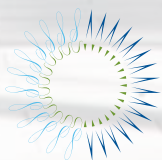


Legal Review Concerning the Use of Health Impact Assessments in Non-Health Sectors

HEALTH **IMPACT**
PROJECT

ASU SANDRA DAY O'CONNOR
COLLEGE of LAW
ARIZONA STATE UNIVERSITY



PEW
HEALTH GROUP



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Executive Summary

“We know that preventing disease before it starts is critical to helping people live longer, healthier lives and keeping health care costs down. Poor diet, physical inactivity, tobacco use, and alcohol misuse are just some of the challenges we face. We also know that many of the strongest predictors of health and well-being fall outside of the health care setting. Our housing, transportation, education, workplaces, and environment are major elements that impact the physical and mental health of Americans.”

**—Regina Benjamin, M.D., U.S. Surgeon General,
in *National Prevention Strategy***

Background

This report examines the legal foundations that support incorporating health considerations into policy and programmatic decisions made in non-health fields. The findings are intended to aid public health professionals and others who seek to ensure that such decisions are made with health in mind.

Many of most urgent health problems facing our nation—such as obesity, asthma, diabetes, heart disease, and injuries—are shaped by the conditions in the places where we live and work. For example, it has been estimated that many cases of asthma and serious injuries such as hip fractures can be attributed to substandard housing conditions due, in part, to environmental hazards like mold, infestations, and pests.^{1,2} Similarly, the planning and design of roads and highways in many regions have made it more difficult for people to exercise safely, a problem that is now recognized as an important contributor to the modern epidemics of obesity and diabetes.³ Conversely, some investments outside the health sector, such as comprehensive early childhood education programs, are now known to have documented benefits on physical and mental health outcomes in later childhood and adulthood.⁴

To address skyrocketing medical costs, prevent illness, and improve the well-being of Americans, health must be taken into account when making decisions in other non-health sectors such as transportation, energy, and agricultural policy. One promising way to factor health into decisions in a systematic way is through the use of health impact assessments (HIAs). HIAs use a systematic

KEY DEFINITIONS AND TERMS

Health Impact Assessment

“A systematic process that uses an array of data sources and analytic methods, and considers input from stakeholders to determine the potential effects of a proposed policy, plan, program, or project on the health of a population and the distribution of those effects within the population. HIA provides recommendations on monitoring and managing those effects.”⁵

Health Assessment (HA)

This term includes other studies or methodologies that evaluate potential impacts on human health, including Health Risk Assessment (HRA).

Health Risk Assessment—HRAs determine the risk of adverse health effects that would be caused by exposure to specific chemicals or other hazards. Calculations typically rely on guidance from the Environmental Protection Agency (EPA) or other authorities.⁶ HRAs are distinguishable from HIAs in that they tend to focus on biophysical risks from exposure to hazardous substances, whereas HIAs evaluate a broader range of health impacts and are generally used to inform policy or programmatic decisions.

process that determines the potential health risks, benefits, and trade-offs of a proposed policy, plan, program, or project. HIAs differ from other commonly used tools for health assessment such as HRAs and community health assessments (CHAs) in that HIAs:

- are intended to inform deliberations on a specific proposal—legislation, proposed rulemaking, and project permitting, for example.
- systematically assess the multiple influences on health that can occur as a result of social, economic, and environmental changes.
- use a broad definition of health that includes physical and psychological health and general well-being.

While HIAs are becoming more common in the United States, they remain underutilized. Most HIAs are done outside of any formal legal or regulatory requirement; however, some laws may require or support their use. The foundation provided by existing laws and policies creates important opportunities to factor health considerations into decisions made in non-health sectors using HIAs. At present, many such opportunities may be missed in part because public health professionals and others may not be aware of these laws.

To address this issue, the Health Impact Project—a collaboration of the Robert Wood Johnson Foundation and The Pew Charitable Trusts—contracted with Arizona State University’s (ASU) Public Health Law and Policy Program to conduct a comprehensive review and analysis of statutes, regulations, and other laws that may support the promotion and use of HIAs.

Methods

Using a sample of 36 jurisdictions in the United States, our research found that existing laws offer many opportunities for health to be factored into a range of decision making in which it typically would not otherwise be considered. The availability of HIA methodologies provides a systematic way to fulfill the full intent and spirit of these laws, allowing health officials and advocates to more fully engage those in other sectors in efforts to improve the public's health.

We reviewed, categorized, and analyzed existing laws that require or facilitate the use of HIAs (**Table 2**). Our sample included laws and policies in 20 states, 10 localities, five tribal nations, and the federal government in four key non-health sectors: (a) environment and energy; (b) transportation; (c) agriculture; and (d) waste disposal and recycling. Additional relevant laws in other sectors are also noted. These jurisdictions were selected to represent a broad and varied range of characteristics (e.g., population size, geographic location, rural in comparison to urban settings) and political characteristics (e.g., the degree of regulatory activity by the jurisdiction). The four sectors were chosen based on background research suggesting areas where considerations of health or health determinants are most concentrated: environment and energy, as well as waste disposal and recycling, have historically evaluated health impacts due to concerns of human exposure to toxic or other harmful substances; transportation addresses both air pollution and injury prevention; and agriculture involves food safety, nutrition, and food supply.

Applying a consistent interpretive legal approach, these research data are classified within each sector under three categories:

1. *HIAs are legally required or facilitated*: laws that specifically require or facilitate HIAs because they create requirements for a broad analysis of health effects to inform decisions, and HIAs could be used to meet those requirements.
2. *HAs may be legally viable*: laws that refer to HAs (such as HRAs) rather than HIAs are included because, under certain circumstances (discussed below), laws contemplating HAs may support the use of HIAs.
3. *HAs are legally prohibited*: laws that thwart or prevent the conduct of HAs since these may implicate the permissibility of HIAs under similar conditions.

Key Findings

Few jurisdictions in our sample specifically require that HIAs be conducted, but our research found considerable legal support for HIAs through laws that appear to open the door for their use (**Table 1**). Even in the absence of explicit legal authority to conduct HIAs, government agencies and officials increasingly conduct HIAs or consider the results of HIAs conducted by other organizations to inform their decisions. This has been the most common method of HIA practice in the United States. Our findings, however, highlight new opportunities to use existing laws and regulations as a way to advocate for a more robust consideration of health through the use of HIAs.

- **Environment and Energy**—Laws in 22 jurisdictions (61 percent of the sample) either require or facilitate the use of HIAs concerning environmental or energy policies and programs. For example, the National Environmental Policy Act (NEPA) and its state equivalents extensively support the use of HIAs in multiple jurisdictions.
- **Transportation**—Laws in seven jurisdictions (19 percent of the sample) require or facilitate the use of HIAs related to transportation policies and programs. Two states' laws (Massachusetts and Washington) specifically require HIAs. Concerning highway planning, U.S. Department of Transportation regulations specifically facilitate broader use of HIAs.
- **Agriculture**—Laws in seven jurisdictions (19 percent of the sample) facilitate the use of HIAs concerning policies, programs, or projects related to farming practices, pesticide use, and regulation of large animal facilities.
- **Waste Disposal and Recycling**—Laws in 11 jurisdictions (31 percent of the sample) facilitate the use of HIAs in this sector, mostly related to assessing the public health impacts for licensing and construction of solid waste or radioactive waste facilities.

Legal Themes

A series of key legal themes emerges from these findings as follows:

- Laws that refer to assessments of a range of health impacts and use of study results to inform policy or program decisions may facilitate the use of HIAs.
- NEPA and corresponding state laws often facilitate the incorporation of HIAs into mandated environmental impact statements.
- Assessments of health effects may be admitted as evidence by courts in litigation. They may be used offensively (e.g., to challenge a proposed project or action, or to allocate responsibility for environmental cleanup) or defensively (e.g., to overcome a challenge to a proposed project or action by showing that negative health effects will not occur).
- Laws requiring HRAs may support the use of HIAs depending on the breadth of the law and the willingness of governmental actors to enhance its scope.

- Federal or state preemption (how federal or state law may override or negate conflicting state or local laws) in specific sectors may prevent some state or local laws from requiring or facilitating HAs or HIAs.

Recommendations

The vast majority of HIAs to date have been conducted voluntarily, with much success. The findings of this report do not suggest that there is a need to invoke legal support for HIAs in instances where this voluntary approach is working.

The research presented in this report uncovered many laws that require a broad consideration of health effects in the decisions of non-health sectors. The degree to which these requirements are being satisfied at present is unknown, but based on the available data regarding HIA practice in the United States, it appears that HIAs have rarely been used as a means to satisfy many of these requirements.⁷ To the extent that HIAs may prove to be an appropriate and effective way to meet the intent and requirements of many such laws, this may facilitate more widespread use of HIAs and help to ensure that the public's health is considered in decision making in non-health sectors.

A number of steps can be taken to implement the findings of this research:

Public Health Professionals and HIA Practitioners

This report is intended to be a resource for professionals interested in finding ways to ensure that health is adequately considered in decisions in other non-health sectors. Many of the laws reviewed in this report may provide a strong foundation from which to advocate for the use of HIAs. Moreover, in jurisdictions or sectors not covered in this report, HIA practitioners should consider reviewing the applicable laws to determine whether they require or facilitate HIAs. If so, they should consider meeting with the appropriate officials to educate them about how HIAs can be used to satisfy the legal requirements as well as improve public health outcomes. Where policy makers are unfamiliar with HIAs, presenting case studies in which HIAs have been applied for similar decisions in other jurisdictions may be helpful.

Policy makers

Policy makers outside the health sector should consider whether existing explicit or implied legal requirements for health analysis in their jurisdictions are being fulfilled, and whether HIAs offer an effective means to fulfill them.

Other Professionals

Officials in energy, environment, transportation, agriculture, waste disposal, and other sectors can review existing legal requirements to determine where health effects are a required consideration, and whether HIAs are an appropriate tool to fulfill such requirements.

I. Introduction

HIAs are defined by the National Research Council as: “a systematic process that uses an array of data sources and analytic methods and considers input from stakeholders to determine the potential effects of a proposed policy, plan, program, or project on the health of a population and the distribution of those effects within the population. HIAs provide recommendations on monitoring and managing those effects.”⁸

HIAs differ from HRAs and other approaches to evaluating health effects that focus, for example, only on biophysical effects. HIAs incorporate a broad definition of health and employ a unique interdisciplinary methodology and input from people with a stake in the outcome of the decision to evaluate prospective effects on the social, economic, and environmental conditions that influence health due to governmental or private-sector policies, programs, and projects.⁹

HIAs typically assess health impacts in areas that may not raise immediate health concerns and that do not typically factor health into the decision-making process.¹⁰ In regulatory arenas, such as transportation, urban planning, agriculture, education, and energy, HIAs utilize public health research and risk analysis to shape policy toward reducing the risk of illness.¹¹ HIAs provide information that allows stakeholders and policy makers to understand and consider a proposed policy’s or program’s impact on all aspects of physical, mental, and social health and well-being, as well as quality of life as it relates to positive and negative aspects of health.

Though the value and utility of HIAs have been demonstrated in multiple contexts, they continue to remain underutilized across all levels of government in the United States.¹² One contributing factor may be an insufficient understanding of how laws outside the health sector may support or promote HIA application. This report is intended to identify legal support for the use or application of HIAs.

The breadth and scope of legal support for the use of HIAs are largely unexplored. This report represents a systematic review of laws that directly or indirectly authorize or facilitate HIAs among select jurisdictions and an analysis that includes key findings regarding varying laws that may further the use of HIAs in practice.

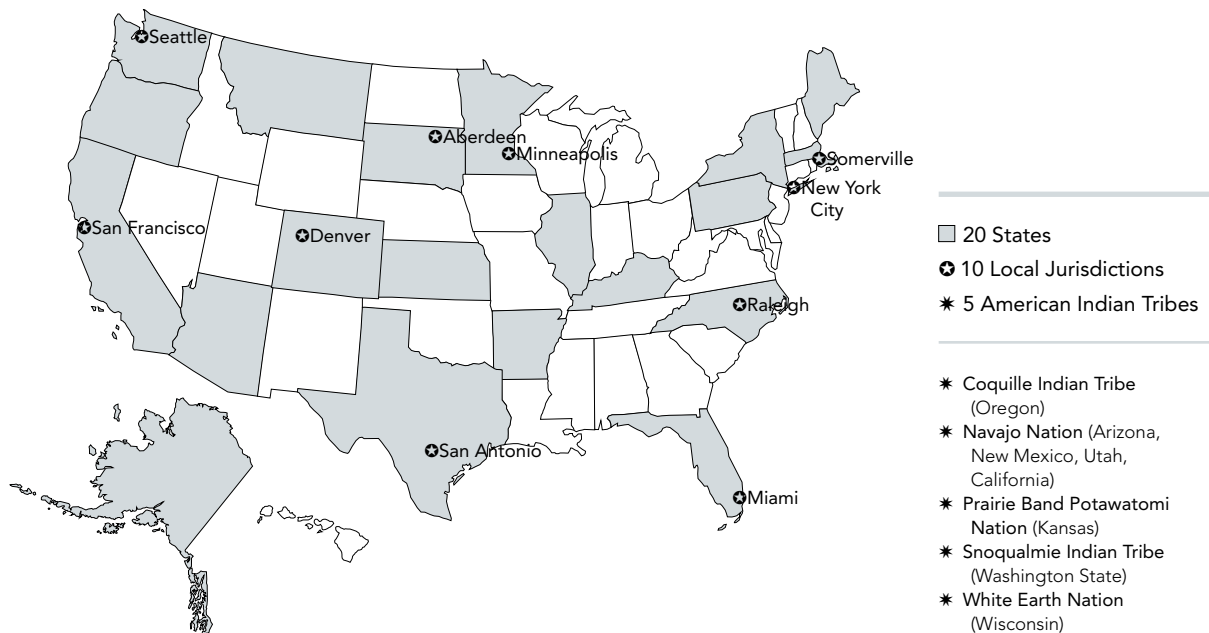
Following this introduction, **Part II** of the report lays out the scope and methodology of our research, including an overview of research strategies, key definitions and terms, research approach, and major assumptions and limitations. **Part III** sets forth findings (including three case studies) organized within four major non-health sectors. From these findings, multiple legal themes are explored in **Part IV**. Following a brief conclusion is **Table 1**, which summarizes the legal research results by jurisdiction. **Table 2**—a comprehensive listing of the data that included hyperlinks—is available online.

