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SHARING THE IMPACTS: ENVIRONMENT RACISM AND THE RHODE ISLAND FREIGHT RAIL IMPROVEMENT PROJECT

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AND THE

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Introduction

1.1 Research Issue

Environmental racism has been present throughout history, and gained notoriety in the civil rights movement of the 1960s. Environmental racism received national attention in the 1980s when members of predominantly black Warren County, North Carolina tried to prevent the siting of a hazardous waste landfill in their community. Although the landfill was eventually located in Warren County, landmark efforts made by community members sparked a renewed interest in the environmental justice movement. Two definitions of environmental racism have arisen as a result of the recent attention (Fisher, 1995:288):

> "as racial discrimination in environmental policy making and the unequal enforcement of environmental laws and regulations. It is the deliberate targeting of people of color communities for toxic waste facilities and the official sanctioning of life-threatening presence of poisons and pollutants in people of color communities." Or,
>
> "any policy, practice, or directive that, intentionally or unintentionally, differentially impacts or disadvantages individuals, groups, or communities based on race or color, [as well as the] exclusionary and restrictive practices that limit participation by people of color in decision-making boards, commissions, and staffs."

Since the 1980s, many other environmental justice activists, such as the National Association for the Advancement of Colored People (NAACP) and the Sierra Club Legal Defense Fund, have brought attention to the common distribution of other environmental burdens in predominantly minority and/or low income communities. Many feel that the siting/distribution of these burdens follows the path of least resistance: many poor and

minority communities lack the political clout necessary to fight the ideas of key decision makers.

Responsibility for the distribution of the majority of these environmental burdens has been placed on the US Environmental Protection Agency (USEPA), the Government entity responsible for overseeing state and federal projects, such as those mentioned above. However, it was not until 1990 that the USEPA, after falling under a great deal of scrutiny, performed a study that revealed that poverty also played a major role in determining the locations of some hazardous facilities. Up until this time, income status was not ordinarily used when referring to environmental racism because "race was consistently a more prominent factor" (Fisher, 1995) in determining the distribution of environmental burdens.

Several bills have been passed and/or proposed, beginning with Title VI of the Civil Rights Act of 1964, that could help to prevent environmental racism. Title VI prohibits discrimination, based on race and national origin, in federally funded programs and activities. Again, the main burden rests on the USEPA because it oversees the actions of federal and state environmental agencies which, in turn, permit various waste disposal facilities and other industrial polluters through the implementation of their environmental policies. If the actions of these federally funded agencies create or perpetuate a racially discriminatory distribution of pollution, then a violation of Title VI has occurred, and a civil rights lawsuit is warranted. Although Title VI has proven to be successful for many claims of environmental racism, minority populations must be able to: first, prove that they are victims of racial disparity; second, show and/or prove "tangible" impact (i.e., decrease in property values), and third, disprove that the proposed project serves a "necessary"

purpose.

Passed in 1970, the National Environmental Policy Act (NEPA) was designed to respond to the many environmental problems that governmental agencies had created as a result of their own projects. Consequently, NEPA placed stricter regulations on those projects that are funded, permitted, or constructed by the federal government, by requiring the preparation of an environmental impact statement (EIS) for each project. An EIS consists of a list of alternatives, including a status-quo or "no build" alternative, a list of measures to mitigate the negative impacts from the build alternatives, and provides for substantial public input and review.

NEPA also requires a balancing of all social, economic, and environmental factors associated with the preferred alternative. Nevertheless, low income and/or minority plaintiffs challenging this statute find that "victory" comes in the form of a court order, mandating the defendants to repeat the decision-making process before construction of the preferred build alternative can begin. In most cases, however, the repeat process yields the same results, and construction is allowed as was originally planned.

The goal of the proposed Environmental Justice Act (EJA) of 1992 "is to establish a program to assure non-discriminatory compliance with all environmental, health, and safety laws and to assure equal protection of the public health." (Blank, 1994). The EJA recognizes the need for federal legislation in both the environmental and civil rights movements, and supplies a connection between the two; the EJA acknowledges the relationship between the degradation of the environment and the deprivation of civil rights and addresses the combined problem in one bill.

However, the urgency of the problem facing minority groups is not reflected in the EJA due to the highly technical terms and the mathematical calculations contained within the statutory language (Blank, 1994). Although the EJA forces the USEPA to consider the unequal distribution of environmental hazards, it only requires the USEPA to identify and/or inspect, review, or prepare studies on dangerous areas. Solutions to proposed health hazards come in the form of additional legislation, while remedies to existing problems are not required at all.

Responding to continued accusations of discrimination in US environmental policy, President Clinton signed Executive Order 12898 on February 11, 1994, to specifically address issues of environmental justice. The Order requires all federal agencies to ensure that adverse impacts of their programs, policies, and actions do not disproportionately affect minority and low-income populations. Executive Order 12898 also requires the identification of both the proportion of adverse impacts that would affect these populations, and the access these populations would have to the benefits of the proposed project. Definitions of both minority and low income populations are contained within the Order. Minorities are those individuals who are of black, Hispanic, Asian/Pacific Islander, or Native American, Eskimo, or Aleut origin, while low income describes those families whose incomes fall below the US Department of Health and Human Services poverty standard[1]. However, since the Order is still relatively new, its effects have yet to be felt.

Although environmental racism appears to occur more frequently as a result of hazardous and toxic waste landfill siting, it can result from any federal, state, or local

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1 In 1996 the Department of Health and Human Services poverty standard for a family of four was equal to $15,600.

project. As the previous synopsis indicates, existing legislation needs to be critically examined to ensure that it is protecting low income and minority populations from environmental racism.

1.2 Research Objective

The primary objective of this research is to determine whether current discrimination legislation, particularly Executive Order (EO) 12898 of 1994, serves to protect low income and minority populations from disproportionately high adverse human health and environmental impacts associated with federal programs, policies, and actions. This will be accomplished by conducting a case study of the effects of the Rhode Island Freight Rail Improvement Project (FRIP) on low income and minority populations. However, since this case study does not present a statistical representation of whether EO 12898 and other anti-discrimination legislation is working nationwide, this research project can only be used as an example.

This case study will address three fundamental issues. First, the study examines environmental racism, highlighting the events leading up to the rebirth of the environmental justice movement in the 1980s, using examples of important case studies and litigation. Second, the study analyzes the potential social, economic, and environmental impacts associated with the FRIP; these impacts will be used to determine whether low income and minority populations will be adversely or disproportionately impacted by the proposed project. Third, this study will make policy recommendations, based on current literature pertaining to environmental racism and the FRIP case study, to provide decision-makers and planners with the knowledge necessary to address policy

questions regarding the protection of low income and minority populations from environmental discrimination.

1.3 Significance of the Research

Currently the Rhode Island Department of Transportation (RIDOT) is involved in an EIS process to determine the potential social, economic, and environmental impacts associated with the Rhode Island Freight Rail Improvement Project (FRIP). The proposed project would involve the construction of a third track, to be used exclusively by freight trains, along a 22-mile section of Amtrak's Northeast Corridor (NEC) right-of-way (ROW), from Quonset Davisville Industrial Park in North Kingstown to Boston Switch in Central Falls. A more detailed description of the project corridor will be provided in Chapter Three.

By improving existing freight rail service, the FRIP has the potential to increase the economic viability of not only the seven communities located along the project corridor, but also the entire State. One of the major economic goals of the FRIP is to create a competitive, intermodal port facility at Quonset Davisville through the use of double stacked container cars and tri-level auto carriers; the use of high and wide freight cars would allow freight to move more efficiently throughout the corridor. In doing so, freight-dependent businesses would be attracted to the area, resulting in an increase in industrial-related employment opportunities. In addition to long-term industrial jobs, short-term construction jobs would also be created.

The construction of a dedicated freight track, and the increased size and volume of rail traffic has the potential to create many adverse impacts within the project corridor

including but not limited to: air pollution; noise and vibration; water quality degradation; loss of historically and archaeologically significant resources; loss of environmentally sensitive habitat; changes in land use; and threats to public health and safety. Therefore, some adverse impacts have the potential to affect the entire corridor, or only certain populations, depending upon their location relative to the impact; although the populations located within the FRIP project corridor are predominantly white, there are many areas within the Cities of Providence, Pawtucket, and Central Falls that are inhabited by low income and minority populations.

This research finds that anti-discrimination legislation, passed or proposed prior to 1994, does not protect low income and minority populations from environmental racism. Overall, the FRIP would only have minor impacts on the natural and physical environments of the communities within the project corridor. Therefore, using environmental justice criteria stated in Executive Order 12898, impacts resulting from the FRIP would be proportionately distributed throughout the entire project corridor.

1.4 Organization of the Study

This study is organized into six chapters. Following the introduction, Chapter Two provides a review of selected literature. Chapter Three defines the purpose and need for the FRIP, and provides a description of the FRIP project corridor. Chapter Four introduces the impacts to the natural and physical environments that would result from the FRIP. Chapter Five analyzes the FRIP's impacts on low income and minority populations. Finally, Chapter Six summarizes the findings of the research and offers policy observations and recommendations, which are drawn from the analyses in the previous chapters.

CHAPTER TWO
Introduction to Environmental Racism Literature

Environmental racism is a problem that has been occurring in our society throughout the course of history. However, beginning in the 1980s, it again caught the attention of not only many federal, state, and local policy makers, but also low income and minority populations that may be living within adversely affected communities. It can be argued that while many policies, such as the Title VI of the 1964 Civil Rights Act and the Environmental Justice Act, were established to protect low income and minority populations from discrimination, these policies do not meet their intended goals. It is for this reason that many poor people of color have decided to fight environmental racism, in order to show that they too care about the environment in which they live.

The purpose of this chapter is to review previous literature on environmental racism. The literature can be categorized into three groups. The first group deals with, the inequitable distribution of environmental hazards and related siting issues (i.e., Bullard, 1983; United Church of Christ, 1987; and Been, 1994). The second group analyzes participation and/or activism by low income and minority populations in the environmental and environmental justice movements (i.e., Zwerdling, 1983; Cutter, 1981; Mohai, 1984; Austin and Schill, 1994; Gottlieb, 1993; and Prout, 1992). And the third group examines federal, state, and local government policies and planning issues that have arisen as a result of racial and environmental discrimination (i.e., Higgins, 1993; Fisher, 1995; Godsil, 1991; Cole, 1992; Blank, 1994; and Scott, 1994). Through the use of empirical and theoretical research, each group of literature identifies the issues, causes, and concerns of various

aspects of environmental racism. These issues, causes, and concerns provide support for the basis of this study.

2.1 Distribution of Environmental Hazards and Siting Issues

This section examines literature pertaining to the siting of environmental hazards, particularly solid or toxic waste facilities, in low income and minority communities. The selected authors were chosen to demonstrate that the siting of these facilities, in areas that are disproportionately poor or minority, is not a random act; the inequitable distribution of hazardous facilities, in most cases, can be considered a trend that follows the path of least resistance In general, hazardous and toxic waste facilities will be sited in areas where political obstruction is projected to be minimal.

However, new research has identified that there is another side to the siting coin: first, the toxic facility is sited; second, people move into the area because of the resulting lower land values; and third, any proposed expansion of the facility is considered environmental racism by the residents of the surrounding area. This review will indicate that, while environmental racism can be considered a product of market dynamics, in almost all cases race and the lack of political and financial resources, more than household income, has been the variable found to best explain the existence (or non-existence in white communities) of commercial hazardous waste facilities in a given area (Scott, 1994).

The recurring theme of race being a more prevalent indicator of environmental racism has been the focus of several studies. While the authors had their own methods for reaching their conclusions, Bullard (1983) and the United Church of Christ's (UCC)

Commission on Racial Justice (1987) found race to be the prominent factor in the siting of hazardous and toxic waste facilities.

Bullard's study concerning the siting of municipal solid waste facilities in the City of Houston, Texas stated the Not in My Backyard (NIMBY) syndrome as the reason why minority populations experience pollution levels five times greater than those experienced by the middle and upper classes (Bullard, 1983). In their study of nationwide ZIP codes, the UCC concluded that three out of five Blacks and Hispanics reside in communities with uncontrolled hazardous waste sites and, based on their findings, that race is the most important factor when determining the presence of hazardous waste facilities, even after controlling for income. And although Anderton et. al. (1994) have come to find fault with the use of ZIP codes and the combination of some races and not others, the study done by the UCC is the most influential and best known study on environmental racism (Pollack and Vittas, 1995). Last, after performing two statistical analyses in which the distance measured was modeled as a function of the respondents' race and income, Mohai and Bryant found that the relationship between race and the location of hazardous waste facilities in the Detroit-area were not affected by income.

In general, there are two reasons that could explain why minority populations are constantly made the targets of hazardous and toxic waste siting decisions. First, the lower housing costs found in the inner city, or "on the wrong side of the tracks" (as opposed to those in the suburbs), are more attractive to poor people of color; and second, although low income and minority populations are concerned about their own environment, they lack the political strength necessary to protest siting efforts. Both of these factors combine to reinforce the idea that environmental racism does follow the path of least

resistance. However, while these explanations are satisfactory for some, others believe that market dynamics, or the change in real estate values and/or the provision of employment attract poor people of color to hazardous and toxic waste facilities.

Been (1994) takes a different approach to the issue of siting hazardous waste facilities. She identifies the presence of a gap in environmental racism research: current research fails to prove that the disproportionate human health and environmental effects placed on low income and minority populations, as a result of the siting of locally undesirable land uses (LULUs), is a result of racism in the siting process itself. She also feels that the research does not address whether the communities were disproportionately low income or minority at the time of the siting. For these reasons Been suggests policy-makers have no way of knowing if the siting process ensures the equal distribution of environmental burdens, or if the effects are the result of market dynamics. This chicken and egg-type paradox is complicated and would require the investigation of LULU siting procedures nationwide. However, a possible solution to this, as Been suggests, is that future research should examine the socio-economic characteristics of the host community at the time of selection, and then trace the changes in those characteristics after the siting of the facility. In doing so, light may be shed on the question of which came first: the LULU or its poor or minority neighbors (Been, 1994). But when trying to answer this question, we must also bear in mind that outside factors, such as "steering" and discrimination on the part of real estate agents may play a big role in where minorities choose to live, and where whites choose *not* to live.

The literature in this section presents two approaches to the siting of toxic and hazardous waste facilities: first, the facility was sited in an area that was already

predominantly low income or minority; or second, the facility was sited, and then because of the lower land values and newly created job opportunities, the area became populated by poor people of color. But despite these two different approaches, the authors in this section pointed out that low income and minority populations will continue to be targets for future siting efforts because they lack the monetary and political resources needed to fight such attacks.

2.2 Participation in the Environmental and Environmental Justice Movements

Much of the literature in this section revolves around case studies of residents that have protested the siting of environmental hazards or pollution within their communities. However, Zwerdling (1973) argues that minority grass-roots environmentalism only emphasizes its inferiority to the mainstream environmental movement. He describes the actions of major corporations as the exploitation of people and resources for maximum profits. In order to produce their goods, Zwerdling says that corporations go about it in the cheapest way possible: harvesting raw materials from public lands; hiring cheap labor to work, despite the imminent threat of industrial injury and disease; producing goods with the quickest and cheapest methods available, and then dumping wastes in the poorest and most powerless parts of town (Zwerdling, 1973). Zwerdling emphasizes that even though grass-roots environmental groups are becoming more popular, those groups that do not have access to monetary and political resources lack the power to contest the decisions made by the middle and upper class members of society.

Studies conducted to identify the differences in environmental concern between blacks and whites revealed that blacks do have concern for the protection of the

environment in which they live. Cutter (1981) and Mohai (1984) dispute claims that upper and middle class whites tend to be more concerned with the environment, than low income and minority populations. Both studies found that environmental activism on the part of the middle and upper classes is the result of their greater access to financial resources, and their greater self confidence and political efficacy. A general conclusion that can be drawn from these studies is that those people who do have concern for the environment, but who lack the proper resources and have low self-esteem in terms of their effects on the political system, will be discouraged from taking action.

This point is reinforced by Austin and Schill (1994), who have another view on the lack of involvement by poor people of color in the environmental movement. The authors point out that because many poor and minority communities associate the preservation of wildlife and natural areas with environmentalism, and do not think that their every-day concerns of sewage and landfill odors, lead poisoning, or workplace contamination are considered "environmental", they are reluctant to join the "environmental" movement. (Austin and Schill, 1994). Additionally, as Gottlieb (1993) states, many poor people of color are reluctant to become affiliated with the mainstream environmental movement, because it has not done its best to reach out to low income and minority populations; in many cases, social justice themes are not incorporated into mainstream environmental agendas.

The Southwest Organizing Project (SWOP) in Albuquerque, New Mexico, however, is an example of one such grass-roots group that has been instrumental in bringing people together to fight issues related to water pollution and workplace contamination. However, SWOP does not consider itself an "environmental"

organization, but rather a community-based organization that addresses toxic issues and their impacts on daily living in such areas as employment, education, housing, health care, and "other issues of social, racial, and economic justice" (Austin and Schill, 1994).

Prout (1992) provides a more positive account of grass-roots involvement in the environmental justice movement. She describes a group appropriately named the Toxic Avengers, whose members have tried to rid their community of industrial pollution. The members of the Toxic Avengers are high school students from the Williamsburg section of Brooklyn, New York. Williamsburg is a working class neighborhood with approximately 40,000 residents, most of whom are of Caribbean or Central American descent (Prout, 1992). The group's main focus has been the Radiac Research Corporation, a company that transports and stores toxic waste and low-level radioactive and flammable materials. Although Radiac has not been found to be in violation of safety requirements, many residents of Williamsburg have criticized its location next to a public school playground. And while the group has not won its fight against Radiac, it has been very successful in educating residents on the hazards within their neighborhoods.

The research included this section provides a positive account of community activism; moreover it illustrates that poor people of color are reluctant to join the environmental movement because they feel that their concerns do not fall within the realm of being truly environmental. For this reason grass-roots organizations have begun to become active in their own communities to fight the social injustices that affect their daily lives; the environmental justice movement incorporates both environmental as well as social justice themes, while the environmental movement is strictly environmental. As the

next section will indicate, even though poor people of color are not yet very active in the environmental movement, they do have an effect on federal, state, and local policies.

2.3 Government Policies and Planning Issues

This section identifies literature on how the environmental justice movement has affected federal, state, and local government policies and planning issues. Authors selected for this section review the advantages and disadvantages of various statutes to determine their strength as anti-discriminatory legislation. However, this review will also identify the difficulties, in terms of proving environmental racism claims, that poor people of color face when involved in litigation in a court of law because they must prove discriminatory intent.

Higgins (1993) identifies the major sources of racial environmental inequities as "objective processes" and "institutionalized environmental racism". An example of an objective process used throughout both the Reagan and Bush Administrations is the use of a cost-benefit analysis to compare the cost of siting in minority and poor neighborhoods to the potential profits to be gained. The costs and benefits can be broken down as follows: costs may include low land values and the likelihood of little political resistance; and benefits may be realized as increased community revenues in the form of jobs and taxes, for what would otherwise be an economically depressed area. Institutionalized environmental racism focuses on the lack of political-economic power of minorities and the poor, the political nature of the "objective" processes that create the inequities, and the job, housing, and community segregation that allows inequitable distribution.

Although Higgins concludes by applauding the achievements of the environmental justice movement, he suggests that a bias still exists among all federal agencies when dealing with environmental equity policy, especially where the US Environmental Protection Agency (EPA) is concerned. For example, environmental racism has been in the spotlight since the 1980s, but EPA did not formally address it until 1992. As a result, environmental advocates still harbor a feeling of distrust towards the EPA and its recent efforts.

