Technology Assessment (1989), Blomquist (1974), Streeter (1979) and Payne (1987). Also consulted are notes from a colleague's visits to solid and hazardous waste sites taken between January and

than landfills since they produce particulates and other air pollutants of varying dangers. However, with appropriate technology (which, incidentally, also can be hard to measure), air discharges from these facilities can also be monitored, and solid waste incinerators also deal mostly with non-hazardous materials. Hazardous waste treatment facilities and hazardous waste disposal facilities pose the greatest measurement problems. These facilities treat materials that genuinely do pose environmental risks, and they pose threats through a variety of media (e.g. air, water, ground) that are hard to monitor and detect. There also are often long latencies between a facility's actions (e.g. an accidental spill) and health or environmental outcomes, so the impact of these facilities is largely uncertain and difficult to prove.

Asset specificity plays a role in each of these facilities as well. Physical asset specificity is relatively low for landfills and solid waste incinerators as investments are typically generic and redeployable. Landfills, for example, are routinely covered and made into parks, parking lots, or sold for industrial development. These facilities generally are, however, built to service specific customers in the region and thus possess site specificity. Hazardous waste treatment facilities similarly contain both physical and site specificity, but probably to a similar degree to landfills and incinerators. Hazardous waste storage & disposal facilities contain the greatest asset specificity, as rigorous zoning requirements impose severe limitations as to where these may be sited, and hazardous materials preclude these sites from being employed for an alternative use.

In sum, we approximate that landfills have low measurement hazards and moderate asset specificity, solid waste incinerators have moderate measurement hazards and moderate asset specificity, hazardous waste treatment facilities have high measurement problems and moderate asset specificity, and hazardous waste storage and disposal facilities have high measurement problems and high asset specificity. We place these four facilities in Appendix

March 1995. It must be stressed, however, that these are only preliminary estimates of hazards and are therefore only roughly comparative.

Figure 2 according to their relative hazards, varying asset specificity along the X-axis and measurement problems along the Y-axis. Since the discriminating alignment hypothesis predicts that transactions that pose added hazards will require additional governance mechanisms, this TCE analysis hypothesizes that landfills and solid waste incinerators will require less hierarchical regulations than will hazardous waste treatment or storage and disposal facilities in order to achieve efficient outcomes. Given the above description of the alternative regulatory mechanisms, one could expect that the siting process for landfills and incinerators should be governed primarily by information enhancing and process enhancing regulations. Alternatively, the siting process for hazardous waste treatment facilities and storage and disposal facilities will likely require additional supports and should, therefore, employ process enhancing and market substituting regulations. These hypotheses are embodied in the diagonal dotted lines in Appendix Figure 2. We construct Figure 2 to summarize these predictions and to graphically illustrate how increasing hazards (along either the X-axis and Y-axis) should prompt increasingly hierarchical governance mechanisms. Certainly, our hypotheses are not limited to two dimensions, and the exercise of aggregating the cumulative hazards associated with a certain transaction can continue as additional hazards are incorporated into the analysis. For example, one can imagine three-dimensional Figure 2 (which would look like a pyramid on its side) that measures three different hazards along axes X, Y, and Z and places increasingly hierarchical regulations in the three-dimensional spaces that expand away from the origin. Considering more than two hazards involves the same approach used in the two-dimensional analysis (though hazards may need to be weighted differently), and the central feature in Figure 2 is that it diagrams the additive nature of incorporating different hazards into the TCE analysis.

SECTION IV: PRELIMINARY EVIDENCE

The primary purpose of this paper is to develop a TCE approach to understanding siting regulations. While a formal empirical test of the predictions developed here is beyond the scope of this introductory paper, the selected case studies below illustrate how the regulatory governance mechanisms discussed in the sections above can support the siting of socially desirable facilities or, when either absent or inadequately designed for the nature of the intended transactions, fail to support siting such facilities. We note that this approach does not assume ex-post efficiency. In other words, some regulations, whether from poor policy making or other limited judgments, are actually inappropriately aligned with the transactions they are intended to govern. We believe that this is a fair assumption. While the difficulties in siting WFs have seriously impeded necessary projects for approximately 30 years, few states have experimented with process enhancing regulations that facilitate siting negotiations, and there are insufficient competitive forces to drive optimal regulatory outcomes. This is partly because the political process is not a market with a “free-entry” condition, and feedback mechanisms to address inefficient policies are rarely effective. Consequently, we assume that there are regulatory “misalignments” that lead to Pareto inferior results, and examining both regulatory successes and failures can inform how regulatory devices can govern particular economic activity in a transaction-cost minimizing way.