II. Project Scope and Methodology

A. Overview of Research Strategy

Data for this report come from a systematic examination of relevant laws drawn from statutes, regulations, ordinances, and judicial cases in 20 states, 10 localities, five tribal nations or bands, and the federal government (Figure 1). This sample represents a broad and varied range of jurisdictions based on geographic, demographic, and political characteristics. The sample included both populous states with large urban centers (California, Illinois, New York, Texas) and states with smaller populations and more rural characteristics (Kentucky, Maine, Nebraska, South Dakota). Correspondingly, research uncovered a wide variety in the degree, number, and specificity of state statutes, from highly regulated states (California and New York) to states with fewer statutes and regulations (Kentucky and South Dakota). Each of the cities selected is located within one of the chosen states but is otherwise diverse in population size and demographics, and its degree of home-rule authority. Results for each of these jurisdictions, where available, are aggregated in **Table 1** and comprehensively listed in **Table 2**. Legal findings in **Table 2** include hypertext links to publicly available sources (where available), or alternatively to LexisNexis (which requires a subscription to access).

Figure 1: HIA Legal Assessment—Jurisdictional Sample



For each of these jurisdictions, legal research techniques and interpretations were used to answer the following research question:

How do laws (i.e., constitutional provisions, statutes, regulations, ordinances, and cases) at all levels of government in the United States directly authorize or require, indirectly facilitate, or potentially inhibit the performance and use of HIAs by public or private actors to guide decisions?

Relevant laws in each of the 36 jurisdictions are organized in tables within four pre-selected major subject areas of policies, programs, or projects: (1) environment and energy; (2) transportation; (3) agriculture; and (4) waste disposal and recycling. These four sectors were chosen based on background research suggesting areas where considerations of health or health determinants are most concentrated: laws concerning environment and energy and waste disposal and recycling historically have been used to evaluate health impacts of human exposure to toxic substances; transportation laws address public health concerns related to air pollution as well as injury prevention; and laws regarding agriculture look at food safety, nutrition, and the food supply. Laws that did not fit within one of these main categories are categorized as “other.”

KEY DEFINITIONS AND TERMS

Health Impact Assessment

“A systematic process that uses an array of data sources and analytic methods, and considers input from stakeholders to determine the potential effects of a proposed policy, plan, program, or project on the health of a population and the distribution of those effects within the population. HIA provides recommendations on monitoring and managing those effects.”¹³

Health Assessment

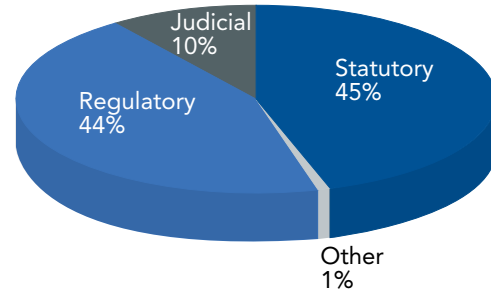
This term includes other studies or methodologies that evaluate potential impacts on human health, including Health Risk Assessments.

Health Risk Assessment—HRAs determine the risk of adverse health effects that would be caused by exposure to specific chemicals or other hazards. Calculations typically rely on guidance from the EPA or other authorities.¹⁴ HRAs are distinguishable from HIAs in that they tend to focus on biophysical risks from exposure to hazardous substances, whereas HIAs evaluate a broader range of health impacts and are generally used to inform policy or programmatic decisions.¹⁵

B. Research Approach




The scope of laws reviewed included statutes, regulations, case law, constitutions, and executive orders found through legal research databases (e.g., LexisNexis and Westlaw) and publicly available legal websites of federal agencies, state legislatures, tribal authorities, and municipalities. As illustrated in **Figure 2**, of the laws identified for this report, 45 percent were statutes, 44 percent were administrative regulations, 10 percent were judicial, and 1 percent were constitutional or executive orders.


Figure 2. Stratification of Types of Laws across Jurisdictions




Specific legal search queries are provided in Appendix A. Each search was conducted within applicable legal codes and regulations (e.g., health, environment, transportation, agriculture), as well as cases in each jurisdiction from 1985 to present. Searches were conducted between September 15 and December 21, 2010.

Based on a consistently applied interpretive approach within each subject area, legal research results are divided into three categories to illustrate the impact of the specific legal provision under the following legend and symbols:

-
-  **HIAs are legally required or facilitated**
 -  **Health assessments may be legally viable**
 -  **Health assessments are legally prohibited**
-

 – **HIAs are legally required or facilitated** for certain projects or policies. This category includes laws that explicitly require HIAs or facilitate their conduct by authorizing or requiring the functional equivalent of an HIA (i.e., a broad assessment of potential health impacts, including factors such as social, economic, or environmental influences on health; health disparities; impact on vulnerable populations; or general welfare and safety) to inform programmatic, policy, or administrative decisions.

 – **Health assessments may be legally viable** subject to specific interpretations of inconsistent or vague legal provisions or supporting policies. This category includes other types of HAs that may be narrower in scope than HIAs (but may be part of an HIA), including HRAs and other studies of health impacts that do not inform decisions relating to projects or policies (e.g., health investigations in response to hazardous material release or remediation).

 – **Health assessments are legally prohibited** for certain projects or policies. This category also refers to the broader array of HAs and may not be specific to HIAs.

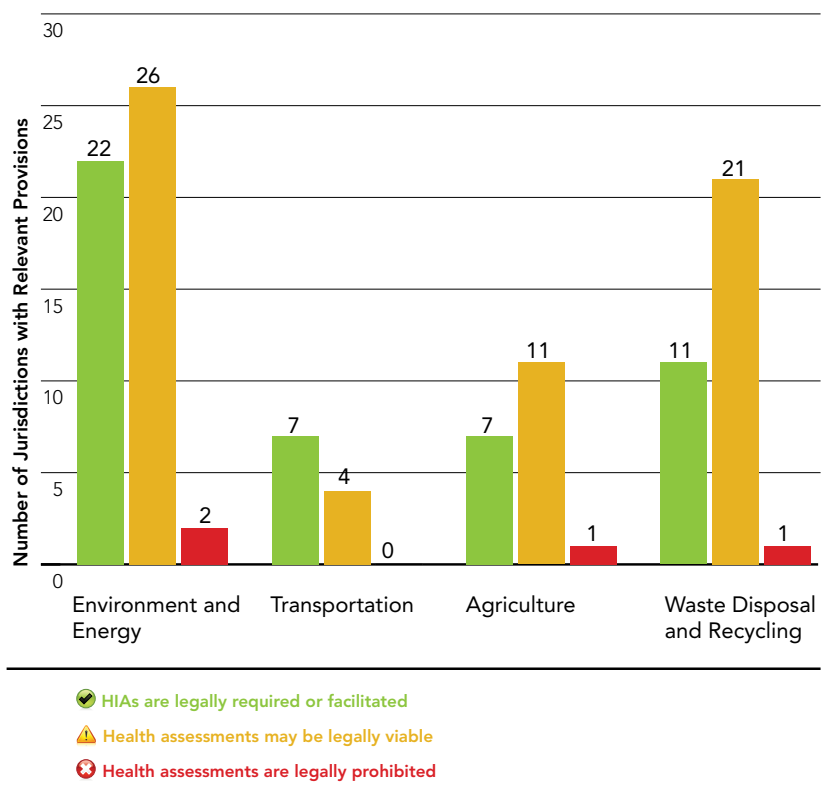
C. Assumptions and Limitations

Though broad in scope, our research results in **Tables 1** and **2** do not include all laws that could implicate the utility or legality of HIAs in a jurisdiction. Rather, our results provide a comparative snapshot of statutory, regulatory, or judicial laws and policies concerning HIAs based on available legal and other data at the time of the search. This snapshot may change due to many factors (e.g., a change in administration, passage of new legislation, implementation of regulations, or outcomes of judicial cases). A primary purpose of the report is to help identify legal support for the increased use of HIAs and to identify opportunities to use HIAs to satisfy the intent and purpose of laws that require consideration of health to inform decision making.

Importantly, general public health laws that do not specifically mention HIAs or other types of health impact studies may still be used to facilitate HIAs. For example, an Oregon statute requires the state health authority to engage in “surveys, investigations or inquiries as may be requested by the Director of Agriculture for the purpose of showing the manner in which the production, processing or distribution of agricultural products may affect the public health.”¹⁶ Although the statute does not specifically mention HIAs or require investigation results to be used to inform policy, it provides ample authority to use HIAs as a means to implement the required surveys or investigations. While these (and other) examples demonstrate the sort of broad public health authority that may allow government to implement HIAs through varied means, our research does not suggest that HIAs are directly authorized by these provisions.

Research results in **Table 2**, further discussed in **Part III**, also do not include broad laws related to public health authority to engage in activities generally to protect the public’s health, safety, or welfare consistent with state-based police powers. Minnesota law, for example, provides the state health commissioner with broad responsibility and authority for “... protecting, maintaining, and improving the health of the citizens.”¹⁷ These types of statutory or regulatory provisions exist in many jurisdictions. As discussed further in **Part III**, while these laws could

Figure 3. Summary of HIA and HA Legal Provisions across Jurisdictions



facilitate the use of HIAs in furtherance of broad exercises of public health powers, our research does not reference them because of their generality and nonspecificity to HIAs.

Select provisions from each subject area are discussed in **Part III**, based on the comprehensive results by jurisdiction and subject area set forth in **Tables 1** and **2**. The total number of jurisdictions reviewed with provisions in each of the subject areas is illustrated in **Figure 3**.

The cost and financing of HIAs are not the primary foci of this report, but cost is an important consideration in implementing HIAs. No published studies in the United States have determined the range of costs of conducting an HIA. Anecdotal evidence indicates that small-scale, rapid HIAs can be conducted in as little as a few weeks for less than \$5,000. More comprehensive HIAs can take six months or more and may cost up to or more than \$100,000. Among the many types of laws and regulations considered in this report, there are a wide range of mechanisms used to pay for the implementation of required studies. Some rely on external fees, such as permit fees; others are wholly funded by the responsible agency; others may be funded and conducted by private industry. HIAs undertaken under an existing legal requirement may be funded as part of the required studies. In some cases, it may be necessary for practitioners to find other means of support.

III. Findings: Legal Provisions Implicating HIAs in Select Jurisdictions

The focus of our findings is on those laws noted in the first category (✔ – **HIAs are legally required or facilitated**) because they provide the strongest legal basis to support the use of HIAs. Very few laws specifically require the conduct of HIAs (identified in only four instances among the laws in the 36 jurisdictions selected for this study).¹⁸ As a result, the majority of legal provisions in this category facilitate the use of HIAs. These laws create pathways for HIAs, even if they do not explicitly refer to HIAs by name. Laws that most clearly facilitate HIAs generally call for:

- an assessment of a broad range or description of health impacts (e.g., effects on public health, safety, general welfare, environmental health, health disparities, vulnerable populations, or social or economic well-being)
- studies or assessments that are used to inform public policy, programs, projects, regulations, or decision making.

Additional discussion of legal provisions that contemplate the conduct of other types of HAs and how these provisions may support the use of HIAs in specific circumstances is analyzed in **Part IV.D**. Laws that prohibit HAs, though limited, are discussed in **Part IV.E**.

A. Environment and Energy

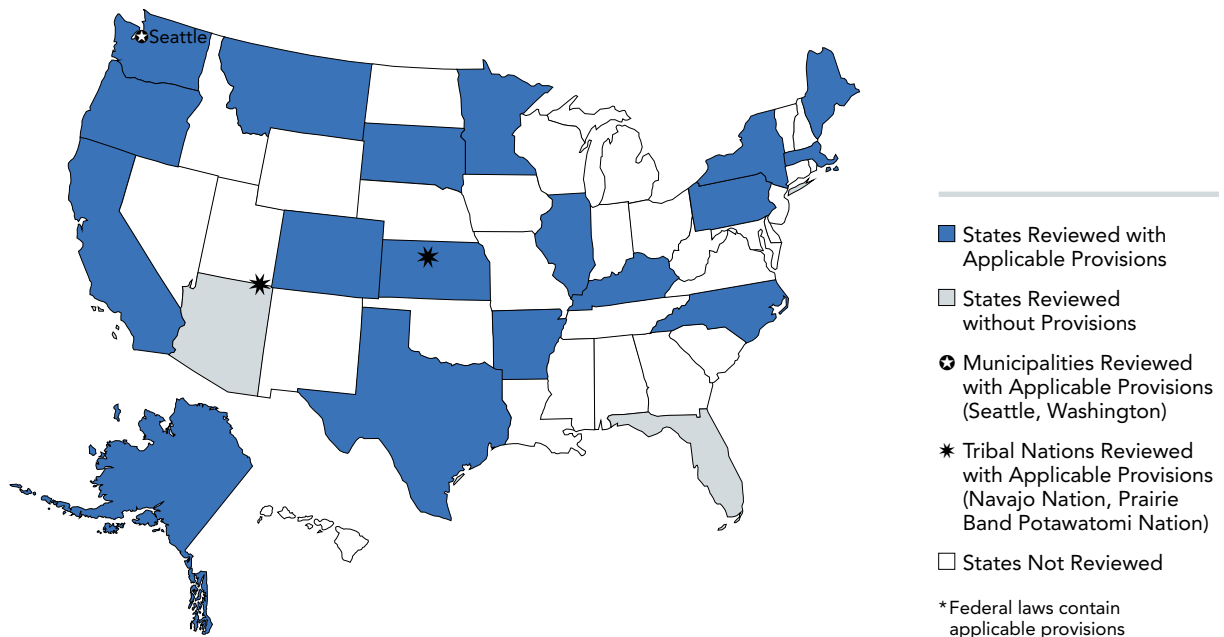
The environment and energy subject area contained the most legal provisions implicating the use of HIAs of all the subject areas studied in this report. This is unsurprising given that environmental laws and policies regulating energy sources, uses, and extraction are proliferate. In addition, HIAs have historically drawn from the established practice of environmental impact statements (EIS).¹⁹ As depicted in **Figure 4**, among the 36 jurisdictions reviewed, 22 (61 percent) featured laws that either require or facilitate the conduct of an HIA within this subject area.

