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The objectives of the Division are: (1) to prepare strategic and systems plans for the state; (2) to coordinate activities of the public and private sectors within this framework of policies and programs; (3) to assist local governments in management, finance, and planning; and (4) to advise the Governor and others concerned on physical, social, and economic topics.

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Concern for the environment and access to parks and open space is not frivolous or peripheral; rather it is central to the welfare of people--body, mind, and spirit.

Laurance S. Rockefeller

Preface

This plan concerns Rhode Island's landscape and the people who use the land, both today and in the future. It is also, more fundamentally, about choices. Rhode Islanders make thousands of individual choices each day that affect the land and that, collectively, are creating the landscape future Rhode Islanders will inhabit. The plan argues that these choices--whether small or large, individual or collective, economic or personal lifestyle--should be made consciously, responsibly, and with a clear vision of what the future landscape of Rhode Island *should be*. *A Greener Path* describes the direction where inertial decision-making is now taking our landscape and advances an alternative vision of the future landscape. It asks Rhode Islanders to *choose* a better destiny for the land they love.

The idea that Rhode Island should have a plan of this nature sprouted during the wave of growth and development that swept across Rhode Island's landscape in the mid-1980s. The real and threatened losses of important resource lands and cherished places during the development boom constituted an "open space crisis" which galvanized public opinion and set the stage for unparalleled action and investment: authorization of over \$100 million of bonds for public open space purchase, enactment of new state laws setting forth local comprehensive planning and zoning requirements, and a State decision to prepare an element of the State Guide Plan focused entirely upon open space.

A Greener Path begins with the presumption, in Part One, that critically important public values inherently reside in the state's landscape. It documents key natural and cultural values that Rhode Island's landscape provides to society and asserts that they are worth defending. Parts Two and Three provide an historical and contemporary review of human interaction with the Rhode Island landscape and define three land usage trends--consumption, fragmentation and resource endangerment--that threaten the integrity, resource security, and public availability of the future landscape. Part Four introduces the possibility that an alternative to the *status quo* exists and sets an expansive goal to move the state in a new direction. Part Five documents the analytical examination of the state's resources performed in the planning process and describes the method used to produce the recommended greenspace and greenways systems plan, which is presented in Part Six. Policies to guide state, local and private landscape-shaping actions in the direction of the new goal are set forth in Part Seven. The concluding Part Eight issues a challenge to a *crucial generation* of Rhode Islanders to create the recommended greenspace and greenways system, and outlines a 25 year program of implementation.

While the idea for a Greenspace and Greenways plan took root in the late 1980s, the seeds were sown much earlier. Over one hundred years ago--in 1893--the Public Parks Association began a tradition of planning and advocacy in behalf of land preservation and adequate space for public recreation. In the subsequent decade, the Metropolitan Park Commission was created by the General Assembly, beginning Rhode Island State government's involvement in park system development. While broader in geographic scope than the Metropolitan Park Commission's landmark 1903 Plan, *A Greener Path* is a direct descendant in spirit of the Commission's

pioneering efforts, and of the many like-minded studies, reports and plans that followed through the decades.

As many of its predecessor studies have done, *A Greener Path* throws down the gauntlet for Rhode Islanders to take charge of the physical destiny of their state. It challenges our leaders to have the vision to see beyond the present hard times and the courage to ask us to invest in our state's future. It challenges private owners of greenspace tracts to recognize the legitimacy of the public's interest in their property, and to be receptive to innovative ways in which their objectives and goals for the land can be best harmonized with protection of the essential values it holds. It challenges builders, developers, and realtors to not see the plan just as a further "locking up" of their raw material, but as a key first step to forging partnerships for the growth of quality communities in which all can prosper. It challenges local governments to be bold in their prescriptions for quality growth and receptive to novel land management tools. It challenges environmentalists to come to consensus on what is truly essential, and to be forthright about where the growth and development we need should go. Finally, it challenges all citizens of Rhode Island to think about the future in a positive sense; to see clearly what is, while envisioning what could be, and to take the risks and make the sacrifices needed to get from here to there.

The path of land conservation in Rhode Island has been a long journey, characterized by incremental progress and fluctuating public interest and commitment. Today, there are encouraging signs that the deep concern that Rhode Islanders have for their environment and landscape is inspiring a new wave of activism and involvement. Even in these difficult times, and with few resources, Rhode Islanders across the state are coming together in small and large groups to find innovative ways to care for the land and water they love. Local greenway groups, pond and river watchers, watershed associations, land trusts are active in virtually all Rhode Island communities. They are giving their time, investing themselves, in cleaning river and shorefronts, creating trails, and planning greenways. This is a dramatic and manifestly hopeful development, and an excellent first step down *a greener path*.

Adoption

A Greener Path: Greenspace and Greenways for Rhode Island's Future was adopted as State Guide Plan Element 155 by the State Planning Council on November 10, 1994, following a public hearing conducted on November 3, 1994. Amendments to adopted State Guide Plan elements are made periodically to report progress, incorporate new data, revise policies, and update recommendations. All proposed amendments are reviewed by the State Planning Council in accordance with its adopted *Rules of Procedure*, and are presented for public comment at a public hearing prior to action by the Council.

Acknowledgements

As in any undertaking of the scope of this plan, *A Greener Path* represents a sum of the energy, creativity, and knowledge contributed by numerous individuals and groups. Among those who must share in any credit which this completed work may receive are: past Rhode Island Department Directors Frederick Lippitt (Administration), Robert Bendick (Environmental Management), and W. Edward Wood (Transportation), who were early advocates for a state open space protection plan and greenways; Judith Benedict, who, at the Department of Environmental Management and later with The Nature Conservancy, was an important friend and patient advisor to this undertaking; and Keith Lewis (Rhode Island's first representative of The Conservation Fund), Colgate Searle of the RI School of Design, and Brown University's Harold Ward (founder of Green Rhode Island) who all championed and assisted the state's entry into greenway planning.

If the ideas advanced in this plan bear fruit, these individuals, together with the Division of Planning's Daniel Varin, with whom the vision of a State Greenspace and Greenways Guide Plan originated, will be remembered as sowing the first seeds of Rhode Island's modern greenways movement.

A Greener Path was prepared by George W. Johnson, Principal Planner, who directed the planning process and wrote the plan, and Steven Sawyer, Senior Environmental Planner, who performed the computerized geographic analysis and composed the plan's maps. Messrs. Johnson and Sawyer were guided in these tasks by Susan Morrison, Chief of Systems Planning; Victor Parmentier, Supervising Planner; and John Stachelhaus, RIGIS Coordinator. Mr. Stachelhaus and Mark Vincent, Senior Environmental Planner (resigned 1992), performed some of the geographic analyses completed early in the planning process.

Many others lent their time and advice to this endeavor, often helping more than they might have realized in moving the project along its long, and often technically-torturous, path towards completion. In addition to Advisory Committee members and alternates listed on pages vi-vii, those to whom the author owes a debt of gratitude include student interns--Jennifer Airoidi, Curt Belavance, Denis Lafaille, Fred Preseley, and Michael Veracka, who all toiled long hours for little or no reward--save for knowledge gained and their faith in the future--and numerous colleagues who gladly offered advice, access to data, constructive criticism, and other support throughout the project. While any listing risks omissions, these professionals include:

Division of Planning

Grace Beiser, Principal Planner
Alfred Freeman, Planning Technician
Kim Gelfuso, Senior Word Processing Typist
Frank Geremia, Chief of Special Projects
Mansuet Giusti, Chief Cartographer
Kathleen Leddy, Principal Environmental Planner
Susan Morrison, Chief of Systems Planning
Victor Parmentier, Supervising Planner, Natural Resources Section

Derwent Riding, Principal Planner
William Sheridan, Supervisor, Local Planning Assistance
David Tonnessen, Supervising Planner, Transportation Planning
Daniel Varin, Associate Director

Department of Environmental Management

Joseph Dias, Assistant Chief of Planning
David Holt, Principal Environmental Planner (resigned 1992)
Ginny Leslie, Principal Planner
Joanne Michaud, Natural Heritage Program
Ernest Panciera, Senior Environmental Planner
Lisa Pointek, Supervisor of Land Conservation
Paul Ricard, Senior Forester
Elizabeth Scott, Chief, Water Supply Management
Richard Tierney, Senior Planner
Frederick Vincent, Associate Director for Administration

Department of Transportation

John Brownell, Chief Civil Engineer
Gregg Keeler, Senior Planner
Ken Marrocco, Chief, MIS/RIGIS Section
Mario Marcoccio, Chief Draftsman
Dennis Sullivan, GIS Specialist
Steve Kut, GIS Specialist

University of Rhode Island--Environmental Data Center

Dr. Peter August, Associate Professor
Charles Labash, Data Manager
Andrew MacLachlan, Data Manager (resigned 1992)

Databasics, Inc.