Fisher (1995) analyzes Title VI of the 1964 Civil Rights Act as a remedy for environmental racism. Title VI states that, "No person in the United States shall, on the ground of race, color, or national, origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance" [Fisher, 1995; Civil Rights Act of 1964, Section 601, 42; U.S.C. 2000d (1988]. All federal agencies are subject to the anti-discriminatory requirements of Title VI. More specifically, Fisher points out that EPA has established its own criteria for implementing Title VI. Under Title VI a complainant has two choices: administrative review by EPA, or litigation. Often, however, complainants must litigate, because after an administrative review in which the complainant has no formal participation, the only penalty the EPA may impose against a discriminatory entity, is the removal of that entity's funding.

There are three problems that minority plaintiffs may have when trying to prove environmental racism claims under Title VI. First, a disparate impact analysis must be performed to determine the size of the affected population; as Fisher states, "Disparate as

compared to what?" (Fisher, 1994). The demographic characteristics of the affected population must then be compared to those of the unaffected population

Secondly, plaintiffs must be able to prove a tangible impact from pollution, because in most cases it is not enough to show that proximity to a toxic facility constitutes a direct impact. Examples of tangible impacts include reduction in property values, lessened use/enjoyment of outdoor activities due to odor, noise, or smoke, or the prior successful opposition to a facility in a white neighborhood.

The last requirement necessary for remedy under Title VI litigation is for plaintiffs to disprove that the siting of a facility serves a "necessary purpose". Even by shifting the burden of proving necessity to the defendant, the plaintiffs must be prepared to present a viable "less-discriminatory" alternative. Although it may be difficult in many situations, the plaintiffs greatly increase their chances for success if they can propose a viable alternative to the original project.

Godsil's (1991) study of remedies for environmental racism begins by identifying the potential for judicial remedy by examining the racial discrimination mechanisms found in the Equal Protection Clause of the Fourteenth Amendment. Under the Equal Protection Clause, minorities wishing to file suit must prove that the siting decision was motivated by a discriminatory purpose. In most cases, minority plaintiffs have difficulty locating evidence that exhibits specific examples of racial hatred, due to their lack of political and economic resources.

Cole (1992), in response to Godsil's article, concurs with her doubts about obtaining judicial remedy under the Equal Protection Clause. *East Bibb Twiggs Neighborhood Association v. Macon-Bibb County Planning and Zoning Commission* can

be used to illustrate the difficulties poor people of color have when trying to prove environmental racism via this statute. In this case, the Eleventh Circuit Court found that even though more than sixty percent of the residents were black, the evidence presented by the plaintiffs was insufficient to show that discrimination was the motivating factor behind the siting of a private landfill in their census tract. The Court held that while the creation of this landfill would have disparate impact on the predominantly black census tract, the other County-operated landfill was located in a predominantly white census tract. Therefore the decision to site the landfill was not racially motivated.

Godsil also identifies Title VII of the Civil Rights Act of 1990 as a model by which minorities could prove disparate impacts. This amendment would be aimed at the consequences of, rather than the motivation behind, a siting decision. Plaintiffs would be responsible for proving that the siting decision would be a disparate burden on the a minority community compared to a white community. The defendant would then have the burden of proving that the decision is an "environmental necessity," by proving that the site is environmentally suitable. The plaintiff could then show evidence of alternative sites that have the same suitability and are available, thereby shifting the burden back to the defendant to prove that the chosen site is *necessary* (Godsil, 1992). Although the Act would increase the success rate for minority plaintiffs bringing environmental racism claims to court, the "environmental necessity" clause would make it easier for the defendants to show that the chosen site would be the absolute safest location for their facility; safety would overrule any claim of disparate impact.

Finally, the author provides recommendations for both state and grass-roots organizations. Godsil suggests that states should designate sites for hazardous waste

facilities, thereby determining whether sites are fairly distributed throughout the cities and towns within the state. She recommends that states establish facilities siting boards (rather than giving the responsibility to a developer) charged with maintaining communications between the state and local governments. Cole, on the other hand, disagrees with Godsil's view on state control of hazardous facility siting, because he feels that states could not be neutral in siting such facilities due to pressures from federal agencies to site the facilities. Basically, if the states do not comply with federal government agencies, they run the risk of losing federal funding.

While both authors agree that strong grass-roots involvement by minorities is needed, Cole supports grass-roots activism because it offers solutions that cannot be found in laws (Cole, 1992). Grass-roots activism has forced industries to move from pollution control to pollution prevention; essentially activists have done what many state and federal laws have failed to do: reduce toxic waste (Ibid., 1992). Cole views Godsil's suggestion that minorities take their environmental racism claims to court as a mistake, because minority plaintiffs do not have the finances necessary to fight big-industry polluters; he feels that the fight for environmental justice belongs on the street.

The goal of the proposed Environmental Justice Act (EJA) is "to establish a program to assure non-discriminatory compliance with all environmental, health and safety laws and to assure equal protection of public health" (Blank, 1994). The EJA was jointly sponsored by Senator Al Gore and Representative John Lewis in 1992, however, the EJA did not pass the Senate or the House during the 102d Congress; Representative Lewis recently reintroduced the EJA in Congress.

The EJA will attempt to achieve the above goal by requiring the identification and assessment of areas that have high amounts of toxic chemicals, and the resulting health impacts that could be caused by these chemicals. One drawback to this proposed legislation is that the EJA pertains to toxic chemicals only, and does not take into consideration all other federal actions. Other goals of the EJA include protection of residents of these areas from adverse human health impacts; resident participation in the siting process; and, that facilities siting will not be inequitably distributed.

Although the EJA is the first bill to recognize the connection between environmental quality and the civil rights movement, Blank finds faults with the content and form of the statute itself. Overall, the EJA fails to reflect the urgency of the situation, by using highly technical language that is incomprehensible to the people the Act is designed to protect (Blank, 1994). Also, while the EJA requires the identification of dangerous areas, it does not require a specific solution to the health hazards posed; additional legislation would be required if a significant problem was found in any area. Finally, while it places a moratorium on the siting of toxic facilities in already highly polluted areas, the EJA provides no remedies for existing problems in these areas.

The EJA does not consider adverse health effects when identifying environmental high impact areas (EHIAs); many of the events that led to the proposal of this statute were health-related. For this reason, and also because the main goal of the statute is to ensure that public health is equally protected, the EJA loses much needed strength. The EJA also recognizes the importance of public participation, and provides industry-funded grants to empower those who may have been affected by pollution from toxic facilities; it provides a means for people to obtain the knowledge necessary to make informed decisions about

what is occurring in their community. However, the use of the grants is limited to the generation of reports or inspection of toxic facilities, rather than to actually finding a solution to the pollution, environmental litigation, hospital bills, or hazardous waste clean-up.

Scott examines the signing of Executive Order (EO) 12898 by President Clinton on February 11, 1994, to illustrate that advancements have been made to promote community empowerment and public participation in the regulatory process. EO 12898 mandates that all federal agencies must develop an agency-wide strategy to ensure that the programs, policies, and actions of that agency promote, or be revised to promote, environmental justice

In order to develop these agency-wide strategies, EO 12898 established a working group consisting of members of various federal agencies. The ultimate goal of this group is to guide other federal agencies in the creation or revision of their policies to include environmental justice provisions. This group will also be used to stimulate coordination between the EPA, the Department of Health and Human Services, and the Department of Housing and Urban Development Last, the Order recognizes the importance of public participation and states that each federal agency must comply with strict public participation requirements. However, the Order fails to state specifics regarding the scope or extent of public participation; EO 12898 states that public meetings should be held by agencies on an as needed basis only (Federal Register, 1995).

The literature in this section deals with the major anti-discrimination statutes that have been passed or proposed by the federal government throughout history. A conclusion that can be drawn from this literature, since this section also identifies major

faults found within each statute, is that civil rights and/or environmental justice legislation needs to focus more on health related and participatory issues in order to better serve the people the statutes are designed to protect. In doing so, many of the goals stated within the legislation will be met

2.4 Future Research

A selected review of past literature demonstrates that the research on environmental racism has been primarily limited to the effects of siting toxic and hazardous waste facilities in black neighborhoods. Thus, as communities attempt to assess the effects of projects in areas dominated by races other than blacks, additional research is necessary to establish a model that is sensitive to the needs of these other minorities as well. This research project attempts to accomplish this task by including Hispanics, Native Americans, and Asian-Americans in the environmental justice evaluation of the Rhode Island Freight Rail Improvement Project (FRIP).

As mentioned above, a major gap in the previous research is that it focused primarily on the siting of toxic and hazardous waste landfills. Environmental racism does not only deal with a population's exposure to toxic chemicals. Rather, future research needs to focus on the impacts of other projects - such as the siting of airports, highways, or railroad tracks - to illustrate that environmental racism deals with a broad scope of issues including air pollution, noise pollution, decreasing property values, impacts to aesthetic and visual resources, water quality, etc. This research project will address this issue by identifying all social, economic, and environmental impacts that could result from the FRIP to determine if low income or minority populations will be adversely or

disproportionately affected by the construction of a dedicated freight track.

CHAPTER THREE
The Rhode Island Freight Rail Improvement Project

The Rhode Island Freight Rail Improvement Project (FRIP), or the Third Track Project, has the potential to create many economic opportunities within the State of Rhode Island. With the expansion of freight rail service within the State, there is a great capacity to attract many new freight-dependent businesses to the area, but more specifically to the former Naval facility known as Quonset Davisville Industrial Park also (known as Quonset Point/Davisville) in North Kingstown.

The primary purpose of this chapter is to acquaint the reader with the FRIP, and the transportation, economic, and safety goals associated with the proposed project. Specifically the chapter will provide a detailed description of the study area, identify the purpose and need for the FRIP, and identify the three alternatives - No Build, Full Build, and Partial Build - considered throughout the planning process.

3.1 Purpose and Need for the FRIP

Quonset Davisville Industrial Park contains approximately one third of the State's vacant industrial land (Frederic R. Harris, Inc., 1996); the entire facility contains approximately 3,000 acres. The Park also contains a deep water port, an airport, and a twenty-three mile internal rail distribution system. Quonset Davisville is also located within close proximity to major highways, such as Routes 4 and 95, and an interstate rail system. With the utilization of these amenities in mind, the Industrial Park has been targeted by the State of Rhode Island for redevelopment into a major intermodal facility;

the FRIP would only enhance the opportunities for this project and would also help to strengthen the business climate not only on-site, but also throughout the State.

Quonset Davisville Industrial Park is home to over 70 manufacturing companies, six of which use freight as a means of shipping and receiving goods. Industries located in the Industrial Park that currently use freight rail include frozen seafood, lumber, plastics, and automobile import/export. However, the travel of freight is hampered by the inadequate height clearances of the many bridges located along the corridor, and also by the reduction of available operating windows due to the Northeast Corridor Improvement Project (NECIP) electrification (operating windows are the times at which freight trains can safely travel on the Amtrak mainline without coming into contact with a passenger train).

The clearance constraints do not allow for the use of double stack container cars or tri-level automobile carriers, two modern methods of moving freight more efficiently; many of these companies, therefore, rely on trucks as their primary mode for shipping and receiving. The lack of operating windows makes it difficult to move freight at certain times of the day, and results in time delays. The failure to provide the necessary clearances and operating windows would impede the growth of automobile import/export operations and other container or cargo-related businesses.

The construction of the FRIP would be occurring in a portion of Amtrak's Northeast Corridor (NEC), a 457-mile rail line that links Boston with Washington, DC (Frederic R. Harris, Inc., 1996). Since 1976, the NEC has been involved in the NECIP, a federally-funded program designed to improve inter-city rail passenger service along the NEC (Frederic R. Harris, Inc., 1996); a major goal of this project is to reduce travel time

between Boston and New York City to three hours, through the use of a high-speed passenger rail system. One phase of the NECIP is the implementation of electrified rail service between New Haven and Boston. The improvements made through the NECIP have the potential to double the amount of passenger trains on the NEC by the year 2010. NECIP construction began in June of 1996 and is expected to be completed by the year 1999.

Currently, the Providence & Worcester Railroad Company (P&W) is the only freight rail provider in the State. P&W trains operate on a separate third track parallel to the mainline between Central Falls and Atwells Avenue in Providence, at a maximum speed of 10 miles per hour (mph). After this point, freight trains return to the mainline tracks, where they operate at a maximum speed of 30 mph; Amtrak passenger trains travel on these same tracks at maximum speeds of 100 mph (Frederic R. Harris, Inc., 1996). As mentioned above, the NECIP improvements will not only double the volume of trains, but will also increase their speeds by approximately 50 mph. This increase in passenger train volume and speed will reduce the operating opportunities for the movement of freight. The combination of slow freight trains and fast passenger trains operating on the same tracks has the potential to create safety hazards not only to Amtrak passengers, but also to the residents of the communities along the FRIP corridor.

The goals of the FRIP are first, to ensure the efficiency and flexibility existing and future rail operations, and second, to eliminate the physical constraints that currently hamper the movement of freight to and from Quonset Davisville and other industrial areas along the corridor. The following objectives have been developed to meet these goals (Frederic R. Harris, Inc., 1996):

- **Transportation Objectives:** involve the maintenance and improvement of the operational capabilities of Rhode Island freight rail facilities, by providing more flexible and efficient service to existing freight customers, as well as areas designated for future economic development.

- **Economic Objective:** enhance the economic development potential of Quonset Davisville Industrial park and other industrial areas in the State that are served by rail.

- **Environmental Objective:** reduce transportation-related air quality and congestion impacts in Rhode Island, as well as developing this project in a way that is sensitive to both the natural and built environments of the communities along the project corridor.

- **Safety Objective:** minimize the existing conflicts between passenger and freight rail operations, limiting increased heavy-vehicle traffic on roadways, and maximize pedestrian safety at rail crossings.

The State of Rhode Island feels the FRIP is important because it can be considered a fundamental component of the economic development plan for Rhode Island. The FRIP would not only help to retain the freight-dependent businesses already located in Rhode Island, it would also help to attract new commercial and/or industrial businesses to the corridor; an increase in jobs would occur over time as a result of this project. The construction of a third track would lead to a reduction in human health impacts due to the absence of freight trains on the mainline tracks, and a reduction of large, cargo-carrying trucks on our roadways. By making improvements to the freight rail system, the State of Rhode Island will be ensuring future economic growth at Quonset Davisville, and the safety of not only the residents living within the corridor, but also the passengers on the trains.

3.2 Description of the Study Area

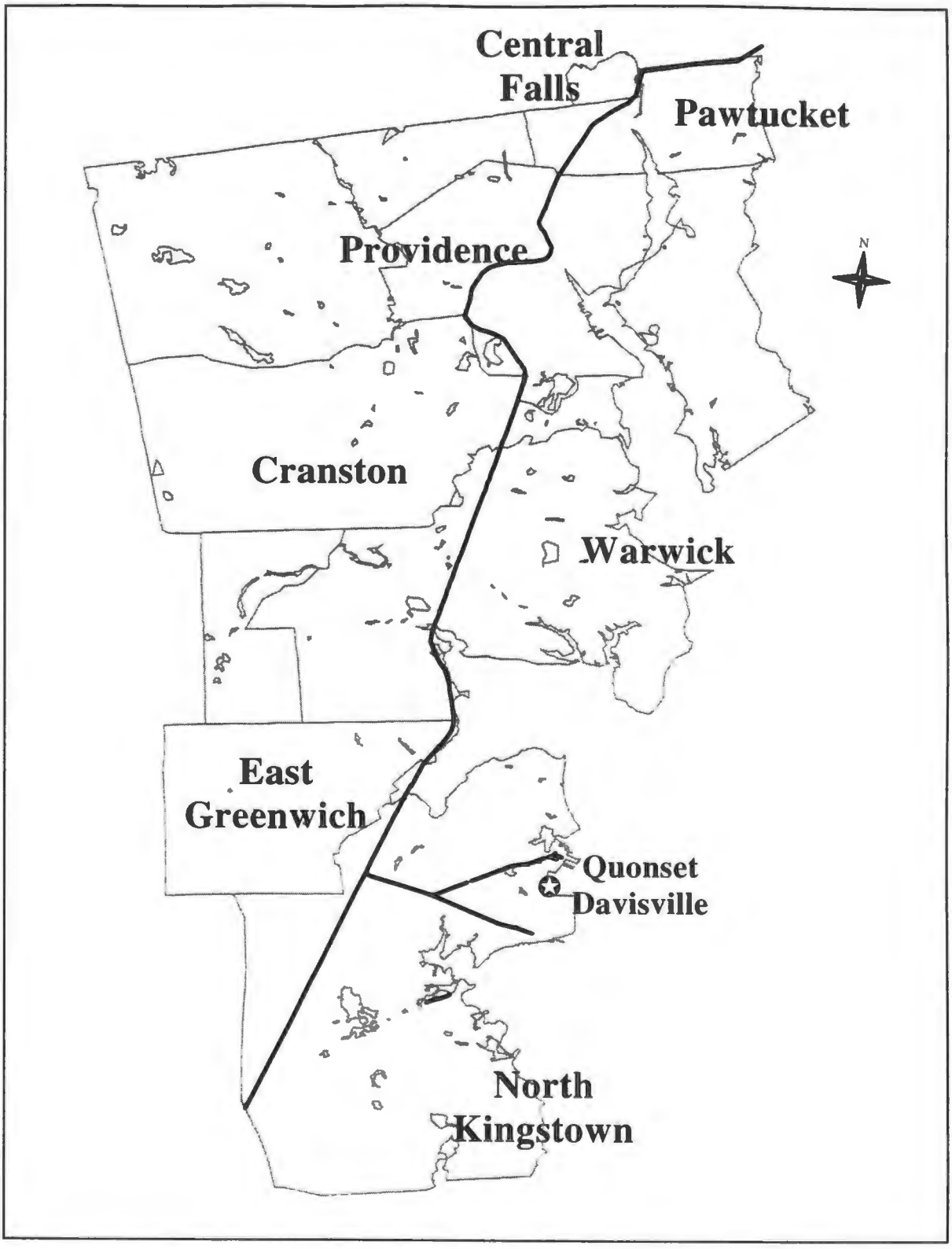
The twenty-two mile FRIP corridor passes through seven communities within the State of Rhode Island: North Kingstown, East Greenwich, Warwick, Cranston, Providence, Pawtucket, and Central Falls (see Figure 3.1). The FRIP corridor is approximately one mile wide, and is part of the larger Amtrak NEC right-of-way (ROW). Although the corridor lies in a north-south orientation, Quonset Davisville Industrial Park in North Kingstown and Boston Switch in Central Falls mark the western and eastern boundaries of the corridor, respectively.

Land Use

While traversing the communities within the State, the corridor passes through many areas with different land use classifications. Although the corridor contains some 3,234 acres of industrially zoned land, with the largest contributor being the former Naval facility at Quonset Davisville, it also contains many high density residential areas particularly in Warwick, Providence, Pawtucket, and Central Falls. The project corridor also contains some areas of environmental sensitivity. For example, the Hunt-Annaquatucket-Pettasquamscutt (HAP) Sole Source Aquifer (SSA) provides drinking water to North Kingstown, East Greenwich, and Warwick. Table 3.1 provides a summary of land uses found within the project corridor.