1. Legal Provisions Requiring HIAs

HIAs are specifically required by law in the environment and energy subject area in only one jurisdiction—the state of Washington. These regulations require that applicants seeking approval to construct new or modified units emitting toxic air pollution who cannot demonstrate compliance with Washington’s ambient air impact requirements at an acceptable level must petition the Washington State Department of Ecology to determine a means of compliance. The petition must include an HIA that presents data about the new or modified pollution source and its built and natural environment.²⁰ Despite the specific use of the term HIA, this regulation appears to define HIAs similarly to an HRA, including requirements to provide a site description, toxic air pollutant concentrations and toxicity, identification of exposed populations, and an exposure assessment. These similarities may be because the

primary health concern in the area of air quality regulation is exposure to pollution. However, since Washington's definition of HIAs is not limited to exposure risk assessment and refers to the built and natural environment, any required HIAs could also include health effects related to the social, economic, or environmental impacts of the air pollution emitter.

Figure 4. Legally Require or Facilitate HIAs—Environment and Energy



2. Legal Provisions Facilitating HIAs

While most legal provisions in this area do not specifically refer to HIAs, they prescribe studies of health impacts that are broad enough to facilitate the conduct of HIAs. Consistent with the purposes of HIAs, many of these laws contemplate that the health impact study conducted would inform policy, licensing, or regulatory decision making. Several examples illustrate these findings.

In California, the State Energy Resources Conservation and Development Commission must conduct assessments of all aspects of energy supply, production, transport, distribution, and prices to develop energy policies no less than once every two years.²¹ The assessments must account for impacts on public health and safety, the state's economy, resources, and the environment. Similarly, New York's State Energy Planning Board's energy plan must include an assessment of the plan's impact upon economic development, health, safety and welfare, environmental quality, and energy costs for consumers generally and low-income consumers specifically.²²

Several states (Colorado, Illinois, Pennsylvania, Texas) and the federal government require a broad assessment of the radiological and non-radiological health impacts (e.g., the impact on public health and safety) when evaluating licensing of facilities that handle or transport

radiological materials.²³ In Pennsylvania, the licensing applications to dispose of radioactive materials must discuss long-term public health, environmental, social, and economic impacts that the facility will have on affected areas.²⁴

Under the federal Clean Air Act (CAA), the primary responsibility for planning for attainment and maintenance of the National Ambient Air Quality Standards (NAAQS) rests with state and local agencies, who are the lead permitting and enforcement authorities for most CAA requirements in most states.²⁵ Consistent with the CAA, five of the 36 jurisdictions in our sample (Alaska, Maine, Montana, Washington, and the Navajo Nation) require an evaluation of the health, environmental, economic, social, and energy effects of any proposed reclassification of attainment or “clean” areas to lower classification (nonattainment areas) under the CAA’s NAAQS program.²⁶

In Kentucky, permit applications for experimental practices in oil and shale operations must include assessments of risks to public health and safety and the environment.²⁷ In Oregon, applicants for a surface-entry permit to enter state lands for the purpose of drilling for oil or gas must receive approval of an environmental assessment that includes assessment of adverse effects on the human and natural resources of the area.²⁸ Oregon’s administrative regulations further specify that the adverse effects evaluated may include scenic, recreational, public health, and plant and animal resources.

Finally, Seattle’s director of the Department of Planning and Development is required to consult with the director of the Seattle King County Health Department and other local, state, regional, and federal agencies to determine when a business establishment is to be regulated as a “High-Impact Use.” A business classifiable under this term (1) is considered to be dangerous or noxious due to the probability or magnitude of its effects on the environment; (2) has the potential for causing major community or health impacts, including nuisance, odors, noise, or vibrations; or (3) is so chemically intensive as to preclude site selection without careful assessment of potential impacts and impact mitigation.²⁹

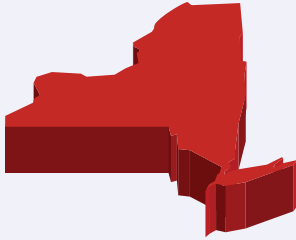
3. HIAs under the National Environmental Policy Act (and State Equivalents)

As discussed in greater detail in **Part IV.B**, NEPA³⁰ and equivalent state laws may provide broad legal support for the conduct of HIAs for an wide range of governmental actions (generally, any proposed action with a potential for significant environmental effects), as contrasted with laws that may only apply to a particular sector, agency, or program. NEPA § 102 requires federal agencies to incorporate environmental considerations in their planning and decision making through a systematic, interdisciplinary approach, which is highly consistent with HIA methodology.³¹ Specifically, all federal agencies must prepare detailed EISs assessing the environmental impact of and alternatives to major federal actions significantly affecting the human environment. Where an agency’s action potentially affects public health, a full analysis of the direct, indirect, and cumulative health effects according to the requirements and steps of the EIS process would be consistent with an HIA.

Several states have analogous statutes (state NEPAs) that require similar assessments of environmental impacts for state agency action that may significantly impact the environment. Eight states reviewed in our research have a state NEPA: California, Massachusetts, Minnesota,

CASE STUDY 1

REQUIRING ZONING DECISIONS TO CONSIDER HEALTH IMPACTS VIA NEW YORK'S STATE ENVIRONMENTAL QUALITY REVIEW ACT



New York's State Environmental Quality Review Act (SEQRA), the state's analog to NEPA, requires impact statements on state actions "which may have a significant effect on the environment."³⁴ SEQRA defines the term "environment" to mean "the physical conditions which will be affected by a proposed action, including land, air, water, minerals, flora, fauna, noise, objects of historic or aesthetic significance, visiting patterns of population, concentration, distribution, or growth, and existing community or neighborhood character." The definition is broad enough to include socioeconomic, environmental, and public health effects, and has been applied in land use and development, among other contexts. Depending on the circumstances and the anticipated effects of the proposed action, an EIS under SEQRA may include an HIA.

In *Riverhead Business Improvement District Management Association v. Stark*,³⁵ the town board in Riverhead, New York, located on Long Island in Suffolk County, enacted a zoning amendment in 1997 that created a commercial planned development district to allow retail stores within the zoned area. Prior to enacting the zoning amendment, however, the town board did not, as required by SEQRA, take the requisite "hard look" at the environmental impacts of the zoning amendment to create the commercial planned development overlay district. Although the town board completed an environmental assessment form in which it determined that the development could increase traffic, affect public health, impact the character of the neighborhood, and possibly cause the release of toxic materials into groundwater aquifers, it found that these risks were not enough to require a full EIS in circumvention of SEQRA requirements. When challenged by petitioners (consisting of a local supply company and a business association), the court held that SEQRA required the town board to fully consider the environmental concerns that were "reasonably likely to result from its zoning amendment at the time of its enactment" in an EIS. The rezoning action was of a type presumed to have a significant adverse impact on the environment and thus require an EIS. Although the court did not specifically distinguish public health and environmental concerns, the types of environmental concerns identified in the assessment included public health impacts. Since these environmental (including public health) concerns were not considered, the zoning amendment was void and unenforceable.

The court also rejected the town board's argument that individual development proposals are subsequently subject to full SEQRA review in connection with the eventual site plan approval process for the proposed shopping center, thus excusing the board itself from the requirements of SEQRA when passing the zoning amendment. The court concluded that the zoning amendment was not enacted in accordance with SEQRA requirements; it was therefore annulled.

This case study illustrates how a state NEPA statute may be used to enforce consideration of health impacts of zoning decisions as part of the EIS process, which may require assessments inherent in an HIA.

Montana, New York, North Carolina, South Dakota, and Washington.³² Most of these statutes include the goal of achieving a healthful environment in their statements of purpose. Only Washington's law explicitly calls for an analysis of health impacts as part of the EIS process.³³ Although most of these statutes do not expressly mention health, health impacts may be evaluated as part of the EIS process due to the interaction between environmental effects and human health.

B. Transportation

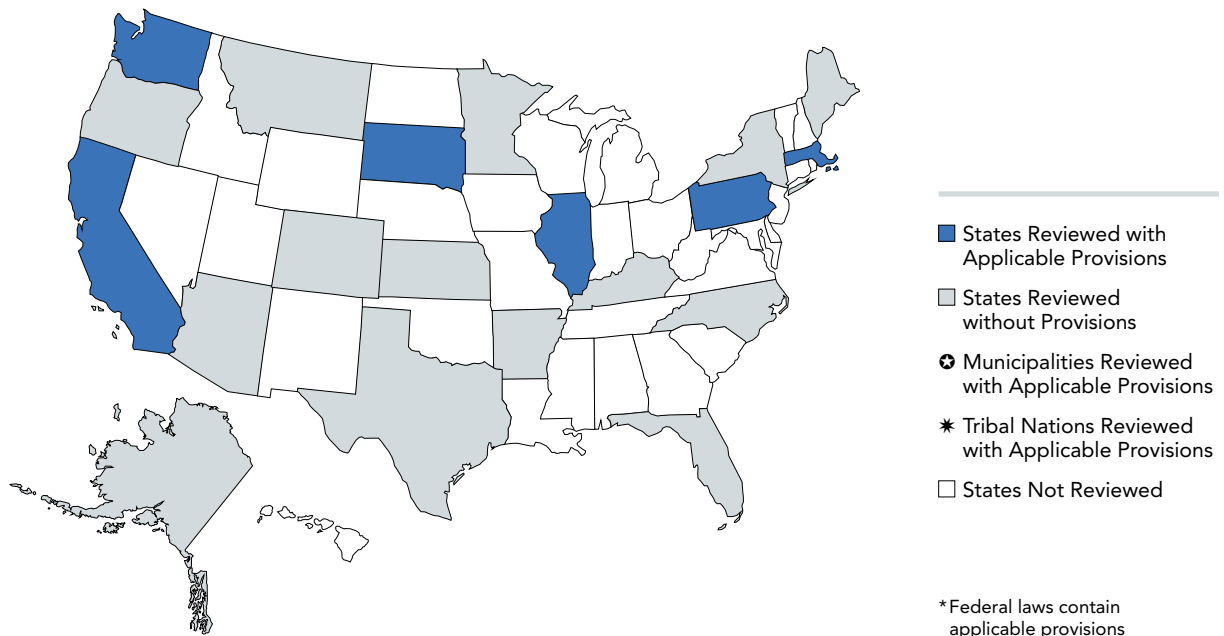
As seen in **Figure 5**, among the 36 jurisdictions reviewed, seven (19 percent) feature provisions that require or facilitate the conduct of an HIA within the subject area of transportation. This includes laws that regulate highway construction and safety, mass transit, and clean vehicles programs.

1. Legal Provisions Requiring HIAs

Two states' laws specifically require an HIA in this sector, the Massachusetts Healthy Transportation Compact and a Washington State bill that required an HIA as part of the planning process for replacing the heavily used State Route 520 bridge in Seattle (see **Case Study 2**).

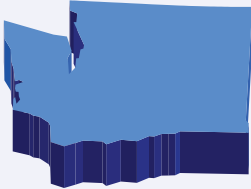
Massachusetts' Healthy Transportation Compact, established by statute in 2009, requires the use of HIAs to assess the effects of transportation projects on public health and vulnerable populations.³⁶ The Healthy Transportation Compact is an interagency initiative that involves

Figure 5. Legally Require or Facilitate HIAs—Transportation



CASE STUDY 2

THE WASHINGTON STATE ROUTE 520 BRIDGE REPLACEMENT PROGRAM— HIA REQUIREMENTS VIA STATE LAW³⁸



In 2007, the Washington Legislature passed Senate Bill 6099 (codified at Wash. Rev. Code § 47.01.406). This bill directed the Office of Financial Management to work with parties affected by the State Route 520 Bridge Replacement and High Occupancy Vehicle (HOV) project to develop a design and plan for an interchange on the west side of Lake Washington (near Seattle). The plan addressed the effects of the project on Seattle neighborhoods and parks, including the Washington Park Arboretum and institutions of higher education. The legislation also directed the Puget Sound Clean Air Agency and Seattle and King County public health agency to conduct an HIA to evaluate the project's effects on air quality, greenhouse gas emissions, and the physical, mental, and social well-being of neighboring communities. This statutory requirement to conduct an HIA is one of the first examples of legislatively mandated HIAs in the United States.

State and local planners considered the HIA in the development and planning of a new bridge across Puget Sound. The HIA incorporated multiple procedures and methods to evaluate the potential effects bridge construction and development may have on the public's health, and how those effects may be distributed across the population. Initially, nine health focus areas for research were determined through the HIA, including air quality, water quality, green space, physical activity, noise, mental well-being of residents and visitors to the area, safety, social connections, and emergency medical services. Researchers showed how these nine areas interrelated, thus suggesting that decision makers consider all areas in conjunction with each other.