IV.1. THREE CASE STUDIES

While examining case studies is restricted to small sample sizes and thus may not support any generalizability of the TCE hypothesis, a careful analysis of specific instances where siting WFs encountered political opposition can serve some important purposes. First, it illuminates the microanalytic dimensions of the siting process and reveals the specific hazards of an individual transaction: what concerns local residents, how concerns translate into political pressures, and how negotiations between conflicting parties progress (or fail to progress).



Second, it illustrates both the role regulation plays, when present, to support the transactions and the consequences that ensue when adequate regulation is not present. And third, a case-study examination of assorted disputes in different municipalities introduces variation in both the type of transaction and the nature of the regulatory regime. The three case studies below each present a different pairing of a NIMBY project with a governance mechanism: the first is an effort to site a solid waste incinerator under a regime of only information enhancing regulations; the second is a landfill project under a regime of information enhancing and process enhancing regulations; and the third is a hazardous waste facility being sited under information enhancing and process enhancing regulations. The success of the second and the failures of the first and third yield some interesting conclusions that support our hypotheses.

1. Philadelphia 1988. Throughout the late 1980s, landfills were being closed across the Northeast and major urban centers were facing waste disposal crises. By 1988, Philadelphia, perhaps more than any other city, was facing a severe disposal crisis. Disposal costs per ton had nearly tripled since 1983, and low capacity in nearby landfills forced the city to dump much of its solid waste in sites as far away as Columbus, Ohio.^{20 21} The city frantically searched for new sites. One proposal tried to persuade the city of Houston to accept some of its solid waste, other attempts propositioned sites in Virginia, South Carolina, and Georgia.^{22 23} Meanwhile, a barge named *The Khian Sea* carrying 14,000 tons of Philadelphia's waste had been roaming the seas for nearly two years searching for a dumping site.²⁴

Some cities began to increasingly rely on trash incinerators, which could reduce the volume of solid waste by as much as 90%.²⁵ Philadelphia at the time had two operating trash

²⁰ "Where Will We Put All That Garbage?" *Fortune*, 4/11/88.

²¹ "Houston Fights Proposal to Import Philadelphia Trash." *Reuters*, 2/3/88.

²² "Trash Disposal Crisis." *LA Times*, 9/2/88.

²³ "Trash Disposal Problem Besieging Philadelphia." *NY Times*, 2/20/88..

²⁴ *ibid.*

²⁵ *LA Times*, 9/2/88.

incinerators, but they operated on outdated technology, were known to be environmental hazards, and had prompted 20 years of demands for their closure.²⁶ The city's administration, as Mayor W. Wilson Goode began his second term in January 1988, proposed construction of a new "trash-to-steam" facility that would replace the two older incinerators. The proposal was designed to address the waste disposal crisis while bringing better, more environment-friendly technology to trash disposal. Deputy Mayor Marjorie Adler, testifying on April 13, 1988 before the Philadelphia City Council, argued that the new trash incinerator would stabilize the city's long-term trash disposal costs by reducing its dependence on expensive landfills while minimizing the environmental and health costs associated with trash incineration.²⁷ Addressing these health concerns, the administration cited a panel of medical experts who determined that the health effect of emissions from the proposed plant would be equal to "one person smoking two cigarettes or drinking two Diet Cokes in a lifetime."²⁸

The trash-to-steam proposal would seem to be able to generate an increase in overall surplus, making it potentially Pareto improving. It would have reduced overall incinerator emissions while disposing more solid waste and reducing expenses on waste disposal. Indeed, one poll showed that most Philadelphians favored the project for the new incinerator, and support was as high as 70% in many neighborhoods.²⁹ However, the siting process devolved into a classic NIMBY political battle as a vocal Trash-to-Steam Alternative Coalition emerged from the South Philadelphia neighborhood near where the proposed facility would be sited. The coalition flexed its political muscle before city council and brought a "foot-stomping, sign-waving" gang of citizens to the Council's hearings.³⁰ They mounted what one administration official called "as fierce opposition as anyone could imagine."³¹

²⁶ *Fortune*, 4/11/88.