Land uses that are located in close proximity to the railroad will be more heavily affected by the FRIP. For example, commercial and industrial businesses located in Quonset Davisville or along the freight line may be positively affected by the construction of the third track due to increased access to modern freight rail facilities, and therefore

FIGURE 3.1. EXISTING FREIGHT RAIL LINE



Created By: Kristen A. Dirnberger
Date: December 1996
Source: US TIGER Files. 1994

Not to Scale
Rail Line
Town Boundaries

TABLE 3.1. FRIP CORRIDOR LAND USE SUMMARY

LAND USE	ACRES	PERCENT
Open space	1,241	9.0
Residential	4,980	36.4
Wetlands	541	3.9
Commercial	1,889	13.8
Transportation	1,384	10.1
Industrial	1,865	13.6
Agricultural	114	1.0
Water	295	2.3
Parks and Recreation	1,336	9.8
TOTAL	**13,645**	**100**

Note: Due to rounding, total percentage may not equal 100.
Source: Frederic R. Harris, Inc., 1996.

reduced shipping costs, for some bulk commodities, as compared to trucks; although freight rail may be cheaper for hauls longer than 500 miles, trucking can be more direct due to the extensive national highway network. On the other hand, residences located in close proximity to the rail line could be negatively impacted by the FRIP due to the potential for increased noise and vibration from the increased volumes of trains. The length of the project corridor within each of these communities could also determine the severity of the impacts.

Table 3.2 provides a summary of the number of miles of FRIP corridor that can be found within each community. The following is a summary of the land uses abutting the railroad and the length of the project corridor within each of the seven communities.

North Kingstown: 1.4 miles of the project corridor pass through North Kingstown. Both industrial and commercial land uses can be found adjacent to the railroad, which includes the former Naval facility at Quonset Davisville. Medium to low density residential uses can also be found throughout the 1.4 mile segment.

East Greenwich: 1.3 miles of the project corridor pass through East Greenwich. This area consists mainly of industrial, commercial and residential uses, with the industrial and commercial land abutting the railroad. High density residential uses lie beyond the tracks.

Warwick: 7.7 miles of the project corridor pass through Warwick. Medium density and high density residential, as well as industrial and commercial uses can be found throughout this area.

Cranston: 2 miles of the project corridor pass through Cranston. This area contains a mixture of high density residential, industrial, and manufacturing uses. There are also two moderately sized commercial districts within this area.

Providence: 6.8 miles of the project corridor pass through Providence. The land abutting the railroad is primarily industrial; high density residential and commercial uses can be found beyond the tracks. High density residential use is also prevalent near the Cranston border.

Pawtucket: 2.2 miles of the project corridor pass through Pawtucket. The majority of the industrial and commercial uses are located between the Providence border and the Moshassuck River. The remainder of the this area contains high density residential uses.

Central Falls: 0.3 miles of the project corridor pass through Central Falls. Industrial and commercial uses can be found abutting the railroad and along the Blackstone River. High density residential uses are distributed throughout this area.

TABLE 3.2. MILES OF FRIP PROJECT CORRIDOR WITHIN EACH COMMUNITY

COMMUNITY	MILES
North Kingstown	1.4
East Greenwich	1.3
Warwick	7.7
Cranston	2.0
Providence	6.8
Pawtucket	2.2
Central Falls	0.3
TOTAL	**22.0**

Note: Due to rounding, totals may not equal 22.
Source: Frederic R. Harris, Inc., 1996.

Demographics

The communities located along the project corridor contain populations with a mixture of demographic characteristics. As Table 3.3 illustrates, the majority of the people living along the FRIP corridor are white, and the communities in which they reside

contain a wide range of median household incomes, from a low of $18,617 in Central Falls, to a high of $50,896 in East Greenwich (Frederic R. Harris, Inc., 1996). Table 3.3 also indicates that Providence and Central Falls contain the largest populations of minority residents, having descendants of African American, Native American, and Asian/Pacific Islander origins. Both of these communities also contain the highest percentages of people living below the federal poverty line, as determined by the US Department of Health and Human Services (Frederic R. Harris, Inc., 1996). A more localized analysis of demographic data is provided in Chapter 5.

TABLE 3.3. DEMOGRAPHIC CHARACTERISTCS OF COMMUNITIES ALONG THE FRIP CORRIDOR, 1990

Municipality	Total Population (1990)	Median Household Income	% Below Poverty Line	% White	% Black	% Native American, Eskimo, or Aleut	% Asian/ Pacific Islander	% Other
Central Falls	17,637	$18,617	22.3	77.2	4.2	0.3	0.8	17.3
Cranston	76,060	$34,528	6.5	95.1	2.4	0.2	1.8	0.6
East Greenwich	11,865	$50,896	4.7	98.0	0.4	0.2	1.4	0.1
North Kingstown	23,768	$40,419	4.6	96.9	1.3	0.4	1.0	0.4
Pawtucket	72,644	$26,541	10.6	89.3	3.6	0.3	0.6	6.2
Providence	160,728	$22,147	23.0	69.7	14.8	0.9	5.9	8.4
Warwick	85,427	$35,768	4.8	98.0	0.8	0.2	0.8	0.2

Note: Percents may not equal 100 due to rounding.
Source: Frederic R. Harris, Inc., 1996.

Historic and Archaeological Resources

The project corridor contains many areas of historic and archaeological significance. Historic resources include bridges, houses, parks, cemeteries, mill complexes, and various historic districts; many of these resources are listed on or recommended for listing on the

National Register of Historic Places (NRHP). While they may be distributed throughout the project corridor, Providence contains the greatest number of historic resources including the Old Union Station, the Gorham Manufacturing Company Complex, and the Roger Williams National Memorial Park.

Archaeological resources are those sites and structures that provide a prehistoric or historic account of our culture. Archaeological resources identified in the FRIP corridor include various sites in East Greenwich, Warwick, and Providence where tools, pottery shards, and mineral/rock flakes or deposits were found (See Table 3.4). Structures such as The Brick House in East Greenwich and the Old State House in Providence are also considered to be archaeological resources; no archaeological resources were found in North Kingstown, Cranston, Pawtucket, or Central Falls.

TABLE 3.4. NUMBER OF HISTORIC AND ARCHAEOLOGICAL RESOURCES BY COMMUNITY

Community	Historic Resources	Archaeological Resources
North Kingstown	3	0
East Greenwich	4	3
Warwick	8	10
Cranston	3	0
Providence	40	8
Pawtucket	3	0
Central Falls	16	0
TOTAL	77	**21**

Source: Frederic R. Harris, Inc., 1996.

Wetlands

Since the project corridor is located along the western shore of Narragansett Bay, both freshwater and coastal wetlands occur quite frequently, especially from Davisville north to Apponaug Cove. Four federal wetlands systems occur within the FRIP corridor: estuarine

wetlands, associated with Greenwich Cove, Greenwich Bay, and Apponaug Cove; one lacustrine wetland, Mashpaug Pond; and various types of palustrine and riverine wetlands (Frederic R. Harris, Inc., 1996). In all, twenty-six wetland areas are located within the project corridor, including the Hunt River wetland, which can be found on both sides of the ROW, for some distance in North Kingstown and East Greenwich; Pains Pond located in the vicinity of Forge Road in East Greenwich; and the Mashpaug wetland in Providence.

Wellhead Protection Areas

Wellhead protection focuses on prevention of contaminants from entering groundwater recharge areas for public supply wells; wellhead protection areas (WHPA) are established in order to ensure that State drinking water quality standards are being met. There are five community and/or non-community wells located within the project corridor (see Figure 3.2): two owned and operated by the Town of North Kingstown that serve the majority of the Town; one owned and operated by the Kent County Water Authority (KCWA) that serves most of East Greenwich and Warwick; and two owned and operated by the Rhode Island Economic Development Corporation (RIEDC) that serve Quonset Davisville Industrial Park exclusively. All of these wells are located within the HAP SSA; the HAP SSA is the primary source of drinking water for North Kingstown, East Greenwich, and parts of Warwick.

The FRIP corridor WHPA located in North Kingstown is the only WHPA within the project corridor. Currently however, North Kingstown, East

Greenwich, Warwick, the KCWA, and the RIEDC are involved in the development of a regional WHPA plan for the HAP SSA.

Surface Water Resources

Both freshwater and salt water resources are distributed throughout the FRIP corridor, many of which are considered to be important drinking water and recreational resources for the State. The following Rhode Island Department of Environmental Management (RIDEM) water quality standards pertain to the surface water resources found within the FRIP corridor (RIDEM, 1988):

Freshwater:

- A - intended to protect public drinking water supplies within the State;
- B - intended to protect water bodies which could serve as public drinking water supplies, if treated appropriately. These waters are used for agricultural, swimming, and also provide fish and wildlife habitat; and
- C - intended to protect water bodies for secondary uses such as boating, fish and wildlife habitat, and for industrial processes.

Salt Water:

- SA - intended to protect those water bodies that are used for contact recreational activities, shellfish harvesting for direct human consumption, and they also provide fish and wildlife habitat;
- SB - intended to protect waters used for shellfish harvesting for direct human consumption after depuration, swimming, and fish and wildlife habitat; and
- SC - intended to protect waters for secondary uses such as boating, fish and wildlife habitat, and industrial processes.

Those freshwater bodies located within the project corridor that are identified as Class A include portions of the Hunt River in North Kingstown and Pains Pond in East Greenwich; other portions of the Hunt River can also be identified as Class B, as can the Maskerchugg River in East Greenwich, and the West River in Providence. Greenwich

Bay in Warwick, which is used seasonally for shell fishing, is identified by the State as SA waters. The northern portion of Greenwich Cove, which is closed to shell fishing, is classified as SB, while the southern portion is classified as SC (see Table 3.5)

TABLE 3.5. SURFACE WATER RESOURCES WITHIN THE FRIP CORRIDOR

Community	Water Body Name	Class
North Kingstown	Hunt River	A & B
East Greenwich	Pains Pond	A
East Greenwich	Maskerchugg River	B
East Greenwich & Warwick	Greenwich Cove	SB & SC
Warwick	Greenwich Bay	SA
Warwick	Mary's Pond	B
Warwick	Mary's Creek	B
Warwick	Apponaug Cove	SB & SC
Warwick & Cranston	Pawtuxet River	C
Providence	Mashpaug Pond	C
Providence	West River	B
Providence	Woonasquatucket River	C
Providence	Moshassuck River	C

Source: RIDEM Water Quality Standards, 1988.
Frederic R. Harris, Inc., 1996.

As Table 3.5 indicates, the majority of the waters within the City of Providence have exceeded their pollutant thresholds and cannot sustain any further degradation; this also applies to SC waters. A, SA, B, and SB are considered to be high quality waters, therefore, water quality must be monitored closely in order to ensure that these waters can maintain their designated uses.

3.3 Identification of the FRIP Alternatives

The severity of the impacts to the environment and the surrounding populations depend primarily on the alternative that will be chosen for the project. As required by the National Environmental Policy Act (NEPA), an Environmental Impact Statement (EIS)

must consist of a list of alternatives for specific projects; one of the alternatives must be a status-quo, or No Build alternative. The purpose of the alternatives in an EIS is to determine the impact of different scenarios for the same project. For the purposes of this study, a brief description of the FRIP No Build, Full Build, and Partial Build Alternatives will be provided. Based on the analysis contained within the Major Investment Study-Draft Environmental Impact Statement-Draft 4(f) Evaluation (MIS-DEIS-Draft 4(f)) for the FRIP, the Full Build Alternative would result in the most adverse impacts to the NEC, while the Partial and No Build Alternatives present scenarios of relatively less impact.

No Build Alternative

The No Build Alternative would not require any construction or improvements to the operation of the existing freight rail system. Only those improvements associated with the NECIP (e.g., track electrification) would occur which, in themselves, would substantially restrict freight service; the No Build Alternative does not include any provision to separate high-speed passenger operations from freight operations. Although the No Build Alternative would accommodate existing freight operations, this alternative would not provide for future expansion of freight rail service, particularly because overhead clearance constraints would not be improved.

Full Build Alternative

The Full Build Alternative would provide a dedicated freight track, from Quonset Davisville in North Kingstown to Boston Switch in Central Falls, parallel to Amtrak's mainline. In doing so, freight and passenger train conflicts would almost be eliminated;

P&W freight trains must cross the mainline track in various locations in order to access such places as the Port of Providence, the Providence Journal, the Pawtucket Yard, and Quonset Davisville (Frederic R. Harris, Inc., 1996). Under the Full Build Alternative, all necessary height clearances would be provided by either lowering tracks or raising the superstructure at 35 overhead bridges, so that double stack container cars and tri-level auto carriers could be used. The Full Build Alternative would also require the construction of 29,295 linear feet of retaining wall, in order to provide the area for the dedicated freight track. The estimated construction time for this alternative is seven years.

Partial Build Alternative

The Partial Build Alternative would require the use of existing mainline track and existing freight track, as well as the construction of additional track sidings. Sidings are areas parallel to the mainline tracks where, for example, slower freight trains can pull off the tracks to let faster passenger trains pass by. The Partial Build Alternative would require the construction of four additional sidings between Quonset Davisville and Central Falls. This alternative would also require clearance modifications at 32 overhead bridges and one pedestrian bridge in order to achieve the desired height clearances necessary for the use of high and wide freight cars. Also, 3,175 linear feet of retaining wall would have to be constructed. While the Partial Build Alternative would not be able to provide the same level of service as a dedicated freight track, it would provide substantial improvement over present conditions, as well as the opportunity for future expansion to accommodate increased rail demands. Construction of the Partial Build Alternative is estimated at four years.

3.4 Summary of Findings

The State of Rhode Island needs to expand its freight rail capacity in order to promote economic development. And, given the size and scope of the project, the overall impacts would be relatively minor (See Chapter 4). As indicated in the text, the Full Build Alternative would require much more construction, and has the potential to impact the social, economic, and natural environments of the communities located in the project corridor more severely than the No Build and the Partial Build Alternatives. Also, one can easily eliminate the No Build Alternative from consideration since it does not propose any improvements, other than those completed through the NECIP, to the existing freight rail system. Therefore, the remainder of this study will focus on the impacts of the Full Build and Partial Build Alternatives, as compared to the No Build Alternative, to determine their effects on low income and minority populations living within the FRIP corridor.

The demographic, historic, and environmental features of the project corridor that were described in the beginning of this chapter all have the potential of being impacted by the construction of this project. According to Executive Order 12898, environmental racism will occur if impacts to those features are distributed disproportionately throughout the project corridor. Chapter 4 of this study will identify potential impacts to both the natural and physical environments of the communities located within the FRIP corridor.

CHAPTER FOUR
Potential Impacts from the Rhode Island Freight Rail Improvement Project

While the Rhode Island Freight Rail Improvement Project (FRIP) has the potential to bring many economic benefits to the State, it also has the potential to adversely affect the natural and physical environments of the communities within the Project corridor. This chapter provides a description of the anticipated environmental impacts from the FRIP Full Build and Partial Build Alternatives, as compared to the No Build Alternative. As mentioned previously, the FRIP Partial Build Alternative has the potential to affect the environment of the project corridor in many ways; however, the overall proposed impacts would be less than those resulting from the FRIP Full Build Alternative.

Specifically, this chapter assesses the proposed impacts to: the natural environment, including land use; wetlands; groundwater and wellhead protection areas; surface water; coastal resources; and air quality; and impacts to the physical environment, including historic and archaeological resources, noise and vibration, and traffic and circulation. An analysis of proposed impacts to low income and minority populations is provided in Chapter Five.

Where possible, the impact information is presented in tabular form by community. This type of organization serves a dual purpose: first, to clearly organize the data; and second, to acquaint the reader with the FRIP impacts - as they would occur in each community - from each alternative. In doing so, overall conclusions regarding the potential for environmental racism in the communities along the FRIP corridor can be drawn more easily.

4.1 Impacts to the Natural Environment

Land Use

As was described in Chapter 3, there are a mixture of land uses present along the project corridor. Impacts to these land uses from the Full Build and the Partial Build Alternatives would come in three forms: right-of-way (ROW) acquisitions, easements, and access for ROW construction. Since existing land uses would be expanded within the existing rail corridor (e.g., the construction of new track or sidings), local zoning ordinances would not be affected by any of the proposed impacts.

No Build Alternative:

Since the No Build Alternative does not involve any expansion of the existing rail facilities, no impacts to existing land uses are expected.

Full Build Alternative:

The Full Build Alternative would require the construction of a new railroad track along the entire Project corridor. In order to complete this task, four fee-simple partial acquisitions would need to occur for the construction of retaining wall and new track and one full fee-simple taking would also be required; fee-simple acquisitions involve the transfer of property ownership, from one group to another, without restrictions and/or limitations. Overall, the Full Build would require the acquisition of 23,305 square feet of land. All landowners would receive just compensation for their property; just compensation is the "fair market value of the property acquired at the time just prior to the taking" (Frederic R. Harris, Inc., 1996: 4-3). And, since the one full fee-simple acquisition does involve a residence in East Greenwich, the property owner would be considered

eligible for relocation assistance under the "Uniform Relocation Assistance and Real Property Acquisition Policies Act" of 1970 (49 CFR, Part 24, 1989).

Several temporary and permanent easements would be necessary for this FRIP alternative. Easements would be required over the entire length of the corridor for such activities as the construction of bridges, retaining walls, and new track, as well as the installation of drainage and utilities. Again, all landowners would receive just compensation for the use of their property throughout the duration of the easement.

Partial Build Alternative:

In order to construct the new track necessary for this alternative, one fee-simple partial land acquisition would be necessary; approximately 4,500 square feet of land would be required for this construction (Frederic R. Harris, Inc., 1996). Land would not be necessary to construct the three sidings required by the Partial Build, because they would be constructed in areas where sidings had once existed. A variety of permanent and temporary easements would also be necessary for drainage and utility installation, and bridge, retaining wall, and track construction. All land owners would be justly compensated based on the terms of the easement.

As indicated in Table 4.1, the Full Build Alternative would require approximately 19,000 square feet of land more than the Partial Build, for the construction of the third track. But, as noted above, the land use impacts would be consistent with local zoning ordinances because all construction would take place within the currently designated railroad ROW

TABLE 4.1. AFFECTED LAND USES: FULL BUILD VS. PARTIAL BUILD[1]

Location	Current Use	Full Build	Partial Build
SE King Street, East Greenwich	Commercial Residential	Partial acquisition 2,000 sf[2] strip	
NW Adelaide Avenue Providence	Industrial	Partial acquisition 4,500 sf strip	Partial acquisition 4,500 sf strip
SE Niantic Avenue Providence	Industrial	Partial acquisition 3,600 sf strip	
SW Huntington Expressway Cranston	Industrial	Partial acquisition 8,200 sf strip	
NE King Street East Greenwich	Commercial Highway Residential	Full acquisition 5,005 sf strip	
Length of Corridor	Commercial, Industrial Residential	Permanent and temporary easements	Permanent and temporary easements
TOTAL		**23,305 sf**	**4,500 sf**

1. Full Build and Partial Build as compared to No Build
2. sf square feet

Source: Frederic R. Harris, 1996.

Wetlands

Fresh water and coastal wetlands are prevalent throughout the FRIP corridor. These wetlands are regulated by federal agencies such as the Army Corps of Engineers (ACOE), the Environmental Protection Agency (EPA), and the National Marine Fisheries Service (NMFS), and also by state agencies such as the Rhode Island Department of Environmental Management (RIDEM) and the Coastal Resources Management Council (CRMC). The state and federal agencies alike have established regulatory measures as well as specific criteria to delineate the wetlands, to evaluate important wetland functions (e.g., wildlife habitat and flood storage), to protect wetlands from harmful activities (e.g., filling and dredging), and to mitigate impacts to wetlands where necessary. Since the

FRIP would be traversing many environmentally sensitive areas, some impacts to wetlands are expected.