Following completion of the HIA in 2008, the report recommended that state transportation providers utilize landscaped freeway lids and more green spaces, make transit improvements, add pedestrian and bicycling amenities, and consider noise reduction strategies. The HIA also provided recommendations for the construction period, which included clearly marked alternative bicycle and walking paths, coordination of noise control, traffic calming devices in affected neighborhoods, and assurances that emergency medical services could access all construction areas, including water. Project planning is ongoing with the bridge replacement scheduled to be completed from 2014 to 2017.

the secretary of health and human services, secretary of energy and environmental affairs, Massachusetts Department of Transportation (MassDOT) highway administrator, MassDOT transit administrator, and commissioner of public health. It aims to facilitate transportation decisions that balance the needs of all users, expand mobility, improve public health, support a cleaner environment, and create stronger communities.³⁷ Among other goals, the compact is charged with reducing greenhouse gas emissions, improving access to services for persons with mobility limitations, expanding opportunities for physical activities (like bicycle and pedestrian travel), promoting wellness, and preventing obesity.

2. Legal Provisions Facilitating HIAs

Some of the strongest provisions to facilitate HIAs in the transportation area are found at the federal level. For example, the U.S. Secretary of Transportation is required by statute to complete a study of the commercial feasibility of constructing one or more high-speed ground transportation systems in the United States.³⁹ Although the study is aimed at commercial feasibility, Congress defined the study broadly to include the effects on air quality, energy consumption, noise, land use, health, and safety. In addition, the Secretary of Transportation is required to consult with the Secretaries of Commerce, Energy, and Defense, the EPA administrator, the Assistant Secretary of the Army for Public Works, and the heads of other interested agencies, in the research and development of high-speed ground transportation systems. These broad criteria suggest an HIA-like analysis, even though the statute does not specifically require it. Similarly, the Federal Highway Administration's highway traffic or construction noise abatement program provides for noise studies and noise abatement measures to protect the public's health, welfare, and livability.⁴⁰ This program, though primarily focusing on noise-related health effects, resonates with the goals of HIAs to inform policy and planning. Information generated through this requirement is provided to state and local transportation officials for use in the planning and design of highways.

Some laws in California and Pennsylvania mandate assessments of health impacts to inform a transportation program or policy decision. In California, following complaints by residents about odors from transit bus-fueling stations using liquefied compressed natural gas, a state statute was passed to require the Omnitrans Joint Powers Authority to complete an assessment of the environmental and public health impacts of these fueling stations in San Bernardino Valley, and to hold at least one public hearing to solicit input from persons who may be affected by those impacts.⁴¹ The completed assessment of March 2004 included door-to-door surveys about health status, review of nurses' logs from nearby schools, and analysis of other industrial emissions in the area. It concluded that exposures to emissions from or proximity to the bus refueling stations did not result in increased health risk.⁴² Although this assessment was conducted after the transit stations were already built, the results of the assessment had the potential to affect future decisions regarding the program if significant health impacts were found.

A Pennsylvania statute established the Low Emissions Vehicle Commission in 1998 to study whether the commonwealth should adopt a low-emissions vehicle program (the Clean Vehicles Program).⁴³ The legislature required the study to include an assessment of the program's impact on economic development; future economic expansion; benefits to public health, welfare, and the environment; and the fiscal impact on consumers. Pennsylvania's Clean Vehicles Program went into effect in 2008, explicitly adopting certain provisions of California's Low Emission Vehicle Program.⁴⁴ Although the California and Pennsylvania laws are good examples for future drafters of laws that require assessment of public health impacts to inform policy, their reach does not extend beyond the particular program for which they were designed.

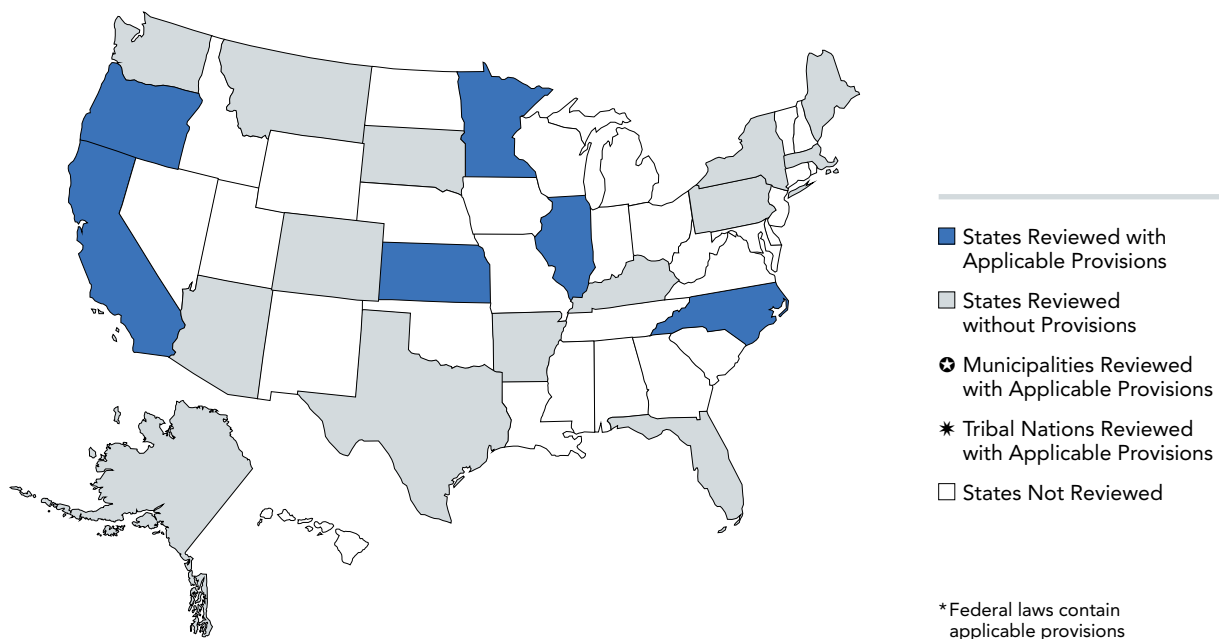
C. Agriculture

As seen in **Figure 6**, seven (19 percent) of the 36 jurisdictions selected for our study feature laws that facilitate the conduct of an HIA within the subject area of agriculture, although none of these laws specifically requires an HIA. The area of agriculture includes, among others, laws that regulate farming, pesticides, large animal facilities, and organic and sustainable food practices.

Federal law provides a broad basis for conducting HIAs related to agriculture programs, policies, and projects. The U.S. Department of Agriculture’s (USDA) Office of Risk Assessment and Cost-Benefit Analysis (ORACBA) must assess the risks to human health, human safety, or the environment, and prepare a cost-benefit analysis, for every proposed regulation with a national fiscal impact greater than \$100 million (in 1994 dollars). USDA’s analysis, which is published in the Federal Register for public review,⁴⁵ must include evaluations of the health and safety risks to persons who are disproportionately exposed or particularly sensitive. The breadth of this USDA requirement, coupled with its use for evaluating proposed regulations, is consistent with HIAs. The extent to which this legal authority has been utilized to conduct assessments similar in scope to HIAs is unclear. Few risk assessments have been published in the Federal Register pursuant to this requirement.⁴⁶ Additional assessments that may fall outside the statutory requirement have also been conducted by ORACBA.⁴⁷

Laws in Minnesota and North Carolina also provide for broad assessments of health impacts of specific agricultural programs and policies. The Minnesota Department of Agriculture must report on the status of organic agriculture every two years to the legislature’s policy and finance committees with jurisdiction over agriculture.⁴⁸ The report must include available information

Figure 6. Legally Require or Facilitate HIAs—Agriculture



CASE STUDY 3

REQUIRING AN ASSESSMENT OF PUBLIC HEALTH IMPACTS IN CALIFORNIA TO ESTABLISH RULES FOR PERMITTING LARGE CONFINED ANIMAL FACILITIES

While many states have right-to-farm laws and exempt agriculture from zoning, some states, including California, require concentrated agricultural farm operations to meet specific health-related requirements. In *Association of Irrigated Residents v. San Joaquin Valley*, residents formed an association and filed a petition challenging the Air Pollution Control District's Administrative Rule 4570 establishing a permit process for large confined animal facilities.⁵³ The residents asserted the district did not comply with a California statute⁵⁴ governing the emission of air contaminants by large confined animal facilities when it passed Rule 4570 because it failed to consider the public health impacts prior to the rule's adoption. The California Court of Appeals agreed.

Specifically, the court found that a statutorily required assessment of the public health impacts of the emissions from confined animal facilities was not satisfied by the district's report. The report included only a single paragraph on the impact of agricultural emissions on occupational health and did not discuss general public health concerns or impacts of Rule 4570 on community health. The district argued that its requirement in Rule 4570 that dairies, feedlots, and poultry houses adopt practices to reduce volatile organic compound emissions would promote public health in the valley by reducing unhealthy concentrations of ambient ozone. The court disagreed, noting that the district's assertion was unsupported by any analysis of the true impacts on public health. It held that Rule 4570 was adopted without conducting an adequate assessment of public health impacts, and directed the district to complete an appropriate assessment of the public health impacts.

When the public health analysis was completed, the district readopted Rule 4570. While the court found that the district should have assessed the public health impacts of the rule prior to initial adoption, it upheld all of the substantive aspects of the rule, and no major changes were required as a result of the health analysis.

This case study illustrates how courts can enforce a legal requirement on a regulatory body to complete assessments of public health impacts before implementing rules, as prompted by community members seeking such assessments through litigation. Although the statute at issue was limited to the evaluation of public health impacts related to air quality and thus did not necessarily call for a broader assessment of health impacts akin to an HIA, court enforcement of its requirements provides a road map of how a statute requiring an assessment of a broader range of health impacts can be enforced through litigation.

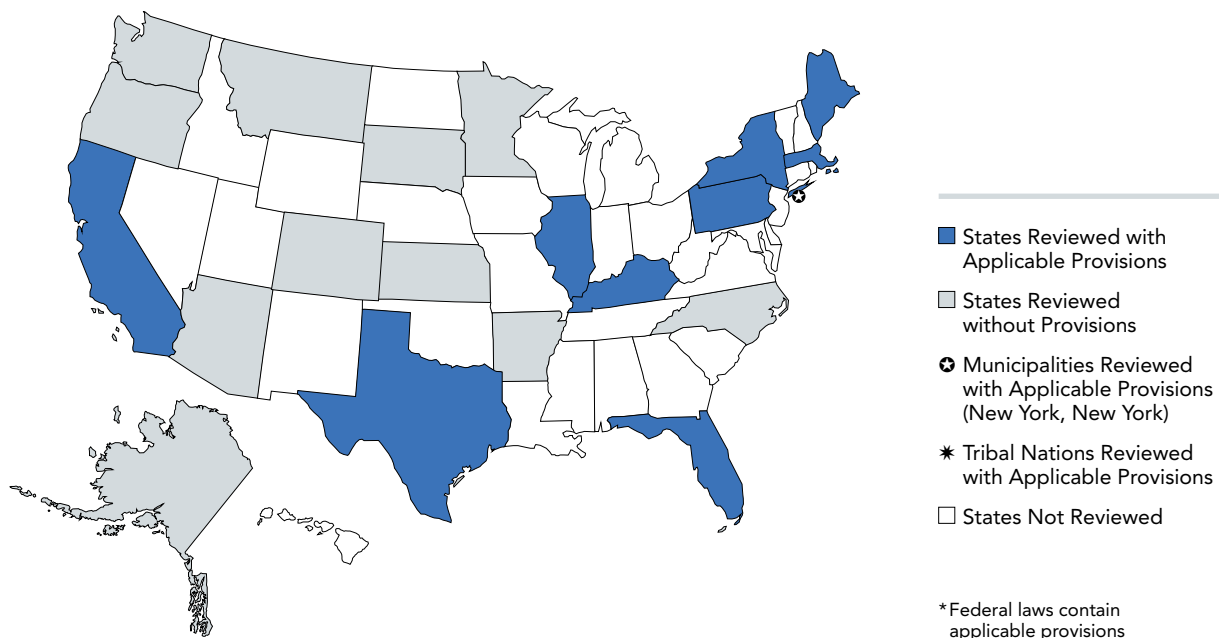
based upon current data on the positive and negative impacts of organic production on the environment and human health. In North Carolina, the Sustainable Local Food Advisory Council is charged with developing sustainable local food programs and policies. It is authorized to consider in-depth assessments of (1) the foods that are served to public school students, (2) the possibility of making sustainable local food available under public assistance programs, and (3) the possibility of promoting urban gardens and backyard gardens to improve the health of citizens.⁴⁹ The council's in-depth assessment may include reviews of health impacts of the various sustainable food programs and policies.

Other states' laws may not explicitly require evaluations of health impacts as part of policy development, but rather demonstrate how more generalized legal authority can facilitate HIAs by supporting research or by authorizing an agency to investigate broader effects of policies on public health. For example, the Illinois Food and Agricultural Research Act funds universities and other researchers to investigate short- and long-term environmental, health, social, economic, and natural resource implications of products, practices, and systems proposed for use in food and agricultural enterprises.⁵⁰ Researchers are also required to work closely with the Illinois Council on Food and Agricultural Research to investigate natural resources, environmental, economic, nutritional, and social impacts of agricultural systems.⁵¹ In Oregon, the Oregon Health Authority is required upon request of the director of agriculture to survey and investigate how the production, processing, or distribution of agriculture products may affect the public's health.⁵²

D. Waste Disposal and Recycling

As summarized in **Figure 7**, 11 (31 percent) of the 36 jurisdictions reviewed feature laws that facilitate the conduct of an HIA related to waste disposal and recycling. None of these jurisdictions' laws, however, specifically require the conduct of an HIA. Most of the legal provisions that facilitate HIAs in this subject area take the form of environmental and public health assessments required for approval to construct or operate waste disposal facilities, notably solid waste facilities (landfills) and facilities handling radioactive wastes.