Larry Manire

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The Rhode Island Geographic Information System (RIGIS), a computerized spatial database developed and maintained by the University of Rhode Island's Environmental Data Center and

cooperating State agencies, afforded the greenspace and greenways planning process the most comprehensive and current geographically-referenced statewide resource data.

The project's geographic analysis was performed using ARC/INFO software packages licensed to the Division by Environmental Systems Research Institute, Inc. of Redlands, CA. Various portions of the analysis were performed on the Division of Planning's SUN/Sparc2 workstation, SUN 386i workstation and Computopia 386/25PC computers.

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Comments on *A Greener Path* are welcomed. Contact George Johnson at (401) 277-6479 or write to the R.I. Division of Planning, One Capitol Hill, Providence, RI 02908-5872.



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155-1 THE PREMISE



Greenspace, land and water reserved undeveloped, is essential to life in Rhode Island, today and in the future. It offers sustenance, promotes public health, safety and welfare, strengthens the state's economic vitality, and makes possible a quality of life desired by Rhode Islanders. Greenways, corridors of open space following rivers, coastlines, and rail or utility lines, link public lands and connect habitats and communities. Creation of an integrated network of protected greenspace and connecting greenways is critically important to Rhode Island's future.



Greenspace and the resources it shelters are, literally and figuratively, the foundation of life in Rhode Island. The state's magnificent bay and its rivers are its lifeblood; the forests, its lungs; and the special places treasured and visited by generations of inhabitants, perhaps as close to an eternal soul as any geopolitical entity can attain.

Greenspace has served, and continues to serve, Rhode Island well. This plan asserts that the future progress of Rhode Island and its people will remain intertwined with the destiny of the state's greenspace resources. In many ways, Rhode Island's prospect depends as much on identifying and securely protecting the essential fabric of greenspace permeating the state, and on guaranteeing the public's right to connect with greenspace, as on any other single factor. Rhode Islanders can have scant hope of living healthy, productive, and rewarding lives, and of having an increasing standard of living in the future if the basic environmental resources that support life and commerce are allowed to erode, or if their time-honored intimacy with the outdoors is severed.

For the benefits provided today by greenspace, we are indebted to our predecessors whose foresight and sacrifice in the cause of land protection gave us such treasures as the ring of major parks encircling metropolitan Providence, the extensive woodland management areas, the Scituate Reservoir watershed, and the Bay Islands Park. In turn, we owe the generations of Rhode Islanders who will follow us a responsibility for similar vision and investment. It is our duty to

insure that the capability of Rhode Island's greenspace to provide essential social values and benefits for its citizens extends as far into the future as it is possible for our will and deeds to reach.

1-1 Assumptions

The Greenspace and Greenways Plan is grounded upon the following points:

- ❖ That public policy objectives for open space protection must be based upon securing the public's fundamental interest in continued enjoyment of the values and benefits society derives from open space;
- ❖ That open space protection should be planned for and executed in the context of the complete systems, resources, and landscape units, which secure the public benefits of open space;
- ❖ That, while our knowledge and information remain imperfect, our tools are sufficiently advanced to allow many essential natural and cultural values of open space to be geographically delineated so that they can be protected for the benefit of present and future Rhode Islanders;
- ❖ That public access to and usage of the outdoors is a public goal concomitant with resource preservation that can and should be promoted, where possible, through the comprehensiveness, extent, location, and configuration of the areas preserved as open space;
- ❖ That the limited resources available to protect open space should, where possible, be focused on an integrated system, which achieves multiple objectives of public policy and affords multiple values and benefits to the state's citizens; and
- ❖ That definition of an integrated system of greenspace and greenways, based upon the above principles, is instrumental to protecting resources essential to the health, safety, and welfare of present and future Rhode Islanders, and is a proper, and desirable exercise of state governmental authority and leadership.

The plan establishes a Greenspace and Greenways system, as a goal of state development policy. More significantly, it attempts to define a vision of Rhode Island's future landscape in which protection of critical resources is ensured, and opportunities for public enjoyment of the state's outdoors are secured.

1-2 A Response to Values....The Public Purpose in Protecting Greenspace

Our purpose, then, is, not to create new luxuries, but to preserve old necessities; not to add new outlets for public expenditure, but to save untold financial burdens. It is to develop the places most valueless, commercially, so that they may be most valuable for the cause of humanity. It is to stimulate growth along proper lines.¹

Why protect greenspace? The simplest and truest reason is as much pragmatic as altruistic. Many of society's needs and desires depend upon the land and water that comprise so-called "open" or greenspace. These benefits comprise the social values of greenspace.

From the verdant woodlands of the rural towns bordering Connecticut, to the placid coastal ponds of *South County*, from the urbanized banks of the Blackstone River to the idyllic seacoast farm fields of the East Bay, Rhode Island's land and water silently and steadfastly serve our needs--from the most basic to the highly trivial--for resources, for space, for venues, for play, for purification, for connection, for conveyance, for discard, for disposal. The land and water performed their functions and yielded their bounty long before we--the present citizen-stewards of Rhode Island--arrived. Through their many substantial contributions, our land and water resources set the stage for the accumulated wealth and social progress we now enjoy. Properly protected and managed, the natural fabric of green will continue to tirelessly provide a multitude of socially-beneficial values far into the future.

1-2-1 Price versus Value

Unfortunately, only one value of greenspace, its utility and desirability as a setting for human habitation and economic activities, is generally considered by our economic system. Conventionally, the "value" of any parcel of open land is expressed by its *price*--set by the "invisible hand" of the free market; the coming together of willing sellers and desirous buyers. More than any other factor, the real estate value of open space, expressed by price, reflects its location--its proximity to public infrastructure such as highways or utilities which facilitate its usage, or to amenities such as a highly-regarded public school system, the coastline or other recreational resources. Be it intrinsically wasteland or eden, greenspace that is in the "right place", in a real estate sense, can be immensely valued by the market for development.

¹ Metropolitan Park Commission of Providence Plantations *Fifth Annual Report to the General Assembly of Rhode Island*. 1909. p.12.

Seldom quantified by the private market, two other dimensions of value intrinsically exist in any parcel of open land. One is its natural resource value--its physical and biological parameters, many of which are also a function of its location. Not location so much with reference to human activities, but rather relative to landscape features, such as the parent rockbodies, water bodies and coastlines, and the topography. These determinants tell how a given parcel of land fits into the natural scheme of things, how valuable it will be for wildlife of certain types, how suitable for different types of vegetation, how much water it will retain or allow to run off.

A second non-traditional value of land is its cultural significance--this a function of each parcel's location on the continuum of time. Our experience of the land is over one short interval of time; but the land retains something--in the artifacts and stories left behind--of all that has happened on it over the long course of its occupancy and use by humans. Some of this happened so long ago that evidence must literally be unearthed and intensely studied to be understood. Other, historically more recent, events in the human drama have left prominent physical remnants on the land--features we revere and cherish for what they tell us of people or events of the past: colonial structures, champion trees spared by early settlers; factory system villages; old churches and meeting houses; the ubiquitous stone walls. These are all aspects of the land's cultural resource or heritage value.

1-2-2 Defining the Public Interest in Greenspace

The natural and cultural values of land constitute the public interest in greenspace. Because they often have little significance to a single prospective purchaser, the private market price of real estate is frequently a poor measure of these values. Rather, the land's natural and cultural values are more of the character of public goods: their mere existence provides benefits to all members of society without exclusion; but, as the land is divided into marketable parcels, the values, unless explicitly recognized and protected, are likely to be extinguished or greatly diminished in the process.