No Build Alternative:

Since construction to expand the existing freight rail facilities would not be taking place under this alternative, no impacts to wetlands are expected.

Full Build Alternative:

The project corridor contains approximately 830 acres of wetlands (Frederic R. Harris, Inc., 1996), 3.62 acres of which have the potential to be altered through the construction of the Full Build Alternative. The majority of the affected wetlands would fall into the category of state-regulated Riverbank or Perimeter wetland. These wetlands are not considered to be functional; rather, they act as a buffer to the functional wetland itself (Frederic R. Harris, Inc., 1996). Limited impacts to wetland wildlife habitat from this alternative could occur due to retaining wall construction.

Partial Build Alternative:

Less than one acre of wetland would be affected by activities associated with the Partial Build Alternative (Frederic R. Harris, Inc., 1996). While, the wetland types that would be most affected are Perimeter and Riverbank wetlands, this Alternative would have considerably less impact than the Full Build Alternative.

As indicated in Table 4.2, impacts to wetlands as a result of the FRIP Full Build or Partial Build Alternatives would be minimal; approximately 0.43 and 0.03 percent of the total wetlands area within the corridor (830 acres) would be affected by the Full Build Alternative and Partial Build Alternative, respectively. Wetland impacts would be greatest in those areas where new track and retaining walls are needed. Since Best

Management Practices (BMPs) (e.g., silt fencing and vegetative cover) would be used for mitigation, and because construction activities are not expected to permanently change the wetlands, the overall construction impacts are also anticipated to be minimal.

TABLE 4.2. WETLAND IMPACTS BY COMMUNITY AND BUILD ALTERNATIVE

Community	Wetland	Full Build (acres)	Partial Build (acres)
North Kingstown & East Greenwich	Hunt River	1.66	0.02
East Greenwich	Maskerchugg River	0.32	0
East Greenwich & Warwick	Greenwich Cove	0	0
Warwick	Greenwich Bay	0	0
Warwick	Apponaug Cove	0.03	0
Warwick	Pains Pond	0.04	0
Warwick & Cranston	Pawtuxet River	1.25	0.25
Providence	Mashpaug Pond	0.07	0
Other Wetlands[1]		.25	0
TOTAL		**3.62**	**0.27**
% OF TOTAL WETLANDS		**0.43**	**0.03**

[1] Other wetlands include those located in small, isolated pockets throughout the corridor.
Source: Frederic R. Harris, Inc., 1996

Groundwater and Wellhead Protection Areas

Groundwater is an important resource for North Kingstown, East Greenwich, and Warwick, because it provides a source of drinking water; all three of these communities are located within the Hunt-Annaquatucket-Pettasquamscott (HAP) Sole Source Aquifer (SSA). The HAP SSA is regulated under the Safe Drinking Water Act (SDWA) of 1974 (40 CFR, Parts 141-149, 1974), which requires states to adopt regulations protecting the quality of drinking water near municipal wells by establishing wellhead protection areas (WHPA). Also, the SDWA gives authority to the Environmental Protection Agency (EPA) to designate and regulate SSAs, by disallowing those projects that have the potential to cause a public health hazard through contamination of the aquifer.

The RIDEM, Division of Groundwater Resources, as well as the Rhode Island Department of Health (RIDH) regulate groundwater within the state through the Rhode Island Groundwater Protection Act (RIGL 46-13.1). The RIDH is responsible for maintaining a testing schedule for wells, and is also responsible for mitigation, if well contamination has occurred.

As was stated earlier, portions of the rail line in North Kingstown, East Greenwich, and Warwick lie within the HAP SSA. Also, one WHPA is located within the Project corridor. The SSA, WHPA, and the five community and/or non-community wells located along the FRIP corridor are considered areas of environmental sensitivity and could be affected by the construction of a new rail line; construction impacts resulting from the storage, repair, and maintenance of equipment could include the release of motor fuels and other vehicular fluids. Post-construction impacts, such as accidental spills, oil drippings, or herbicide applications by Amtrak, could also occur; Amtrak applies both pre-emergent and post-emergent herbicides to the ROW to control vegetation along the tracks. Pre-emergent herbicides are applied in the spring before vegetation emerges, while post-emergent herbicides are applied during the summer after vegetation has emerged.

No Build Alternative:

The No Build Alternative would not require any construction, therefore groundwater resources would not be impacted by construction activities.

Full Build Alternative:

The Full Build Alternative would require the construction of a third track through the HAP SSA, which includes five public wells and one WHPA. Since freight train volumes would be increased by this alternative, post-construction impacts could be

increased. Additional herbicide applications by Amtrak would be necessary for the length of the new track. Herbicides are applied to the ballast (i.e., the rocky material laid in the railbed); movement through the rail ballast would ensure further filtering, therefore impacts to groundwater are considered to be unlikely (Frederic R. Harris, Inc., 1996).

Partial Build Alternative:

The Partial Build Alternative would require the construction of 1,600 linear feet of new track and a siding in East Greenwich, all within the HAP SSA (Frederic R. Harris, Inc., 1996); a portion of the East Greenwich siding is also located within a WHPA. The potential for post-construction impacts would be increased due to the higher volume of trains that would be traveling on the tracks. Also, since new track would be constructed in selected areas throughout the corridor, pre-emergent herbicide applications by Amtrak would then be needed in these locations.

In general, groundwater resources could be affected by activities during and after construction. Although construction impacts to groundwater resources would differ between the Full Build and Partial Build Alternatives, the post-construction impacts would be consistent between both, since the increased volume of trains would be the same for both alternatives.

Surface Water Resources

In Chapter 3, key surface water resources were identified within each community along the FRIP corridor. Pollutants that would potentially threaten or degrade surface water resources could come from direct impacts (e.g., placement of fill into the water body), construction impacts (e.g., release of vehicular fuels); and post-construction

impacts (e.g., accidental oil spills). All of these impacts are regulated on the federal level, as well as the state level.

The Clean Water Act regulates the discharge of pollutants into the surface waters of the United States. Specifically, Section 404 (33 CFR Parts 320-330 and 335-338) of the Clean Water Act regulates the discharge of dredge or fill material into surface waters, while Section 401 (33 CFR, Parts 1251-1387) requires a permit from the state water pollution control agency in order to discharge dredge or fill materials. It is the responsibility of RIDEM's Division of Water Resources (DWR) to ensure that proposed discharges comply with federal and State discharge limitations and water quality standards (Frederic R. Harris, Inc., 1996). DWR also regulates the State's surface water, groundwater, tidal water, and wetlands through the Water Quality Regulations for Water Pollution Control (1988). These regulations establish classifications based on use, and are designed to protect the uses within each classification.

In order to create the desired height clearances required for the use of double stack container cars and tri-level auto carriers, modifications to existing bridges are necessary. The main impact at these locations would be parallel bridge span (for new track) construction impacts. These activities have the potential to affect tidal flows and could possibly increase erosion and sedimentation in the water bodies.

No Build Alternative:

Since construction is not needed under the No Build Alternative, direct and construction related impacts would not occur.

Full Build Alternative:

Since the Full Build Alternative has the largest construction area, and would also be constructed over more surface water bodies than the other alternatives, more impacts to surface water resources are anticipated. Direct impacts from the Full Build Alternative are expected at Apponaug Cove, the Hunt River, the Pawtuxet River, and the Maskerchugg River. These impacts can be primarily attributed to the construction of new bridge spans, piers, or supports over these water bodies. Erosion and sedimentation are of greatest concern in the Hunt and Maskerchugg Rivers; these rivers are both threatened for total suspended solids (TSS) since increased amounts of TSS result in increased turbidity of the water. As a result, this water body would eventually become anoxic (no oxygen present) due to the lack of sunlight able to penetrate through the water.

Partial Build Alternative:

Direct impacts from the Partial Build Alternative are expected only to the Pawtuxet River. Not unlike the Full Build Alternative, construction of new bridge spans and piers would be the cause of the impacts. Construction impacts would primarily be from the storage, maintenance and repair of heavy construction equipment, which could result in minor releases of contaminants to surface waters. Due to increases in freight traffic volumes, the potential for accidents would also increase.

Table 4.3 identifies the surface water resources within the FRIP corridor that are most likely to be adversely impacted as a result of the Full Build or Partial Build Alternatives. While other surface resources do exist throughout the corridor, impacts have the potential to be quite minimal and could be mitigated or even avoided by using BMPs.

TABLE 4.3. IMPACTS TO SURFACE WATER RESOURCES

Community	Surface Water Body	Class	Impacts from the FRIP	
			Full Build (Y/N)	Partial Build (Y/N)
North Kingstown	Hunt River	A & B	Y	N
East Greenwich	Maskerchugg River	B	Y	N
Warwick	Apponaug Cove	SB & SC	Y	N
Warwick & Cranston	Pawtuxet River	C	Y	Y

Source: Frederic R. Harris, Inc., 1996

Coastal Resources

The study area lies along the western side of Narragansett Bay. All of the coastal resources found within the study area are located within the watershed of Narragansett Bay, and are state and federally regulated. The Coastal Zone Management Act of 1972 (CZMA) (16 U.S.C. 1451 et. seq.) was established to protect the natural resources such as wetlands, floodplains, and fish and wildlife within the coastal zone. Under the CZMA, states are encouraged to develop coastal zone management plans in order to ensure that state plans and programs are consistent with federal plans and programs.

In Rhode Island, in accordance with the State's federally approved coastal zone program, the Coastal Resources Management Council (CRMC) has jurisdiction over all coastal resources including tidal waters, beaches, dunes, barrier beaches, coastal wetlands, banks, rocky shores, manmade shorelines and freshwater wetlands contiguous to coastal features (Frederic R. Harris, Inc., 1996); land within 200 feet of a coastal feature also falls under CRMC jurisdiction. CRMC also regulates activities including, but not limited to: filling; dredging; and the construction of public roads, bridges, and rail lines, and all other activities that could impact important coastal resources.

No Build Alternative:

Impacts to coastal resources are not anticipated under the No Build Alternative because construction activities would not occur.

Full Build Alternative:

Impacts from the Full Build Alternative would primarily result from the construction of bridge spans, the relocation of pole lines, the construction of retaining walls, and those impacts associated with current rail operations and other construction activities (e.g., vehicular fluid release). Anticipated impacts from these activities would include sedimentation, impacts to scenic views, wildlife and plant habitats, and the increased potential for accidental spills of oil and gasoline from construction equipment. Coastal resources most likely to be affected by the Full Build Alternative are the Maskerchugg River in East Greenwich, and Greenwich Cove, Greenwich Bay, Apponaug Cove and Mary's Pond, Mary's Creek/Thatch Cove, all located in Warwick. All of these coastal resources are located in areas that are affected by current rail operations.

Impacts to coastal resources are expected to be minimal, since the spills and related construction impacts would be minimized or otherwise avoided through the use of BMPs. Also, proposed impacts to coastal resources would be minor because the construction of new structures would not result in an alteration of the value or the overall function of the resource. However, long-term impacts are expected from the construction of retaining walls, specifically, the impediment of wildlife travel, the obstruction of scenic views.

Partial Build Alternative:

Since construction activity would not take place in the vicinity of coastal resources, impacts to coastal resources are not expected under the Partial Build Alternative.

Although impacts to coastal resources from the Full Build Alternative are expected to be minor, all construction or related activities taking place within the vicinity of coastal resources must be approved by the CRMC. The severity of the impact or alteration to a coastal resource (e.g., tidal waters, banks, coastal wetlands) delegates the procedural process, to be completed by the applicant, required by the CRMC; the CRMC could require a Category A Assent, which is a more routine procedure, or a Category B Assent, which is a more involved procedure (CRMC, 1993).

Air Quality

Transportation sources are the leading causes of elevated carbon monoxide (CO), oxides of Nitrogen (NO_x), hydrocarbons (VOC, or volatile organic compounds), and particulate matter (PM_{10}) emissions. It is for this reason that air quality is a major concern within the communities located along the project corridor.

Currently, the State of Rhode Island is in attainment, or complies with the National Ambient Air Quality Standards (NAAQS) for CO, NO_2, and PM_{10}; Rhode Island Ambient Air Quality Standards (RIAAQS), which are maintained by the RIDEM, Division of Air and Hazardous Materials, are the same as the NAAQS. However, Rhode Island is in non-attainment for ozone due to previous violations of the ozone standard. Also, the City of Providence is classified as a maintenance area for CO. This designation indicates that

Providence is currently meeting attainment standards, after a period of non-attainment; the State Implementation Plan (SIP) includes criteria to help Providence maintain this status (Frederic R. Harris, Inc., 1996).

Impacts to air quality from the FRIP could result from construction-related activities and would affect emissions, ambient concentrations, and odors in the air. Since RIDEM is responsible for inventorying concentrations of air pollutants within the State (at different monitoring locations, to determine the present quality of the air that Rhode Islanders breathe), the possible impacts resulting from the No Build, Partial Build and Full Build Alternatives would be analyzed in comparison to the existing (1994) air quality conditions found within the FRIP corridor.

No Build Alternative:

Since no changes to existing freight rail operations are expected to occur through the No Build Alternative, emissions levels in the future would remain the same as the 1994 levels (See Table 4.4). Emissions from trucks have also been factored into this conclusion. If freight rail service is not improved to meet current and future demands, it is expected that businesses would rely more heavily on trucks to ship and receive goods, which would also contribute to an increase in emissions. However, economic studies done for the FRIP indicate that the opposite would occur. If freight rail service is not increased, businesses who favor freight rail would not be attracted to Quonset Davisville; therefore, freight demand would not increase due to lack of business development, and increased emissions from trucks would not occur (Frederic R. Harris, Inc., 1996).

TABLE 4.4. CURRENT AND FUTURE EMISSIONS IMPACTS FROM THE FRIP BUILD ALTERNATIVES

Pollutant	1994	2000			2010		
	Existing Conditions[1]	No Build	Full Build	Partial Build	No Build	Full Build	Partial Build
CO	15.1	15.1	15.1	15.1	15.1	51.3	51.3
NO_X	136.3	136.3	136.3	136.3	136.3	462.2	462.2
VOC	4.8	4.8	4.8	4.8	4.8	16.3	16.3
PM_{10}	2.9	2.9	2.9	2.9	2.9	9.7	9.7

[1] Concentrations measured in Kg day

Source: Frederic R. Harris, Inc., 1996.

Ambient, or surrounding, air concentrations were measured throughout the project corridor at many sensitive receptors; sensitive receptors include schools, nursing homes, libraries, hospitals, places of worship, and recreational areas, as wells as residences located in close proximity to the ROW. Impacts were expected to be greatest at these locations because of the nature of the activities that take place at them. Under the No Build Alternative, impacts to ambient concentrations would not occur. Also, due to the lack of construction associated with this alternative, there would be no construction or odor impacts to air quality.

Full Build Alternative:

Air quality impacts are expected to occur from the Full Build Alternative. Since no changes to the freight rail service are expected in the year 2000, impacts to air quality would not occur until approximately 2010 due to the anticipated increases in freight rail demand at that time. Under the Full Build Alternative, freight rail service in 2010 would increase to six trains per day (Frederic R. Harris, Inc., 1996). Impacts to air quality would be a direct result of the increase in the total number of locomotive-miles traveled by each train. Also, because of the increase in freight rail service, ambient concentrations would increase slightly over No Build levels. Odor impacts are not expected, and construction

impacts would be short-term, resulting from emissions from construction equipment, dust from excavation, and potential increased exhaust emissions from construction-related traffic delays.

Partial Build Alternative:

Impacts to air quality throughout the Project corridor can also be expected from the Partial Build Alternative. These impacts would be the same as the air quality impacts resulting from the Full Build Alternative, due to the proposed increases in freight rail demand being the same for both alternatives. Although impacts to emissions would be the same for both the Full Build and the Partial Build, the ambient concentrations would differ, but only slightly (Frederic R. Harris, Inc., 1996) due primarily to the construction differences between the two alternatives. Since the Partial Build only requires the construction of dedicated track in certain areas, the distance between the tracks and some of the sensitive receptors would change. However, since this change is rather minute, both the Full Build and Partial Build Alternatives would have the same impacts on ambient air concentrations. Again, no odor impacts would result from this alternative; however, short-term construction related impacts, similar to those under the Full Build, are expected.

4.2 Impacts to the Physical Environment

Historical and Archaeological Resources

As noted in Chapter 3, historical and archaeological resources are important elements in the physical environments of many of the communities located along the FRIP

corridor. Many of these resources are presently on, or are eligible for nomination on, the National Register of Historic Places (NRHP), which was created through the enactment of the 1966 National Historic Preservation Act (NHPA).

Section 106 (36 CFR, Part 800) of the NHPA requires that those structures included on, and also those nominated to be included on, the NRHP be identified within the boundaries of proposed projects; potential effects to these resources must also be stated at this time. State or federal agencies involved in the proposed project may have to confer with the State Historic Preservation Officer (SHPO) to determine if the resources would be adversely affected by the proposed project. At the local level, the Rhode Island Historical Preservation Act of 1968 (RIGL 42-45) requires that the SHPO ensure that other State agencies are active in the preservation of historical and archaeological resources within the State.

Adverse impacts to historic and archaeological significant resources are also regulated by the Department of Transportation Act of 1966, Section 4(f) (49 USC 303). Section 4(f) states that the Secretary of Transportation cannot approve projects that result in the use of public parks, recreation areas, wildlife refuges, and historic sites unless: first, there is no other alternative; or second, plans are established to ensure the minimization or avoidance of harm to the property in question (Frederic R. Harris, Inc., 1996).

Historic resources are prevalent in all seven communities along the FRIP corridor. The FRIP must comply with all federal and State regulations mentioned above, as they pertain to the preservation and protection of historically significant resources.

No Build Alternative:

Since the No Build Alternative does not require any construction in the vicinity of these resources, this alternative would not impact historic or archaeologically significant resources.

Full Build Alternative:

The Full Build Alternative has the potential to impact historic structures in North Kingstown, East Greenwich, Warwick, Cranston, and Pawtucket (See Table 4.5). The majority of the proposed impacts, which would result from the construction of new retaining walls and construction at various bridges along the project corridor, are visual impacts.

Only one potential archaeologically significant site (See Table 4.5), located in East Greenwich, would be impacted by the construction of a third track. A Phase I evaluation, which would include research to determine NRHP status, must be performed to determine whether this site is actually archaeologically significant. Proposed impacts would mainly result from the construction of a retaining wall and new track, and the widening of bridges.

Partial Build Alternative:

As Table 4.5 illustrates, the Partial Build Alternative has the potential to impact only two historically significant resources; the Partial Build Alternative would not affect any archaeologically significant resources. Rhode Island Historical Cemetery No.4 in North Kingstown, and the Pawtucket/Central Falls Railroad Station in Pawtucket would be impacted by the construction of retaining walls, and the construction of new, or the relocation of existing railroad tracks.

TABLE 4.5. SUMMARY OF AFFECTED CULTURAL RESOURCES

Community	Resource	National Register Status	Full Build Impacts	Partial Build Impacts
Historic Resources				
North Kingstown	RI Historical Cemetery, No. 4	NA[1]	Track and retaining wall construction	Same as Full Build
East Greenwich	Pains Pond Culvert	Recommended Eligible	Construction & visual impacts	None
East Greenwich	King Street Bridge	Contributes to Historic District	Visual impacts from new bridge	None
East Greenwich	East Greenwich Historic District	Historic District	Visual impacts from retaining wall	None
East Greenwich	88 King Street	Contributes to Historic District	Relocation or demolition of residence	None
Warwick	Arch Road/Ocean Point Road Bridge	Recommended Eligible	Construction & visual impacts from bridge	None
Warwick	Elizabeth Spring	Listed	Construction & visual impacts from retaining wall & bridge	None
Cranston	Wellington Avenue Bridge	Recommended Eligible	Construction & visual impacts from bridge	None
Pawtucket	Pawtucket/Central Falls RR Station	Recommended Eligible	Construction & visual impacts from retaining wall & track lowering	Same as Full Build
Archaeological Resources				
East Greenwich	East bank of Maskerchugg River	NA[1]	Sub-surface testing to determine presence/ absence of prehistoric site	None

[1] Not Applicable
Source: Frederic R. Harris, Inc., 1996.