Figure 7. Legally Require or Facilitate HIAs—Waste Disposal and Recycling



At the federal level, the EPA regulations require commercial and industrial solid waste incineration units to complete a siting analysis to obtain a permit for construction of solid waste facilities. This siting analysis must consider air pollution control alternatives that minimize potential risks to public health or the environment, including costs, energy impacts, non-air environmental impacts, or any other practical factors relating to the alternatives.⁵⁵

In Kentucky, Maine, Massachusetts, and New York, the permitting/licensing process for landfills requires state environmental agencies to evaluate facility siting and design for potential effects on public health, safety, and the environment.⁵⁶

Laws in Pennsylvania and Texas require additional types of impacts (even beyond those effects on “public health” or “safety”) to be evaluated in waste management permit applications. Broad inclusion of various types of health impacts is highly consistent with HIA methodology. In Pennsylvania, for example, permit applications for municipal or residual waste management projects must include a detailed analysis of the potential impact of the proposed facility on the environment, public health, and public safety.⁵⁷ In Texas, solid waste management plans must include feasibility studies that evaluate alternatives in terms of their public health, physical, social, economic, fiscal, environmental, and aesthetic implications.⁵⁸

New York City’s legal requirements concerning landfills exemplify how HIAs may be facilitated through law. The city’s Department of Sanitation is required to complete a comprehensive study of the city’s commercial solid waste management system, including analysis of the ways all applicable laws, rules, and regulations regarding solid waste transfer stations and transportation are enforced to minimize potential adverse public health impacts.⁵⁹ The study must also analyze potential public health impacts of processing residential and commercial waste, the options for transporting such waste, and the presence of large numbers of private transfer stations within communities.

The second major category of waste disposal regulations implicating HIAs involves radioactive waste disposal. The U.S. Department of Energy requires that the selection of sites for high-level radioactive waste must be accompanied by an environmental assessment that includes evaluation of effects on public health, safety, and the environment.⁶⁰ If the decision amounts to a “major federal action” under NEPA, this assessment would fulfill NEPA’s environmental assessment requirements.⁶¹ (Note that this is a different statute than the one addressing low-level radioactive waste challenged by the state of New York as violating the Tenth Amendment in the 1992 U.S. Supreme Court case *New York v. United States*.⁶²)

Similarly, at the state level, permit applicants for radioactive waste disposal facilities may be required to address prospectively the facility’s potential health and environmental effects. In Illinois, for example, applicants for low-level radioactive waste disposal facility licenses must describe their environmental monitoring program and evaluate potential health impacts.⁶³ In New York State, permit applications for low-level radioactive waste disposal must demonstrate due consideration of the degrees and durations of risks to human health and the environment, and protection of public health, safety, and the environment.⁶⁴

E. Other Areas

Although most of our findings are concentrated in the four major subject areas described above, more generalized legal requirements or authorizations for assessments of health impacts were also found in six (17 percent) jurisdictions: federal, California, Kentucky, Washington, Minneapolis, and Navajo Nation (see **Table 1**). This section includes all of the laws identified in our research that either require or facilitate HIAs but fall outside the four major subject areas.

1. Legal Provisions Requiring HIAs

In California, all hospitals are required to comply with seismic safety standards and improvements by certain deadlines, or specific hospital buildings may be removed from service. The applicable statutes require the Office of Statewide Health Planning and Development to conduct an HIA to determine whether the removal of hospital buildings from service may significantly diminish the availability or accessibility of health care services to an underserved community.⁶⁵

2. Legal Provisions Facilitating HIAs

Several legal provisions authorize assessments of health impacts without restriction or reference to a particular agency, program, policy, or issue area. Multiple federal executive orders signed by President Clinton require federal agencies to collect and assess data regarding the health impacts of their actions. For example, Executive Order 12866 requires each federal agency to provide the Office of Information and Regulatory Affairs with a list of its planned regulatory actions, along with an assessment of the anticipated costs and benefits across a variety of dimensions, including health and safety.⁶⁶ Executive Order 12898 requires federal agencies (when legally permissible) to collect and analyze information assessing and comparing environmental and human health risks borne by populations identified by race, national origin, or income to determine whether the agency's policies or activities have a disproportionately high adverse effect on the health or environment of minority or low-income populations.⁶⁷ Executive Order 13045 directs each federal agency to prioritize the identification and assessment of environmental health and safety risks that may disproportionately affect children.⁶⁸

At the state level, the Washington State Board of Health is required (subject to available funding) to complete health impact reviews of legislative or budgetary proposals to determine the extent to which the proposal improves or exacerbates health disparities.⁶⁹ Although the board conducted health impact reviews from 2007 to 2009 (many relating to education policies), funding for these reviews was legislatively suspended in 2009. No new reviews have been posted on the Board of Health's Website since then, although the Board indicates it will attempt to continue reviews upon request, subject to resource limitations.⁷⁰ In Kentucky, the governor's cabinet is authorized to undertake planning studies and surveys, and to create maps relating to a litany of subjects affecting the general health and welfare. These include zoning; soil conditions; land use and classifications; population distribution; schools; park and playground development; port, harbor, and waterway work; parkways; highways; traffic; transit; water supply; drainage and sewerage; long-range financial programs; real property inventories; tax maps; building and housing conditions; and subdivision controls.⁷¹

IV. Analysis: Key Themes Concerning Legal Authority to Conduct HIAs in Non-Health Sectors

Other jurisdictions' laws relate to specific policy areas. The Navajo Nation authorizes and directs the Department of Diné Education to determine the impact on students of educational programs in multiple areas of concern, including social and economic variables and health and safety relevant to the educational situation of Navajo students.⁷² An ordinance passed by Minneapolis directs the community planning and economic development department to conduct an assessment of the impact of electronic and digital billboards on the public health, safety, and welfare of its citizens, and to then propose zoning amendments or other regulations deemed necessary and advisable.⁷³

A. Triggers for Increased Use of HIAs under Existing Legal Authority

As discussed in **Part III**, most of the legal provisions in the first category (✔ – **HIAs are legally required or facilitated**) consist of laws that facilitate, rather than specifically require, HIAs. Though these laws may not require HIAs or refer to them by name, they create pathways for and support the use of HIAs. Laws that most clearly facilitate HIAs feature two key criteria:

1. They refer to a broad range or description of health impacts, such as effects on public health, safety, general welfare, environmental health, health disparities, social or economic well-being, or effects that are borne disproportionately by vulnerable populations.
2. They call for studies or assessments that are used to inform public policy, programs, projects, regulations, or decision making.

These two features are highly consistent with HIA methodology that incorporates a multidisciplinary approach to evaluating a wide range of health effects beyond, for example, the biophysical effects from exposure to hazardous materials (which is more common in HRAs). HIAs are used primarily to inform policy or programmatic decisions, which are furthered by laws that call for assessments to be conducted prospectively or periodically to evaluate programs and policies prior to, or at least as part of, their implementation. In contrast, an HA that is conducted primarily in response to a specific event (e.g., remedial investigations for toxic contamination sites or assessments to allocate responsibility for environmental cleanup) is less reflective of HIAs.

One other feature of HIAs, the solicitation of public input, was not seen as frequently among these legal provisions, except for HIAs facilitated by NEPA or state NEPAs, which call for public input through the EIS process (as discussed further in **Part IV.E**).

Not all laws that facilitate HIAs are equally strong. Some provisions merely allocate funding for or authorize an agency or research institution to conduct studies or evaluations of health impacts of programs or policies, without specifically stating that results will be used to inform further policy or programmatic decisions. Examples of this type of provision include: (1) the Illinois Food and Agricultural Research Act, which funds universities to investigate environmental, health, social, economic, and natural resource implications of food and agriculture enterprises,⁷⁴ and (2) an Oregon statute authorizing the state's health authority to survey and investigate how the production, processing, or distribution of agriculture products may affect the public's health.⁷⁵ These types of laws may still facilitate HIAs on the premise that study results are intended to be used to inform policy or programs, even if it is not explicitly stated. Moreover, HIAs may offer an effective way to implement the aims and purposes of these laws.

Other laws meet the two criteria but are weaker candidates for furthering the use of HIAs because they are limited to a particular program or are intended to address a one-time occurrence. Transportation laws in California (requiring an HA of bus fueling stations in San Bernardino County)⁷⁶ and Pennsylvania (requiring an HA in the development of a Clean Vehicles Program) are illustrative.⁷⁷ Once these assessments are complete, the provision does not authorize further use of HIA-type assessments for other programs. Though limited in duration and scope, these laws may serve as examples for future legislative or regulatory provisions requiring or facilitating HIAs.

B. HIAs under Federal and State Environmental Statutes

NEPA and certain state NEPAs provide broad legal support for the use of HIAs. NEPA applies expansively to federally funded projects, federal agency policy decisions, and actions relating to federal land.⁷⁸ NEPA's legal requirements derive from statutory language as well as regulations issued by the Council on Environmental Quality (CEQ), which oversees the implementation of NEPA by federal agencies.⁷⁹ Although in practice the implementation of NEPA's mandate to assess the effects of proposed agency actions has traditionally focused mainly on environmental impacts, NEPA provides a strong legal basis for the inclusion of health effects, and it can and is being used as a legal vehicle for the use of HIAs.

Although NEPA's mandate to evaluate impacts of agency actions traditionally included only environmental impacts, NEPA can and is being used as a legal vehicle for the use of HIAs.

NEPA's potential as a legal platform to facilitate the use of HIAs lies primarily in its mandate that an EIS be prepared whenever a federal agency takes "major Federal actions significantly affecting the quality of the human environment."⁸⁰ In 2007, an HIA was conducted within the legal framework of

NEPA to inform the Bureau of Land Management's decision to expand the license of a major oil development project affecting the Inupiat communities in the North Slope Borough, particularly residents of Nuiqsut, Alaska.⁸¹ The community relied on two provisions of NEPA to facilitate the integration of an HIA into an EIS: (1) CEQ regulations requiring the agency to respond to substantive public comments on health concerns, and (2) NEPA's stated purpose and language embracing consideration of health impacts.⁸²

The Inupiat community members raised concerns that an expanded oil lease could exacerbate local health problems, including asthma and drug and alcohol use, and could adversely affect the community's supply of locally harvested foods. These concerns, however, were not initially addressed with a robust analysis of available public health data.⁸³ CEQ regulations require an agency preparing an EIS to respond to all comments by modifying the proposed action or its analysis, developing new alternatives, or explaining why the agency does not need to respond to the comments.⁸⁴ Where significant public comments involve health impacts, this regulation requires some health impact analysis, and potentially an HIA.

In addition, advocates in the North Slope Borough—the regional government—argued that health impacts fall within the scope of impacts under NEPA's statutory purposes.⁸⁵ NEPA mentions “health” six times, notably in its purpose “to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man”⁸⁶ and in its intent to “assure for all Americans safe, *healthful*, productive, and aesthetically and culturally pleasing surroundings.”⁸⁷ The Inupiat community and its advocates successfully argued that HIA is functionally equivalent to an adequate health analysis as required by NEPA and the applicable CEQ regulations, and should therefore be included in the EIS.⁸⁸

To determine if an agency action is “significant” under NEPA (and thus requires an EIS), an agency will often first perform a shorter environmental assessment.⁸⁹ Approximately 50,000 environmental assessments are produced each year, compared to 400 to 600 EISs.⁹⁰ Although environmental assessments have generally not included HIAs, these “mini-EISs” provide a possible vehicle for HIA use. CEQ regulates environmental assessments less thoroughly than EISs⁹¹ and only requires that agencies involve “applicants, and the public, *to the extent practicable*.”⁹² However, environmental assessments are meant to further the same NEPA purpose of public notice and protection that applies to an EIS.

Arguments similar to that advanced in Nuiqsut, Alaska, can be proffered to include an HIA in EISs and environmental assessments in other jurisdictions. Eight of the 20 states reviewed for our study (California, Massachusetts, Minnesota, Montana, New York, North Carolina, South Dakota, and Washington) have adopted NEPA-like statutes that require an EIS for state actions that significantly affect the environment, and include an opportunity for the public to review and comment on proposals.⁹³ While local interpretations vary, states generally follow federal interpretations of NEPA when applying their state versions.⁹⁴

C. Moving Beyond HRAs to HIAs

The second category of legal interpretation, demarcated by (⚠️) in **Tables 1** and **2**, includes laws that call for other types of HAs, namely HRAs or HESs. As noted in **Part II.B**, HRAs refer to a specific methodology established by EPA and others for assessing risks to human health from exposure to hazardous substances and are thus narrower than HIAs. As a result, many laws addressing hazardous substances or pollution implicate HRAs rather than HIAs. To the extent that a legal provision specifically references an HRA or HRA-like methodology or refers only to the health impacts resulting from exposure to hazardous substances, it may not facilitate the use of broader HIAs.

Whether laws requiring HAs may support the use of HIAs depends on their breadth as well as the knowledge and willingness of agency actors and stakeholders to enhance the scope of resulting HAs.

For example, a regulation promulgated under the CAA requires manufacturers to conduct health effects assessments (HEAs) on motor vehicle fuel and additives. HEAs are defined as “supplemental studies designed to determine the potential for reproductive/teratologic, carcinogenic, mutagenic, and neurotoxic

health effect outcomes from vehicle/engine emission exposures, which may be required before registration of a fuel or fuel additive can occur.”⁹⁵ By specifically enumerating the biophysical health effects to be measured, this law prescribes a narrow type of HA. While these types of assessments may further similar objectives as an HIA, namely improving policies that impact human health, they are not HIAs because of their limited breadth. It is difficult to assert legally that broader HIAs are required by these types of laws.