²⁷ "It Was Familiar Opposition to a Familiar Proposal." *Philadelphia Inquirer*, 4/14/88.

²⁸ *NY Times*, 2/20/88.

²⁹ "Trash: The Boomerang's Back." *Philadelphia Inquirer*, 4/18/88.

³⁰ *Phila Inquirer*, 4/14/88.

³¹ *LA Times*, 9/2/88.

Because the project required the city to offer a bond issue to raise the necessary capital funds, the project needed City Council approval. It did not benefit from an expedited regulatory siting mechanism and instead needed to pass through the open political process. Consequently, as the administration attempted to enter into negotiations with interested parties, local opposition rounded up Councilmembers to block the proposal. One of South Philadelphia's advocates continued to rail against the proposal, threatening "to fight this thing until I'm not here anymore," and other members joined suit.³² The opposition expressed itself through adamant neighborhood groups, grandstanding politicians, and public interest representatives. The diversity of interests involved in the opposition created further difficulties for the administration to negotiate a settlement, making coordinated bargaining substantially more difficult, and talks continued fruitlessly into the summer. Mayor Goode eventually resigned to call the plan "dead" on July 27, 1988 and bitterly noted that residents will consequently face higher trash disposal bills.³³

Why was the administration unable to mobilize its majority support and reach a negotiated settlement with the South Philadelphia residents? Much of the answer lies in the hazards inherent in siting waste incinerators. Jerome Balter, a spokesperson for opponents of the project, accused administration officials of misrepresenting the plant's safety standards.³⁴ Other opponents often cited many other potentially harmful effects incinerators may cause -- airborne dioxins, particulates, and ash -- despite the noted improvements in incinerator technology. As one industry expert observed, "it's very clear that the technologies for new plants are a lot better, but it always comes down to a value judgement. Building up public confidence is a very critical factor."³⁵ In short, the complexity of the information, or information impactedness, presented contracting hazards in the negotiations and impeded efficient

³² *Phila Inquirer*, 4/14/88.

³³ "Philadelphia Mayor: Trash-to-Steam Plan Dead." U.P.I., 7/27/88.

³⁴ *Phila Inquirer*, 4/14/88.

³⁵ *LA Times*, 9/2/88.

bargaining from arriving at a resolution. These hazards were further complicated by negotiating externalities, which impeded coordinated negotiation and any serious attempt to address specific concerns.

The Philadelphia case is one where a new incinerator was likely to be potentially Pareto improving, but contracting difficulties caused the proposal to fall victim to the political process. Were a more hierarchical governance mechanism to support the siting process, like the one used in the following case study, Philadelphia may have been able to address its waste disposal crisis with a new incinerator.

Dane County, Wisconsin 1992. Though the Madison, WI metropolitan area was not experiencing a waste disposal crisis quite like Philadelphia, the Wisconsin Department of Natural Resources (DNR) forecasted that municipalities in Dane and surrounding counties would need new landfill space soon.³⁶ In response to anticipated rising demand, Browning-Ferris Industries (BFI) proposed to expand its Madison-Prarie landfill from 22 to 44 acres and to accept municipal waste in addition to the industrial waste it then received.

