The Costs of Federal Permitting

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It is by now a cliché to observe that it's much too hard to build infrastructure in America. Urban rail is three times as expensive per mile as it is in other developed countries (Goldwyn et al. 2023). The buildout of solar fields, wind farms, and high-voltage transmission lines, all urgently needed for the climate transition, has been slow and uneven (Jenkins et al. 2022). A major tunneling project in Massachusetts, the Big Dig, took almost a decade longer and cost several times as much as originally anticipated (Greiman and Warburton 2009). Even highway construction is more expensive than in peer countries (Brooks and Liscow 2023).

Critics of America's approach to infrastructure development have identified federal permitting as a key chokepoint. Most major infrastructure in the United States must navigate a thicket of procedural laws, including the National Environmental Policy Act, the National Historic Preservation Act, the Clean Water Act, and the Endangered Species Act. Compliance can entail years of study and intensive public participation, followed by unpredictable back-end judicial review. As those criticisms have gained traction in recent years, Congress has taken a few modest steps to reform federal permitting. Today, it is considering going much further.

What do we know about the effects of federal permitting laws on the pace and cost of infrastructure development? Would amending those laws spur the construction of more infrastructure and, if so, to what extent? This paper collects the available evidence on these

questions, offers a tentative assessment of what that evidence shows, and identifies gaps in our understanding.

The chief conclusion is that several converging lines of evidence, taken together, offer strong support for the claim that federal permitting is a substantial drag on infrastructure development. Environmental reviews have become both protracted and expensive, sometimes ludicrously so. Litigation is both risky and routine, imposing both direct costs (if the project is stopped in court) and indirect costs (bulletproofing environmental reviews, hedging against timeline risk, avoiding litigation-prone projects). Developers consistently report that permitting weighs heavily on decisions about when and whether to invest. Studies of state permitting laws confirm that they can impose very large burdens. And the costs of American infrastructure spiked around the same time that the federal permitting regime came into force.

The available studies, however, do not allow for a reliable estimate of the burdens of federal permitting laws. Because individual projects differ from each other along so many margins on which permitting may operate—geography, political support, state permitting, project complexity, local opposition, and more—it is exceedingly difficult to isolate the effects of federal permitting. Even carefully designed comparisons of different infrastructure projects cannot account for projects that are never proposed or are proposed in altered form in anticipation of permitting-related burdens. And if all the permitting laws were repealed tomorrow, government officials might still do many of the things that those laws require, either voluntarily or because of independent legal obligations, further complicating efforts to isolate their marginal contributions to project cost. With few exceptions, existing studies of permitting burdens do not even try to overcome these obstacles.

The evidence does suggest, however, that the bulk of the costs of the federal permitting regime stem from the defensive measures agencies and developers take to guard against the risk of a bad outcome in court. That insight allows for a rough evaluation of the likely effects of popular permitting reform ideas. Some—including popular ones like time limits and statutes of limitations—are unlikely to accomplish much. Only those reforms that change the incentives created by the risk of judicial review will meaningfully move the needle.

I. What Is "Permitting Reform"?

Legal rules prohibit many productive activities—the distribution of drugs in interstate commerce, for example, or the provision of legal services or medical care—in the absence of government say-so. To allow those activities to proceed, federal, state, and local governments issue innumerable permits, licenses, and approvals. In the abstract, "permitting reform" could cover any or all of them.

In fact, the debate over permitting reform is not nearly so expansive. It concentrates, instead, on a subset of *generally applicable federal procedural statutes*. Once triggered, these laws require agencies to follow certain procedures to make sure that they account for specified public values, backed up by judicial review. Major infrastructure projects tend to trigger these laws because the federal government usually plays a role in their development.

The National Environmental Policy Act of 1969 is emblematic. NEPA requires federal agencies to issue "a detailed statement" canvassing the environmental effects of "major Federal actions … significantly affecting the quality of the human environment."[1] The law covers not only actions led by federal agencies but also those for which private parties need a federal permit. NEPA

[1] 42 U.S.C. § 4332(2)(C).

contains no substantive obligations—it does not require agencies to mitigate the environmental harms of their actions or to select the least environmentally damaging alternative. It just requires agencies to think before they act.

Other federal statutes are similar. The National Historic Preservation Act, for example, requires federal agencies to "take into account the effect" of any undertaking "on any historic property."[2] The capaciousness of the definition of "historic property"—"any prehistoric or historic district, site, building, structure, or object … eligible for inclusion on … the National Register, including artifacts, records, and material remains relating to the district, site, building, structure, or object"[3]—means that NHPA is frequently triggered.

Some laws contain both substantive and procedural features. The Clean Water Act's most important substantive provision, for example, directly regulates the discharge of pollutants. But sections 401 and 404 are mainly procedural in nature. Under section 401, applicants for federal permits or licenses for activities that "may result in any discharge" into the waters of the United States must secure a water-quality certification from officials in the state where the discharge would occur. States have wide discretion to deny certification or attach conditions, giving rise to especially serious challenges for projects that span multiple states and must therefore secure multiple approvals. Under section 404, a permit is necessary before any person can discharge "dredged or fill material"—gravel, rocks, or soil—into the navigable waters of the United States. Because navigable waters include many wetlands, and because wetlands cover more than 5% of

[2] 54 U.S.C. § 306108.

[3] 54 U.S.C. § 300308.

the contiguous United States,[4] many infrastructure projects need section 404 permits from the U.S. Army Corps of Engineers.

The Endangered Species Act similarly blends process and substance. The ESA's most important substantive rule prohibits the taking of endangered species. But section 7 also requires all federal agencies to consult with the U.S. Fish and Wildlife Service to "insure that any action authorized, funded, or carried out by such agency … is not likely to jeopardize the continued existence" of any listed species, including through modifications to their critical habitat.[5] The consultation process can contribute to lengthy delays.

These federal permitting statutes do not operate independently. A project that is otherwise entirely private might need a federal permit for a relatively minor activity. One common trigger, for example, is adding fill material to a wetland. A developer must then secure a permit under section 404 from the Army Corps, which then triggers NEPA and NHPA review, as well as ESA consultation if an endangered species may be affected.