In contrast, some laws arguably may authorize assessments of other non-biophysical health impacts through HIAs. In Arizona, county air pollution programs require owners of new sources of air pollutants to conduct risk management analyses that include HAs and health studies, which are then reported to county boards of supervisors.⁹⁶ Although HAs in this law likely refer to HRAs (because HRAs are typically used to assess air pollution and because they call for analysis of risk management), the additional reference to “health studies” may be interpreted broadly by courts. Consistent with judicial principles of statutory interpretation, all statutes should be given effect and not be interpreted as superfluous or inoperative. Thus, if the statute-mandated HA is an HRA, the additional “health study” referred to in the Arizona law must be something else—arguably an HIA. Under this interpretation, other types of health impacts may be evaluated, such as the effect that the source of air pollution may have on traffic collisions due to reduced visibility, ability of nearby residents to engage in recreational activities outdoors, or health impacts in terms of lost days of school or work due to increased incidence of respiratory ailments.

Whether laws requiring HAs may support the use of HIAs depends on their breadth as well as the knowledge and willingness of agency actors and stakeholders to enhance the scope of resulting HAs. If challenged, a plausible claim may be made that the broad language of the provision shows the intent of the legislature or regulatory body to not restrict studies to narrow HAs, but rather to allow more expansive and thorough HIAs.

D. The Role of HAs as Evidence in Litigation

Most available case law involves HAs, not HIAs. In several cases, courts either ordered that HAs be performed or admitted their results or similar studies into evidence.⁹⁷ HAs are admitted into evidence in litigation for multiple reasons. They may be used *offensively* (e.g., to challenge a proposed project or action or allocate responsibility for environmental cleanup)⁹⁸ or *defensively* (e.g., to overcome a challenge to a proposed project or action by showing that negative health effects will not occur).⁹⁹ In California, an HRA was admitted defensively as evidence to support a school district’s decision to construct a high school to overcome a challenge by the city alleging the planned school site would not meet environmental and safety standards.¹⁰⁰ Although not always persuasive in implementing changes to policies or programs under review (as seen in **Case Study 3**), an HA may be used to either challenge or defend policies and programs.

In several cases, courts either ordered that HAs be performed or admitted the results of HAs or similar studies into evidence as part of a case.

A deficient HA can result in a court ordering further studies before issuance or denial of a permit.¹⁰¹ The lack of an HA may be used offensively against alleged polluters who fail to meet their burden of proving the costs of pollution abatement.¹⁰² These and other cases

illustrate how a properly conducted HA can be a powerful tool for justifying specific policies or decisions that impact public health. Conversely, failure to conduct an appropriate HA may be used by courts to overturn governmental agencies' decisions. HAs can also be used as a tool to demonstrate minimum compliance with health and safety requirements, and thus fall short of the goals of promoting broader consideration of health impacts.

Similar outcomes are expected as HIAs may be admitted into evidence as they become more prevalent. HIAs may also be used to either challenge or defend policy, programmatic, or other decisions that the HIA was intended to inform.

E. Federal Preemption of Tribal, State, or Local Laws Authorizing HAs and HIAs

In a few instances identified in **Table 2** where HAs were legally prohibited, the HA required by a state or local law was preempted by higher law.¹⁰³ Tribal, state, or local laws requiring or facilitating HAs or HIAs may be subject to legal challenges under the doctrine of preemption.¹⁰⁴ Preemption refers to ways in which federal law may override or negate conflicting state or local laws. Though subject to considerable interpretation, federal preemption may occur because a state or local law directly conflicts with a federal legal requirement or because federal law so thoroughly occupies a field that state or local laws are subsumed. This latter example, known as field preemption, is common concerning nuclear power and wastes where the legal authority of Congress is encompassing and national uniformity is essential.¹⁰⁵ Just as state or local laws may be preempted by federal laws, local laws may be preempted by state laws in any jurisdiction, subject to the degree to which the state assigns local governments authority to govern in specific areas, including public health.

In a number of cases, state or local requirements to conduct HAs were prohibited due to federal preemption.

In a number of cases, state or local requirements to conduct HAs were prohibited due to federal preemption. For example, in a 2007 California case, local regulations requiring railroads to provide information about the health risks

arising out of the railroads' local operations were preempted by the Interstate Commerce Commission Termination Act of 1995, which expressly preempts state and local regulation of the railroads.¹⁰⁶ The federal Atomic Energy Act preempts all state laws (not just those in conflict) relating to nuclear safety for nuclear power facilities¹⁰⁷ that may include any tribal, state, or local regulation requiring an HIA to assess safety issues related to nuclear power plants. A federal district court in 1991 restricted a tribal entity in Minnesota from imposing more stringent regulations or requiring an HA on the transport of radioactive material to and from a nuclear

power facility.¹⁰⁸ State and local government action, while not uniformly preempted, may be restricted in certain circumstances, such as their attempts to implement provisions relating to pollutants that the federal government has chosen to regulate.¹⁰⁹

A practical effect of federal preemption is that tribal, state, and local governments may be unable to require or facilitate HIAs in areas where the federal government retains the authority to regulate. Local governments must ensure that their laws requiring or facilitating HIAs do not conflict with state laws.

F. Forging Ahead Despite Legal Gaps: HIAs Concerning Zoning and the Built Environment

While legal support for HIAs is a pervasive theme throughout this report, HIAs in the United States have most often been undertaken without relying on specific legal requirements or authorization. General legal authorities under federal, tribal, state, and local laws to protect the public's health, control communicable and chronic diseases, or abate public or private nuisances that harm individual health may undergird efforts by governmental or private-sector actors to study, evaluate, or assess health effects. Continued calls by legislators, executive agency officials, community members, and other stakeholders for enhanced consideration of health effects in making new policies or programs naturally support conducting HIAs. In recognition of this trend, public health advocates and legal actors must advance the utility of HIAs in all places where the law requires affirmative HIAs, empirically documented proof of efficacy, or meaningful interventions to protect the public's health.

[P]ublic health advocates and legal actors must advance the utility of HIAs in all places where the law requires affirmative HIAs, empirically documented proof of efficacy, or meaningful interventions to protect the public's health.

One of the most extensive uses of HIAs nationally concerns land use planning and zoning and related decision making as it affects the built environment. The term “built environment” refers to human-made surroundings, resources, buildings, and infrastructure designed to support human activity. In their 2008 review of 27 case studies

involving HIAs from 1999 to 2007 in the United States, 12 (44 percent) of the HIAs documented by Dannenberg and colleagues concern zoning adjustments or other decisions that affect built environments.¹¹⁰ Many HIAs related to the built environment have been completed in the United States, as detailed on the Health Impact Project's Web site.¹¹¹ Examples are numerous and include: (1) an assessment outside Oakland, California, of a proposed new use of an area under the elevated tracks of a mass transit system as a future walking/biking trail,¹¹² and (2) reliance on an HIA to redesign core urban areas of transit in Atlanta, Georgia.¹¹³

Despite the common application of HIAs concerning policies or programs in zoning and the built environment, there are few explicit legal requirements noted in the study for their performance and only minimal references to laws that may facilitate their use in the jurisdictions reviewed. Although zoning and land use laws reviewed for this report regularly refer to “health” as a basis for key decisions, none required or facilitated HIAs. Rather, HIAs in these settings are often carried out through new collaborations between health

experts and planning officials who recognize potential benefits of including a more robust and comprehensive consideration of health in the planning process.¹¹⁴ As discussed in **Case Study 1** and **Part IV.B**, judicial interpretations of state NEPA laws may find that some assessments of health impacts be considered as part of the environmental assessment process required for certain urban planning and zoning decisions. However, these decisions do not expressly require that HIAs be conducted. Thus, to the extent that HIAs are used to assess health impacts in matters related to zoning or the built environment, in many cases it appears that it is not pursuant to explicit legal requirements as much as in furtherance of general authority to consider health, public health, or related human or environmental impacts of land use decisions.

However, there may be other reasons that explain the relative absence of zoning and land use policies from our sample. First, our study was limited in the number of jurisdictions studied. Zoning issues are inherently local in nature and are subject to local ordinance requirements.¹¹⁵ Although our study included a representative sample of 10 localities, this small group of municipalities may not reflect trends in thousands of other localities that may expressly require HIAs via ordinance or zoning regulation. Second, as per the court's findings in **Case Study 1**, this is one area of policy in which general legal authority to conduct HAs may increasingly be interpreted by local zoning boards and other government officials as necessitating a broad consideration of health, such as can be accomplished through an HIA.

Finally, programs and policies concerning the built environment invariably are tied to the natural environment. Our study explicitly examined relevant environmental laws but did not attempt to delineate how extensively these provisions may also apply to policies concerning the built environment. For example, New York's SEQRA was clearly relied upon by the court in requiring more intense review of health impacts underlying a zoning issue but is classified in our research as an environmental law.

Recommendations

As research has illuminated the central importance of decisions made outside the health sector to efforts to prevent illness in the United States, there are growing calls for collaboration with other sectors. The Institute of Medicine found in 2002 that “governmental public health agencies alone cannot assure the nation’s health.”¹¹⁶ More recently, the National Prevention Council, comprising the Secretaries of Transportation, Housing, Labor, Education, and more than a dozen other federal agencies, issued a strong call for cross-sector prevention efforts, stating, for example, that when “all sectors (e.g., Housing, Transportation, Labor, Education, Defense) promote prevention-oriented environments and policies, they all contribute to health.”¹¹⁷ HIAs have emerged as a practical way to ensure that opportunities to improve health are recognized and built into new policies and projects. The research presented in this report shows that there are already many laws that require the consideration of health effects in decisions made by non-health policy makers. Such laws may prove to be one essential building block for a more effective, multidisciplinary approach to prevention.

Interestingly, HIA practitioners have rarely used legal arguments to advocate for consideration of the findings or recommendations. More commonly, HIAs have been conducted through voluntary efforts by health officials, advocates, or officials outside the health sector who are interested in ensuring that the health implications of a proposed action are proactively identified and addressed. The findings and recommendations are often considered and acted on by responsible officials, but not necessarily because of legal requirements to do so.

The findings of our research do not suggest that there is a need to invoke legal arguments in cases where this voluntary approach is successful. Where effective, HIA practitioners can continue to conduct successful HIAs solely through building strong cross-sector collaborations, providing robust scientific analysis and recommendations, and educating decision makers and community members about the health impacts of proposed policies, projects, and plans, even when HIAs are not clearly required or facilitated by law.

While few jurisdictions’ laws in our sample specifically require the use or conduct of HIAs, many legal provisions require a broad consideration of health effects for the purpose of informing decisions. In addition, NEPA and corresponding state laws may incorporate HIAs into mandated EISs, furthering the use of HIAs across multiple agencies. HIAs may prove to be an appropriate and effective way to meet the intent and requirements of many such laws, and hence these laws may facilitate more widespread use of HIAs. This report may provide a legal foundation to assert the need for a consideration of the results when needed.

There are a number of steps that can be taken to implement the findings of this research:

Public Health Officials and HIA Practitioners

When planning an HIA, evaluate whether there may be existing laws that would support a consideration of the HIA's findings and recommendations to inform policy or programmatic decisions. To do this, we suggest starting with the results of **Tables 1** and **2**. If the sector or jurisdiction of the planned HIA is not covered, the legal search queries used for this report (discussed in **Part II** and provided in **Appendix A**) can be replicated.

Successfully advocating for the use of HIAs in cases where it appears that there are laws or policies that require or facilitate HIAs requires a solid understanding of the applicable laws and strong relationships with decision makers. Providing clear information about the types of health effects that should be considered, what new information an HIA is likely to add, and the costs and time requirements for conducting an HIA can strengthen the case for using HIAs. Presenting case studies in which an HIA has been applied for similar decisions in other jurisdictions may be particularly helpful.

Where needed, seek knowledgeable legal counsel to help frame arguments based in existing law about the need to use HIAs in specific instances. Additional technical assistance for legal questions may be obtained through resources such as the Network for Public Health Law.¹¹⁸

Policy Makers

Decisions among policy makers that significantly affect living conditions—including social, economic, or environmental changes—should be informed by whether applicable laws and regulations contain explicit or implied legal requirements for health analysis, and whether HIAs appear to offer an effective means to fulfill them. Consultation with health officials, public health institutes, or other health experts may help policy makers determine whether health effects are likely and whether an HIA should be conducted.

Table 1—Summary of HIA Legal Provisions across Jurisdictions

	Environment and Energy			Transportation			Agriculture			Waste Disposal and Recycling			Other		
Federal	●	●	●	●	●		●	●		●	●	●	●		
States															
Alaska	●	●			●			●			●				
Arizona		●									●				
Arkansas	●	●									●				
California	●	●		●	●		●	●	●	●	●		●		
Colorado	●	●									●				
Florida		●								●					
Illinois	●	●		●			●			●	●				
Kansas	●	●					●				●				
Kentucky	●	●								●			●		
Maine	●	●						●		●	●				
Massachusetts	●	●		●						●	●				
Minnesota	●	●					●				●				
Montana	●	●						●			●				
New York	●	●			●					●	●				
North Carolina	●	●					●	●			●				
Oregon	●	●					●	●			●				
Pennsylvania	●	●		●				●		●	●				
South Dakota	●	●		●							●				
Texas	●	●						●		●	●			●	
Washington	●	●	●	●				●			●		●		
Cities															
Denver, CO		●													
Raleigh, NC		●													
New York, NY		●								●	●				
Minneapolis, MN													●		
San Francisco, CA		●												●	
Seattle, WA	●													●	
Indian Tribes															
Snoqualmie Indian Tribe											●				
Prairie Band Potawatomi Nation	●														
Navajo Nation	●	●						●			●		●	●	
Totals	22	26	2	7	4	—	7	11	1	11	21	1	6	4	—

* No relevant legal provisions were found implicating HIAs for the following cities and tribes: Miami, Florida; Somerville, Massachusetts; Aberdeen, South Dakota; San Antonio, Texas; the White Earth Nation; and the Coquille Indian Tribe.