Noise and Vibration

Noise and vibration, as a result of this project, would originate from two sources: trains and construction. Impacts to noise are based on annoyance criteria established by the Federal Transit Authority (FTA); basically, how much could the level of noise increase before two groups of people, those who are already exposed to higher levels of noise, and those who do not experience increased noise levels, notice the increase and become annoyed by it As indicated by the criteria, noise impacts are also dependent upon the time of day that the impact is occurring. For example, the US Department of Housing and

Urban Development (HUD) (HUD, 1979) requires that noise levels, day or night, for construction be less than 75 decibels (dB) in areas of long-term residential use. This requirement is also applicable to those non-residential noise-sensitive locations with only daytime use such as schools (Frederic R. Harris, Inc., 1996).

Vibration is the direct result of velocity or instantaneous acceleration, and typically causes the displacement of objects, or the rapid movement of surfaces, relative to some non-moving neutral force (Frederic R. Harris, Inc., 1996). Vibration is usually based on a threshold of land uses and event frequency. For example, a vibration analysis seeks to determine how residences located in close proximity to the ROW would be affected by the increase in daily train volumes resulting from the Full Build and Partial Build Alternatives. Construction activities such as pile driving and blasting also have the potential to be sources of vibration impacts.

No Build Alternative:

For this analysis, the No Build Alternative includes the Northeast Corridor (NEC) electrification improvements, which would increase the numbers and speed of Amtrak passenger trains. Taking these factors into consideration, the No Build Alternative has the potential to impact, in terms of noise, several residences and businesses located along the 22-mile project corridor. Table 4.6 provides a summary of the anticipated noise impacts resulting from the No Build, Partial Build, and Full Build Alternatives of the FRIP.

Vibration2 impacts from the No Build Alternative could also be directly attributed to the increase in commuter rail, as a result of the Northeast Corridor Improvement Project (NECIP). Other proposed sources of vibration to residences or business, under this

alternative, would result from the passing of heavy trucks and/or construction equipment on nearby roadways. See Table 4.7 for a summary of proposed FRIP vibration impacts by alternative

TABLE 4.6. SUMMARY OF PROPOSED NOISE IMPACTS TO SENSITIVE RECEPTORS FROM TRAINS

Community	No Build Alternative		Full Build Alternative		Partial Build Alternative	
	Residences	Commercial	Residences	Commercial	Residences	Commercial
North Kingstown	68	2	87	2	84	2
East Greenwich	28	3	40	3	40	3
Warwick	121	7	137	7	133	7
Cranston	13	0	15	0	14	0
Providence	11	4	11	4	11	4
Pawtucket	0	0	3	0	3	0
Central Falls	1	1	1	1	1	1
Totals by Receptor	242	17	294	17	286	17
Totals by Alternative	259		311		303	
Increase over No Build	--	--	52	0	44	0

Source: Frederic R. Harris, Inc., 1996.

TABLE 4.7. SUMMARY OF PROPOSED VIBRATION IMPACTS TO SENSITIVE RECEPTORS FROM TRAINS

Community	No Build Alternative		Full Build Alternative		Partial Build Alternative	
	Residences	Commercial	Residences	Commercial	Residences	Commercial
North Kingstown	64	3	65	3	64	3
East Greenwich	45	2	47	4	45	3
Warwick	138	49	135	50	138	49
Cranston	9	21	9	21	9	21
Providence	17	35	17	44	17	44
Pawtucket	14	0	36	5	36	5
Central Falls	1	1	15	3	15	3
Total by Receptor	288	111	324	130	324	128
Total by Alternative	399		454		452	
Increase over No Build	--	--	36	19	36	17

Source: Frederic R. Harris, Inc., 1996.

2 Mitigation of No Build impact is required by the proponent of the NECIP Electrification Project (AMTRAK) and not the FRIP.

Full Build Alternative:

Since the Full Build Alternative takes into consideration both the future increase in high-speed passenger trains, and the proposed future increase in freight trains, much more significant impacts from noise and vibration are expected to occur. Under the Full Build, Amtrak operations would be the same as under the No Build Alternative, however freight train operations are expected to increase; six additional daytime and two additional nighttime trips would result. The construction of a dedicated third track would provide the height clearances necessary for double stacked container cars and tri-level auto carriers, and would also allow the freight trains to travel at maximum speeds of 50 miles per hour (mph), which could result in greater impacts to noise and vibration.

Consequently, as indicated in Table 4.6 and Table 4.7, the Full Build Alternative would increase noise and vibration impacts to various sensitive receptors located along the project corridor over those noise and vibration impacts of the No Build Alternative; commercial business receptors would not experience noise impacts as a result of the Full Build Alternative.

Partial Build Alternative:

The Partial Build Alternative would involve the construction of new track, the rehabilitation of existing tracks, and the use of three sidings in order to provide freight rail service that would meet the future freight demands. The proposed future increase in passenger and freight train volumes under this alternative would be the same as under the Full Build Alternative.

However, since freight trains would be traveling on sidings in some areas rather than on a dedicated freight track, speeds through these areas would be reduced from 50

mph to 30 mph. As a result, due to the increase in freight operations, the Partial Build Alternative would result in more noise and vibration impacts along the project corridor, than the No Build Alternative. However, the impacts from the Partial Build would still be less than those resulting from the Full Build.

Traffic and Circulation

Impacts to traffic and circulation would result from bridge construction located throughout the FRIP corridor. As previously mentioned, many bridges, including roadway and pedestrian bridges as well as rail passenger station structures, need to be modified in order to provide the height clearances necessary to operate double stack container cars and tri-level auto carriers. Of the eighty-three bridges located along the project corridor, a maximum of fifty-two may require construction as part of the Full Build Alternative, and thirty-eight as part of the Partial Build Alternative (Frederic R. Harris, Inc., 1996). Twenty-one bridges already satisfy the clearance criteria necessary for the project and would not require any modification. Additionally, many of the bridges are located at key intersections throughout the FRIP corridor.

While some bridges would remain operational throughout construction or rehabilitation, some such as the Lincoln Avenue Bridge, Clyde Street Bridge, and the Ocean Point Road Bridge in Warwick, would be closed during construction. Although adequate detour routes would be provided to accommodate traffic volumes, commuters/travelers would have to allow more time in their morning and evening commutes because the detour routes are expected to take longer than normal travel routes. Another concern is that the proposed detours and resulting delays would

TABLE 4.8. PEAK TRAFFIC VOLUMES AT MAJOR INTERSECTION AND BRIDGE LOCATIONS ALONG THE FRIP CORRDIOR

Community	Bridge and/or Intersection	Peak AM Traffic Volumes	Peak PM Traffic Volumes
North Kingstown	RI 403/Davisville Road	1,150	1,500
East Greenwich	Forge Road (Forge and Ives)	730	885
East Greenwich	King Street	85	115
Warwick	Ocean Point Road (Arch Road)	0	0
Warwick	Chepiwanoxet Way	75	70
Warwick	Masthead Drive	55	90
Warwick	Clyde Street (Nausauket Road)	20	30
Warwick	Arnold's Neck Road	90	130
Warwick	Route 117/Rocky Point Road	1,125	1,500
Warwick	Lincoln Avenue	600	570
Cranston	Wellington Avenue	35	450
Providence	Magnan Road	270	575
Providence	Cranston Street	1,200	1,200
Providence	Huntington Expressway/Route 10	4,500	6,000

Source: Frederic R. Harris, Inc., 1996.

have the potential to delay buses traveling to and from area schools, and would also delay emergency response times for police and fire fighters. Table 4.9 provides a summary of the existing, as well as anticipated, travel times for the six proposed detour routes along the FRIP corridor.

TABLE 4.9. FRIP DETOUR SUMMARY: EXISTING AND PROPOSED TRAVEL TIMES

Location	Existing			Detour		
	Distance	Average Speed	Average Time	Distance	Average Speed	Average Time
King Street	0.3 miles	25 mph	0:43	1.3 miles	20-30 mph	3:54
Clyde Street	0.3 miles	15 mph	0:54	A. 1.1 miles	5-35 mph	2:53
				B. 1.1 miles	5-35 mph	3:36
Lincoln Avenue	0.3 miles	25 mph	1:11	A. 2.1 miles	25-50 mph	3:28
				B. 1.5 miles	25-35 mph	3:59
				C. 1.5 miles	25-35 mph	3:45
Wellington Avenue	0.6 miles	25 mph	1:30	A. 2 miles	30 mph	4:47
				B. 2 miles	30 mph	4:47
Cranston Street	0.3 miles	25 mph	0:31	0.3 miles	30 mph	0:51
Magnan Road	0.1 miles	25 mph	0:16	A. 0.4 miles	25 mph	1:28
				B. 0.4 miles	25 mph	2:39

Source: Frederic R. Harris, Inc., 1996.

The detours described in the above table would be necessary for the Full Build Alternative only. The Full Build Alternative has the potential to impact many more area bridges and intersections than the Partial Build and No Build Alternatives. Since the No Build Alternative would not require any construction, impacts to traffic and circulation patterns would not be expected as a result of this alternative. Although the Partial Build Alternative has the potential to affect thirty-five overhead bridges, two station structures, and one drainage culvert, traffic impacts would be substantially less than those resulting from the Full Build Alternative. Overall, the Partial Build would require less bridge construction than the Full Build.

4.3 Summary of Findings

All of the impacts associated with the FRIP No Build, Partial Build, and Full Build Alternatives have been presented in this chapter. It is quite evident from the information provided that the Partial Build Alternative would be the more desirable build alternative. Not only would it provide the height clearances needed for the use of high and wide freight cars, but it would also have substantially less impacts on the natural as well as physical environments of the surrounding communities. However, since the "preferred" build alternative has not been selected by the State of Rhode Island, the remainder of this study would continue to focus on the impacts associated with all three FRIP build alternatives.

CHAPTER FIVE
Environmental Racism Evaluation

The purpose of this research is to determine whether environmental injustice will occur as a result of the Rhode Island Freight Rail Improvement Project (FRIP). By conducting a case study of the FRIP, this research attempts to address whether passed or proposed anti-discrimination legislation, particularly Executive Order (EO) 12898, act to protect low income and minority populations from disproportionately high adverse human health and environmental impacts associated with federal programs, policies, and actions.

Although the FRIP will traverse communities in the State of Rhode Island that could be characterized as being predominantly white, low income and minority populations are present within each of the seven communities located along the Project corridor. Chapter Four identified the impacts to the natural and physical environment that would occur as a result of the No Build, Full Build, and Partial Build Alternatives. This chapter illustrates how those proposed impacts would affect low income and minority populations living within the FRIP corridor.

The environmental racism analysis included in the Chapter will be conducted in accordance with the environmental justice requirements set forth in EO 12898, which was signed by President Clinton in 1994. EO 12898 provides that environmental racism will result in an area if low income and minority populations are disproportionately or adversely affected by human health and environmental impacts. EO 12898 also recommends general approaches to mitigation and enhancement to offset any adverse impacts resulting from federal programs, policies, and actions.

This chapter provides a summary of the methods and evaluation techniques used to study the potential effects of the FRIP on the low income and minority populations living within the project corridor; low income and minority populations will be defined using the definitions for these terms provided in EO 12898. The census tracts and their respective block groups that could be most affected by the FRIP are described and are also illustrated on project area maps. Last, the findings of the environmental racism analysis are presented, using the impact data provided in the previous chapters, relevant to the locations and make-ups of the census block groups contained within the project corridor.

5.1 Method/Evaluation Techniques

As stated above, EO 12898 requires all federal agencies to identify and address any impacts of their policies, programs, and actions that may have disproportionately high adverse human health effects on low income and minority populations. Also, as part of EO 12898 evaluations, the proportion of adverse impacts that would affect low income and minority populations, and the access that these populations would have to the benefits of the proposed project, should be identified; benefits resulting from the FRIP would be primarily economic in the form of short-term construction and long-term industrial and/or manufacturing employment opportunities.

The method and/or evaluation techniques used for this analysis were developed to fulfill the environmental justice requirements of EO 12898. By using a combination of census data, the impacts resulting from the Full Build and Partial Build Alternatives, and census and impact area mapping, a conclusion is drawn to answer the original question posed by this research project. The following steps outline the procedure used in this

analysis to determine if the environmental justice criteria, stated in EO 12898, serve to protect low income and minority populations from impacts from the FRIP:

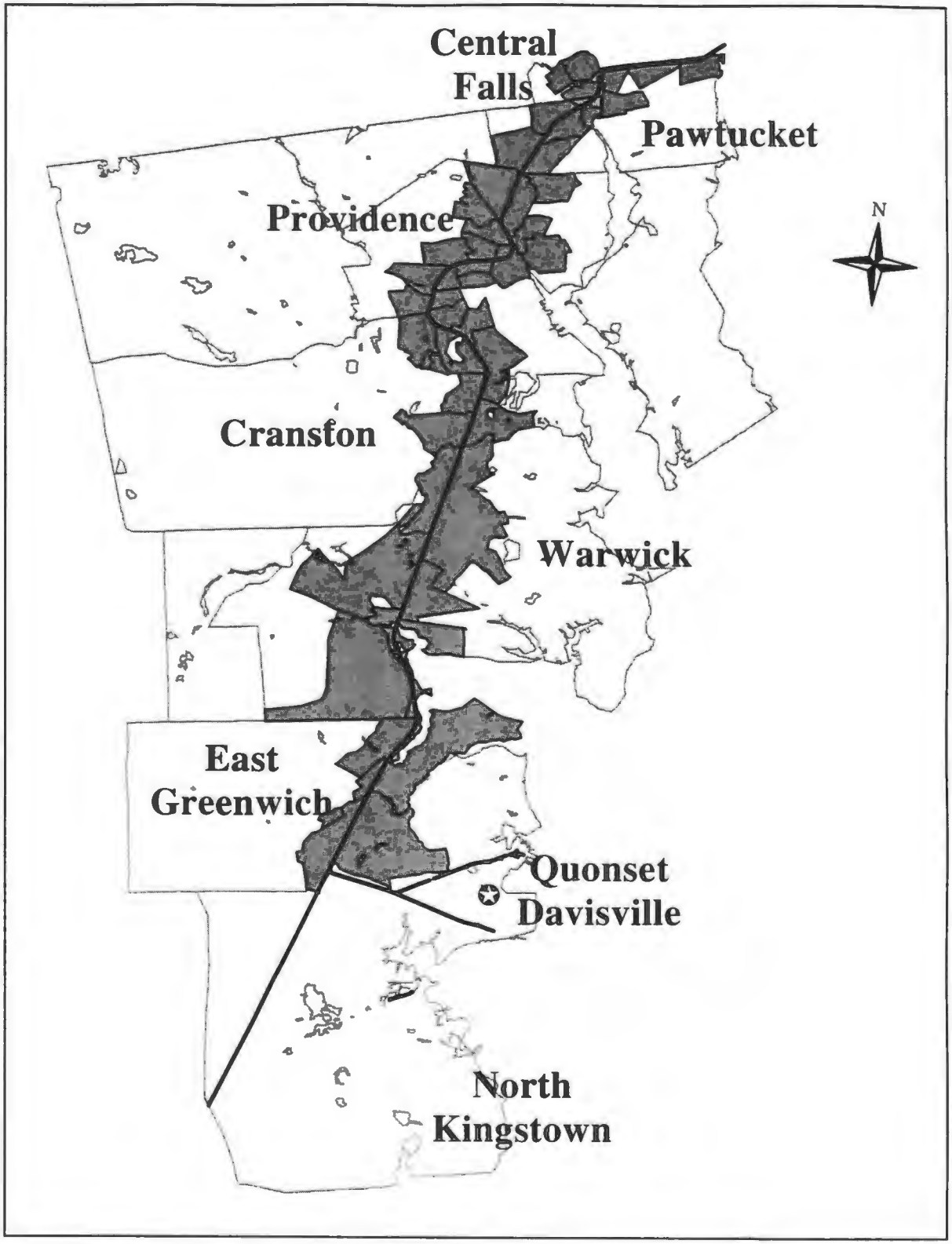
Step One: Census Mapping

To determine the impacts of the FRIP on the low income and minority populations living within the project corridor, the boundaries of the 1990 census tracts and block groups had to be identified. These boundaries were obtained from the Rhode Island Department of Statewide Planning, and were geographically transposed onto a FRIP project corridor map (See Figure 5.1).

Step Two: Data Refinement

From the newly created map, the information pool to be utilized for the remainder of this analysis was further refined. Block groups were chosen as the unit of analysis because they provide the most site-specific level of information for race and income characteristics; 1990 US Census of Population and Housing race and income characteristics used for this analysis will be defined later in the chapter. Of the 123 block groups located within the project corridor, only those whose total area was more than fifty (50) percent contained within the one-mile wide, and twenty-two-mile long project corridor were selected for the analysis.