What unites these laws is their open-endedness and their associated vulnerability to litigation. Obligations to consider and consult have no clear stopping point. Agencies can always evaluate more alternatives, solicit more feedback, and engage more experts. Because the rules governing standing—who is allowed to sue—are very generous, a wide array of parties can sue over countless alleged deficiencies. Compliance with permitting laws is then enforced through the Administrative Procedure Act, which makes all final agency actions presumptively reviewable. Under the APA, courts are supposed to set aside an action that is judged to be "arbitrary and

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[4] U.S. Fish and Wildlife Service, "Wetlands," https://www.fws.gov/initiative/protecting-wildlife/wetlands.

[5] 16 U.S.C. § 1536(a)(2).

capricious."[6] Though arbitrariness review is meant to be deferential, judges are also expected to undertake a "searching and careful" review of the agency's explanation.[7] Because the standard is so elastic, it's hard to know in advance how a judge will rule in any given case. Will she say that the agency should have considered an alternative that it ignored? Will she demand further investigation into risks that the agency deemed small? From the perspective of a federal agency leading an infrastructure project, or a private developer that needs federal approval for such a project, the prospect of unpredictable back-end judicial review of every aspect of their decision-making creates serious risks. Agencies hedge against those risks by trying to bulletproof their decisions and minimize a project's disruptive effects.

II. Methodological Challenges

A. Costs

The costs of federal permitting statutes are sometimes assumed to be the time and resources devoted to direct compliance—how long it takes to draft an environmental impact statement, for example, or the costs of hiring consultants. For infrastructure projects, however, the indirect effects of permitting laws (and the associated risk of judicial review) on the selection, scale, and mitigation of infrastructure projects are likely more significant. Legal risk also amplifies non-legal risk, as when court-induced delays lead to loss of support from key officials, a shift in interest rates, or a change in government policy. At the limit, the costs associated with federal permitting laws may make some projects, or entire categories of projects, so untenable that they are never even proposed.

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[6] 5 U.S.C. § 706(2)(A).

[7] *Citizens to Preserve Overton Park v. Volpe*, 401 U.S. 402, 416 (1971).

The myriad channels through which federal procedural laws affect project costs make it hard to isolate their effects. Ideally, researchers would compare many otherwise-identical projects, some of which are subject to federal permitting laws and others of which are not. Any gap in costs and duration could then plausibly be attributed to those laws. But because federal laws are uniform and major infrastructure projects are not easily comparable, that experiment is difficult to run.

Further complicating matters is that agencies may have independent reasons to do what permitting laws require. Permitting laws, for example, are often understood to require community consultation. If that requirement were eliminated, private developers and federal agencies might still conduct community outreach, both because feedback is useful for its own sake and to limit political risk. In addition, state and local permitting laws may impose procedural requirements on infrastructure projects. At least some of those requirements may duplicate federal standards. It is thus difficult to predict in advance whether and to what extent a change in federal law will provoke changes in behavior.

The point runs deeper than is commonly appreciated. In probing the arbitrariness of an agency's rationale, the courts will ask, among other things, whether the agency has reasonably evaluated the science, considered plausible alternatives, and addressed meaningful objections. Agencies would be subject to that scrutiny even in the absence of federal permitting laws. To the extent that federal permitting laws simply require agencies to consider factors that any reasonable agency would have considered anyhow, eliminating those procedural obligations, without addressing judicial review, will not affect agency behavior.

To make the point concrete, consider NEPA. How far does an agency have to go in evaluating environmental impacts? The courts have held that "inherent in NEPA and its

implementing regulations is a 'rule of reason.'"[8] Agencies don't have to study every conceivable environmental effect or every possible alternative; they just need to explore the reasonable ones. But they would have the same obligation *even if NEPA did not exist*. Agencies would have to act reasonably with respect to the environment because the APA requires them to act reasonably on all matters (Bagley 2025).[9]

To be sure, federal permitting laws attune both agencies and courts to specific areas of heightened concern and provide a focal point for judicial review. Repealing NEPA, for example, would probably make a difference to cases challenging the content of environmental reviews. Just how much, however, is hard to say, and by any measure, the APA is a major contributor to costs that are attributed to federal permitting laws.

An evaluation of the effects of permitting reform must therefore be attentive not just to changes in federal permitting laws, but also to any changes to judicial review under the APA. It's therefore disquieting that basic empirical questions about arbitrariness review remain open. In the two decades after the APA's adoption in 1946, for example, federal courts were highly deferential to agency judgments. That changed around 1970, when the courts pioneered a more probing style of arbitrariness review known as "hard-look review." More than fifty years after the switch, there is no consensus on the extent to which hard-look review slows down (or "ossifies") agency action, much less whether it improves the quality of agency decision-making.

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[8] *Department of Transportation v. Public Citizen*, 541 U.S. 752, 767 (2004).

[9] One 2019 study, exploiting a circuit split over NEPA's application to critical habitat designations under the Endangered Species Act, reported that "[r]ules that underwent NEPA analysis *in addition* to APA rulemaking requirements were completed, on average, three months *faster* than those that did not undergo NEPA analysis" (Ruple, Tanana, and Williams 2019). The finding is not statistically significant. One way of understanding the result, however, is that the already-rigorous APA rulemaking process largely duplicated NEPA's requirements.

Further complicating matters is that the intensity of judicial review is not fixed over time. In 2025, for example, the Supreme Court issued an important decision, *Seven County Infrastructure Coalition v. Eagle County*, chastising the lower courts for the overly strict application of NEPA: "Some courts have strayed and not applied NEPA with the level of deference demanded by the statutory text and this Court's cases."[10] It is possible that lowering the intensity of judicial review may reduce the time and resources spent on NEPA compliance. But just how much is hard to say: Risk-averse agencies may still guard against hard-to-predict court decisions that might derail a project, even if those risks are somewhat smaller after the Supreme Court's decision than before.

B. Benefits

The benefits of federal permitting laws are sometimes taken to be self-evident. Deliberate consideration, public feedback, and targeted mitigation are essential to protecting public values that might otherwise be overlooked. The open-endedness of permitting laws reflects that the world is a complex place that cannot be reduced to simple rules. Judicial review, in turn, is necessary to force agencies to consider factors that they may have preferred to downplay or ignore in single-minded pursuit of their mission.