Appendix A

Legal Search Queries

LexisNexis

(Specific search query used initially across all jurisdictions)

“health impact assessment!” or “health impact review” or “health impact statement!” or “health risk assessment”

health! w/1 (impact or effect or risk) w/1 (study! or assess! or review! or investigate! or inquire! or analyze! or research or appraisal or determine! or audit or inspect!)

(General search query used secondarily across all jurisdictions except judicial cases)

TEXT (health! or “public health” or “public-health” or wellness or well-being or “well being”) /s (study or studies or studied or assess! or review! or investigate! or inquire! or analyze or analysis or research) AND NOT (“health impact assessment!” or “health impact review” or “health impact statement!” or “health risk assessment” or “health effect! study!” or “health risk study!” or “HIA” or “HRA”)

(General search query used secondarily across all jurisdictions concerning judicial cases)

OVERVIEW (health! or “public health” or “public-health” or wellness or well-being or “well being”) /s (study or studies or studied or assess! or review! or investigate! or inquire! or analyze or analysis or research) AND NOT (“health impact assessment!” or “health impact review” or “health impact statement!” or “health risk assessment” or “health effect! study!” or “health risk study!” or “HIA” or “HRA” or “mental health” or “health care”)

Westlaw

(Specific search query used initially for New York City and Indian tribes)

“HEALTH IMPACT ASSESSMENT!” “HEALTH IMPACT REVIEW” “HEALTH IMPACT STATEMENT!” “HEALTH RISK ASSESSMENT”

HEALTH! /1 (IMPACT EFFECT RISK) /1 (STUDY! ASSESS! REVIEW! INVESTIGATE! INQUIRE! ANALYZE! RESEARCH APPRAISAL DETERMINE! AUDIT INSPECTION!)

(General search query used secondarily for New York City and Indian tribes)

TE((HEALTH! “PUBLIC HEALTH” “PUBLIC-HEALTH” WELLNESS WELL-BEING “WELL BEING”) /S (STUDY STUDIES STUDIED ASSESS! REVIEW! INVESTIGATE! INQUIRE! ANALYZE ANALYSIS RESEARCH) % (“HEALTH IMPACT ASSESSMENT!” “HEALTH IMPACT REVIEW” “HEALTH IMPACT STATEMENT!” “HEALTH RISK ASSESSMENT” “HEALTH EFFECT! STUDY!” “HEALTH RISK STUDY!” “HIA” “HRA”))

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1. James Kreiger, *Home is where the triggers are: Increasing asthma control by improving the home environment*, 23 *Pediatric Allergy, Immunology, and Pulmonology* 139-45 (2012).
2. James Krieger & Donna L. Higgins, *Housing and health: time again for public health action*, 92 *American Journal of Public Health* 758-68 (2002).
3. American Public Health Association, *The Hidden Health Costs of Transportation* (Washington, DC, American Public Health Association 2010).
4. Robert Wood Johnson Foundation Commission to Build a Healthier America, *Issue Brief 1: Early Childhood Experiences: Laying the Foundation for Health Across a Lifetime* (Princeton, NJ, Robert Wood Johnson Foundation 2008), available at <http://www.commissiononhealth.org/PDF/095bea47-ae8e-4744-b054-258c9309b3d4/Issue%20Brief%201%20Jun%2008%20-%20Early%20Childhood%20Experiences%20and%20Health.pdf>.
5. National Research Council, *Improving Health in the United States: The Role of Health Impact Assessment* (Washington, DC, The National Academies Press 2011), available at http://www.nap.edu/catalog.php?record_id=13229.
6. U.S. Environmental Protection Agency, *Human Health Risk Assessment*, <http://epa.gov/riskassessment/health-risk.htm>.
7. Health Impact Project, <http://www.healthimpactproject.org/hia/us>.
8. National Research Council, *supra* note 5.
9. Rajiv Bhatia & Aaron Wernham, *Integrating Human Health into Environmental Impact Assessment: An Unrealized Opportunity for Environmental Health and Justice*, 116 *Environmental Health Perspectives* 991 (2008).
10. *Health Impact Assessment: Concepts, Theory, Techniques and Applications* (John Kemm et al. eds., Oxford, UK, Oxford University Press 2004).
11. World Health Organization, *Health Impact Assessment*, <http://www.who.int/hia/examples/en/>.
12. Aaron Wernham, *Health Impact Assessments Are Needed In Decision Making About Environmental And Land-Use Policy*, 30 *Health Affairs* 947 (2011); Andrew L. Dannenberg et al., *Growing the field of health impact assessment in the United States: an agenda for research and practice*, 96 *American Journal of Public Health* 262 (2006).
13. See National Research Council, *supra* note 5. We began the research for this project prior to the publication of the Research Council's definition of HIA and used the World Health Organization's (WHO) definition of HIA to frame our early research. WHO defines HIA as "a combination of procedures, methods and tools by which a policy, program or project may be judged as to its potential effects on the health of a population, and the distribution of those effects within the population," available at <http://www.who.int/hia/about/defin/en/index.html>.
14. U.S. Environmental Protection Agency, *supra* note 6.
15. Some of the legal provisions listed in Table 2 may also refer to HES. Although there was not a consistent definition of HES, they appear to be similar to HRAs in that they typically refer to an assessment of the biophysical effects of exposure to toxic or hazardous substances.
16. Or. Rev. Stat. § 616.020 (2009). In addition to any Oregon Health Authority survey, investigation, or inquiry authorized by law that involves the production, processing, or distribution of agricultural products, the authority shall make such further surveys, investigations, or inquiries as may be requested by the director of agriculture for the purpose of showing the manner in which the production, processing, or distribution of agricultural products may affect the public health.
17. Minn. Stat. § 144.05, available at <https://www.revisor.mn.gov/statutes/?id=144.05>.
18. Cal. Health & Safety Code § 130061.5; Mass. Gen. Laws ch. 6C, § 33; Wash. Rev. Code § 47.01.406; Wash. Admin. Code §§ 173-460-090, 173-460-100.
19. Janet Collins & Jeffrey P. Koplan, *Health Impact Assessment: A Step Toward Health in All Policies*, 302 *Journal of the American Medical Association* 315 (2009).
20. Wash. Admin. Code §§ 173-460-090, 173-460-100. An applicant for approval to construct a new or modified unit emitting toxic air pollution who cannot demonstrate compliance using an acceptable source impact level analysis (first tier) must submit a petition requesting that the Department of Ecology perform a second-tier or third-tier review to determine a means of compliance. Such petition must include the development of a HIA protocol and the results of an HIA.
21. Cal. Pub. Res. Code §§ 25301, 25302. At least every two years, the Energy Resources Conservation and Development Commission shall conduct assessments and forecasts of all aspects of energy

- industry supply, production, transportation, delivery and distribution, demand, and prices. It shall use these assessments and forecasts to develop energy policies that conserve resources, protect the environment, ensure energy reliability, enhance the state's economy, and protect public health and safety.
22. N.Y. Energy Law § 6-104. The State Energy Planning Board's energy plan shall include an assessment of the impacts of implementation of the plan upon economic development, health, safety and welfare, environmental quality, and energy costs for consumers, specifically low-income consumers.
 23. See, e.g., 10 C.F.R. §§ 52.34, .47, .79, .137, .157 (regarding federal regulations for nuclear plants); 10 C.F.R. §§ 150.31, 960.3-2-2-4 (regarding nuclear waste disposal); Colo. Rev. Stat. § 25-11-203; 6 Colo. Code Regs. 1007-1; 32 Ill. Adm. Code 332.100; 35 Pa. Cons. Stat. § 7130.308; 25 Pa. Code § 236.204; Tex. Health & Safety Code §§ 401.113, .263; 30 Tex. Admin. Code §§ 336.5. 513, .617, .1007.
 24. 25 Pa. Code § 236.204. The content of a licensing application to possess and dispose of low-level radioactive materials must include a detailed assessment of the radiological and non-radiological impacts to the public health and the environment along with a discussion of the long-term public health and environmental impacts, and social and economic impacts of the regional disposal facility on the host and affected municipalities.
 25. 42 U.S.C. § 7401(a)(3); 40 C.F.R. § 58.10.
 26. 40 C.F.R. § 52.21; 18 Alaska Admin. Code 50.250; Me. Rev. Stat. 38 § 583(b); Mont. Admin. R. 17.8.807; Wash. Admin. Code § 173-400-118; Navajo Nation Code Ann. tit. 4, § 1117.
 27. 405 Ky. Admin. Regs. 30:025. Applicants to the Energy and Environment Cabinet Department for Natural Resources for permits for the use of experimental practices in oil shale operations must include information and plans to monitor and identify potential risks to environmental and public health and safety.
 28. Or. Admin. R. 141-070-0110. The Division of State Lands may issue a surface entry permit to enter state lands to drill for oil or gas upon receipt and approval of an environmental assessment including adverse effects on the human and natural resources of the area (e.g., scenic, recreational, public health, and plant and animal resources). The assessment will also require a description of procedures the lessee will take to mitigate said impacts.
 29. Seattle, Wash., Code § 23.84A.016. "High-impact use" means a business establishment that is considered to be dangerous or noxious due to the probability or magnitude of its effects on the environment; or has the potential for causing major community or health impacts, including nuisance, odors, noise, or vibrations; or is so chemically intensive as to preclude site selection without careful assessment of potential impacts and impact mitigation. The director of the Department of Planning and Development shall consult as necessary with the Seattle Fire Department chief, the director of the Seattle-King County Health Department, and other local, state, regional, and federal agencies to determine when a business establishment shall be regulated as a high-impact use.
 30. 42 U.S.C. § 4321 et seq.
 31. See *id.* § 4332.
 32. Cal. Pub. Res. Code §§ 21000-21177; Mass. Gen. Laws Ann. ch. 30 §§ 61-62H; Minn. Stat. §§ 116D.1 to -.11; Mont. Code Ann. §§ 75-1-101 to -324; N.Y. Evtl. Conserv. Law §§ 8-0101 to -0117; N.C. Gen. Stat. §§ 113A-1 to -13; S.D. Codified Laws §§ 34-A-9-1 to -13; Wash. Rev. Code § 43.21C.10 et. seq.; Wash. Admin. Code § 197-11 et seq.
 33. Cal. Pub. Res. Code § 21000(b); Minn. Stat. § 116D.01; Mont. Code Ann. § 75-1-103(2)(b); N.Y. Evtl. Conserv. Law § 8-0103(1); N.C. Gen. Stat. § 113A-2; Wash. Rev. Code § 197-11-440(6)(c)(ii).
 34. N.Y. Evtl. Conserv. Law. §§ 8-0101 to -0117. The purpose of SEQRA is to maintain a quality environment for the people of this state that at all times is healthful and pleasing to the senses and intellect of man now and in the future. To help achieve this goal, EISs must be prepared for state actions and address the environmental impact of the proposed action, including short-term and long-term effects.
 35. Riverhead Business Improvement District Management Ass'n v. Stark, 253 A.D. 2d 752 (N.Y. App. Div. 2d Dep't 1998).
 36. Mass. Gen. Laws ch. 6C, § 33. The Department of Transportation established a healthy transportation compact, which requires HIAs to assess the effect of transportation projects on public health and vulnerable populations and to institute a HIA for planners, transportation administrators, public health administrators, and developers to use to achieve positive health outcomes.
 37. Massachusetts Healthy Transportation Compact, <http://www.massdot.state.ma.us/main/healthytransportationcompact.aspx>.
 38. Wash. Rev. Code § 47.01.406. Development of State Route 520 bridge replacement and HOV project required a plan for addressing the impacts of the project on Seattle city neighborhoods, parks, and institutions of higher education. In developing the plan, the mediator and planning staff incorporated recommendations of an HIA to calculate the project's impact on air quality, carbon emissions, and other public health issues.