FIGURE 5.1. LOCATION OF CENSUS TRACTS ALONG THE FRIP CORRIDOR



Not to Scale

Created By: Kristen A. Dirnberger
Date: December 1996
Source: US TIGER Files, 1994

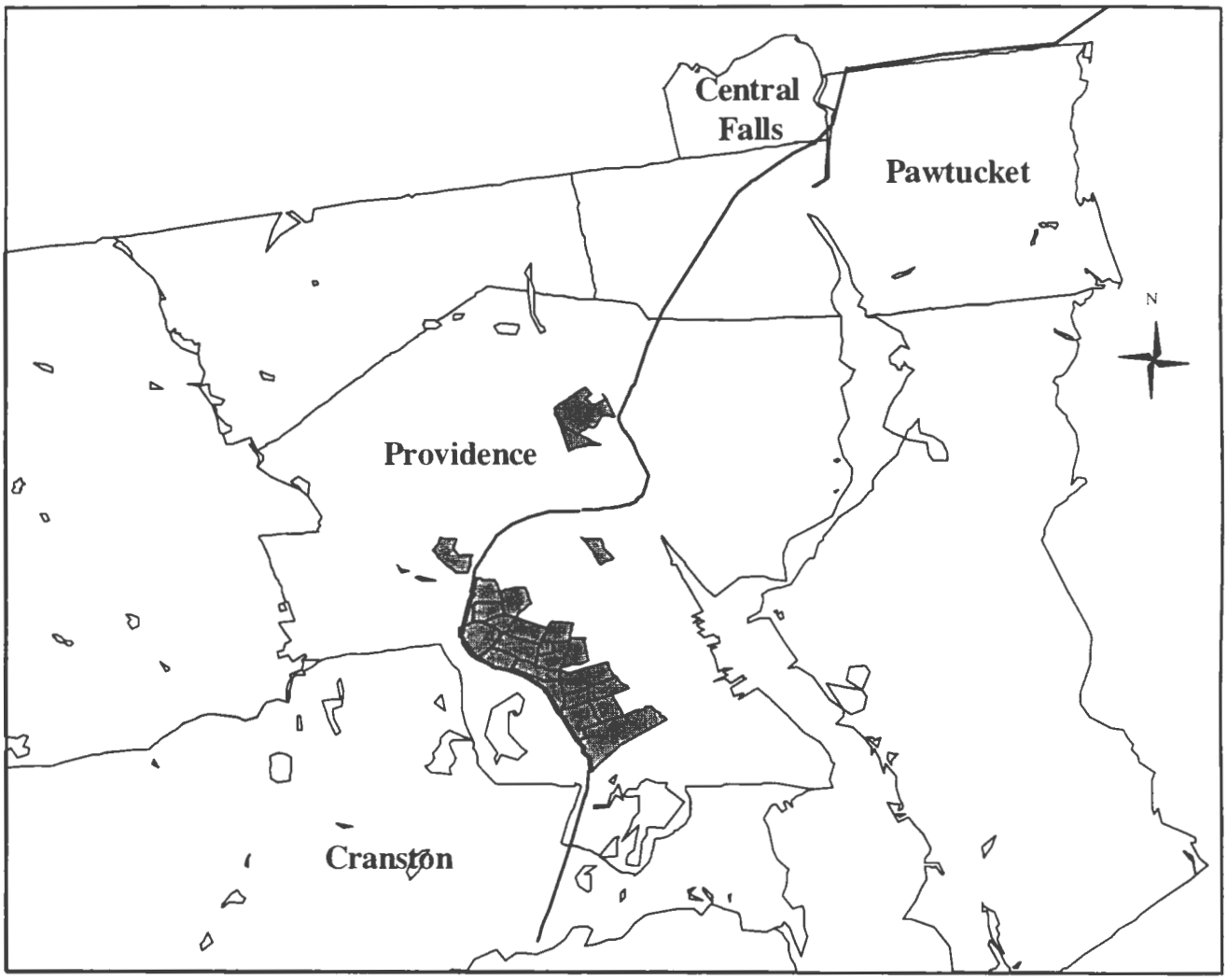
Rail Line
Census Tract Boundaries
Town Boundaries

Step Three: Definition of Minority and Low income

The racial composition and median household income for each of the selected block groups was obtained from the 1990 US Census of Population and Housing. According to EO 12898, minority populations are defined as persons who are of Black, Hispanic, Asian/Pacific Islander, American Indian, or Native American, Eskimo, or Aleut origin. For the FRIP analysis, a block group was considered minority if fifty (50) percent or more of the residents were within these minority categories. The locations of the minority block groups were then geographically transposed onto a project corridor map (See Figure 5.2).

Low income persons, as defined in EO 12898, are those whose median household income is below the US Department of Health and Human Services (DHHS) poverty guideline. The DHHS uses the federal poverty indicator of $7,740 for one person households, then adds $2,620 for each additional person within the household (DHHS, 1996). Therefore, the poverty indicator used in this evaluation to define low income populations, assuming an average household size of four persons, was $15,600. For the purposes of this analysis, the population of a block group was considered to be low income if the median household income of the entire block group, in 1989, was less than $15,600. The locations of low income block groups were then geographically transposed onto a project corridor map (See Figure 5.3).

FIGURE 5.2. MINORITY BLOCK GROUPS ALONG THE FRIP CORRIDOR

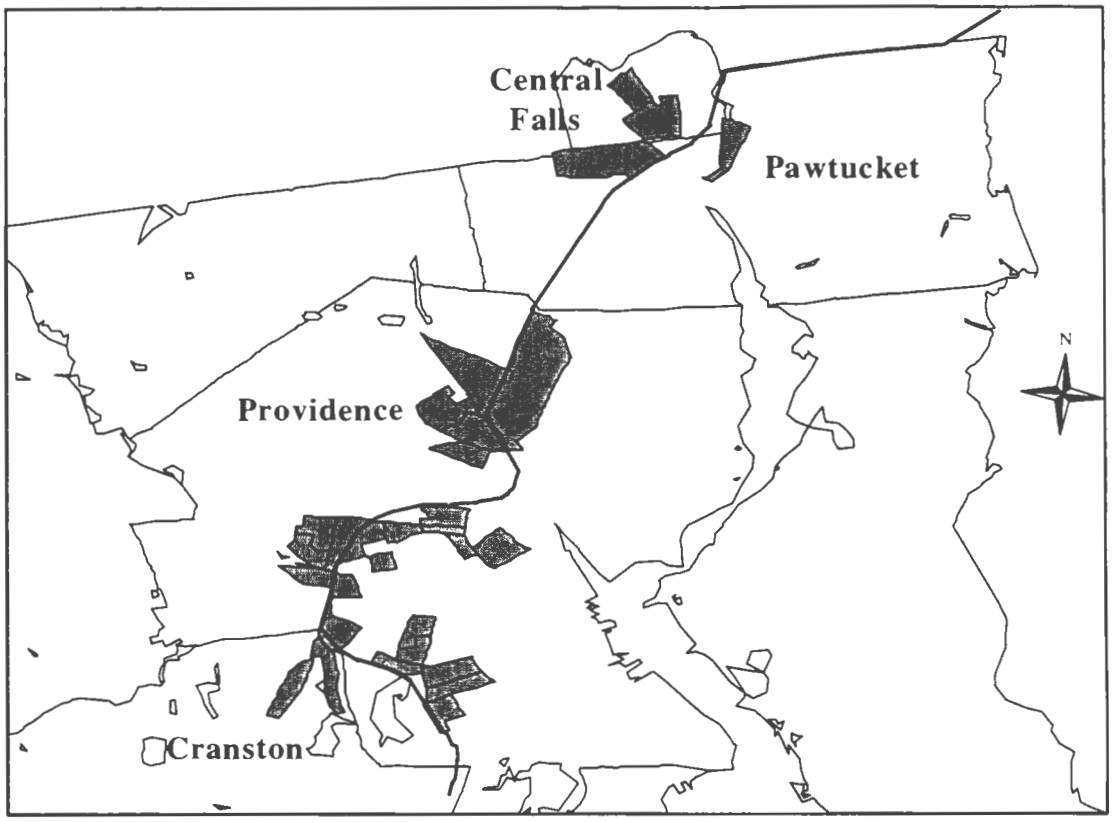


Not to Scale

Created By: Kristen A. Dirnberger
Date: December 1996
Source: US TIGER Files, 1994

Rail Line
Minority Block Groups
Town Boundaries

FIGURE 5.3. LOW INCOME BLOCK GROUPS LONG THE FRIP CORRIDOR



Not to Scale

Created By: Kristen A. Dirnberger
Date: December 1996
Source: US TIGER Files, 1994

Rail Line
Low Income Block Groups
Town Boundaries

Step 4: Identification of Impact Areas

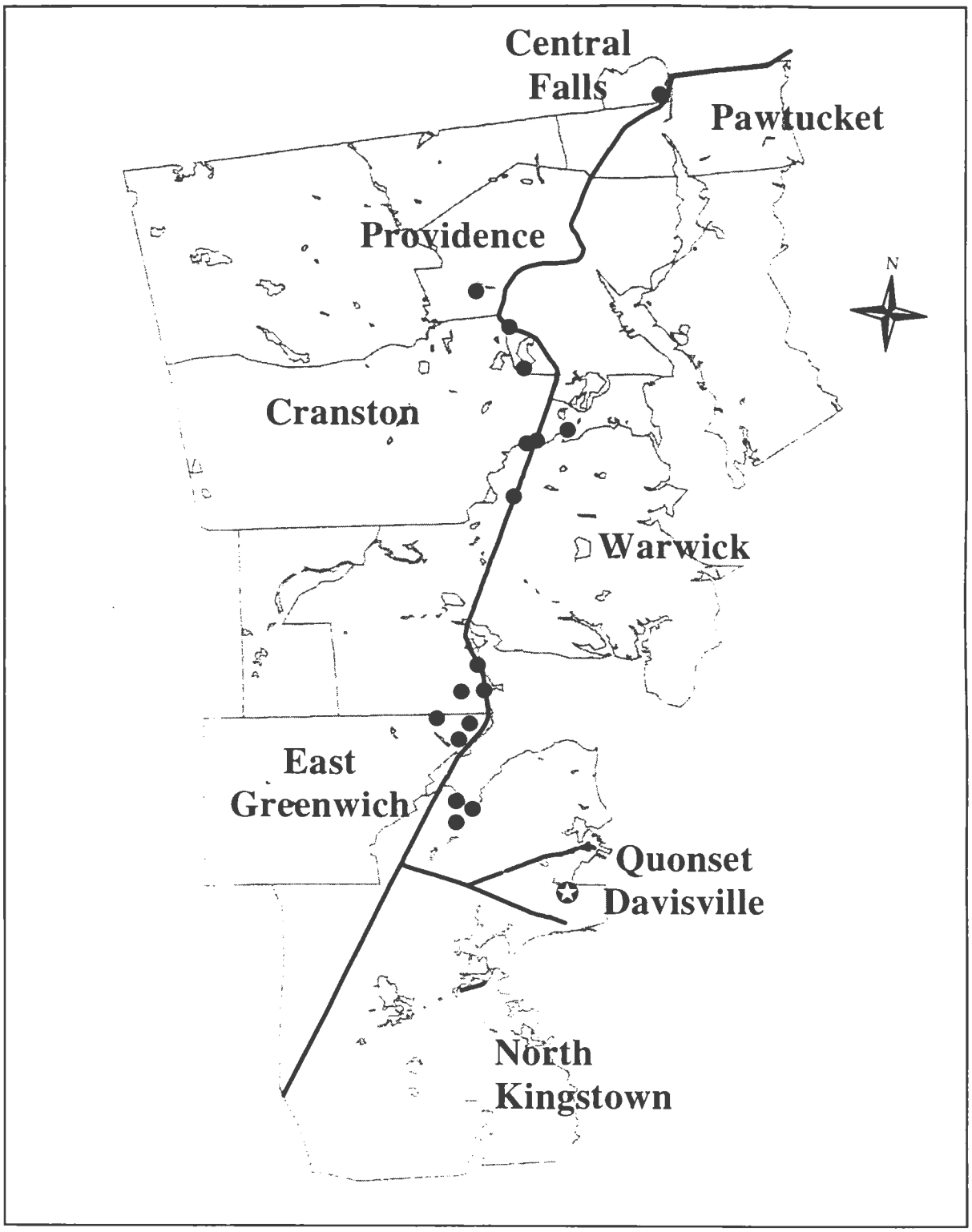
Impact areas can be described as those locations that will be adversely affected by the Full Build and Partial Build Alternatives. Whether a disproportionate number of low income and/or minority block groups fall within those impact areas will determine if environmental racism will occur.

When possible, the impacts from the Full Build and Partial Build Alternatives were geographically transposed onto the maps illustrating the locations of the low income and minority block groups (See Figure 5.4). Project area-wide impacts, such as temporary easements and changes in traffic and circulation patterns, were intentionally left off the maps; corridor-wide impacts cannot be considered disproportionate since their affects are not concentrated in one particular location.

Step 5: Determination of Disproportionality and or Environmental Racism

The map of the FRIP impact areas was used to determine if environmental injustice would occur as a result of the proposed project. Disproportionate adverse impacts would be found in those areas where the proportion of adverse impacts in low income and minority block groups was higher than those impacts experienced in non-low income and non-minority block groups. In general, environmental injustice, would occur in those areas where the frequency of impacts to the natural and physical environment is higher in communities inhabited by low income and minority populations, than in communities inhabited by white, upper and middle class residents. Environmental racism would also be found in areas where barriers (e.g., social or physical) would prohibit access to the economic benefits resulting from the FRIP.

FIGURE 5.4. APPROXIMATE LOCATION OF IMPACT AREAS ALONG THE FRIP CORRIDOR



Created By: Kristen A. Dirnberger
Date: December 1996
Source: US TIGER Files, 1994

Not to Scale

Rail Line

Town Boundaries

5.2 Findings

In total, 48 census tracts were found to be located within the FRIP project corridor. The number of census tracts within each community ranges from a high of nineteen (19) in Providence, to a low of two (2) in East Greenwich. Table 5.1 provides a summary of the number of census tracts found within each community located along the FRIP corridor.

TABLE 5.1. CENSUS TRACTS BY COMMUNITY ALONG THE FRIP CORRDIOR, 1990

Community	Number of Census Tracts
North Kingstown	3
East Greenwich	2
Warwick	6
Cranston	4
Providence	19
Pawtucket	10
Central Falls	4
TOTAL	**48**

Source: 1990 Census of Population and Housing.

Overall, 123 block groups were found within the census tracts located within the seven communities along the FRIP corridor. Block groups were used as the unit of analysis for this research project because race and income characteristics can be examined on a more localized level; block groups provide the most site-specific level of census data available.

A previous demographic study done for the FRIP compared the race and income characteristics of block groups within the project corridor to their respective towns as a whole. The results of that particular analysis were unsatisfactory since the study did not focus specifically on the rail corridor populations. The study also compared census tract-level race and income data to community-level race and income characteristics; in order to

ensure proper detail, the census tracts should have been compared to each other, instead of being compared to their respective FRIP community. The race and income characteristics of the block groups located within the rail corridor will be discussed in the following sections

Minority Populations

As mentioned in the previous section, minority populations, as defined by EO 12898, include all racial categories except whites. Of the 123 block groups within the project corridor, twenty-three (23) were identified as containing primarily minority populations. The City of Providence not only contains the greatest number of census tracts and block groups, it also contains, as Table 5.2 indicates, all of the minority block groups located within the project corridor; the majority of the minority block groups are located within close proximity to the railroad ROW. However, nine (9) of the minority block groups can also be considered low income. Appendix A provides a summary of the race and income characteristics for each block group located along the FRIP corridor.

TABLE 5.2. MINORITY BLOCK GROUPS BY COMMUNITY ALONG THE FRIP CORRIDOR, 1990

Community	Census Tract	Block Group
Providence	2	1[1], 2, 3[1], 4, 6
Providence	3	3, 4[1], 5[1], 6[1], 7
Providence	11	1
Providence	13	2, 3, 4[1]
Providence	14	2, 3, 4[1], 5, 6
Providence	19	6[1]
Providence	26	5
Providence	27	3[1]

[1] Both low income and minority populations.
Source: 1990 Census of Population and Housing.

Low Income Populations

Low income populations, as defined by the Department of Health and Human Services poverty indicator, include those households whose median household incomes are below $15,600. Of the 123 block groups found within the FRIP corridor, twenty-eight (28) were identified as low income. Again the majority of the low income block groups are located within the City of Providence, although low income populations were also found in Central Falls, Cranston, and Pawtucket. Table 5.3 provides a summary of the low income block groups found within the FRIP corridor. Like the minority populations, nine (9) of these block groups can be classified as both low income and minority.

TABLE 5.3. LOW INCOME BLOCK GROUPS BY COMMUNITY ALONG THE PROJECT CORRIDOR, 1990

Community	Census Tract	Block Group
Central Falls	108	2
Central Falls	110	2
Cranston	141	3
Pawtucket	151	1
Pawtucket	160	3
Providence	2	1[1], 2, 3[1]
Providence	3	4[1], 5[1], 6[1]
Providence	8	3
Providence	9	1, 2, 3
Providence	10	1, 3
Providence	11	1
Providence	13	4[1]
Providence	14	4[1]
Providence	19	1, 2, 6[1], 7
Providence	26	1, 4
Providence	27	3[1]
Providence	29	4
Providence	30	1

[1] Both low income and minority populations.
Source: 1990 Census of Population and Housing.

TABLE 5.4. SUMMARY OF ADVERSE IMPACTS FROM THE FRIP BUILD ALTERNATIVES

Impact Category	No Build Alternative	Full Build Alternative		Partial Build Alternative	
		Project-Wide	Low Income & Minority Populations	Project-Wide	Low Income & Minority Populations
Land Use	None	Total land acquisitions: 16,950 sf. Use of historic resources	No land acquisitions No use of historic resources	Total land acquisitions: 4,500 sf	No land acquisitions
Water Resources	None	Loss of wetlands, erosion and sedimentation, increased use of herbicides.	Impacts not disproportionate.	Minimal loss of wetlands, increased herbicide use in selected locations.	Impacts not disproportionate.
Traffic/Circulation	None	Short-term increases in traffic volumes and travel times in selected areas due to bridge construction.	Impacts not disproportionate.	Short-term increases in traffic volumes and travel times in selected areas due to bridge construction.	Impacts not disproportionate.
Air Quality	None	Emissions increases. Temporary impacts from construction activities in the vicinity of construction sites, access routes, and detours.	Since more construction sites and/or activities are located in the southern portion of the corridor, impacts would not be disproportionate.	Emissions increases the same as the Full Build. Impacts from construction include direct emissions from activities, vehicles, and equipment.	Since more construction sites and/or activities are located in the southern portion of the corridor, impacts would not be disproportionate.
Noise and Vibration	242 houses affected by noise; 288 by vibration	Short-terms increases in noise and vibration levels due to construction. Long-term increases in noise and vibration due to increased freight train use.	15 residences affected by noise and 68 by vibration. The remainder of the corridor: 279 affected by noise, 256 by vibration. Impacts are not disproportionate.	Short-term increases in noise and vibration levels due to construction. Long-term increases in noise and vibration due to increased freight train use.	Same as Full Build. Impacts are not disproportionate.
Cultural Resources	None	Total number of cultural resource impacts: 9	No adverse impacts in these areas.	Total number of cultural resources impacts: 2	No adverse impacts in these areas.

Source: Frederic R. Harris, Inc., 1996

Impacts to Low Income and Minority Populations

Using the map of the impact areas (Figure 5.4), the locations of the impacts from the FRIP Full Build and Partial Build Alternatives were used to determine if low income and minority block groups would be affected by the proposed project; Table 5.4 provides a summary of the proposed adverse impacts, both project corridor-wide and in low income and minority populations, resulting from each of the FRIP Build Alternatives.

As Table 5.4 indicates, there would be more impacts corridor-wide than there would be to low income and minority block groups; therefore, the impacts resulting from both the Full Build and Partial Build Alternatives would not be adverse nor disproportionate. Table 5.4 illustrates that, although low income and minority block groups would be affected by some aspects of the construction of a dedicated freight track, the remainder of the project corridor residents would also be experiencing some of the same, if not more, impacts.

In general, impacts to water resources, traffic and circulation, air quality, and noise and vibration would not affect low income and minority block groups disproportionately for two reasons: first, either the impacts would be concentrated in the southern portion of the project area; or second, the impacts would be distributed throughout the entire FRIP corridor. In addition, since land acquisitions or the use of cultural and/or historic resources would not be occurring in low income or minority block groups, there would be no adverse impacts in these areas.

The FRIP would also fulfill the EO 12898 requirement of providing access to benefits of the proposed project to low income and minority populations; benefits from the FRIP would come in the form of short-term construction, and long-term industrial and/or

manufacturing and train operating employment opportunities. Although the FRIP would have a direct impact on the Quonset Davisville Industrial Park by attracting other freight-dependent businesses to the area, the Industrial Park is central in location, and could be accessed easily from points north or south. The Rhode Island Department of Transportation (RIDOT) is also considering the use of local contractors for the construction of the FRIP. Since the FRIP would be increasing the overall economic viability of the State, all Rhode Islanders would have access to the benefits of the proposed project.

Comparison to the State[3]

This study would not be complete without analyzing the concentration of low income and minority populations within the FRIP corridor to the number of minorities in the State of Rhode Island as a whole. As Table 5.5 indicates, almost thirty-three percent of the total number of minorities living in the State are concentrated within block groups along the FRIP corridor. Although the number of minorities living within the FRIP corridor is less than half of the number distributed throughout the State, this number still indicates that a significant portion of the minority population of Rhode Island is concentrated within the twenty-two mile FRIP corridor.