There is truth in this account. But this conventional defense tends to ignore that permitting laws yield benefits only to the extent that they provoke positive changes that would not have been made in their absence. That kind of thinking on the margin is rare in discussions of the benefits of permitting statutes. That's so even though the marginal benefits of federal permitting laws are almost certainly lower today than they were in the past. When NEPA was signed into law in 1970,

[10] *Seven County Infrastructure Coalition v. Eagle County*, 605 U.S. 168, 183 (2025).

for example, few substantive environmental laws existed. In that permissive regime, a stop-and-think requirement might do much to protect the environment. Today, a welter of federal, state, and local environmental rules aim to curb emissions, limit pollution discharges, and regulate hazardous waste. As those laws have proliferated, NEPA's benefits have receded.

Demonstrating the existence of residual benefits, much less estimating their magnitude, is extremely challenging. There is almost no rigorous research on the question.[11] Because the cost side of the equation is much better-studied, the balance of this paper will concentrate on the burdens that federal permitting laws place on infrastructure development. Nothing here should be taken as conclusively resolving whether those burdens are worth bearing.

III. Direct Evidence

NEPA is the best studied of the federal permitting statutes. We will start there before turning to the NHPA, CWA, and ESA.

A. National Environmental Policy Act

Broadly speaking, NEPA studies fall into three categories: studies measuring the frequency, length, duration, and cost of environmental reviews; studies of the rate, pace, and outcomes of NEPA lawsuits; and surveys of officials to identify major sources of project delay.

1. Frequency, Length, Duration, and Cost of Environmental Reviews

Roughly 95% of all actions covered by NEPA qualify for "categorical exclusions," which allow agencies to skip environmental review for types of activities that do not have substantial

[11] The closest we have are two studies of oil and gas development in the Mountain West. Ruple and Capone (2016) examined thirteen oil and gas projects and found that the NEPA process was associated with a modest reduction in surface disturbance that could not be attributed to compliance with substantive environmental laws. Similarly, Capone and Ruple (2017) compared wells approved under a categorical exclusion against wells that received an EA or EIS and found the unreviewed wells disturbed roughly twice as much land apiece.

environmental impacts (GAO 2014). Because of NEPA's broad sweep, agencies have adopted thousands of categorical exclusions, some of which are absurdly specific. (The FBI, for example, categorically excludes picnics.)

For actions not covered by categorical exclusions, most are determined, after an "environmental assessment," not to present any significant environmental impact. No one knows exactly how many EAs are conducted annually because agencies do not systematically count or report them. Estimates range from 12,000 (CEQ 2016) to 50,000 (CEQ 1997) each year.

EAs vary widely in length and duration. One federal task force in 2003 estimated that a small EA might run 10 to 30 pages and take between two weeks and two months, while a large EA might run 50 to 200 pages and take 9 to 18 months (NEPA Task Force 2003). More recent studies suggest that many take much longer: the Department of Energy reported an average completion time of 23 months in 2016 (DOE 2017), while a study of Forest Service reviews found that EAs took an average of 19 months (Edwards and Sutherland 2022). Some, like the EA developed for New York's congestion-pricing proposal, take many years and are thousands of pages long.

A full-dress "environmental impact statement" is required only for those actions that are expected to have significant environmental effects. EISs are relatively rare, comprising less than 1% of total NEPA actions, though that figure is much higher for complex projects (GAO 2014; see also Adelman 2024). The total number of draft, revised, supplemental, and final EISs fell from roughly 2,000 in 1973 to 608 in 1995 (CEQ 1997). More recently, agencies have issued about 100 final EISs annually—123 in 2024, following a low of 78 in 2023 (NAEP 2025). EISs are extremely long and their length has increased over time. Liscow (2025) assembled a random sample of fifty final environmental impact statements from 1977 and 1978 and found that they averaged just 270

pages, or 414 pages including appendices. Between 2013 and 2017, the average EIS ran 668 pages, or 1,703 pages including appendices—a fourfold increase in total length.

A CEQ study of EISs completed between 2010 and 2018 found that the process took an average of 4.5 years from the notice of intent through the record of decision (CEQ 2020). A more recent CEQ report using a slightly different methodology—it examined the length of time from the notice of intent to the final EIS, not the record of decision—found a median completion time of 2.8 years for the years 2019 to 2024 (CEQ 2025). Completion times for EISs conducted for manufacturing facilities between 2016 and 2025 were slightly longer but roughly comparable (FAI and NAM 2026). Solar and wind projects appear to complete the EIS process faster than all project types across all federal agencies (Fraas et al. 2025a).

These statistics mask considerable variability. The average EIS completed in 2024 took 4.4 years, but the standard deviation was very large—4.0 years (NAEP 2025). In CEQ's 2010-2018 data, the twenty-fifth percentile EIS took 2.2 years to conduct and the seventy-fifth took 6.6 years, with four EISs taking longer than 17 years. Nor does the type of environmental review—whether a CE, an EA, or an EIS—offer much confidence about duration. One study of Forest Service reviews found that the time ranges for different types of environmental review overlap so much that "the level of analysis does not reliably predict decision-making time" (Ruple, Pleune, and Heiny 2022).

There is no systematic tally of the direct financial costs associated with NEPA. Estimates suggest that compiling an EA costs on the order of tens of thousands of dollars, and an EIS several million (NEPA Task Force 2003). From 2003 through 2012, for example, the Department of Energy paid outside consultants a median of $65,000 to complete an EA and $1.4 million to complete an EIS, with the latter averaging $6.6 million (GAO 2014; see also NEPA Task Force

2003, estimating costs of $5,000 to $200,000 for EAs and $250,000 to $2 million for EISs). A crude extrapolation from those figures suggests that the direct costs of environmental reviews exceed $1 billion per year.[12]

Commentators interpret these data differently. NEPA's defenders point to the small number of EISs as evidence that NEPA's burdens are overstated. They emphasize that most EAs are conducted relatively quickly and at no great expense; even $1 billion is a rounding error on a $7 trillion federal budget. To the extent environmental review is slow, that may reflect agency resource constraints more than a problem with NEPA. And the duration of outlier reviews may simply reflect that some projects are more environmentally disruptive and thus require deeper consideration.

NEPA's critics, in contrast, deplore the time devoted to thousands of EAs for projects that have no significant environmental impacts. They see the falling number of EISs as evidence that agencies avoid big projects that would trigger NEPA. They flag the extended time it takes to compile environmental reviews, and (perhaps more importantly) the unpredictability of review timelines, as evidence that the laws substantially magnify project risk. And they argue that NEPA's burdens arise not primarily from the direct costs of environmental reviews, but the indirect costs associated with delay, mitigation, project redesign, and legal risk.