Opposition immediately emerged. Local residents feared traffic congestion, odor, and damage to local enterprise. Further worries came from the nearby Dane County Regional Airport, which feared that the landfill would attract additional birds and bring danger to planes using their runways. The most vocal opponent was American Family Insurance, whose corporate headquarters were 4,700 feet from the planned expansion. American Family brought a suit against BFI and organized protests at the Wisconsin State Capitol.³⁷

Nonetheless, the DNR conducted an environmental impact statement and declared the proposed expansion to be safe.³⁸ Yet this did little to allay opponents fears. Citizens first argued that the DNR's report was incomplete since it did not consider the "economic and social

³⁶ "Landfill Expansion Approved; Opponents to Continue Fight." *Wisconsin State Journal*, 2/8/92.

³⁷ "Landfill Foes will Protest at Capitol." *Capital Times*, 3/12/92.

impact the larger landfill would have on the nearby community.”³⁹ In addition, American Family disputed the results of the DNR study arguing it overlooked the severity of contamination caused by a nearby landfill that would be exacerbated by the expansion, though BFI countered that new technologies in lining landfills would preclude seepage and consequent contamination of local groundwater.⁴⁰ As opposition grew throughout the spring, the DNR eventually bowed to public pressure and released a second study in June 1992 admitting that the landfill may impose some environmental and economic costs that warrant concern.

When the dispute entered July, little progress had been made. Despite the region’s growing needs for waste disposal, a vocal opposition had organized and vowed to fight the project. Multiple parties opposed the landfill expansion and mounted individual challenges to block its approval, creating negotiating externalities that would complicate any effort to enter into bargaining. Furthermore, environmental impact statements, designed to facilitate information between BFI and local residents, did little to clarify the landfill’s effects and reduce measurement problems. Multiple hazards seemed to preclude efficient bargaining, and one might have anticipated a stalemate similar to what occurred in Philadelphia.

However, Wisconsin in 1980 instituted new siting procedures, consisting primarily of information and process enhancing regulations, aimed to overcome the NIMBY problem (Ruud & Werner 1985). First, the landfill siting process mandates the establishment of a “local committee” of affected municipalities to represent interested parties. This committee becomes the authorized representative for local interests and is the exclusive negotiating partner with the developer. Thus, regulations mandating a local committee preclude opportunities to shirk from negotiations and minimize negotiating externalities. Second, the landfill siting process administers the negotiations between parties and requires them to bargain in good faith or

³⁸ “DNR Calls Madison Prairie Landfill Safe.” *Capital Times*, 2/7/92.

³⁹ “American Family Rips Mad-Prarie Plan.” *Capital Times*, 3/13/92.

⁴⁰ “Foes Cite Toxins by Dump.” *Capital Times*, 3/26/92.

otherwise face binding arbitration or other undesirable consequences.⁴¹ To facilitate BFI's negotiations with the local committee, the Municipal Waste Siting Board, which supervised the negotiations, scheduled public hearings that resemble a court trial where parties are subjected to scrutiny by each other and by state environmental officials. The hearing, scheduled for the mid-fall and to last several weeks, provided an impetus to all parties involved to enter into rigorous negotiations to reach a settlement.⁴²

In mid-October, both BFI and American Family made substantial concessions and pushed negotiations toward fruitful results.⁴³ On February 4, 1993, a creative agreement was finalized. BFI would expand the landfill but only to receive additional industrial waste, thereby not accepting municipal waste that would attract birds that may endanger the local airport. BFI would further pledge not to seek to further expand the landfill, limit the number of daily truck trips, limit the landfill's height, and plant trees and implement other landscaping to minimize the visual and aesthetic impact of the site. BFI would also establish a "neighbor to neighbor" group consisting of members from BFI, American Family, and other interested parties to discuss additional concerns to nearby residents.⁴⁴ Thus, the agreement compromised on environmental, economic, and monitoring issues while still alleviating the region's need for solid waste disposal.

In sum, while numerous elements of the siting transaction may have potentially blocked a final agreement, the siting regulatory process mitigated specific contracting hazards and created a process wherein bargaining led to a final resolution. The Wisconsin regulations are notable in that they employed both market and hierarchical elements. They intervened with information and process enhancing regulations that directed how parties may proceed, but they allowed the resolution to arrive chiefly through market-oriented negotiations. According to the

⁴¹ "Wisconsin's Landfill Siting Process." <http://www.dnr.state.wi.us/org/aw/wm/solid/landfill/>

⁴² "Landfill Firm Rips State About-Face." *Capital Times*, 7/2/92.