This plan presumes that, at minimum, the public interest in greenspace embraces the following values. They are of great importance to Rhode Island's future. Land and water resources crucial to perpetuation of these values must be protected as components of the greenspace and greenway system.

Pure Water

Greenspace is essential to the integrity and proper functioning of Rhode Island's hydrologic cycle. It traps, stores, and conveys water. It is pervious, like a sponge, intercepting and stockpiling both surface and ground waters. Just as importantly, it provides a natural buffer and filter for water as it flows through the environment, protecting and restoring its purity. Vegetated land and wetlands, retained surrounding waterbodies and overlying groundwater aquifers, cleanse runoff of much of its pollution load before it can degrade receiving waters. The velocity of surface runoff is decreased, allowing suspended particles to settle out, and nutrients to be captured and utilized by the growing plants. Even relatively narrow greenway strips of natural vegetation along streams

can have positive effects upon the water quality by providing shading, which increases the amount of oxygen the water can carry during critical high temperature periods.

The purifying functions of greenspace are critical for public water supply. All Rhode Islanders, regardless of where they live, need clean, safe drinking water to live. Upwards of 75 percent of us rely upon a public surface supply system for the water we need; the remaining quarter obtain water from the ground--either via individual private wells or from a public supplier². Every drop of water that eventually touches our lips starts as a drop of rain on the land, and follows a journey--whether of feet, or many miles--that leaves it vulnerable to contamination by the effluvia of urban society--from bacteria to toxic industrial chemicals. Reservation of water supply resource lands as greenspace, be they surface watersheds or lands overlying subterranean aquifers, substantially reduces the risk that our critical water supplies will be contaminated.

Rhode Island's commitment to clean water is legion. In recent years vast sums have been expended on treatment facilities and tremendous progress made in restoring the quality of the state's inland waters and Narragansett Bay. In the state's most urbanized areas, where the natural filter of greenspace has been eliminated, expensive remedial solutions, such as runoff interception and detention basins, are now being deployed. Upwards of a half billion dollars in additional capital investments in wastewater storage, conveyance and treatment facilities may be needed to restore the quality of upper Narragansett Bay and the urbanized rivers that flow into it³. The need for such expensive structural "retrofits" must be avoided or minimized in areas of the state that are yet to be developed. Retention of sufficient greenspace, wetlands, and wooded buffers, which preserve the drainage and filtration functions of the natural landscape, can protect water quality naturally.

A biologically diverse environment

The essential green fabric is a tapestry of life. It is home not only to humans but to thousands of other species. The largest and most common are familiar to us; we call them plants and wildlife. The tiniest, micro organisms, pique the interest of only the most intent researchers. Other species flourish and perish anonymously, escaping entirely through still gaping holes in the net of human cognizance and comprehension. Throughout history the human mission has been one of reducing natural complexity, simplifying the environment to suit human needs and tastes. Only recently

² U.S. Geological Survey. *National Water Summary--Rhode Island*. 1985. p. 373.

³ Narragansett Bay Project, and R.I. Division of Planning. *Comprehensive Conservation and Management Plan for Narragansett Bay*. 1992. p. 4.75.

have we fathomed the most exposed and direct of the myriad interrelationships in the web of life; other links in the chain, more complex, and likely crucial to our own existence, still elude our science and investigation. But, from what we know and what we are learning, it is increasingly clear that maintaining environmental diversity and complexity is unquestionably in humankind's interest.

Rhode Island is blessed with an environmental diversity that belies its compact size. Its glacially sculpted landscape, situation at the oceanic--continental interface, and temperate climate yield a rich variety of marine, terrestrial, and aquatic habitats and an abundance of species. The state's woodlands, fields, lakes, streams, marshes, and coastal waters harbor over 435 species of birds, mammals, fish, reptiles and amphibians. More than 1,500 native species of vascular plants have been identified in the state. Through proper management, many of Rhode Island's wildlife species are rebounding in numbers, and one or two long-extirpated species have recently returned. A number of species are **not** faring well, however, and continue to decline; 12 animal species and 53 plant species are listed as Federal or State Endangered by the Rhode Island Natural Heritage Program⁴. Less is known about the state's invertebrates, fungi, algae, lichens, mosses and liverworts; a few species (primarily insects which vex our agricultural endeavors) have been studied intensively but what we know about these fellow beings is dwarfed by our ignorance.

The benefits provided us by plants and animals are significant, and continue to expand as science reveals new properties and utilities. Plants provide many social benefits: food, fiber, energy, and medicinal derivatives being the most direct and valuable. Direct benefits of wildlife include provision of food, hides, and other consumables. Indirect benefits are equally significant: our flora and fauna support a diversity of outdoor recreational pursuits enjoyed by up to 30 percent of Rhode Islanders, including hunting, fishing and nature observation and photography. Wildlife also makes important contributions in helping control the populations of nuisance species such as rodents and mosquitoes, in research and environmental education, and as indicators of the overall quality of the environment. Beyond tangible benefits, plants and wildlife also provide aesthetic and spiritual values; captured and conveyed through art, literature, music and other cultural interpretations. The beauty and joy brought to human existence by flowering plants and by the songbirds' tune is undeniable, if intangible.

Locally-produced food, fuel and fiber products

Making a livelihood from the forests, fields and waters was the occupation of the earliest "Rhode Islanders"--the Narragansett Indians. Their communities and economies, based upon subsistence hunting, gathering and tending native crops, flourished for centuries before Roger Williams--the founder of colonial Rhode Island--arrived in 1636. In the first two centuries following European settlement of our shores, the natural resource-based sector continued to be the mainstay of the colonial and early state economies. Today, the hard work of producing food, fuel and fiber from the land remains a traditional lifestyle kept alive by many Rhode Islanders. And while no longer pre-eminent, resource production remains an important component of Rhode Island's economy.

4

Enser, Richard. R.I. Natural Heritage Program. Personal Communication. 1993.

The state's 1992 agriculture output was valued at \$141 million⁵. Fishermen landed a catch of finfish and shellfish valued at \$83 million⁶. The state's primary and secondary forest products industry employed approximately 5,000 persons, and provided a wage base of \$70 million⁷. The value of products derived from Rhode Island's forests was an estimated \$40 million in 1984⁸.

Our productive resource lands are also a strategic reserve for certain commodities. While it is impossible to produce indigenously all the food, fiber and fuel products needed by the state's citizens, the retention of resource-producing capabilities does provide a cushion for supply disruptions, at least over the short term. This was demonstrated when thousands of Rhode Islanders turned to wood as their primary or supplemental fuel source in response to the national energy shortages and price shocks of the 1970s and 80s. Fuel wood production from Rhode Island's forests temporarily skyrocketed from under 10,000 cords to over 200,000 cords in a few short years⁹. Similarly, in-season, locally-produced crops out-compete the factory-farm-produced national supply in both price and quality. The roadside farmstand is an icon of Rhode Island's rural landscape, and the Sunday afternoon drive into the "country" to get tomatoes or sweet corn, or to pick berries, a pleasant summertime outing for thousands of Rhode Island families. Indeed, if it were not for Rhode Island-grown, would any of us remember what a *fresh, "real"* tomato tastes like?

Recreation, Leisure, and Learning

Greenspace, our land and water, is the venue for all forms of recreation, leisure, enjoyment, and education in the outdoors.

Outdoor Recreation

Rhode Islanders, like all Americans, love the outdoors. The six recreation guide plans which Rhode Island has prepared since 1965 have consistently documented this love, and its expression via pursuit of a myriad of outdoor activities. In 1990, recreational usage of the state's outdoors by Rhode Islanders was estimated to be an astonishing 200 million activity occasions--nearly one recreational activity every other day per resident¹⁰. From the tens of thousands who bask on the

5 R.I. Department of Economic Development, *The Rhode Island Economy*. 1993. p. 15

6 *Ibid.*

7 Rhode Island Department of Environmental Management, Division of Forest Environment, *et al. Primary Wood Producers Directory*. 1990.

8 R.I. Office of State Planning and R.I. Division of Forest Environment. *Rhode Island Forest Resources Management Plan*. 1984. p. 2.21.