2. Litigation Studies

In raw numbers, NEPA litigation is significant but not overwhelming. A litigation survey from CEQ counted 1,497 new NEPA cases between 2001 and 2013, or an average of about 115

[12] At $1.4 million each, 225 EISs per year would cost about $315 million. At $65,000 each, 12,000 EAs per year would cost about $780 million. The roughly $1.1 billion total is likely a lower bound: average costs for EAs and EISs appear to be higher than median costs, and the total number of EAs could be much larger.

per year. Annual filings declined from 138 at the beginning of that period to 96 at its end. (CEQ n.d.) In 2014, GAO likewise concluded that the number of NEPA suits has hovered around one hundred cases per year and been pretty stable since the 1980s (GAO 2014). A 2025 report from the Breakthrough Institute found that the district courts issued an average of 144 NEPA decisions every year from 2013 to 2022, though that figure is not directly comparable because some NEPA lawsuits result in multiple decisions (Trembath et al. 2025).

Federal agencies typically prevail in NEPA suits, but they also lose with some regularity. CEQ's review found an average of 32 injunctions or remands per year, amounting to roughly 28% of the surveyed cases (CEQ n.d.). Breakthrough similarly found that agencies lose in about 26% of court rulings (Trembath et al. 2025). Those figures track the observed loss rate in APA suits: several studies have found that the government usually loses about one-third of the time.[13]

Litigation can be protracted even when the agency ultimately wins. Breakthrough found that the median project spent 19 months in legal proceedings after a challenge was filed, while 7% remained in litigation for more than six years (Trembath et al. 2025).[14] An earlier study of nearly 1,500 cases reported similar results: a median duration of 23 months, with one-quarter of the cases lasting more than 3.2 years (Ruple and Race 2020). Because litigation may overlap with ongoing permitting review, financing, or construction, these long timelines do not necessarily contribute to construction delays. But they do reflect extended periods of legal uncertainty.

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[13] See Zaring (2010, 169–73, 178), collecting studies whose results clustered around a two-thirds agency-validation rate; and Pierce and Weiss (2011, 519–21), reviewing prior studies and finding that agencies prevail in approximately 70 percent of cases.

[14] See also Chiappa et al. (2024), reporting that an average of 4.2 years elapsed between publication of a challenged environmental review and the conclusion of the corresponding appellate proceedings.

What to make of these figures is a matter of controversy. One widely cited study divided the roughly 115 annual lawsuits by all NEPA-related actions and calculated a litigation rate of only 0.22% (Ruple and Race 2020). David Adelman likewise found that federal environmental litigation affected only 2.8% of the wind projects and 0.7% of the solar projects in his dataset, with state and local opposition much more common (Adelman 2024). For the study authors, the infrequency of NEPA litigation is evidence that the law is not especially burdensome (see also Fleischman et al. 2020).

That conclusion is unsound for two independent reasons. First, counting the number of observed lawsuits is not an exogenous measure of burden. A low litigation rate is consistent with NEPA being a paper tiger. It is also consistent with a forceful NEPA that leads projects to be abandoned in anticipation of litigation, redesigned to avoid legal vulnerability (or to pay off objectors), or supported by overly elaborate environmental studies that make them hard to challenge. At the limit, a rule that deterred every environmentally sensitive project would yield a litigation rate of zero percent. The point is familiar from the literature on selection effects in litigation studies: because cases that end up in court are not a random subset of potential legal disputes, the filed cases can't tell you much about the rule's effect on behavior (Priest and Klein 1984).

Second, these studies use a denominator that includes thousands of categorical exclusions and environmental assessments—actions that, by definition, do not have significant environmental impacts. Studies that select a narrower denominator reveal a different pattern. One study of 355 major energy and transportation projects that completed an EIS between 2010 and 2018, for example, found that 28% were litigated and that 89% of those lawsuits included a NEPA claim. Litigation rates reached 64% for solar projects, 50% for pipelines, 38% for wind projects, and 31%

for transmission lines (Bennon and Wilson 2023). Among the 355 projects, fewer than half were operational by 2023. Most remained in development or construction, but 14% had been canceled.

Other studies are similar. Although EISs account for just 1% of NEPA-related actions, Breakthrough found that they led to 37% of district court decisions and 42% of appellate decisions in its dataset (Trembath et al. 2025). Two studies of Forest Service decisions found litigation rates of only about 1% for categorical exclusions and 2% to 3% for environmental assessments, but between 12% and 17.5% for environmental impact statements (Fleischman et al. 2020; Edwards and Sutherland 2022). Indeed, the same study that produced the 0.22% government-wide figure estimated that 16.1% of final EISs resulted in a federal court decision about their adequacy (Ruple and Race 2020).

Among projects with substantial environmental impacts, then, the available studies confirm that NEPA lawsuits are routine, lengthy, and serious. It's safe to say, therefore, that the prospect of NEPA litigation will increase project costs, affect project selection, increase the intensity of environmental reviews, and delay project timelines. But studies of litigation rates can offer little insight into the magnitude of those effects.

3. Sources of Delay

A handful of studies survey government officials to understand why environmental reviews take so long. In 2000, for example, the Federal Highway Administration took a close look at EIS processes that exceeded five years. State transportation officials reported that the chief sources of delay were inadequate funding, local controversy, and project complexity. Litigation and environmental review were cited much less frequently (FHWA 2000). A study of Oregon highway construction reached similar conclusions: 83% of projects were delayed by design changes, 75% by public controversy, and 42% by agency staffing or communications problems (Dill 2005).

Studies like this are sometimes invoked to support the view that NEPA is not a major impediment to infrastructure development. That overreads what the surveys reveal, however. The surveys demonstrate that delay rarely has a single source and that environmental review sits alongside, and sometimes amplifies, other sources of project risk.[15] If litigation risk associated with NEPA leads to longer review timelines, for example, NEPA may be responsible for delays that threaten projects—even if the immediate cause is, say, a surge in inflation or the loss of political support.

B. Clean Water Act

Most major infrastructure projects will need to move some dirt into wetlands or other waters covered by the Clean Water Act. Doing so triggers §404, which governs the discharge of dredged or fill material into the waters of the United States. Every year, the U.S. Army Corps of Engineers processes a large volume of §404 permits. Nearly all are so-called "general permits"—the rough equivalent of categorical exclusions for NEPA. Between 2012 and 2015, the Corps authorized an average of 63,000 actions annually, 97% of them through general permits. In 2016, general permits took an average of forty days to process (Carter 2017).