⁴³ "Landfill Won't Take Municipal Waste." *Capital Times*, 10/12/92.

⁴⁴ "Madison-Prairie Landfill Deal to Relieve Rodefild." *Capital Times*, 10/13/92.

TCE discriminating alignment hypothesis, this institutional arrangement is comparatively optimal for some transactions – like landfills – where contracting hazards are moderate, but it may not be effective in supporting transactions with greater hazards, as the Massachusetts case illustrates below.

Massachusetts 1990. In 1980, Massachusetts passed regulations that instituted a similar siting process as Wisconsin's, implementing information and process enhancing regulations that were designed to force negotiated settlements between developers and local committees. The Massachusetts law, however, extended to siting hazardous waste facilities in addition to landfills and consequently has exhibited very little success. In the first twelve years the law came into force, five proposals for hazardous waste facilities were offered and none began construction.

Examining the case study of the Clean Harbors proposal can illuminate how the negotiation-based siting process failed in Massachusetts.⁴⁵ In May 1987, Clean Harbors filed its notice of intent to expand its existing hazardous waste transfer station in a highly industrialized section of Braintree, near Boston. The incinerator would destroy some waste on-site rather than transporting it to other facilities as far away as Alabama and Arizona, thus saving significant hauling and disposal costs. In October 1987, in accordance with the siting procedures, the proposal was deemed "feasible and deserving" by the state regulators, and a local committee was formed by nearby municipalities to enter into siting negotiations.

The process continued as planned though the following year, with Clean Harbors completing its initial environmental surveys and satisfying its regulatory obligations. But in September 1989, the local committee decided to withdraw altogether from negotiations with Clean Harbors. So, while Clean Harbors continued to receive approval from the state's environmental regulators and advance through the regulatory process, the local committee

refused to participate in negotiations and instead remained organized to fight the project in the political arena. Gradually, the state politicians responded to local residents' protests. First, the secretary of environmental affairs required Clean Harbors to submit a supplemental environmental impact statement (here likely being used as a delay tactic and not as a device to facilitate information exchange) and later to request permission from additional state agencies. Meanwhile, as the review process slowed during the spring and summer of 1990, local residents solicited Massachusetts' gubernatorial candidates to oppose the plan (all five did so by September 1990). Later that month, additional dissent came from state agencies, and the state's Site Safety Council, which twice before approved the proposed facility, ruled that the project was no longer "feasible and deserving" of state support. Clean Harbors then saw it was losing the political battle and decided not to appeal the decision, ending its effort to expand its facility without ever meeting to negotiate with the local committee.

Why did the negotiation-based process work for a landfill in Wisconsin but not a hazardous waste incinerator in Massachusetts? According to O'Hare & Sanderson (1993), the project failed "because many of the site's neighbors did not believe it could lead to an outcome acceptable to them; partly because the state's political leadership gave neighbors, and the developer, no reason to believe it would protect the siting process or the case for hazardous waste facilities itself from localized attack; and partly because the neighbors simply could not understand the health issues and were at best ill-served by the state agencies concerned with them" (pg. 369-70). This evaluation provides two explanations for the project's failure: first, the process did not ensure a credible commitment to either the developer or the residents that an agreement would be in their interest, or in other words, there was inadequate governance supporting the transaction. And second, the nature of the information was too complex and impacted to make efficient bargaining possible. Siting Wisconsin's landfill may have introduced some measurement hazards and other contracting problems, but siting the hazardous waste

⁴⁵ The Clean Harbors case study is adapted from O'Hare & Sanderson (1993).

facility near Boston created far greater measurement problems and gave rise for greater opposition. The market-oriented regulations broke down because coordinated negotiation could not credibly support a transaction with excessive hazards. This observation is consistent with TCE theory, since transactions laden with such hazards require more hierarchical governance.