9 *Op. cit.*, pp. 1.17 -- 1.18.

10 R. I. Division of Planning and R.I. Department of Environmental Management. *Ocean State Outdoors: Rhode Island's Comprehensive Outdoor Recreation Plan*. pp. 4.12 and 4.20.

state's expansive ocean beaches on summer's warmest days, to the solitary and silent ice fisherman on January's frozen lakes, greenspace provides the common bond: the setting for people to access and interact with their environment in their individual and personal fashion. A place to relax; to be among family and friends and to forget--however briefly--the worries and compulsions of the world. A place to compete; to pit one's abilities against those of others, or one's wits against the elements, in strength and character-building activities. The social benefits derived from such recreational activity are not readily quantified, but unquestionably include improved public health and vigor, reduction of stress, and quite likely, the development of well-rounded and fully-engaged members of society.

Tourism

Tourism, a billion plus dollar contributor to the gross state product, is grounded upon Rhode Island's distinctive natural and cultural features and on the public's ability to access and use them. Our magnificent Narragansett Bay and ocean shoreline, swimmable beaches, fishable streams and ponds, rural farmscapes, and autumnal forest-foliage combine with historic villages and sites, heritage-rich "working" rivers, and preserved architectural marvels to constitute a strong magnet drawing tourists to our state. Our guests "use" our outdoors in their quest for recreation, relaxation, leisure, and cultural enrichment and in the process, help enrich the state's economy, providing an estimated \$1.1 billion in retail sales¹¹ income for Rhode Islanders in 1991. Expenditures by visitors to Rhode Island for fishing, hunting, and non-consumptive wildlife recreational activities alone were estimated at \$52.5 million in 1985¹². If we succeed in preserving key elements, and integrating visitor support services, tourism should continue as a rising star of the state's economy. The Nature Conservancy's designation of Block Island as one of only twelve "Last Great Places" in North America will help bring "eco-tourists" from around the world to witness the diversity of life in our unique island ecosystem. The creation of the Blackstone River Valley National Heritage Corridor will do the same for all interested in the story of our nation's industrial past.

Environmental Education

Greenspace provides a setting for teaching and learning about the wonders and workings of our natural environment. Our woods, wetlands, shorelines, and fields are all open-air classrooms where our innate curiosities about nature can be nurtured and gratified. Careful observation and instruction on natural processes and cycles reveal the diversity, complexity and interconnectedness of ecosystems. Even casual and occasional exposure to the natural world can reveal wonders which lead to new personal understandings of one's place in the natural order.

Many Rhode Island schools have active environmental education curricula, a number based upon the successful "Rhode Island Naturally" teaching guide developed by the Audubon Society of Rhode Island. The Narragansett Bay Classroom of the University of Rhode Island provides environment-based instruction to hundreds of Rhode Islanders each year. Brown University's

¹¹ R.I. Department of Economic Development, Research Division. *The Rhode Island Economy*. 1993. p.15.

¹² U.S. Fish and Wildlife Service. *1985 National Survey of Fishing, Hunting, and Wildlife Associated Recreation*. Table 93.

Center for Environmental Studies has won national acclaim for its innovative and activist programs. In recognition of the importance of environmental education, and its dependence upon protection of and access to open space, the R.I. Natural Heritage Preservation Commission considers the proximity of target sites to schools and the sites' suitability for environmental education when awarding grants and loans to local governments for greenspace acquisition.

The venues, resources, and materials needed to continue the important mission of environmental education can only be found in the outdoors. The need to promote wider understanding of the lessons of nature, and of each individual's role and responsibilities within it, is growing in concert with the very distance and isolation from nature which our urban/technological society increasingly enforces. The emergence of transcendent environmental concerns such as ozone depletion, deforestation and desertification, and global warming make urgent the need for each citizen to become more aware of the impact his or her demands have upon planet Earth's natural resources and systems, and ultimately upon the sustained habitability of the planet.

Economic Capital

Rhode Island's natural endowment also provides essential working capital for its economic base. This dependence was clearly evident in the past when agriculture, commerce, and basic industry dominated the economic picture; but it is only slightly less true today. While diminished from their past dominance, the natural resource-based industries--fishing, agriculture, and forest products--continue to be traditionally significant livelihoods in certain locales; and, as indicated previously, are important to the state's overall economic diversity. Guaranteeing an abundant supply of pure water remains a fundamental plank of state industrial policy and could be increasingly important in attracting targeted growth sectors such as biotechnology and micro-electronics. Greenspace, and access to it, are also central to the state's promotion of its engaging lifestyle and recreational amenities as competitive advantages in attracting and retaining "Information Age" industries and the talented employees they need. A high quality of life for employees was identified in a 1989 national survey of chief executive officers as the third most important factor (following access to markets and availability of skilled labor) in their business location decisions¹³. While we strive to increase Rhode Island's competitiveness on labor costs, energy, and other production factors, we must simultaneously insure that the environmental and lifestyle advantages it already enjoys over many areas are not allowed to diminish.

Hazard Avoidance

Greenspace mitigates the risk to life and property posed by natural hazards. In cases where the risk is great, and the consequences high, reservation of such areas as permanent greenspace provides a social benefit in avoided loss of life, injury, and property damage.

Flooding is the greatest natural calamity Rhode Island has faced historically, and flood hazard areas are present throughout the state. Coastal barrier beaches, coastal ponds, and the wetlands and lowlands surrounding them are the state's front-line defense against the assaults of hurricanes

¹³ 1989 Cushman and Wakefield Survey of CEOs, cited in *Economic Impacts of Protecting Rivers, Trails and Greenway Corridors*. National Park Service. 1990. p. 6-3.

and "northeasters" on the coastline. Where undeveloped, these features absorb and dissipate the energies of wave and wind attack, affording a measure of protection to inland areas. In similar fashion, riverine wetlands and riparian lowlands, where they remain intact, reduce the magnitude and velocity of flooding.

Protection of life and property by reserving flood risk areas as open space has been a successful strategy in two Rhode Island instances: a riverine floodplain and a hurricane-susceptible coastal barrier. In the early 1960s the State purchased East Beach in Charlestown--a three mile long strip of low-lying barrier beach--and created the Ninigret Conservation Area. A significant consideration in this decision was preemption of human occupancy on this vulnerable coastal barrier, which had been swept clean of development in

previous hurricanes. Twenty years later, the State, the U.S. Army Corps of Engineers and the City of Warwick cooperated in the acquisition of flood-damaged properties in the Belmont Park neighborhood along the Pawtuxet River. As in the case of Ninigret Beach, the area is now managed as a greenspace and recreation area, and no further risk to life or property exists.

In addition to flooding, Rhode Island is susceptible to some risk of earthquakes, sea level rise, radon infiltration, and severe weather events such as tornados, hailstorms, drought, and lightning. However, the geographic dimensions of these natural hazards are, at this stage, much less well understood or predictable than flood risks.

Community Character and Aesthetics

The aggregate amount and distribution of greenspace largely defines, in the physical sense, the character of communities. Cities become *urban* as they progressively and near completely replace the natural landscape with human-engineered structures and built environments. Areas remain *rural* only if the *un*-built landscape retains dominance--remaining a setting for, rather than being supplanted by, buildings and roads. Effectively deployed as a state growth management tool, greenbelts, or broad expanses of greenspace in which only open space and low intensity land uses are allowed, could separate and differentiate urban from rural environments, allowing each to retain its distinctive characteristics.

Preserved greenspace, along with artifacts of heritage and architectural landmarks, is also crucial to retaining what has been called "a sense of place" in our communities; a distinctiveness, integrity, and continuity allowing residents to feel familiarity and identity with the physical features of their everyday environment. Be it the farm that has been in the same family for generations, the town green, an urban community garden, or just a stand of pines that "*has always*

been there" atop the ridge, familiar natural settings play a considerable role in establishing the spatial limit of what we consider our community, our place in the world.

The creation and management of public greenspace can be a powerful force in the actual creation of *community*, that feeling of shared interest and outlook, by serving as the common ground that brings individuals together to define shared objectives and to cooperate in their attainment. The work of the Southside Community Land Trust in Providence illustrates the power of greenspace as a catalyst in inspiring community, and in addressing neighborhood problems that extend far beyond the traditional mission of land protection or reclamation.