General permits are sufficient for many types of infrastructure. One recent study of renewable projects, for example, found that only 2.4% of the wind projects and 2% of solar projects in the sample required more than a general permit. CWA litigation was rare: the study identified just three §404 cases involving wind and one involving a solar project (Adelman 2024).

For complex projects requiring a "standard permit," however, costs and delays can be substantial. Standard permits tailored to individual projects took much longer—an average of 217

[15] See generally Congressional Research Service (2011, 26), finding that factors "outside the NEPA process" were identified as the cause of delay between 68 and 84 percent of the time.

days in 2016. That figure only accounts for the processing time, however. One older study measured the process from preparation of the application through approval and found that individual permits took an average of 788 days (383 for preparation, 405 for approval). The same study found that preparing the application costs an average of $271,596 (Sunding and Zilberman 2002).

More recent studies report shorter timelines. Among 59 large and complex infrastructure projects, §404 review averaged about 3 months for transmission lines, 10 months for pipelines, and 13 months for renewable-energy projects; the much shorter medians suggest that a few difficult projects pulled up the averages (FPISC 2020). A 2026 study of manufacturers reported that standard Corps permits took an average of 1.3 years and that 82% of the surveyed manufacturers needed a discharge permit, 49% needed a §401 certification, and 30% needed a §404 permit (FAI and NAM 2026).

There is also evidence that developers may favor incurring higher direct compliance costs in exchange for faster or more predictable review. Section 404(g) allows states and tribes, with EPA approval, to assume administration of the federal dredge-and-fill permitting program for certain waters. In a 2024 economic analysis accompanying reforms to the program, EPA reported that permittees sometimes preferred state administration even though states charged higher fees than the Corps (EPA 2024). The benefits included "faster permit processing time, reduced duplication of application materials, increased consistency in permitting decisions, application of local knowledge, and a single point of contact." When Michigan considered relinquishing its section 404 authority, for example, regulated parties argued that they would rather pay higher fees than return to federal administration. The experience suggests that the direct administrative

expense of permitting may matter less to developers than the delays and uncertainty associated with the process.

C. National Historic Preservation Act

According to the Advisory Council on Historic Preservation, more than 120,000 federal undertakings undergo section 106 review each year (ACHP 2025). But few studies examine the NHPA in any detail. One exception is a 2020 analysis of 59 large energy projects, which found that NHPA consultation lasted an average of 3.1 years for transmission lines, 2.1 years for pipelines, and 1.6 years for renewable energy projects (FPISC 2020). A 2026 Institute for Progress report found that NHPA review falls especially heavily on transmission lines and wind farms because tall and sprawling infrastructure has a much larger visual footprint than most fossil fuel infrastructure. Large review areas require more sightline surveys and more intensive consultation with preservation officials and Indian tribes (Schifman and Mackenzie 2026). Neither study, however, estimates the marginal contribution of NHPA review to overall project duration, as distinct from the effects of NEPA review, CWA permits, or ESA consultation.

D. Endangered Species Act

Section 7 of the ESA requires federal agencies to consult with the Fish and Wildlife Service (FWS) whenever they "authorize, fund, or carry out" an action that "may affect" a listed species or a designated critical habitat. Though nominally applicable only to government actions, the section 7 consultation process covers purely private projects when developers need section 404 permits or other approvals from the government. The section 7 process is distinct from the ESA's

substantive prohibition in section 9 on "taking" listed species, including (at least until a recent rule change[16]) habitat modifications that kill or injure protected wildlife.

Two recent studies have attempted to isolate the ESA's effects on housing construction. First, Max Tabarrok examined 1,200 listing decisions over a 45-year period and found that FWS listing decisions led to a 10% reduction in the flow of housing permits in affected places (Tabarrok 2026). The cumulative effect is large: he estimates that the ESA has caused a reduction in U.S. housing stock of at least 1.6 million units and perhaps as many as 11.1 million. Second, a research group led by Eyal Frank and his colleagues examined land values and found heterogeneous and generally small effects associated with listing decisions (Frank et al. 2025), though Tabarrok argues that the divergent results are mainly due to methodological differences.

What the studies cannot do is distinguish the procedural burdens of the Section 7 permitting process from the substantive rule in Section 9. The two are intertwined: securing Section 7 approval may sometimes require mitigation to avoid harming a listed animal under Section 9. By any measure, however, the Section 7 process is burdensome. The leading analysis of the consultation process examined 88,290 Fish and Wildlife Service consultations conducted between 2008 and 2015. More than 92% were informal consultations and were completed in a median of 13 days. Only 6,829 proceeded to formal consultation, which took a median of 62 days. Just two formal consultations—0.03%—produced a jeopardy finding, and no project was stopped or extensively altered as a result of a jeopardy or adverse-modification finding. The medians mask substantial variation: 20% of formal consultations exceeded 135 days (Malcom and Li 2015).

[16] 91 Fed. Reg. 43300 (July 14, 2026). The validity of the rule has been challenged in court.

Studies of major infrastructure projects report longer timelines, but generally find ESA review shorter than NEPA or NHPA review. Among 59 large transmission, pipeline, and renewable-energy projects, ESA consultations took an average of 6 to 8 months, with medians between 4 and 7 months (FPISC 2020). One study found that consultation was uncommon among renewable projects: of 630 wind projects studied, 20 underwent formal consultation; among 439 solar projects, 49 did. Only 4% of wind projects and 0.5% of solar projects required a habitat-conservation plan or incidental-take permit (Adelman 2024).

Again, it is hard to know what to make of the data. The fact that most consultations were swift and almost none led to a jeopardy determination may suggest either that the process is not especially burdensome or that it is a pointless charade. Whatever the case may be, these studies do not isolate the marginal contribution of ESA consultation to project burdens.

IV. Indirect Evidence

What can other evidence tell us about the costs of permitting?

A. Escalating Infrastructure Costs

In an influential 2023 study, Leah Brooks and Zachary Liscow found that per-mile spending on highway construction more than tripled in the years between 1960 and 1980. Because the costs of labor, land, and other inputs could not explain the cost growth, they suggest that the rise of "citizen voice" associated with changes in culture, judicial doctrine, and new legislation (including NEPA) may be responsible. The mechanism, they think, is that "growing citizen voice leads to more expensive routes and structures that respond to local concerns," an argument they bolster by noting an increase in squigglier roads and noise barriers (Brooks and Liscow 2023).