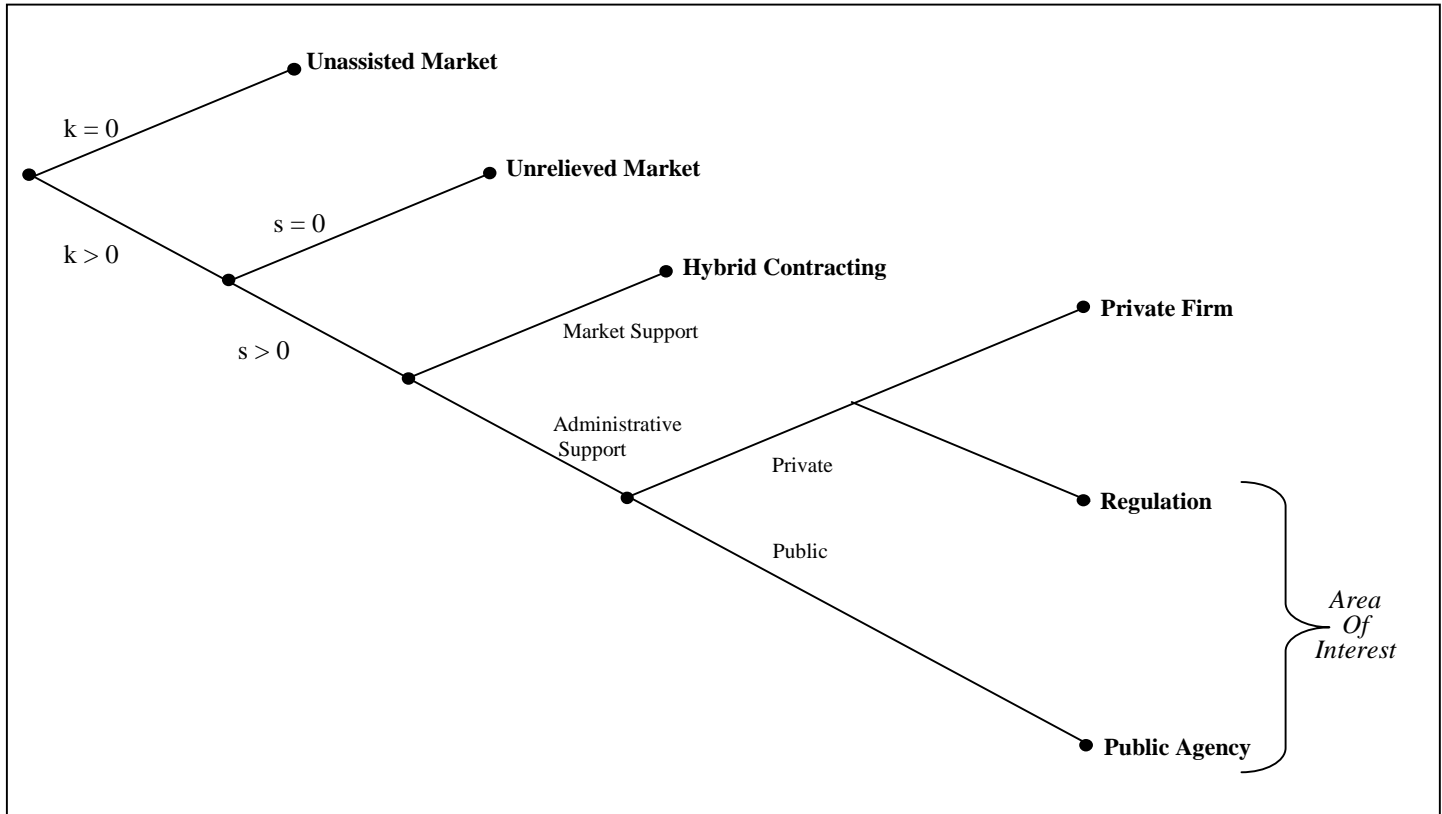
The three case studies, taken together, offer preliminary evidence, and some interesting insights, into the TCE approach to siting regulations. Since siting WFs involve contracting hazards, some kind of governance mechanism is required to support the transaction. Thus, the Philadelphia case study illustrates how an attempt to site an incinerator with only information enhancing regulations led to failure. Alternatively, Wisconsin's information and process enhancing regulation provided sufficient institutional intervention and governance to support negotiations and allowed the project to proceed through comparatively market means. This regulatory regime, however, proved to be appropriate only for certain types of transactions. The same regulations failed in Massachusetts when it attempted to facilitate siting a project that was hampered by greater hazards. According to the TCE discriminating alignment hypothesis, a more hierarchical governance mechanism would be required for hazardous waste facilities.