Retention of greenspace within communities also contributes to the aesthetics of the built landscape. A greensward threaded through a densely developed urban neighborhood provides visual and physical relief from the the jumble of concrete, bricks, and pavement comprising our cities. Such a break in the pattern of the human-made landscape may be a neighborhood's only reminiscence of nature, providing the solitary escape for eye and mind from an otherwise harsh and garish visual pattern. Something as simple as a row of urban street trees can work wonders in separating and softening the "hard edges" of development.

In rural communities, greenspace retained in the right amount and locations can provide a distinct boundary between areas to be intensively developed, such as village centers, and the surrounding, more rural, landscape. Effectively employed as part of a community development strategy, such green buffers prevent the monotonous sprawl of uniform-density development across the entire landscape--and the consequent loss of landscape diversity.

The Spiritual

Many greenspace areas also have religious, spiritual or ceremonial significance.

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The above enumeration, limited by our contemporary understanding of natural processes, and by its anthropocentric bias, far from exhausts the values which greenspace provides to Rhode Island. It does, however, make clear that things important to all Rhode Islanders alive today, and all that will follow, are embodied within the woods, the fields, the fens, the rivers, the bays, the ponds, the hills, the lakes, the beaches, the bogs, the shores, the marshes, the islands, and the swamps of

our small state. From the most direct dependency to the most obscure connection, our fate is, in many consequential ways, inseparably linked to the fate of the good, green land we daily tread.



155-2 THE PAST



What's Past is Prologue
W.E. Shakespeare
The Tempest

To plan effectively for the future of Rhode Island's landscape, we must understand the forces and events which shaped the present landscape. The story Rhode Island's landscape would tell of the last 350 years echoes, in microcosm, the story of the American landscape: the unyielding advance of the frontier, rout of native vegetation, unfettered exploitation of resources, supplanting of indigenous species and habitats, and despoiling of waters.



2-1 A Prolonged Siege

Since the toppling of the first tree by Roger Williams and his followers in 1636 at the head of Narragansett Bay--a place they named Providence--humans have laid siege to Rhode Island's greenspace. The attacks have waxed and waned over time, but the campaign has been sustained and unwavering in ultimate purpose: replacement of the natural with the built, reshaping of the landscape to suit human purpose.

Rhode Islanders' changing relationship with the land has evolved through three distinct epochs--agrarian, industrial, and automotive.

2-1-1 Agrarian era

The initial agrarian assault had perhaps the most extensive, but least enduring impact. By 1767 virtually three quarters of Rhode Island's virgin forests had been felled by colonial settlers and farmers.¹ Hundreds of thousands of acres were cut or burned clear and laboriously hand-culled of their ubiquitous stones. These efforts sent the native wildlife scurrying for refuge in advance of the woodsman's axe. Some species--wolf, moose, eastern mountain lion--never returned; others--wild turkey and beaver--are only today repopulating western Rhode Island's woods.

¹ Rhode Island Department of Environmental Management, Division of Forest Environment. Rhode Island Forest Legacy: Needs Assessment. 1992. p. 4.

2-1-2 Industrial era

Rhode Island's economic destiny, however, was not to lie in agriculture. Samuel Slater's Mill, built in 1790 at Pawtucket's Blackstone River falls, heralded the second epoch of our dealings with the land: the American Industrial Age. The ensuing two-century march of industrialism across the landscape forever changed the face of Rhode Island (and America). While the eclipse of farming allowed Rhode Island forests to rebound--the resilient native oak-hickory stands again covered 62 percent of the state by 1935² -- urbanization engendered new assaults on Rhode Island's land and water.

Falling water, source of energy for Rhode Island's fledgling industries, made the valleys of rivers and major streams the initial locus of development. As natural cataracts were few, entrepreneurs created dams and impoundments for their factories, permanently changing the free-flowing character of Rhode Island's surficial hydrology. Many waterbodies became common sewers for industrial effluvia and human waste. Such "improvements" to the natural scheme drastically altered the distribution and composition of Rhode Island's freshwater habitats, generally extinguished the anadromous fishery, and greatly diminished the diversity and abundance of its original aquatic wildlife.

By the mid-nineteenth century, new tools--steam power, bricks and mortar, iron and steel--came into full play, fueling our ability to rearrange nature on a faster, bigger, and more permanent scale. As Rhode Island gained dominance in textiles, machine tools, and other manufactures, vast industrial complexes crowded the banks of the Blackstone, Pawtuxet, Woonasquatucket, and Moshassuck rivers. To provide room for expansion of commerce, the railroads, and shipping, Providence's Great Salt Cove, many of the expansive salt marshes and tidal flats along the upper Bay shore, and swamps and fens along major rivers were filled in. Eventually, Rhode Island would come to lose much of its original wetlands legacy--up to half of its productive salt marshes³--before they were afforded any protection.

The indignities visited directly upon the rivers flowing into Narragansett Bay were notorious. Sewage from the growing population in cities at the head of the bay went, untreated, directly into its waters. Providence's Moshassuck Canal was described in 1854 as "foul smelling with hogs, dogs and cats [floating] in the water and large quantities of gas arising from decaying substances⁴. Six million gallons of manufacturing wastes and 50,000 pounds of grease were found by an 1895 report to be the *daily* burden dumped by industries into the Providence River⁵. Such exploitation and neglect diminished the richness and diversity of life in large portions of Narragansett Bay.

² Ibid.

³ R.I. Division of Planning and R.I. Department of Environmental Management. Ocean State Outdoors: Rhode Island's Comprehensive Outdoor Recreation Plan. 1992. 3.38.

⁴ Snow, E. Statistics on Causes of Asiatic Cholera. 1855. cited in Olsen, S., Robadue, D., and Lee, V. An Interpretative Atlas of Narragansett Bay. University of Rhode Island Coastal Resources Center Marine Bulletin 40. 1980. p. 40

⁵ Ibid.

Our three centuries of war against the land were not devoid of "counterattacks". Occasionally, the land fought back with cataclysms illuminating the folly of our transgressions: a water pollution-induced cholera epidemic in the 1850s; floods and hurricanes, erasing in an afternoon, decades of building on shifting sands and soggy soil; the collapse of oystering in the Bay, a once bountiful resource and source of livelihood, extinguished by one short generation of mismanagement and pollution. But mostly, greenspace played the victim.

2-1-3 Automotive era

The twentieth century brought the automobile, and the ribbons of asphalt and concrete highways we unfurled across the land before it. Rather than solving the festering problems of overcrowded cities, the auto provided the means to escape them. The cities were no longer the focus of our landscape rearrangement; indeed we ultimately came to abandon many of the ambitions we once held out for their beautification and betterment. Instead, as barriers of time and distance fell, we cast our space-hungry gaze farther into the hinterland.

The mobility our cars granted, however, came at high cost to greenspace: a greatly "democratized" distribution of pollution and land degradation. More cars, more buildings, and more pavement spread over more and more of the landscape, meant more destruction and displacement of plant and animal communities, more polluted runoff flowing into waterbodies, and less greenspace.

In Rhode Island, the fruits of decentralization were subdivisions and shopping centers spilling outward from Providence, down the Post Road, and Route 2; creeping up Aquidneck Island from Newport; and climbing the walls of the Blackstone and Pawtuxet Valleys. Small coastal towns shed their traditional role of summer colony and blossomed into year-round communities, acquiring in process all the accoutrements--shopping centers, office/industrial parks--and many of the problems--pollution, traffic--of modern suburbs. Mill villages and farms forgotten by time for a half century found themselves engulfed in a sea of much newer developments, which often dwarfed their scale and mocked their heritage.

A marked economic downturn, followed by inflation and high interest rates, slackened development pressures in Rhode Island throughout the 1970s, but left untouched the desire burning in many Rhode Island families to escape the cities and the older inner suburbs for bigger homes with better views. By the 1980s, the stage was set for an explosion (see box, page 2.4). The centrifugal diffusion would approach its end game as "escapees" from metropolitan Providence ran headlong into refugees from Boston and Hartford. To those seeking escape, "The City" encompassed, figuratively and quite nearly literally, all within the 30-odd mile belt Interstate 295 wraps around Providence.