Their study assigns hard numbers to a well-known observation: that infrastructure costs surged in the 1970s. Alan Altshuler and David Luberoff, in their 2003 book *Mega-Projects*, call it the "do no harm" era of infrastructure development in which "it is now essential to avoid or fully

mitigate any significant disruption" (Altshuler and Luberoff 2003). Major infrastructure investment fell off a cliff: the Bureau of Economic Analysis reports that "[r]eal investment in basic infrastructure … peaked in the late 1960s, at about $230 billion, and fell in the 1970s and early 1980s. It did not rise appreciably above its late-1960s level until the early 2000s and it has remained fairly flat since then," notwithstanding population growth.

B. Developer Experience

Surveys of developers consistently report that federal permitting adds costs and delays to major projects. A report commissioned by the National Association of Manufacturers, for example, tallied more than $7.9 billion in annual permitting costs for manufacturers (FAI and NAM 2026). Because that figure includes compliance with substantive mandates, especially from the Clean Air Act, it does not offer a reliable estimate of burdens associated with federal procedural statutes. Manufacturers nonetheless report that NEPA and section 404 permits impose burdens over and above compliance with substantive laws.

The renewables industry has likewise flagged the permitting process as a substantial drag on development. A 2021 report on hydropower development surveyed more than 50 stakeholders from an array of backgrounds and found that "[t]here are frequent and sometimes protracted disagreements on what environmental impacts are relevant to the project" (Levine 2021). A Lawrence Berkeley National Laboratory survey of developers at 62 companies responsible for roughly half of U.S. wind and solar development found that significant project delays occurred most often during the permitting phase (Nilson, Hoen, and Rand 2024). In a February 2026 survey of 50 people working in the renewable industry, for example, 94% reported that federal permitting led to the delay or cancellation of projects (Crux 2026a). More than 80% of the respondents said that they had intentionally sited projects to avoid triggering federal environmental reviews (Crux 2026b).

Investor disclosures tell a similar story. In its annual report for 2025, for example, SOLV Energy, a major solar-energy engineering and construction company, reported that regulatory and permitting delays had negatively affected some projects and said that permitting reform could accelerate project approvals and stoke demand for its services (SOLV Energy 2026). The main lobbying arm of the renewables industry, the American Clean Power Association, has pushed hard for an overhaul of permitting laws, arguing that reform is "necessary" to develop new energy infrastructure and that delays and uncertainty were "strangling" investment.[17]

Experience with the CHIPS and Science Act is especially suggestive. The 2022 law made new semiconductor manufacturing facilities eligible for federal grants. But that discretionary funding triggered NEPA review. The head of the Commerce Department office that administered the CHIPS program recalls that NEPA posed "significant risks of delay and litigation" and required hiring a dedicated twelve-person permitting team that oversaw as many as twenty contractors (Schmidt 2025). Semiconductor manufacturers, which had not previously had much experience with NEPA, found the unfamiliar process unmanageable. They complained to Congress that, without reform, new manufacturing facilities would be canceled or delayed.[18] Apparently convinced, Congress passed a bespoke exemption from NEPA in October 2024.[19]

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[17] American Clean Power Association, "ACP Statement on House Natural Resources Committee Advancing Permitting Bill," https://cleanpower.org/news/acp-statement-on-house-natural-resources-committee-advancing-permitting-bill.

[18] Semiconductor Industry Association, "SIA Urges House Passage of Bipartisan Bill to Streamline Environmental Review of CHIPS Projects," https://www.semiconductors.org/sia-urges-house-passage-of-bipartisan-bill-to-streamline-environmental-review-of-chips-projects.

[19] Building Chips in America Act of 2023, Pub. L. No. 118-105, § 2, 138 Stat. 1587, 1587–90 (2024).

C. State Permitting

Studies of state permitting regimes bolster the industry-side consensus that federal permitting impedes infrastructure construction.

Evan Soltas and Jonathan Gruber examined land parcels in Los Angeles County that were sold *after* permits were secured ("ready-to-issue" permits) but *before* construction began. Needed permits include approvals from state planning agencies as well as review under the California Environmental Quality Act (CEQA), a state analog to NEPA. Examining roughly 5,000 parcels sold from 1995 to 2024, Soltas and Gruber found that permit approvals raised the price of land by about 50 percent (Soltas and Gruber 2026). Theirs is one of the rare studies to isolate permitting costs, albeit in a single area, and offers powerful evidence that permitting can impose substantial costs. Soltas and Gruber moreover conclude that the avoidance of delay, more than the hassle of securing the permits, is responsible for about half of that premium, suggesting that "time-based measures of permitting can provide useful insight into its cost." To the extent that the study generalizes—and it may not, given the differences between federal and state permitting regimes—studies of federal permitting timelines may be similarly informative.

A second study from Soltas, this time joined by D'Amico and Wang, assembled data on housing permitting and construction across sixty American cities from 2000 to 2025. After adjusting for differences in the types of housing built, the authors found huge differences in the time that municipalities take to approve new projects, with the fastest cities completing construction in roughly the same time that the slowest cities issued permits. They also found that longer permitting timelines were associated with higher housing prices and lower housing production, and that permitting times had risen steadily over the study period (D'Amico, Soltas, and Wang 2026). Although they do not address federal permitting, the Soltas studies reinforce the conclusion that permitting can place substantial burdens on new development.

A recent study from Matthew Gustafson, Lubomir P. Litov, and Bharat Raj Parajuli examined border discontinuities between the states that have adopted their own version of NEPA (roughly sixteen states) and those that have not. Counties exposed to NEPA-like laws, the study found, grew more slowly than counties not exposed to those laws (5% fewer establishments and 4% less employment within 5 years of adoption). The authors conclude that "the evidence is most consistent with a cut-off agglomeration mechanism"—some businesses that would have expanded across the border chose not to, reducing the benefits that would otherwise have emerged from greater concentration (Gustafson, Litov, and Parajuli 2026).