SECTION V: CONCLUSION

The purpose of this paper is to begin outlining a logic of regulation with respect to the siting of WFs. Unlike existing approaches to the NIMBY problem, which seek to critique and improve upon state siting regulations, this paper seeks to develop a theoretical foundation articulating the functions these regulations are designed to accomplish and which types of transactions they are able to support. Utilizing a TCE framework, the attributes of siting transactions are defined and the costs and competencies of various alternative governance

mechanisms are explored. A discriminating alignment is then posed in which specific siting transactions are matched to governance structures in order to achieve efficient outcomes (i.e. site necessary facilities). A preliminary review of three separate cases suggests that this framework may provide important insights into the use of government regulation to facilitate cooperation between developers and local host communities.

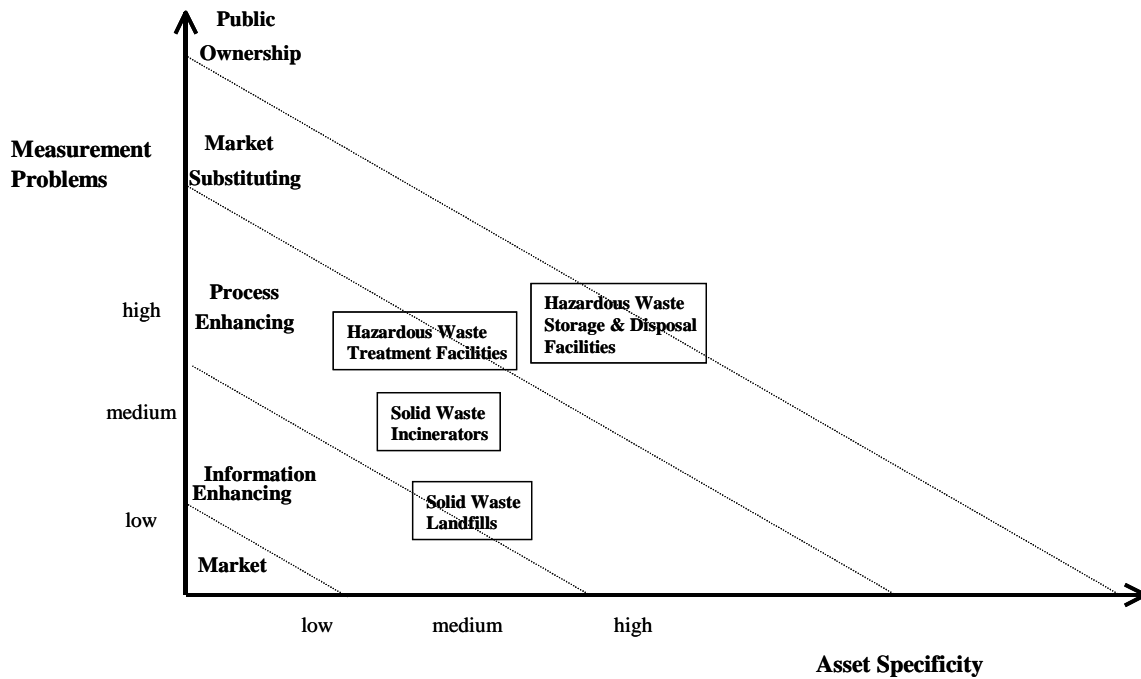
APPENDIX FIGURE 1



Based on Williamson (1999)

APPENDIX FIGURE 2

Waste facilities, with their respective hazards, aligned with their optimal regulatory governance



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