3 The existing ROW has been in place for over 100 years. For this reason it is difficult to put the evolution and/or existence of low income and minority populations in the FRIP corridor into context: did the presence of the railroad cause land values to drop and low income and minority populations to move in? Or, did the presence of poor and minority residents cause the ROW to be sited where it is today? Neither of these questions will be answered by this research, nor is it entirely certain if an answer exists.

TABLE 5.5. RACIAL CHARACTERISTICS OF THE STATE OF RHODE ISLAND AND THE FRIP CORRIDOR, 1990

Racial Group	State Total	FRIP Corridor Total	% of Total in FRIP Corridor
Hispanic	43,932	16,999	38.7
American Indian, Eskimo, or Aleut	4,267	784	18.3
Black	37,968	11,330	29.8
Asian/Pacific Islander	17,615	5,243	29.8
White, Non-Hispanic	919,073	91,305	9.9
TOTAL	**1,022,855**	**125,661**	**12.3**

Source: 1990 Census of Population and Housing.

As the 1990 Census of Population and Housing reports, the overall median household income for the State of Rhode Island in 1989 was $32,181. By comparing this number to the median household incomes of the block groups along the project corridor, it was determined that only twenty-five block groups, or twenty-percent, of the 123 used for this study had median household incomes equal to or higher than that of the State (See Appendix A).

In all, about one quarter of Rhode Island's minority residents lived in the FRIP corridor in 1990 (See Table 5.5). The concentration was most severe for Rhode Island's Hispanics, 38.7 percent of whom lived in the corridor, and also serious for blacks and Asian Pacific Islanders; for both groups, 29.8 percent of the residents statewide lived within the corridor. Only 9.9 percent of the State's white population, on the other hand, lived in the area. However, as Table 5.5 indicates, minorities are in fact concentrated within the FRIP corridor. In general, since people within the FRIP corridor would feel the adverse effects more than those living outside the corridor, it is valid to conclude when considering the project on a statewide scale, that the FRIP adversely affects minority Rhode Islanders.

5.3 Limitations

Certain limitations must be considered when reflecting on the results of this study. The block groups examined in the environmental racism evaluation were classified as minority if fifty percent or more of the population was from minority origin. What this study does not take into consideration is the number of minority block groups that were potentially left out of the evaluation by setting the "minority standard" at fifty percent. The following table indicates the number of minority block groups found within the FRIP corridor when the minority standard is at fifty, forty, and thirty percent of the total population of the block group.

TABLE 5.6. SUMMARY OF MINORITY LIMITATIONS

Minority Standard (%)	Number of Block Groups	Percent (%) of Total in FRIP Corridor
50	23	19
40	25	20
30	34	28

Source: 1990 Census of Population and Housing.

As the above table illustrates, more block groups would have been identified as minority if the standard used to measure the racial composition of each block group was lower. Although the increase in minority block groups from the fifty percent standard, to the thirty percent standard was not significant, it is still important to note that 10 minority block groups were not accounted for in this evaluation, and therefore could be affected by the proposed project.

In addition, this study bases the determination of low income populations on the guidelines set forth in EO 12898: families of four whose median household incomes are

below $15,600. Although this study uses the DHHS poverty indicator, other agencies use different indicators for measuring poverty. Also, while median household incomes are expressed in family units, households are rarely ever families and are usually less than four people.

5.4 Conclusion

Although the technique used to evaluate the potential for environmental racism from the FRIP is not fool-proof, it does take into consideration all race categories. It also specifies an income indicator which is used to adequately measure low income populations; the definitions stated in EO 12898 help to provide a better understanding of 'who' and 'what' makes up low income and minority populations. This technique, by using census block groups to examine race and income characteristics, provides more detailed and localized results.

The majority of the low income and minority block groups found along the FRIP corridor are located in the City of Providence; low income block groups are also found in Central Falls and Pawtucket. Although the No Build Alternative would not involve construction to expand existing freight rail facilities, the low income and minority block groups within the project corridor may be affected by the increase in the number of daily passenger trains as a result of the NECIP electrification improvements. However, the noise and vibration level impacts resulting from the NECIP would be felt corridor-wide, and would therefore not be disproportionate.

The Full Build and Partial Build Alternatives, on the other hand, would affect both the natural and physical environments in many different ways, and would therefore have a

potentially greater affect on the low income and minority populations living within the project corridor. However, because the Full Build and Partial Build Alternatives would not require the taking of property, the use of parkland, or have the potential to affect any historic and/or archaeological resources in low income and minority block groups, no adverse impacts would result from these alternatives

Also, as was stated previously, environmental injustice would occur in areas where the proportion of adverse impacts in low income and minority block groups was higher than those impacts experienced in non-low income and non-minority block groups. As a result of the FRIP Full Build and Partial Build Alternatives, low income and minority populations would not be disproportionately affected by impacts to traffic and circulation, air quality, water resources, or noise and vibration. Because construction will be taking place throughout the entire corridor, the entire FRIP corridor will be affected by short-term increases in traffic volumes and emissions, as well as long-term increases in noise and vibration due to increased freight train use. However, when examining the proposed project on a state-wide scale, minority populations would be disproportionately affected because the project corridor contains a greater concentration of minority residents, as compared to the rest of Rhode Island.

CHAPTER SIX
Conclusions and Policy Observations and Recommendations

With sixty (60) percent of voter approval on Question 4 on the November 5, 1996 ballot, the Rhode Island Freight Rail Improvement Project (FRIP) will become a reality for the residents of the State of Rhode Island. Construction is scheduled to begin in the Spring of 1997 and, depending on the selected alternative, would be completed by the year 2004 for the Full Build or 2001 for the Partial Build Alternatives, respectively. As communities in Rhode Island and throughout the United States deal with the issue of environmental racism, and as they attempt to establish a balance between environmental necessities and the protection of public health and safety, evaluation techniques such as those utilized in this study will become fundamental in local planning and decision-making processes.

6.1 Conclusions

As part of the FRIP environmental racism evaluation, background data on the purpose and need for the FRIP, the description of the project corridor, and also the impacts from the Full Build and Partial Build Alternatives (as compared to the No Build) were provided. Overall, considering the size and scope of the proposed project, impacts to the natural and physical environments would be minimal.

Demographic characteristics, such as race and median household income, were also obtained for each of the 123 census block groups in the FRIP corridor; in total, twenty-three were identified as containing primarily minority populations, while twenty-eight were identified as low income. Additionally, nine of the minority block groups were

also found to be low income. In terms of socioeconomic impacts to these populations, the FRIP would not adversely or disproportionately impact the low income and minority populations found within the project corridor. And, when compared to other minority populations distributed throughout the State of Rhode Island, the minorities residing in the FRIP corridor will be affected more by the proposed project.

The results of this environmental injustice analysis are different when examining the corridor-wide impacts of the FRIP, as compared to the state-wide impacts of the FRIP. As was indicated in the previous chapter, minorities residing in the FRIP corridor would not be disproportionately or adversely affected by the construction of a dedicated freight rail track. However on a larger scale, minorities living within the FRIP corridor would be disproportionately affected by the FRIP, as compared to other non-minorities living within Rhode Island.

The preceding analysis indicates that, based on Executive Order (EO) 12898, environmental injustice would not occur as a result of the FRIP. The analysis also suggests that environmental discrimination legislation is working to its potential to protect low income and minority populations from the siting of environmental hazards. However, although the environmental justice requirements provided in EO 12898 were adequate to disprove environmental racism from the FRIP, other anti-discrimination legislation, as identified in Chapter Two, leaves much to be desired.

6.2 Policy Observations and Recommendations

Chapter Two identified the major pieces of anti-discrimination legislation that have been passed or proposed within the last thirty years. The question posed by this research

was partially answered through an in-depth examination of Title VI of the Civil Rights Act of 1964, the National Environmental Policy Act (NEPA), the proposed Environmental Justice Act (EJA) of 1992, and Executive Order 12898: past anti-discrimination legislation does not protect low income and minority populations from environmental racism, while present legislation (1994) does. Throughout the course of this study, several policy implications have arisen that specifically pertain to each law or act that was examined as part of Chapter Two. For the purposes of this section, the major shortcomings of the anti-discrimination laws will be briefly summarized. Policy recommendations will then be made, based on these shortcomings and other research observations.

All federal agencies are subject to the anti-discrimination requirements of Title VI of the 1964 Civil Rights Act. However, each agency can interpret these requirements and then establish their own criteria for implementing Title VI. For example, the US Environmental Protection Agency (EPA) has its own criteria for implementing Title VI, which oftentimes results in litigation processes for complainants. But, due to the specificity of the evidence required to prove environmental racism claims under this Title, low income and minority populations often face great difficulties when involved in litigation processes.

In order to alter the legal process to better serve the needs of low income and minority populations, Congress should designate the overall criteria to be used when implementing Title VI. In general, these criteria could include a series of evaluation techniques that could be used by all federal agencies when determining the affected populations of their programs, policies, and actions. In other words, federal agencies must be able to prove that the location selected for the siting of an environmental hazard is the

safest and best location, based on evidence that shows that the proposed project will not result in adverse human health effects, that the project is an environmental necessity, and that the project stands to benefit the majority of the population. These criteria could then be amended to conform to the specific needs of each agency such as the EPA, or the US Department of Transportation (USDOT). The burden of proof in environmental racism litigation must be shifted from low income and minority populations, to the agency requiring the facility siting.

NEPA also requires the balancing of all social, economic, and environmental impacts associated with proposed federal or federally funded projects. However, while NEPA's "less is more" policy may be adequate for cutting down the length of environmental impact statements (EIS), NEPA should include more information specifically pertaining to how this balance would occur. In terms of "human effects" (43 CFR Part 1500), NEPA should include the demographic characteristics of the populations who would most benefit from, or be protected by, the balance. Also, since victory under this statute comes in the form of a court order mandating the defendants to repeat the decision making process before construction of the preferred build alternative can begin, affected populations should be given the opportunity to present relevant alternatives to the original project.

As stated in Chapter Two, the goal of the proposed Environmental Justice Act (EJA) of 1992, is to assure equal protection of public health by establishing a program that requires compliance with all environmental, health, and safety laws. Although the intent of this act is clearly stated and the goal appears to be adequate, the EJA is very narrow in scope because it deals only with toxic chemicals, and does not assure the equal protection

of public health from other sources. Also, the EJA recommends that mitigation for hazards posed by toxic chemicals be in the form of additional studies or legislation; although the EJA requires the identification of dangerous areas, this act does not include provisions for specific solutions to health hazards posed by the presence of toxic facilities in a community.

Congress should not pass the EJA as it is currently written. As mentioned above, the overall intent of the act is quite meaningful. However, in order for it to be truly effective, the EJA must be rewritten to include equal protection of public health from all potentially hazardous facilities, ranging from landfills, to automobile emissions. Also, the act must designate whom it is protecting. Is the EJA designed for the protection of the general population, or is it designed to only protect poor people of color? In addition, the EJA should also provide specific remedies or plans for clean-up of both existing hazardous facilities, and those discovered through the identification processes outlined in the Act.

In general, while the goals of the anti-discrimination legislation are clearly stated and widely accepted, these goals are not being met by the contents of the acts themselves or those who enforce them. The quest for environmental equity among all racial and income groups should begin and end with the EPA. Policies on environmental protection should include socioeconomic descriptions of low income and minority populations, and as well as techniques by which impacts of a proposed project could be evaluated, mitigated, or even avoided, so as to not adversely or disproportionately affect members of these groups. Since EPA is responsible for most environmental policy-making, it should weigh the costs and benefits of a proposed project more heavily before allocating any money for federally funded projects. Although a project could serve to benefit entire

populations of cities, towns, or even states, EPA must investigate the health-related and environmental impacts that could be borne by the residents in close proximity to the project.

Environmental policies should also address the following question: At what scale should project effects be considered in analyzing disproportionate racial and socioeconomic impacts? Should policies consider only the area adversely affected by the project, or should they compare the adversely affected area to other areas that will seemingly benefit from the project? As was shown in the analysis of the FRIP, different answers to the same question were obtained when determining the proposed impacts to low income and minority populations in the immediate project corridor, as compared to impacts borne by the minority and non-minority populations of the State of Rhode Island as a whole. Environmental policies should require that the adversely affected area be compared to other areas outside the study zone in all environmental justice evaluations. By comparing the affected population to the "benefiting" population, decision-makers could more specifically determine, and clearly illustrate, the effects of a proposed project on low income and minority populations. If this comparison is used in the beginning stages of a project, environmental injustice could easily be avoided.

Finally, racism and the degradation of the environment are problems that have been occurring, and that will continue to occur, in our society for some time. In an attempt to alleviate the combined problem of environmental racism, more representation by poor people of color is needed on local, state, and federal regulatory boards, as well as in leadership positions among the activists in the environmental movement. Environmental education is also desperately needed in both elementary and high schools across the

country. By improving or heightening an individual's awareness of his/her environment, and by providing knowledge and, consequently, an educated voice, to those who would have remained silent in the past, it will be possible to offset the racial and environmental imbalances that have been created in our society.

APPENDIX A

TABLE A.1. SUMMARY OF RACE AND INCOME CHARACTERISTICS

Census Tract	Block Group	Community	Total Population	Population By Race Distribution	Percent*		Median HH Income
109	1	Central Falls	872	White	731	84	$16,384
				Black	10	1	
				American Indian, Eskimo, Aleut	0	0	
				Asian Pacific Islander	3	0	
				Hispanic	128	15	
109	2	Central Falls	2,570	White	1,747	68	$21,726
				Black	71	3	
				American Indian, Eskimo, Aleut	19	1	
				Asian Pacific Islander	20	1	
				Hispanic	713	28	
110	2	Central Falls	2,322	White	1,567	67	$15,711
				Black	64	3	
				American Indian, Eskimo, Aleut	2	0	
				Asian Pacific Islander	10	0	
				Hispanic	679	29	
136	2	Cranston	661	White	596	90	$25,652
				Black	18	3	
				American Indian, Eskimo, Aleut	20	0	
				Asian Pacific Islander	26	4	
				Hispanic	19	3	
136	3	Cranston	1,180	White	1,125	95	$29,922
				Black	14	1	
				American Indian, Eskimo, Aleut	2	0	
				Asian Pacific Islander	19	2	
				Hispanic	20	2	
137.01	1	Cranston	977	White	958	98	$38,333
				Black	6	1	
				American Indian, Eskimo, Aleut	4	0	
				Asian Pacific Islander	1	0	
				Hispanic	8	1	
137.01	2	Cranston	1,064	White	975	92	$27,450
				Black	27	3	
				American Indian, Eskimo, Aleut	0	0	
				Asian Pacific Islander	21	2	
				Hispanic	41	4	
137.01	3	Cranston	953	White	905	95	$26,250
				Black	14	1	
				American Indian, Eskimo, Aleut	2	0	
				Asian Pacific Islander	1	0	
				Hispanic	31	3	
137.01	4	Cranston	1,191	White	1,142	96	$28,571
				Black	13	1	
				American Indian, Eskimo, Aleut	0	0	
				Asian Pacific Islander	8	1	
				Hispanic	28	2	
138	1	Cranston	858	White	835	97	$29,803
				Black	0	0	
				American Indian, Eskimo, Aleut	2	0	
				Asian Pacific Islander	11	1	
				Hispanic	10	1	
138	2	Cranston	966	White	942	98	$28,802
				Black	8	1	
				American Indian, Eskimo, Aleut	1	0	
				Asian Pacific Islander	0	0	
				Hispanic	15	2	
138	3	Cranston	675	White	671	99	$31,420
				Black	2	0	
				American Indian, Eskimo, Aleut	0	0	
				Asian Pacific Islander	2	0	
				Hispanic	0	0	

Census Tract	Block Group	Community	Total Population	Population By Race Racial Distribution		Percent*	Median HH Income
141	1	Cranston	1,553	White	1,372	88	$28,750
				Black	11	1	
				American Indian, Eskimo, Aleut	1	0	
				Asian Pacific Islander	130	8	
				Hispanic	39	3	
141	3	Cranston	937	White	815	87	$15,104
				Black	35	4	
				American Indian, Eskimo, Aleut	4	0	
				Asian Pacific Islander	29	3	
				Hispanic	54	6	
141	4	Cranston	1,033	White	990	96	$35,246
				Black	2	0	
				American Indian, Eskimo, Aleut	2	0	
				Asian Pacific Islander	30	3	
				Hispanic	9	1	
209.01	1	East Greenwich	1,366	White	1,308	96	$22,679
				Black	14	1	
				American Indian, Eskimo, Aleut	7	1	
				Asian Pacific Islander	18	1	
				Hispanic	19	1	
209.01	2	East Greenwich	811	White	790	97	$41,719
				Black	5	1	
				American Indian, Eskimo, Aleut	5	1	
				Asian Pacific Islander	3	0	
				Hispanic	8	1	
209.01	3	East Greenwich	639	White	626	98	$17,898
				Black	5	1	
				American Indian, Eskimo, Aleut	3	0	
				Asian Pacific Islander	2	0	
				Hispanic	3	0	
209.01	4	East Greenwich	1,129	White	1,096	97	$31,902
				Black	5	0	
				American Indian, Eskimo, Aleut	2	0	
				Asian Pacific Islander	18	2	
				Hispanic	8	1	
501.03	3	North Kingstown	851	White	845	99	$41,806
				Black	0	0	
				American Indian, Eskimo, Aleut	1	0	
				Asian Pacific Islander	1	0	
				Hispanic	4	0	
501.03	4	North Kingstown	1,056	White	1,012	96	$38,750
				Black	22	2	
				American Indian, Eskimo, Aleut	8	1	
				Asian Pacific Islander	6	1	
				Hispanic	8	1	
501.03	5	North Kingstown	1,104	White	1,067	97	$37,311
				Black	8	1	
				American Indian, Eskimo, Aleut	5	0	
				Asian Pacific Islander	18	2	
				Hispanic	6	1	
149	1	Pawtucket	749	White	660	88	$8,072
				Black	32	4	
				American Indian, Eskimo, Aleut	5	1	
				Asian Pacific Islander	5	1	
				Hispanic	47	6	
151	1	Pawtucket	1,981	White	1,310	66	$15,615
				Black	221	11	
				American Indian, Eskimo, Aleut	10	1	
				Asian Pacific Islander	6	0	
				Hispanic	434	22	