By 1985, all of Rhode Island's landscape fell within the range of comfortable commutation. Affordable cars and good roads allowed more Rhode Islanders than ever before to enjoy the good life in the country or idyllic setting of a house by the sea. As they moved to such settings, they brought with them new, insidious, threats to the natural and cultural treasures of greenspace: nitrates leaching invisibly from thousands of septic tanks to overpower the natural cleansing capacities of a waterbody or aquifer; tens of thousands of vehicle trips (and countless millions of

crankcase drips) shuttling at breakneck speed along roads laid out for horseback travel; century-old farms raising new crops of three-bedroom ranches or office buildings.

Wake up call

For a few remarkable years in the 1980s Rhode Island was a boomtown. Real estate, development, and construction drove the state's "go go" economy for five frenetic years. Fortunes, legitimate and fraudulent, were made in real estate in those few short years. When the growth bubble burst, it left a shattered banking system and economy, a bill an entire generation of honest, hard-working Rhode Islanders will pay, and a state's faith in its institutions profoundly shaken.

In the aftermath much effort has been expended to dissect the *who, what, where, how and why* of the development boom and bust, but available data tell little of the boom's impact on the landscape. Statistics reveal, for instance, that commercial construction surged from \$44 million in 1981 to \$95 million in 1987, or that new housing unit permits jumped from 2,400 in 1982 to over 7,000 in 1987. The acres of forest felled, wetland infringed, shoreline walled off, or farmland paved were not so dutifully counted as the wave of growth swept across the state

But as the boom proceeded, Rhode Islanders knew that their landscape was paying dearly. Across the breadth and depth of the state, they saw an all too tangible "downside" of growth as bulldozers disrupted the peace of their neighborhoods, and open spaces near and dear to their hearts and souls--farms, woodlands, historic structures--disappeared forever. Driven by rampant speculation, development of hithertofore marginal land was pursued in earnest. Open spaces long skipped over as the cities and suburbs grew, suddenly were the venue for proposed house lots, condominiums, and shopping centers.

While the sheer magnitude of the growth shocked Rhode Island to reality, perhaps the most chilling feature of the boom was the ubiquitousness and seeming incoherence of what was being built. Development of some fashion was happening literally in every corner of the state, frequently without discernible regard for sensitive resources, or respect for time-honored, traditional patterns and scales of community organization. Many of the developments bore little relationship to needs of communities affected--some, unmarketable for years after they were built, bore scant relationship to economic reality. To many longtime residents, the pace and scale of landscape change was unprecedented and frightening: Rhode Island was becoming California, in a development sense, before their very eyes.

The dramatic period proved a rude awakening to the vulnerability of gre changes to Rhode Island's landscape witnessed in such a short enspaces so many Rhode Islanders treasured. Lulled by the sluggish growth of the seventies and early eighties, many had grown accustomed to think that the view out their back windows would never change...that the woods at the end of the block would always be there. The naivete that remoteness conferred immunity from change was just one of many public innocences lost in the 80s.

Lessons of the 80s

The 80s are now history. The boom seems a distant, receding memory; while the *morning-after* effects of the bust linger still. What did we learn? What lessons can we carry forward as we rebuild our economy, heal our landscape, and regain our confidence?

We learned that our plans and programs were not neutral; they proved to be decidedly pro-growth, and the protections they professed for open space were weaker than we had thought. A graver fault was that our plans lacked a definitive vision for the landscape. We found, too late in many cases, that it was not enough to rely upon the wisdom of the market to decide exactly how and when land would be developed. In our desire to embrace the benefits of growth, we had failed to specify the kind of growth we wanted, when we wanted it, and to detail how it should properly relate to the land.

We learned the price of neglecting regular programmed investment in greenspace. Slow growth, tight budgets, and federal cutbacks had brought investments in local recreation and open space system expansions virtually to a standstill in the late 70s and early 80s. When the boom came, communities discovered their open space acquisition programs at low ebb at precisely the time when burgeoning growth both spurred public demand for greenspace and threatened critical lands.

Finally, Rhode Island learned a lot about the passionate love our people have for their land and water. Recoiling as they took measure of the toll development was exacting on the landscape, citizens mobilized in opposition to projects threatening their special open spaces. Soon, a groundswell of concerned citizens were clamoring for government action to protect open space. Watching their landscape devoured and heritage erased, on three occasions, Rhode Islanders dug deep into their pockets to finance over \$130 million in State and local borrowing for open space and recreation. Over five years, nearly 10,000 acres--historic farms, beloved beaches, urban playgrounds--were purchased. Because we had waited until the crisis was upon us, however, many crucial sites demanded a peak price; but the cost if they had been lost would have been far higher still.

History will record the 1980s as a watershed for Rhode Island's landscape. Rhode Island was, as its autotag slogan invited for decades, "discovered" in the 80s: by Boston-bound commuters, by tourists, by out-of-state developers, by national retailers, by global industries. While the decade's stratospheric growth rates are unlikely to be repeated soon, the pressures of growth on the land will surely return as prosperity again takes root.

The eighties gave us a foretaste of the destiny which economics and inertia alone hold for Rhode Island's landscape. Armed with this revelation, the challenge falls now to a weary citizenry to bring forth a better fate for the land they love.

2-2 Countertrend

Throughout the long story of our landscape one principle was dominant: land's worth lay solely in its utility to our immediate, principally economic, purposes. Our belief systems--religion, economics, science--all reassured our smug dominion over the earth and counseled that its bounty was put here for our purpose, our productivity, our manipulation. Land and water were taken for granted: there in ample quantity for the taking, and we generally took them without a thought to consequences.

But, against the predominant theme of a landscape besieged, a countertrend of preservation is interposed through the story of Rhode Island's greenspace. While not pervasive enough to constitute a "land ethic," periodic attempts to reconcile our immediate demands on the land with its abilities and with the needs of the future are also recorded. On distinct, and long separated, occasions the urge to preserve rose to the fore as Rhode Islanders, motivated by crisis, necessity, noble instinct, desire to be memorialized, unique opportunity, or some combination, decisively acted to reserve critical lands and waters for public use and for posterity.

2-2-1 Early public spaces

The beginnings were small: tiny parcels donated or set aside as "commons" and public parks in the 1700s in Providence and Newport. It was not until the late 1800s, as industrialization and immigration choked the cities with people and pollution, that the idea of a "public estate" (reserving land for public recreation, to improve the environment and aesthetics of the cities, or to protect key resources) gained wider acceptance. As late as 1872, Providence city fathers expressed reservations over accepting Betsy Williams' donation of the 100 acre Williams family farm for public recreation, because it extended beyond the southern boundary of the city and was removed from built-up areas⁶. (Eventually accepted, the Williams' donation grew into the 400 plus acre Roger Willams Park--an acknowledged jewel of modern metropolitan Providence.)

⁶ R.I. Historical Preservation Commission. Providence: A Citywide Survey of Historic Resources. 1986. p. 178.

2-2-2 Planning of public park systems

A significant advance came at the close of the nineteenth century--one hundred years ago. Inspired by the 1883 Chicago Exposition and the City Beautiful movement it spawned, Providence joined other American cities in planning a regional-scale public park system as an escape for residents of overcrowded neighborhoods. In Providence, a voluntary group--the Public Park Association--was formed in 1883 to advocate preserving greenspace for public usage. The City created a Board of Park Commissioners in 1901, and by 1910 it oversaw 31 parks covering 640 acres.

On a broader scale, the General Assembly of Rhode Island formed the Metropolitan Park Commission in 1903 to plan a park system encompassing all the environs of Providence. With \$550,000 authorized by state voters in 1906 and 1912, the Commission pursued a grand scheme of parks, boulevards, and public reservations (see Figure 155-2(1)). By 1933, the jurisdiction of the Commission had been broadened to encompass the entire state, and it had acquired 34 reservations containing over 4,300 acres. While the entire plan was never fully realized, the elements of the Commission's plan that were implemented constitute an important fraction of the public open space of modern-day greater Providence. The work of the Commission also laid the foundation for the present-day state park system. Sadly, while the state system continued to grow, efforts at broad-scale system-wide planning evidenced by the Metropolitan Commission's grand plan waned.