State permitting laws may even indirectly affect federal permitting timelines. A 2024 study found that EISs conducted in states with more restrictive permitting regimes—specifically, states with relaxed rules around who has standing to sue, relatively low thresholds for state environmental review, and more citizen involvement—took longer than EISs in states with more permissive permitting. The authors posit that states with restrictive permitting may foster the development of groups that intervene in state permitting processes. Those groups are then well-positioned to flex their organizational muscle to intervene in federal processes (Bennon, De La Hormaza, and Geddes 2024).

V. Discussion

Taken together, the balance of the evidence strongly supports the conclusion that federal permitting laws contribute meaningfully to the outsize costs and extended duration of major infrastructure projects in the post-1970 era. No one piece of evidence clinches the case. But the lengthy and expensive process for developing environmental reviews, the relative frequency of litigation over environmentally sensitive projects, the explosion in infrastructure costs coincident with the advent of modern federal permitting laws, the practical experience of private developers,

the testimony of public officials, and evidence from state permitting regimes all converge on the same conclusion.

Frustratingly, the studies offer little purchase on the magnitude of permitting burdens. Further research should concentrate on isolating the effects of the federal permitting regime from other headwinds to infrastructure construction. Ideally, that would involve comparing many otherwise-similar projects, some of which are exposed to federal permitting and some of which are not. Energy facilities offer an intriguing possibility: future research might compare the costs of developing solar fields or oil wells on federal land versus private land, for example. Alternatively, researchers may attempt to exploit the economically irrelevant distinction between discretionary federal grants, which trigger federal permitting review, and non-discretionary federal tax credits, which do not. (The Inflation Reduction Act, for example, extended both grants and credits to support various clean-energy investments.) Or researchers may seek to use the variation in state permitting regimes as an instrument for estimating the costs of federal procedural burdens, as with the Gustafson-Litov-Parajuli study.

VI. Evaluating Reform

If permitting laws make it meaningfully more difficult to build infrastructure in the United States, reducing the stringency of those laws should make it easier. The precise mechanism could be shorter government reviews, reductions in mitigation because of less legal exposure, fewer delays associated with judicial review, and more. The extent to which reform will reduce the cost or duration of infrastructure construction will vary by project type. Federal reforms may not make a difference for projects that must comply with burdensome state permitting laws (e.g., for interstate transmission lines across states with mini-NEPAs). They will matter more for projects that don't have to run state procedural traps (e.g., for natural gas pipelines that are subject to federal, but not state, permitting).

In general, however, we should have relatively low expectations for the immediate effects of permitting reform on project costs or timeframes. Federal permitting laws were adopted in the late 1960s and early 1970s, a period of intense cultural change that ushered in a new era of skepticism about big government projects. That skepticism spurred wide-reaching changes in judicial doctrine, bureaucratic norms, and substantive laws. Permitting reform may be necessary to spur more infrastructure development, but it is unlikely to be sufficient without sustained attention to the dense network of laws and practices that have built up around that cultural change.

Still, can we make informed judgments about the likely effects of different reforms? Start with the observation that there is a big divergence between what federal permitting laws formally require and the large compliance burdens documented in the literature. NEPA, for example, just instructs agencies to issue a "detailed statement" about the environmental consequences of federal actions that "significantly affect" the environment. Taking its language at face value, the law could have been read to apply to a small set of agency actions and to require a cursory discussion. But the courts did not choose to read it that way. The advent of a tougher mode of arbitrariness review around 1970, and especially the D.C. Circuit's 1971 decision in *Calvert Cliffs' Coordinating Committee v. Atomic Energy Commission*, required courts to make a "searching and careful" inquiry into the rationale for an agency action.[20] That inquiry is supposed to be paired with a healthy deference to agency decisions. But different judges weigh the dual commitments to skepticism and deference differently, and they do so in the context of complicated, multistage projects that they only dimly understand. As a result, litigation outcomes can be very hard to predict.

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[20] *Citizens to Preserve Overton Park, Inc. v. Volpe*, 401 U.S. 402, 416 (1971); *Calvert Cliffs' Coordinating Committee v. Atomic Energy Commission*, 449 F.2d 1109, 1114 (D.C. Cir. 1971).

Agency officials are highly sensitive to legal risk. They know that a bad judicial outcome could throw a wrench into a project to which they have dedicated much time and effort. They take a reputational hit when courts find a procedural failure and declare that an agency has behaved unreasonably. And a loss in court can provoke oversight from both executive branch officials and Congress. The unpredictability of case outcomes magnifies this bureaucratic caution and creates the incentives to bulletproof environmental reviews, to shy away from controversial projects, and to buy off potential litigants.

To make a difference, federal permitting reforms must find ways to reduce or eliminate court-induced bureaucratic caution. Using that as our touchstone, it's possible to make an informed judgment about the likely effects of reform.

A. Time and page limits

In 2023, Congress signaled its impatience with NEPA burdens by imposing page limits and time limits on EISs and EAs. But it left intact the ordinary framework for judicial review. Because agencies have the same incentives they had before, agencies are unlikely to change their behavior. Instead, they may move information to appendices and artificially delay the point at which the statutory clock starts to run. That appears already to be happening. In its 2024 final EIS for a major wind project, for example, BLM confessed that it stuffed material into Appendix 15 "to comply with the [law's] 300-page limit."[21] And state transportation officials have released

[21] U.S. Bureau of Land Management, *Lava Ridge Wind Project Final Environmental Impact Statement*, App. 15 (2024).

recent guidelines with extensive requirements for "pre-NEPA activities," including development of a preliminary purpose-and-need statement.[22]

To the extent that the 2023 reforms do successfully reduce timelines or page counts, they may perversely *increase* the risk of judicial invalidation: agencies that are less able to bulletproof might lose more often. NEPA burdens could as easily increase as decrease.

B. Statutes of limitations

Proposals to reduce the statute of limitations for permitting lawsuits suffer from a similar problem. Lawsuits raising arbitrariness challenges are not especially difficult to file. Under the APA, litigants are confined to challenging deficiencies in the agency's explanation based on the information that the agency had before it. Because litigants have all the information they need to file at the moment of decision, they can typically meet even a very compressed statute of limitations. One recent review of NEPA challenges to renewable projects, for example, found that more than one-third were brought within 60 days of the record of decision and nearly all by 180 days (Fraas et al. 2025b).

Adopting a tighter timeframe would simply induce the vast majority of litigants to accelerate their filing dates. And because legal complaints are easily amended under the Federal Rules of Civil Procedure, a hurried initial filing can be bolstered weeks or months down the line. The possibility of discouraging a few marginal cases is unlikely to insulate projects from judicial attack, much less reduce agency defensiveness about their compliance with permitting laws.