39. 49 U.S.C. § 309.
40. 23 C.F.R. § 772.1.
41. Cal. Pub. Util. Code § 99165. The Omnitrans Joint Powers Authority shall contract with an independent third party to prepare and submit to the legislature and governor a report on the environmental and public health impacts of transit bus fueling stations located within the jurisdiction of the authority and owned or operated by the authority. In conducting the assessment, the authority shall hold at least one public hearing (with advance notice) in the vicinity of each bus fueling station to solicit input from persons who may be affected by those impacts.
42. CNG Fueling Station Environmental Impact Report, <http://www.omnitrans.org/news/reports.shtml>.
43. 75 Pa. Cons. Stat. § 4709. The Low-Emissions Vehicle Commission shall complete a study that addresses whether adoption of the low-emissions vehicle program will result in a more cost-effective reduction in ozone precursors than other alternative control strategies for mobile and stationary sources to achieve and maintain the NAAQS standards established by the Clean Air Act. The study shall include the low-emissions vehicle program's impact on economic development, future economic expansion, benefits to public health, welfare and environment, and the fiscal impact on the consumer.
44. The Pennsylvania Clean Vehicles Program, <http://www.dep.state.pa.us/dep/deputate/airwaste/aq/cars/cleanvehicles.htm>.
45. 7 U.S.C. § 2204(e); 7 C.F.R. §§ 2.29, 2.71.
46. See Special Areas; Roadless Area Conservation; Applicability to the National Forests in Colorado, Regulatory Risk Assessment, 73 Fed. Reg. 54125 (Sept. 18, 2008); Refrigeration and Labeling Requirements for Shell Eggs, 63 Fed. Reg. 45663 (Aug. 27, 1998); Transportation and Storage Requirements for Potentially Hazardous Foods, 61 Fed. Reg. 59372 (Nov. 22, 1996).
47. USDA Office of the Chief Economist, *Risk Assessment*, <http://www.usda.gov/oce/risk/assessment/index.htm>.
48. Minn. Stat. § 31.94. By November 15 of even-numbered years, the Department of Agriculture Commissioner and task force shall report on the status of organic agriculture to the legislative policy and finance committees and divisions with jurisdiction over agriculture. The report must include available information, using currently reliable data, on the positive and negative impacts of organic production on the environment and human health.
49. N.C. Gen. Stat. § 106-832. In developing sustainable local food programs and policies for North Carolina, the North Carolina Sustainable Local Food Advisory Council may consider an in-depth assessment of the foods that are served to public school students, an in-depth analysis of the possibility of making sustainable local food available under public assistance programs, and an in-depth analysis of the possibility of promoting urban gardens and backyard gardens for the purpose of improving the health of citizens.
50. 505 Ill. Comp. Stat. 82/10. Researchers and other program participants under the Food and Agriculture Research Act shall investigate short- and long-term environmental, health, social, economic, and natural resource implications of products, practices, and systems proposed for use in food and agricultural enterprises.
51. 505 Ill. Comp. Stat. 82/20. Universities receiving funding via the Food and Agriculture Research Act shall work closely with the Illinois Council on Food and Agricultural Research to support a broad program of food and agricultural research, including research on natural resources, environmental, economic, nutritional, and social impacts of agricultural systems, human and animal health, and the concerns of consumers of food and agricultural products and services.
52. Or. Rev. Stat. § 616.020. In addition to any Oregon Health Authority survey, investigation, or inquiry authorized by law that involves the production, processing, or distribution of agricultural products, the authority shall make such further surveys, investigations, or inquiries as may be requested by the director of agriculture for the purpose of showing the manner in which the production, processing, or distribution of agricultural products may affect the public health.
53. *Association of Irrigated Residents v. San Joaquin Valley Unified Air Pollution Control Dist.*, 168 Cal. App. 4th 535 (Cal. Ct. App. 2008).
54. Cal. Health & Safety Code § 40724.6.
55. 40 C.F.R. §§ 60.2050, .2895.
56. 401 Ky. Admin. Regs. 47:180; 06-096 Me. Code R. § 401; 310 Mass. Code Regs. 19.030; N.Y. Comp. Codes R. & Regs. tit. 6, § 360-1.15.
57. 25 Pa. Code §§ 271.127, 287.127 (specifically including traffic, aesthetics, air quality, water quality, stream flow, fish and wildlife, plants, aquatic habitat, threatened or endangered species, water use, land use, and municipal waste plans).
58. Tex. Health & Safety Code § 363.069. A feasibility study of regional and local solid waste management plans evaluates alternatives in terms of their public health, physical, social, economic, fiscal, environmental, and aesthetic implications.
59. N.Y.C., N.Y. Admin. Code, tit. 16, ch. 1, § 16-134.
60. 42 U.S.C. §§ 10132, 10155, 10193, 10195, 10197.

61. See *id.* § 10155(c)(1).
62. 62 New York v. United States, 505 U.S. 144 (1992) (challenging 42 U.S.C. § 2021e(d)(2)(c), the “take title” provision regarding low-level radioactive waste, as violating the Tenth Amendment of the Constitution).
63. Ill. Admin. Code tit. 32, §§ 601.100, .240.
64. N.Y. Comp. Code R. & Regs. tit. 6, §§ 383-6.9, -6.10.
65. Cal. Health & Safety Code § 130061. If a hospital cannot afford required seismic safety improvements and seeks relief, the Office of Statewide Health Planning and Development must determine through an HIA that the removal of the building or buildings from service may significantly diminish the availability or accessibility of health care services to an underserved community.
66. Executive Order 12866, 58 Fed. Reg. 51735, 51741 (Oct. 4, 1993).
67. Executive Order 12898, 59 Fed. Reg. 7629 (Feb. 16, 1994), as amended by Executive Order 12948 (Jan. 30, 1995).
68. Executive Order 13045, 62 Fed. Reg. 19885 (Apr. 23, 1997), as amended by Executive Orders 13229 (Oct. 9, 2001) and 13296 (Apr. 18, 2003).
69. Wash. Rev. Code §§ 43.20.025, .270, .285.
70. Washington State Board of Health, *Health Impact Reviews*, <http://www.sboh.wa.gov/HIR/>.
71. Ky. Rev. Stat. Ann. § 147.100. The Governor’s cabinet may make maps, planning studies, and surveys relating to subjects affecting general health and welfare, including zoning, soil conditions, land use and classification, population distribution, schools, park and playground development, port, harbor and waterway work, parkways, highways, traffic, transit, water supply, drainage and sewerage, long-range financial programs, real property inventories, tax maps, building and housing conditions, and subdivision control.
72. Navajo Nation Code Ann. tit. 10, § 107; Navajo Nation Code Ann. tit. 2, § 1803.
73. Minneapolis, Minn., Code of Ordinances § 582.30. The community planning and economic development department is directed to commence a study of the impact of electronic and digital billboards on public health, safety, and welfare in light of existing regulation and to propose such amendments to the zoning code or other regulations that the planning division deems necessary and advisable.
74. 505 Ill. Comp. Stat. 82/10. Researchers and other program participants under the Food and Agriculture Research Act shall investigate short- and long-term environmental, health, social, economic, and natural resource implications of products, practices, and systems proposed for use in food and agricultural enterprises.
75. Or. Rev. Stat. § 616.020. In addition to any Oregon Health Authority survey, investigation, or inquiry authorized by law that involves the production, processing, or distribution of agricultural products, the authority shall make such further surveys, investigations, or inquiries as may be requested by the director of agriculture for the purpose of showing the manner in which the production, processing, or distribution of agricultural products may affect the public health.
76. Cal. Pub. Util. Code § 99165. The Omnitrans Joint Powers Authority shall contract with an independent third party to prepare and submit to the legislature and governor a report on the environmental and public health impacts of transit bus fueling stations located within the jurisdiction of the authority and owned or operated by the authority. In conducting the assessment, the authority shall hold at least one public hearing (with advance notice) in the vicinity of each bus fueling station to solicit input from persons who may be affected by those impacts.
77. 75 Pa. Cons. Stat. § 4709, available at <http://www.legis.state.pa.us/WU01/LI/LI/CT/HTM/75/00.047.009.000.HTM>.
78. Joan E. Drake, *The NEPA Process—What Do We Need to Do and When?* at 1, 4 (Rocky Mountain Mineral Law Foundation 2006).
79. National Environmental Policy Act of 1969 §§ 202, 204, 42 U.S.C. §§ 4342, 4344 (2011).
80. See *id.* § 102(c), 42 U.S.C. § 4332 (2011).
81. Aaron Wernham, *Building a Statewide Health Impact Assessment Program: A Case Study from Alaska*, 16 Northwest Public Health 16 (2009).
82. *Id.*
83. Bhatia & Wernham, *supra* note 9, at 991, 995.
84. 40 C.F.R. § 1503.4(a).
85. Bhatia & Wernham, *supra* note 9, at 991, 995.
86. 42 U.S.C. § 4321 (emphasis added).
87. *Id.* § 4331 (emphasis added).
88. Bhatia & Wernham, *supra* note 9, at 991, 995.
89. 40 C.F.R. § 1508.9(a)(1).
90. George Cameron Coggins et al., *Federal Public Land and Resources Law* 248 (6th ed. 2007).
91. Drake, *supra* note 78, at 1, 4.
92. 40 C.F.R. § 1501.4(b) (emphasis added).

93. Cal. Pub. Res. Code §§ 21000-21177; Mass. Gen. Laws Ann. ch. 30, §§ 61-62H; Minn. Stat. §§ 116D.01 to .11; Mont. Code Ann. §§ 75-1-101 to -324; N.Y. Env'tl. Conserv. Law §§ 8-0101 to -0117; N.C. Gen. Stat. §§ 113A-1 to -13; S.D. Codified Laws §§ 34A-9-1 to -13; Wash. Rev. Code § 43.21C.10 et seq.
94. Kenneth S. Weiner, *NEPA and State NEPAs: Learning from the Past, Foresight for the Future*, 39 Environmental Law Reporter 10675, 10677 (2009).
95. 40 C.F.R. § 79.62 (2011).
96. Ariz. Rev. Stat. Ann. § 49-480.04 (emphasis added). Under county air pollutant programs, owners of new sources of air pollutants must conduct risk management analysis that includes health assessments and health studies, and report to the county board of supervisors.
97. See, e.g., "Case Law—Court approves or notes conduct of HA or admits results of HAs into evidence" on page 8 and "Case law requiring conduct of HRAs" on page 23 of Table 2.
98. See, e.g., Vill. of DePue v. ExxonMobil Corp., 537 F.3d 775, 780 (7th Cir. Ill. 2008); Dodge v. Cotter Corp., 328 F.3d 1212 (10th Cir. 2003); ExxonMobil Oil Corp. v. Nicoletti Oil, Inc., 2010 U.S. Dist. LEXIS 100460 (E.D. Cal. Sept. 22, 2010).
99. See, e.g., Pine Bluff for Safe Disposal v. Ark. Pollution Control & Ecology Comm'n, 354 Ark. 563 (Ark. 2003) (using an HRA to demonstrate that the expected emissions of a chemical weapons disposal facility are not expected to be materially injurious, precluding a challenge to the permits granted to build the facility); United States v. Newmont USA Ltd., 504 F. Supp. 2d 1077 (E.D. Wash. 2007) (admitting a remedial investigation/feasibility study, which included an HRA, into evidence so defendant could prove that certain costs incurred in performing the study might be duplicative or unnecessary).
100. City of Long Beach v. Los Angeles Unified School Dist., 176 Cal. App. 4th 889, 896 (Cal. Ct. App. 2009).
101. *In re Winona County Municipal Solid Waste Incinerator*, 442 N.W.2d 344, 347 (Minn. Ct. App. 1989).
102. United States v. Sunoco, Inc., 644 F. Supp. 2d 566 (E.D. Pa. 2009).
103. Other provisions in the (⊗) category included instances in which a law or court expressly states that an HA would not be required in certain circumstances. See Cal Food & Agric. Code § 13128 (2011) (stating that an applicant registering a pesticide does not have to submit or cite mandatory health effect data about a purchased pesticide when the applicant has purchased a registered pesticide from another producer to formulate the purchased pesticide into a new pesticide); Citizens v. City of Port Angeles, 151 P.3d 1079 (Wash. Ct. App. 2007) (finding that fluoridation of public water supplies was categorically exempt from review under Washington's State Environmental Policy Act); Cingular Wireless v. Thurston County, 129 P.3d 300 (Wash. Ct. App. 2006) (denying consideration of testimony by citizens concerned about the adverse health impacts of radiofrequency [RF] emissions relating to a cellular phone tower because the Federal Telecommunications Act expressly prohibits local officials from basing land use decisions on fears about RF emissions when proposed wireless communication facilities comply with FCC RF exposure limits).
104. Federal legislation, regulations, or cases preempt state law pursuant to the Supremacy Clause of the U.S. Constitution. U.S. Const. art. VI, cl. 2. There are three primary types of legislative preemption: (1) express preemption, which occurs when the legislation itself clearly states Congress's intent to preempt state law in the area regulated, (2) field preemption, where Congress has reserved an entire area for federal jurisdiction and state law attempts to intrude into the area, and (3) conflict preemption, where the state law at issue cannot be complied with while also complying with federal law regulating the conduct at issue. Friberg v. Kansas City Southern Railway Co., 267 F.3d 439, 442 (5th Cir. 2001).
105. Vill. of DePue v. ExxonMobil Corp., 537 F.3d 775, 780 (7th Cir. Ill. 2008) (holding that a municipality's attempt to hasten a cleanup ordered by the State of Illinois by declaring a polluted site a nuisance and imposing a fine of \$750 per day until the cleanup was completed was preempted by state law).
106. Ass'n of Am. R.R. v. South Coast Air Quality Mgmt. Dist., 2007 U.S. Dist. LEXIS 65685 (C.D. Cal. Apr. 30, 2007).
107. Pacific Gas & Electric Co. v. State Energy Resources Conservation & Development Commission, 461 U.S. 190, 212 (1983).
108. Northern States Power Co. v. Prairie Island Mdewakanton Sioux Indian Community, 781 F. Supp. 612 (D. Minn. 1991).
109. Ass'n of Am. R.R. v. South Coast Air Quality Mgmt. Dist., 2007 U.S. Dist. LEXIS 65685 (C.D. Cal. Apr. 30, 2007); Vill. of DePue v. ExxonMobil Corp., 537 F.3d 775, 780 (7th Cir. Ill. 2008).
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113. Health Impact Project, *Case Study: Atlanta's BeltLine*, <http://www.healthimpactproject.org/resources/case-study-atlantas-beltline>.
114. Wernham, *supra* note 12, at 947.
115. 83 Am. Jur. 2d *Zoning and Planning* § 11 (2011).
116. Institute of Medicine, *The Future of the Public's Health in the 21st Century*, at 2 (Nov. 11, 2002), <http://www.iom.edu/Reports/2002/The-Future-of-the-Publics-Health-in-the-21st-Century.aspx>.
117. National Prevention Council, *National Prevention Strategy*, at 6 (June 2011), <http://www.healthcare.gov/prevention/nphpphc/strategy/report.pdf>.
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