The first grand scheme for greenspace and greenways in Rhode Island was produced nearly 100 years ago by the Metropolitan Park Commission. Parts of the plan that were implemented give Providence much of its present day supply of greenspace.

Figure 155-2(1)

Rhode Island's First Grand Greenway Plan

2-2-3 Watershed land

The necessity of supplying pure water for growing urban populations provided a second impetus for publicly-preserved greenspace. As their local water sources were overtaxed or polluted by encroaching development, several of Rhode Island's growing cities looked to the hinterland for water. In 1885-6 the City of Pawtucket acquired land at Diamond Hill in northern Cumberland for its reservoir. Between 1915 and 1926, the City of Providence bought and condemned over 23 square miles of land on the north branch of the Pawtuxet River and relocated residents of five villages to create the Scituate Reservoir.

Today, the Scituate watershed is a 13,000-acre preserve on the fringe of metropolitan Providence. A veritable wilderness, it provides much more than the pristine water it was established to ensure. Other Rhode Island communities that have developed water supply reservoirs, and protected greenspace in the process, include Woonsocket, Newport, East Providence (since abandoned as primary supply), Jamestown, and the Bristol County communities.

What We've Saved

Rhode Islanders, over the last 350 years, have saved about 13 percent of the state's land area as preserved greenspace (see map). This estimate, derived from the R.I. Recreation, Conservation and Open Space Inventory, includes a public estate (federal, state, and local) of about 80,000 acres (just under 12 percent of the state's area), and about 7,000 private conservation acres that can be considered securely protected (1 percent).

More important than quantity is the quality of what we've set aside. What we've saved includes places of outstanding scenic wonder... Clay Head Cliffs, Goosewing Beach, Beavertail Point; irreplaceable natural treasures...Trustom Pond, Seapowet Marsh, Great Swamp; commemorations of the state's industrial and ethnic heritage...Blackstone River Corridor, Cliff Walk, Trestle Trail; critical resource lands..Scituate Reservoir, Arcadia, Cottrell Farm; and places where generations of Rhode Islanders have gone for family outings...Goddard Park, Scarborough Beach, Roger Williams Park. These places are now secure--solid ground in an increasingly fragmented and shifting landscape.

2-2-4 Federal property transfers

Some greenspace preservation resulted from unique opportunities. Sizable tracts in western Rhode Island were set aside in the Depression Era as federal camps under the Civilian Conservation Corps program. These holdings were later turned over to the state, becoming extensive management areas in the state woodlands system.

A similar opportunity was capitalized upon in the early 1970s when the U.S. Navy closed and abandoned a number of its fortifications and munitions depots on islands in Narragansett Bay. After considerable effort, nearly 2,000 acres of this former military land was deeded to Rhode Island to create the Bay Islands Park System.

2-2-5 Recent land acquisition programs

Federal social and environmental programs of the 1960s and 1970s brought a major push to provide green space for public use. Rhode Island, like other states, took advantage of the Land and Water Conservation Fund Program, which underwrites 50 percent of eligible open space purchases and recreation facility development; the Pittman-Robertson Act, which provides funding for wildlife habitat acquisition; the Dingell-Johnson/Breaux-Wallop program, which funds fisheries habitat protection and restoration; and the Coastal Zone Management Act, which funds estuarine sanctuaries and coastal land purchases, to preserve many important greenspaces. Direct federal acquisition also played a role: about 1,200 acres have been acquired along Rhode Island's coast as National Wildlife Refuges.

Funding under most of these programs dwindled to a trickle during the 1980s; but while they were at their heyday, Rhode Island used their resources to support a major expansion of its protected greenspace. Federal acquisition programs, combined with state funds under the Green Acres and reservoir land acquisition bonds of the 1960s and the Open Space bonds of the 1980s, allowed Rhode Island's public open space to grow from around 50,000 acres in the early 1960s to approximately 80,000 acres today.



155-3 THE PRESENT



**Living in places where nothing is connected properly,
we have forgotten that connections are important.**

James Howard Kunstler
The Geography of Nowhere

Part Two portrayed our first three centuries on these shores as a period of disrespect for the landscape and scant concern to the needs of the future. But it also revealed a brighter imperative in our history: times when we acted on our responsibility towards the inanimate land and water, respected our commonality with the creatures which co-habited it with us, and honored obligations to those who would follow. Where has this mixed record of our long march across the landscape brought us? What are the problems facing greenspace today?



3-1 Greenspace Erosion

Three dynamics are affecting greenspace today: *consumption*--we are using the landscape up at an increasing rate; *fragmentation*--we are cutting up the natural landscape in an alarmingly unplanned and uncoordinated manner, with unknown consequences; and *endangerment of critical areas*--we continue to threaten critical areas without sensitivity to their natural and cultural values. In sum, these trends amount to a loss of connections: a severing of the natural connections that stitch the landscape's ecological systems together, and a breaking of our ties to the land.

3-1-1 Consumption

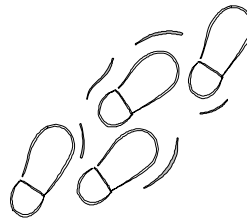
**We're gonna' use it up and wear it out;
ain't noth'in in this ol' world that I care about.**

Pat and Mick, © PWL Records, 1990

As a micro-state, consumption of land is something that Rhode Island must be continually aware of. Once our precious 1,000 or so square miles are gone--committed permanently and irretrievably--the jig, as the saying goes, is up. How far along that continuum are we? How heavily have our footsteps tread on the land?

Leave only Footprints.....

Most Rhode Islanders have walked along one or two of the Ocean State's beaches in their lives. The reality of our collective tread on the landscape is quite different from the comforting image of vanishing footprints in the sand: imagine leaving behind a footprint about 50 feet wide and 160 feet long. Each Rhode Islander, just over a million of us at present, has a "developed land" footprint of that size--his or her proportionate share of our developed landscape.



Each step embraces the good, the bad and the ugly of our built world: from the most elegant historic home to the crassest commercial strip, the up-scale "executive" subdivision to the blighted urban tenement.

Save for the extinction of a precariously-sited beach house now and then, the incoming tide does not erase this evidence of our long trek. Our mark on the land continues to grow: in 1960, each of our footprints was about 40 by 150 feet, and there were 150,000 fewer of them. By 2010, unless we do better in guiding and concentrating growth, each Rhode Islander's footprint on the land will measure 75 by 175 feet, and there will be 55,000 more of them than there are today.

Our land is about one-quarter gone. While, at one time or another and in one way or another, we've altered just about all of Rhode Island's land, we've consumed--physically occupied with structures and pavement--just about 25 percent of the state's land area¹.

While a quarter of the state developed may seem an amazingly small "footprint" from more than three centuries of European occupancy, consider what that means: during our tenure as stewards, we've been twice as effective at using up land as we have at saving it (recalling the 13 percent "protected open space" statistic from Part Two). This is quite a departure from the land used/land preserved ratios of the previous "tenants"-- the Narragansetts, Wampanoags, and other Native American tribes.

Consider also that the 25 percent figure excludes an additional quantity of land (perhaps another 4-5 percent), mostly the large lots associated with the very low density residential development that has proliferated in rural parts of the state in recent years. While "undeveloped," this land is very much "committed" to developed use.

Even if we've "committed" nearly one-third of our landscape to developed uses, that leaves two-thirds of the state as raw land. True, but consider, most significantly that land consumption is accelerating. Between 1636, when European settlement began, and 1960, Rhode Island urbanized just under 20 percent of its land, an average rate of 6.2 percent per century. During the last generation--1960 to 1990--however, development proceeded at a per-century rate of 11.6 percent--nearly double the long-term average².

The threat to greenspace lies not in the time-honored patterns of using land that brought us most of the way to the contemporary landscape, but rather in the continued pursuit of the land use trends of the last generation. During that period, we developed an amazing zeal for equating better with bigger when it comes to land use, translating into an ever increasing scale of development, quantity of land consumed, and toll on the landscape. The price of engaging in everyday activities such as working and shopping, in land consumed, grows higher each year.