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[22] Nebraska Department of Transportation, *Environmental Procedures Manual* ch. 5, https://dot.nebraska.gov/media/zekp5gvl/epm_ch_5.pdf.

C. Limits on injunctive relief

Other proposals would restrict court injunctions for violations of procedural statutes. Because these proposals target judicial review, they are in the right ballpark. The trouble is that an injunction is usually not necessary to stop an infrastructure project from being built.

The conventional remedy for an APA violation is not an injunction, but vacatur. Specifically, the APA allows courts to "set aside," or vacate, an arbitrary agency action.[23] When a court vacates an agency action, that action is a nullity. Legally speaking, the action no longer exists—the permit is invalidated; the grant is eliminated. If the project cannot proceed without the relevant agency action—it needs that permit or is dependent on that grant—the project will grind to a halt.

An injunction is just a court order directing a party to do something or to stop doing something, backed by the threat of contempt. Although injunctions can aid in enforcing an order setting aside an agency action, vacating the agency action will usually be sufficient to induce compliance. Limiting injunctive relief is thus unlikely to much reduce permitting burdens unless it is paired with limits on vacatur.

D. Harmless error

Another reform under discussion would require challengers to demonstrate that the agency's procedural mistakes were substantially likely to have affected the ultimate decision. With such a rule in place, agencies would have more confidence that minor errors would be held harmless, thereby reducing their incentives to over-comply. Such a reform would have incentive

[23] 5 U.S.C. § 706(2).

effects similar to those of the Supreme Court's decision in *Seven County*: it would tell courts to go easier on agencies when they overlook minor problems or make trivial mistakes.

This reform is likely to make a difference, at least on the margin, because it directly addresses court-induced bureaucratic incentives. But will that difference be substantial? There is some reason to be skeptical. As I explained in a 2017 paper on harmless error under the APA (Bagley 2017):

> A relaxed remedial approach is not the same as the elimination of assertive judicial review. Agencies that fear judicial review will still fear it, even if the rule of prejudicial error becomes somewhat more prominent. An agency official would be foolish to put much stock in the uncertain prospect that litigators could perhaps salvage a defective [action] down the line. Yes, that response might be "rational" in a narrow economic sense. But agency officials are unlikely to calculate their legal exposure with such refinement that the downstream possibility of remedial flexibility will change their behavior.

If that analysis holds in the permitting context, adjusting judicial remedies may have muted effects. The risk of drawing a judge with an idiosyncratically narrow view of which errors count as harmless would still induce the bureaucratic caution that prompted the reform in the first place. By way of analogy, Congress in 2005 adopted a categorical exclusion from NEPA for drilling permits for some oil and gas projects. Even so, the Bureau of Land Management was sometimes "overly cautious" in applying the exclusion "in part because BLM fears litigation from environmental groups" (GAO 2009).

The point should not be overdrawn. A stern instruction from Congress that only critical errors should forestall a project, together with the deference under *Seven County*, may give agencies newfound confidence that the courts will take a very light touch in reviewing compliance with permitting laws. Especially over time, as agencies come to appreciate a new accommodation with the judiciary, they may be able to reduce their compliance-oriented costs.

In short, increasing the role of harmlessness review is a promising reform measure, but its effects are highly uncertain.

E. Preclusion

When it wishes to do so, Congress can preclude judicial review of certain agency decisions. One example is the provision of the Inflation Reduction Act requiring Medicare to negotiate drug prices. To avoid the risk that judicial review would derail the program timeline, Congress exempted implementation decisions from judicial review.[24] So far, despite the pharmaceutical manufacturers' best efforts, the courts have largely respected that legislative choice.[25]

Preclusion addresses the incentive problem by reassuring agencies that a court will not later declare that their permitting-related actions are arbitrary. The reassurance is not total: the courts apply a strong presumption favoring judicial review of agency action, which at times leads them to read preclusion language narrowly (Bagley 2014). But a clear statutory bar would give agencies a much greater degree of confidence that a project's objectors would be unable to use litigation to derail an approved project.

How much confidence will depend partly on the language of the preclusion statute. A law that simply bars judicial review of an EIS or an EA, for example, would still allow for a challenge to the agency's decision for arbitrariness. Litigants will be tempted to recast deficiencies in an environmental review as generalized deficiencies under the APA. For example, an objection under

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[24] Inflation Reduction Act of 2022, Pub. L. No. 117-169, § 11001(a), 136 Stat. 1818, 1851 (adding Social Security Act § 1198), codified at 42 U.S.C. § 1320f-7.

[25] *Novo Nordisk Inc. v. Secretary*, 154 F.4th 105, 110–14 (3d Cir. 2025); but see *Teva Pharmaceuticals USA, Inc. v. Kennedy*, No. 25-5425 (D.C. Cir. Aug. 18, 2026) (construing the bar on judicial review more narrowly than the Third Circuit).

the ESA that an agency failed to consider the harms of noise pollution on endangered species might be recast as a failure under the APA to consider sound barriers for adjoining homeowners.

Still, not every deficiency in an environmental review can be effectively recast in non-environmental terms, and a large fraction of the objections traditionally raised in suits over federal permits would be taken off the table. What's more, Congress could draft its preclusion language even more expansively to exempt entire classes of infrastructure permitting from arbitrariness review under the APA.

Conclusion

The available evidence allows us to say with a high degree of confidence that the federal permitting regime contributes meaningfully to the cost overruns and lengthy delays that are characteristic of major infrastructure construction in the United States. The burdens of the permitting regime, moreover, extend beyond the direct compliance costs and the delays associated with judicial review. Federal permitting also distorts project selection, spurs sometimes-excessive mitigation, and induces expensive project changes.

The evidence, however, does not allow for reliable quantitative estimates of the burdens of federal permitting. The challenges are myriad: agencies may have independent incentives to take steps required by the permitting statutes; state permitting laws may impose similar requirements on some infrastructure; some of the costs that are thought to arise from federal permitting statutes may instead be a function of generalized arbitrariness review under the APA; and more. In evaluating the efficacy of permitting reform, the key is to appreciate how the uncertainty of judicial review reinforces bureaucratic incentives toward caution and defensiveness. Reforms that are inattentive to those incentives are unlikely to make a substantial difference.

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