Census Tract	Block Group	Community	Total Population	Population By Race Racial Distribution		Percent*	Median HH Income
151	2	Pawtucket	945	White	724	77	$26,979
				Black	82	9	
				American Indian, Eskimo, Aleut	3	0	
				Asian Pacific Islander	1	0	
				Hispanic	135	14	
151	3	Pawtucket	1,545	White	1,013	66	$19,513
				Black	181	12	
				American Indian, Eskimo, Aleut	4	0	
				Asian Pacific Islander	35	2	
				Hispanic	312	20	
153	2	Pawtucket	1,236	White	971	79	$17,350
				Black	61	5	
				American Indian, Eskimo, Aleut	7	1	
				Asian/Pacific Islander	11	1	
				Hispanic	186	15	
153	3	Pawtucket	557	White	516	93	$31,700
				Black	14	3	
				American Indian, Eskimo, Aleut	1	0	
				Asian Pacific Islander	1	0	
				Hispanic	25	4	
153	4	Pawtucket	378	White	347	92	$30,088
				Black	6	2	
				American Indian, Eskimo, Aleut	1	0	
				Asian Pacific Islander	2	1	
				Hispanic	22	6	
160	3	Pawtucket	496	White	440	89	$15,104
				Black	20	4	
				American Indian, Eskimo, Aleut	3	1	
				Asian Pacific Islander	7	1	
				Hispanic	26	5	
161	1	Pawtucket	617	White	461	75	$18,393
				Black	54	9	
				American Indian, Eskimo, Aleut	2	0	
				Asian/Pacific Islander	9	1	
				Hispanic	91	15	
161	2	Pawtucket	771	White	535	69	$28,348
				Black	76	10	
				American Indian, Eskimo, Aleut	0	0	
				Asian Pacific Islander	2	0	
				Hispanic	158	20	
161	3	Pawtucket	1,422	White	1,036	73	$30,542
				Black	134	9	
				American Indian, Eskimo, Aleut	7	0	
				Asian Pacific Islander	3	0	
				Hispanic	242	17	
161	4	Pawtucket	1,777	White	1,206	68	$21,602
				Black	212	12	
				American Indian, Eskimo, Aleut	21	1	
				Asian/Pacific Islander	9	1	
				Hispanic	329	19	
163	1	Pawtucket	479	White	473	99	$44,808
				Black	5	1	
				American Indian, Eskimo, Aleut	0	0	
				Asian Pacific Islander	0	0	
				Hispanic	1	0	
163	2	Pawtucket	1,192	White	1,153	97	$38,947
				Black	4	0	
				American Indian, Eskimo, Aleut	0	0	
				Asian Pacific Islander	7	1	
				Hispanic	28	2	

Census Tract	Block Group	Community	Total Population	Population By Race Racial Distribution		Percent*	Median HH Income
164	1	Pawtucket	2,140	White	1,758	82	$22,150
				Black	160	7	
				American Indian, Eskimo, Aleut	2	0	
				Asian Pacific Islander	11	1	
				Hispanic	209	10	
164	2	Pawtucket	1,549	White	1,155	75	$27,250
				Black	155	10	
				American Indian, Eskimo, Aleut	8	1	
				Asian Pacific Islander	11	1	
				Hispanic	220	14	
164	3	Pawtucket	802	White	585	73	$22,434
				Black	86	11	
				American Indian, Eskimo, Aleut	2	0	
				Asian Pacific Islander	28	3	
				Hispanic	101	13	
2	1	Providence	1,947	White	378	19	$15,337
				Black	584	30	
				American Indian, Eskimo, Aleut	60	3	
				Asian Pacific Islander	99	5	
				Hispanic	826	42	
2	2	Providence	1,927	White	473	25	$18,355
				Black	523	27	
				American Indian, Eskimo, Aleut	21	1	
				Asian Pacific Islander	56	3	
				Hispanic	854	44	
2	3	Providence	1,062	White	311	29	$13,750
				Black	449	42	
				American Indian, Eskimo, Aleut	23	2	
				Asian Pacific Islander	41	4	
				Hispanic	238	22	
2	4	Providence	1,414	White	257	18	$29,981
				Black	540	38	
				American Indian, Eskimo, Aleut	14	1	
				Asian Pacific Islander	103	7	
				Hispanic	500	35	
2	6	Providence	2,094	White	526	25	$20,163
				Black	567	27	
				American Indian, Eskimo, Aleut	39	2	
				Asian Pacific Islander	226	11	
				Hispanic	736	35	
2	7	Providence	1,309	White	951	73	$25,750
				Black	128	10	
				American Indian, Eskimo, Aleut	7	1	
				Asian Pacific Islander	76	6	
				Hispanic	147	11	
3	3	Providence	1,119	White	362	32	$18,095
				Black	186	17	
				American Indian, Eskimo, Aleut	14	1	
				Asian Pacific Islander	219	20	
				Hispanic	338	30	
3	4	Providence	1,085	White	228	21	$12,125
				Black	393	36	
				American Indian, Eskimo, Aleut	13	1	
				Asian Pacific Islander	149	14	
				Hispanic	302	28	
3	5	Providence	874	White	298	34	$14,861
				Black	195	22	
				American Indian, Eskimo, Aleut	11	1	
				Asian Pacific Islander	118	14	
				Hispanic	252	29	

Census Tract	Block Group	Community	Total Population	Population By Race Racial Distribution		Percent*	Median HH Income
3	6	Providence	987	White	337	34	$10,875
				Black	268	27	
				American Indian, Eskimo, Aleut	26	3	
				Asian Pacific Islander	27	3	
				Hispanic	329	33	
3	7	Providence	390	White	92	24	$20,221
				Black	127	33	
				American Indian, Eskimo, Aleut	6	2	
				Asian/Pacific Islander	13	3	
				Hispanic	152	39	
8	1	Providence	654	White	569	87	$37,109
				Black	19	3	
				American Indian, Eskimo, Aleut	0	0	
				Asian Pacific Islander	38	6	
				Hispanic	28	4	
8	2	Providence	482	White	455	94	$22,273
				Black	25	5	
				American Indian, Eskimo, Aleut	0	0	
				Asian/Pacific Islander	0	0	
				Hispanic	2	0	
8	3	Providence	1,376	White	1,125	82	$7,549
				Black	121	9	
				American Indian, Eskimo, Aleut	14	1	
				Asian Pacific Islander	45	3	
				Hispanic	71	5	
9	1	Providence	300	White	282	94	$14,667
				Black	4	1	
				American Indian, Eskimo, Aleut	1	0	
				Asian Pacific Islander	2	1	
				Hispanic	11	4	
9	2	Providence	685	White	583	85	$8,434
				Black	27	4	
				American Indian, Eskimo, Aleut	3	0	
				Asian Pacific Islander	9	1	
				Hispanic	63	9	
9	3	Providence	1,389	White	1,084	78	$14,345
				Black	47	3	
				American Indian, Eskimo, Aleut	0	0	
				Asian Pacific Islander	4	0	
				Hispanic	254	18	
9	4	Providence	185	White	150	81	$16,250
				Black	1	1	
				American Indian, Eskimo, Aleut	4	2	
				Asian/Pacific Islander	0	0	
				Hispanic	30	16	
10	1	Providence	920	White	784	85	$7,632
				Black	37	4	
				American Indian, Eskimo, Aleut	2	0	
				Asian Pacific Islander	1	0	
				Hispanic	96	10	
10	2	Providence	738	White	538	73	$18,173
				Black	66	9	
				American Indian, Eskimo, Aleut	0	0	
				Asian Pacific Islander	1	0	
				Hispanic	133	18	
10	3	Providence	598	White	467	78	$13,295
				Black	25	4	
				American Indian, Eskimo, Aleut	0	0	
				Asian Pacific Islander	2	0	
				Hispanic	104	17	

Census Tract	Block Group	Community	Total Population	Population By Race Racial Distribution		Percent*	Median HH Income
10	4	Providence	242	White	174	72	$17,708
				Black	15	6	
				American Indian, Eskimo, Aleut	0	0	
				Asian Pacific Islander	1	0	
				Hispanic	52	21	
11	1	Providence	70	White	35	50	$4,999
				Black	0	0	
				American Indian, Eskimo, Aleut	0	0	
				Asian Pacific Islander	0	0	
				Hispanic	35	50	
11	3	Providence	808	White	638	79	$20,375
				Black	37	5	
				American Indian, Eskimo, Aleut	2	0	
				Asian Pacific Islander	0	0	
				Hispanic	131	16	
11	4	Providence	767	White	586	76	$15,917
				Black	65	8	
				American Indian, Eskimo, Aleut	6	1	
				Asian Pacific Islander	8	1	
				Hispanic	102	13	
11	5	Providence	638	White	508	80	$20,625
				Black	8	1	
				American Indian, Eskimo, Aleut	1	0	
				Asian Pacific Islander	8	1	
				Hispanic	113	18	
13	1	Providence	597	White	360	60	$26,350
				Black	89	15	
				American Indian, Eskimo, Aleut	31	5	
				Asian Pacific Islander	9	2	
				Hispanic	108	18	
13	2	Providence	1,557	White	715	46	$22,545
				Black	165	11	
				American Indian, Eskimo, Aleut	18	1	
				Asian Pacific Islander	159	10	
				Hispanic	500	32	
13	3	Providence	1,432	White	583	41	$22,545
				Black	141	10	
				American Indian, Eskimo, Aleut	14	1	
				Asian Pacific Islander	262	18	
				Hispanic	432	30	
13	4	Providence	1,198	White	578	48	$12,708
				Black	140	12	
				American Indian, Eskimo, Aleut	16	1	
				Asian Pacific Islander	169	14	
				Hispanic	295	25	
14	2	Providence	1,970	White	329	17	$16,932
				Black	454	23	
				American Indian, Eskimo, Aleut	23	1	
				Asian Pacific Islander	495	25	
				Hispanic	669	34	
14	3	Providence	1,066	White	231	22	$18,438
				Black	211	20	
				American Indian, Eskimo, Aleut	3	0	
				Asian Pacific Islander	257	24	
				Hispanic	364	34	
14	4	Providence	1,148	White	401	35	$11,833
				Black	228	20	
				American Indian, Eskimo, Aleut	9	1	
				Asian Pacific Islander	157	14	
				Hispanic	353	31	

Census Tract	Block Group	Community	Total Population	Population By Race Racial Distribution		Percent*	Median HH Income
14	5	Providence	789	White	155	20	$18,167
				Black	246	31	
				American Indian, Eskimo, Aleut	9	1	
				Asian Pacific Islander	73	9	
				Hispanic	306	39	
14	6	Providence	354	White	106	30	$29,000
				Black	69	19	
				American Indian, Eskimo, Aleut	14	4	
				Asian Pacific Islander	16	5	
				Hispanic	149	42	
15	1	Providence	230	White	187	81	$26,696
				Black	22	10	
				American Indian, Eskimo, Aleut	0	0	
				Asian Pacific Islander	8	3	
				Hispanic	13	6	
15	2	Providence	1,342	White	891	66	$28,462
				Black	143	11	
				American Indian, Eskimo, Aleut	8	1	
				Asian Pacific Islander	219	16	
				Hispanic	81	6	
15	3	Providence	984	White	826	84	$35,833
				Black	63	6	
				American Indian, Eskimo, Aleut	11	1	
				Asian Pacific Islander	34	3	
				Hispanic	50	5	
16	1	Providence	694	White	535	77	$21,324
				Black	16	2	
				American Indian, Eskimo, Aleut	4	1	
				Asian Pacific Islander	24	3	
				Hispanic	115	17	
16	2	Providence	958	White	844	88	$19,273
				Black	23	2	
				American Indian, Eskimo, Aleut	1	0	
				Asian Pacific Islander	22	2	
				Hispanic	68	7	
16	3	Providence	431	White	353	82	$18,187
				Black	14	3	
				American Indian, Eskimo, Aleut	3	1	
				Asian Pacific Islander	1	0	
				Hispanic	60	14	
16	4	Providence	1,354	White	1,151	85	$32,422
				Black	48	4	
				American Indian, Eskimo, Aleut	0	0	
				Asian Pacific Islander	50	4	
				Hispanic	105	8	
16	5	Providence	1,040	White	951	91	$30,729
				Black	10	1	
				American Indian, Eskimo, Aleut	0	0	
				Asian Pacific Islander	26	3	
				Hispanic	53	5	
19	1	Providence	701	White	508	72	$7,510
				Black	12	2	
				American Indian, Eskimo, Aleut	12	2	
				Asian Pacific Islander	29	4	
				Hispanic	140	20	
19	2	Providence	124	White	76	61	$8,191
				Black	21	17	
				American Indian, Eskimo, Aleut	0	0	
				Asian Pacific Islander	0	0	
				Hispanic	27	22	

Census Tract	Block Group	Community	Total Population	Population By Race Racial Distribution		Percent*	Median HH Income
19	6	Providence	967	White	459	47	$12,374
				Black	114	12	
				American Indian, Eskimo, Aleut	10	1	
				Asian Pacific Islander	77	8	
				Hispanic	307	32	
19	7	Providence	1,057	White	572	54	$15,875
				Black	39	4	
				American Indian, Eskimo, Aleut	17	2	
				Asian/Pacific Islander	88	8	
				Hispanic	341	32	
22	2	Providence	394	White	282	72	$21,250
				Black	24	6	
				American Indian, Eskimo, Aleut	0	0	
				Asian Pacific Islander	7	2	
				Hispanic	81	21	
22	3	Providence	9	White	9	100	$28,750
				Black	0	0	
				American Indian, Eskimo, Aleut	0	0	
				Asian Pacific Islander	0	0	
				Hispanic	0	0	
22	4	Providence	1,496	White	1,059	71	$22,266
				Black	69	5	
				American Indian, Eskimo, Aleut	7	0	
				Asian Pacific Islander	43	3	
				Hispanic	318	21	
25	2	Providence	696	White	391	56	$25,521
				Black	61	9	
				American Indian, Eskimo, Aleut	2	0	
				Asian Pacific Islander	106	15	
				Hispanic	136	20	
25	3	Providence	227	White	179	79	$16,615
				Black	13	6	
				American Indian, Eskimo, Aleut	0	0	
				Asian Pacific Islander	2	1	
				Hispanic	33	15	
26	4	Providence	1,925	White	983	51	$12,727
				Black	205	11	
				American Indian, Eskimo, Aleut	10	1	
				Asian Pacific Islander	307	16	
				Hispanic	420	22	
26	5	Providence	1,351	White	639	47	$21,078
				Black	211	16	
				American Indian, Eskimo, Aleut	1	0	
				Asian Pacific Islander	210	16	
				Hispanic	290	21	
27	3	Providence	2,065	White	519	25	$12,235
				Black	921	45	
				American Indian, Eskimo, Aleut	54	3	
				Asian Pacific Islander	26	1	
				Hispanic	545	26	
29	1	Providence	938	White	901	96	$43,929
				Black	6	1	
				American Indian, Eskimo, Aleut	2	0	
				Asian Pacific Islander	5	1	
				Hispanic	24	3	
29	2	Providence	914	White	848	93	$18,365
				Black	34	4	
				American Indian, Eskimo, Aleut	3	0	
				Asian Pacific Islander	0	0	
				Hispanic	29	3	

Census Tract	Block Group	Community	Total Population	Population By Race Racial Distribution		Percent*	Median HH Income
29	3	Providence	1,488	White	1,379	93	$12,727
				Black	33	2	
				American Indian, Eskimo, Aleut	5	0	
				Asian Pacific Islander	3	0	
				Hispanic	68	5	
29	4	Providence	963	White	879	91	$13,145
				Black	6	1	
				American Indian, Eskimo, Aleut	1	0	
				Asian/Pacific Islander	6	1	
				Hispanic	71	7	
30	1	Providence	592	White	481	81	$6,462
				Black	91	15	
				American Indian, Eskimo, Aleut	7	1	
				Asian/Pacific Islander	1	0	
				Hispanic	12	2	
31	3	Providence	1,911	White	1,050	55	$24,451
				Black	482	25	
				American Indian, Eskimo, Aleut	12	1	
				Asian/Pacific Islander	246	13	
				Hispanic	121	6	
31	4	Providence	385	White	339	88	$16,719
				Black	18	5	
				American Indian, Eskimo, Aleut	2	1	
				Asian Pacific Islander	14	4	
				Hispanic	12	3	
33	5	Providence	254	White	192	76	$23,264
				Black	29	11	
				American Indian, Eskimo, Aleut	0	0	
				Asian Pacific Islander	0	0	
				Hispanic	33	13	
36	6	Providence	2,410	White	1,746	72	$17,292
				Black	205	9	
				American Indian, Eskimo, Aleut	4	0	
				Asian Pacific Islander	329	14	
				Hispanic	126	5	
36	7	Providence	1,015	White	932	92	$38,750
				Black	19	2	
				American Indian, Eskimo, Aleut	1	0	
				Asian Pacific Islander	42	4	
				Hispanic	21	2	
211	1	Warwick	1,550	White	1,516	98	$31,085
				Black	2	0	
				American Indian, Eskimo, Aleut	4	0	
				Asian Pacific Islander	12	1	
				Hispanic	16	1	
211	2	Warwick	1,284	White	1,269	99	$41,023
				Black	7	1	
				American Indian, Eskimo, Aleut	4	0	
				Asian Pacific Islander	4	0	
				Hispanic	0	0	
211	4	Warwick	752	White	731	97	$24,817
				Black	7	1	
				American Indian, Eskimo, Aleut	0	0	
				Asian Pacific Islander	10	1	
				Hispanic	4	1	
211	5	Warwick	825	White	760	92	$37,833
				Black	31	4	
				American Indian, Eskimo, Aleut	1	0	
				Asian Pacific Islander	8	1	
				Hispanic	25	3	

Census Tract	Block Group	Community	Total Population	Population By Race Racial Distribution		Percent*	Median HH Income
219.01	1	Warwick	1,163	White	1,132	97	$34,375
				Black	10	1	
				American Indian, Eskimo, Aleut	4	0	
				Asian Pacific Islander	5	0	
				Hispanic	12	1	
219.01	2	Warwick	1,036	White	991	96	$32,813
				Black	11	1	
				American Indian, Eskimo, Aleut	2	0	
				Asian Pacific Islander	12	1	
				Hispanic	20	2	
219.01	3	Warwick	687	White	672	98	$41,750
				Black	1	0	
				American Indian, Eskimo, Aleut	0	0	
				Asian/Pacific Islander	7	1	
				Hispanic	7	1	
220	1	Warwick	2,010	White	1,981	99	$38,298
				Black	12	1	
				American Indian, Eskimo, Aleut	8	0	
				Asian Pacific Islander	9	0	
				Hispanic	0	0	
220	2	Warwick	375	White	351	94	$22,656
				Black	13	3	
				American Indian, Eskimo, Aleut	0	0	
				Asian Pacific Islander	3	1	
				Hispanic	8	2	
220	3	Warwick	1,312	White	1,276	97	$30,704
				Black	10	1	
				American Indian, Eskimo, Aleut	1	0	
				Asian Pacific Islander	18	1	
				Hispanic	7	1	
221	1	Warwick	2,699	White	2,663	99	$35,417
				Black	11	0	
				American Indian, Eskimo, Aleut	1	0	
				Asian Pacific Islander	14	1	
				Hispanic	10	0	
221	2	Warwick	889	White	881	99	$41,189
				Black	4	0	
				American Indian, Eskimo, Aleut	2	0	
				Asian Pacific Islander	2	0	
				Hispanic	0	0	
221	3	Warwick	929	White	918	99	$35,978
				Black	0	0	
				American Indian, Eskimo, Aleut	3	0	
				Asian Pacific Islander	1	0	
				Hispanic	7	1	
222.01	1	Warwick	2,846	White	2,718	96	$71,689
				Black	39	1	
				American Indian, Eskimo, Aleut	6	0	
				Asian Pacific Islander	4	1	
				Hispanic	43	2	
222.01	3	Warwick	1,175	White	1,165	99	$72,964
				Black	2	0	
				American Indian, Eskimo, Aleut	0	0	
				Asian Pacific Islander	1	0	
				Hispanic	7	1	
222.01	4	Warwick	712	White	679	95	$71,689
				Black	2	0	
				American Indian, Eskimo, Aleut	0	0	
				Asian/Pacific Islander	18	3	
				Hispanic	13	2	

Census Tract	Block Group	Community	Total Population	Population By Race Racial Distribution		Percent*	Median HH Income
224	2	Warwick	1,147	White	1,124	98	$46,542
				Black	7	1	
				American Indian, Eskimo, Aleut	1	0	
				Asian Pacific Islander	1	0	
				Hispanic	14	1	

* Percents may not equal 100 due to rounding.
Source: 1990 Census of Population and Housing.

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