Think about the changes the last generation has witnessed in the sheer scale of common land uses:

- ❖ Supermarkets, originally 10,000-20,000 square-foot emporiums (considered spacious and modern when they replaced the 2,000 square-foot corner market in the 1950s and 1960s), now are functionally obsolete unless they cover several football fields and stock everything from arugula to antifreeze.

¹ Data from RIGIS, Landuse/landcover dataset, based upon 1988 aerial photography.

² This analysis is based on figures in the 1975 State Land Use Plan and the RIGIS Landuse/landcover dataset. The 1960-90 rate estimate is conservative because the 1988 aerial survey counted undeveloped portions of large residential lots committed to low density residential usage as undeveloped land. If these "undeveloped" but committed areas were counted as "consumed", the land consumption rate of the last generation would likely be more than double the historic average.)

- ❖ In like vein, the department store--the venerable, multi-storied downtown flagship--was first replicated as single-floored suburban plaza anchors, and later became part of the malls that functionally supplanted downtowns as our marketplaces. Today, the new retailing phenomena is the differentiated, or specialty superstore: we have electronics superstores, discount clothing superstores, office supply superstores, hardware superstores, and sporting goods superstores. What the department store brought together under one roof is now spread out under a proliferation of roofs--each taking a bigger chunk out of the landscape than all but the largest of their predecessors. As our retailing options expanded, each increment of space consumed undoubtedly added to our choice and convenience as consumers, and to the gross domestic and state products; but each leap forward has also had consequences for the landscape and our greenspace.
- ❖ Our workplaces have also fundamentally changed, as the territorial imperative affected industrial land usage. Employment density ratios, commonly twenty to thirty or more employees per acre in old manufacturing districts, have dropped to an average of fewer than ten employees per acre as factories have gone from multi-to single-storied affairs, and have occupied more spacious sites.
- ❖ Our contemporary "neighborhoods"--if fifty homes strung out along ten miles of rural road can be called a neighborhood--reflect the dispersion process carried to extreme in the spaces we need to live. New residential development at the densities and specifications that gave us such endearing traditional neighborhoods as Providence's Benefit Street, Pawtucket's Quality Hill, and East Greenwich's Hill and Harbor is now illegal in most of the state.

For better than a generation, we have embraced spaciousness as an unspoken national goal. We *needed* more space: the American Dream required it--bigger houses on bigger lots to accommodate our acquisitive lifestyles; wider highways carrying faster cars to satiate our desire for mobility and speed; a proliferation of stores to maximize our craving for convenience and choice. In a headlong rush to spread ourselves diffusely across the land we never paused sufficiently to contemplate the implications such patterns would have for our landscape or for our lives. Instead, we reticently accepted sweeping changes in how we use land and how we relate to the landscape, and restructured our lives to accommodate the new patterns. Only now are we beginning to question the effects of our space-hungry postwar growth. We wonder: Are the patterns efficient? Are they sustainable? What have we given up in trade? Are we better off, other than materially, than we were before?

3-1-2 Fragmentation

All the King's horses and all the King's men couldn't put Humpty together again.

Although, in aggregate, undeveloped open land in Rhode Island remains substantial, the way in which we use land is fragmenting and compartmentalizing the natural landscape. This poses an increasing threat to the values greenspace provides. By plunking development down without adequate consideration to the integrity and dynamics of natural systems, we are chopping the landscape into smaller and smaller pieces, and severing the invisible links which bind ecosystems together and allow them to function.



Figure 155-3(1) illustrates the permeation of development throughout the state. The "buckshot" distribution of development and the resulting fragmentation of open space are plainly evident, notably in western and southern Rhode Island. The visual image is supported by recent research at the University of Rhode Island's Department of Natural Resource Science, which has found that over one third of Rhode Island's forests are edged or bordered by urban or heavily disturbed land types (residential, commercial, farming), and that Rhode Island's landscape is approaching the threshold between one in which natural landcovers predominate to one in which managed and disturbed landcovers are dominant³.

A buckshot scattering of development is fragmenting Rhode Island's rural landscape.

³ August, P. V. *The Changing Rhode Island Landscape and the Need for Ecological Monitoring*. Paper presented at Conference on Rhode Island Natural History survey, Providence, April, 1993.

Statistics on forest ownership collected by the U.S. Forest Service also confirm the portrait of an increasingly divided landscape. In 1972, there were 14,200 private forest landowners in the state. Less than half (some 6,700) of these held forest parcels smaller than ten acres in size. By 1984, a mere 12 years later, the number of forest landowners had more than doubled to 32,800; and the number of landowners holding tracts less than ten acres had nearly quadrupled to 26,200.

While such "democratization" of land ownership has undeniable social benefits, it represents a tremendous loss of security that the resources embodied in our forests will remain forever safe and available. Resource management and protection becomes a much bigger job: where twenty years ago a 10,000-acre aquifer might have been covered by fewer than a hundred large farms and woodlots posing little threat; today, divided and developed under large-lot zoning (intended to protect it from "intensive" development), it might accommodate a thousand homes and septic tanks, a hundred or more commercial and industrial establishments, and roads connecting them all. This multiplication of potential pollutant sources, must now be managed by "someone", if the viability and quality of the aquifer is to be assured.

As the natural landscape is broken into smaller and smaller pieces by development that disrupts the integrity of natural systems, the habitat and territorial needs of some species may no longer be met. Routes to water or food sources may be cut off, or a major highway may separate breeding populations. Some songbird species require unbroken forest habitat of 500 acres or more in size, and will not cross major breaks in the forest canopy such as created by a four-lane highway right-of-way. As housing tracts and roads pierce and open the forest canopy, susceptible populations, crowded and stressed, will decline. Other, more adaptable, species will fill their niche; but the forest will have lost diversity.

We know too little about how far the disturbances of adjoining developed land uses penetrate into forests and what effect, in aggregate, they are having on ecological processes; and it should give us great pause, to realize that we are dividing up the landscape on a grand scale, changing the dynamics of natural systems *willy-nilly*, while actually knowing very little about the specific habitat needs of many species, or the potential effects of our actions. A 1993 symposium, organizing a Rhode Island Natural History Survey, illuminated the paucity of our understanding. Phrases such as: "knowledge is sparse," "our understanding is poor," and "wide gaps in our knowledge" peppered the talks of biologist/ecologist presenters.

Bit-by-bit, we continue to fragment the natural landscape of Rhode Island while actually knowing little about the long-term effects.

If we continue on the present

path, the development pattern we will permanently enshrine in much of Rhode Island will be a diffuse amalgam of low to very low density residential development, broken occasionally by broad swaths of jumbled commercial and other uses strung along Interstate and arterial highways. Under this "vision" for the future landscape, there will be lots of "greenspace", but it will be in people's backyards--carved into two-to-five acre homesites. Such fragmentation will make protection of the social values and interests embodied in the state's greenspace a virtual impossibility.

3-1-3 Endangerment of Critical Areas

The most immediate threat to critical greenspace lies in our failure to take full measure of the public interest and values embodied in it. The prevailing, economic allocation of the landscape too often promotes development in precisely the spots that a public-interest, resource-based valuation would require avoiding. Developing these "wrong" places endangers the very resources that we profess to treasure and that support the fundamental values of greenspace.

"A home in the country.... Beachfront... Ocean view... Good country air... Woodland estate..." The real estate advertisements capture as selling points the very natural and cultural features that development imperils. As improvements in transportation and communication have facilitated a diffusion of population and commerce across the state's landscape, more and more important greenspaces are threatened.

Three resources typify the plight facing critical greenspace throughout Rhode Island:

❖ *The Shoreline*

Everyone loves the coast. Nationally, the coastal zone has been attracting population like lemmings to the sea: 40 percent of the nation's population now lives in coastal counties, and 75 percent live within 50 miles of tidal waters and the Great Lakes. Rhode Island's coastal zone is no exception to this trend. In the 1980s, the growth rate of Rhode Island's 21 coastal communities was nearly twice that of the state as a whole, and the least developed coastal towns (those with less than 10,000 population in 1980) grew at nearly four times the statewide rate. In 1990, nearly one third of the state's population lived in census tracts contiguous to the Rhode Island coastline.

The allure of life by the sea causes us to imprudently set our dwellings on shifting sands, sometimes with catastrophic result.

Our loving embrace of coastal greenspace has a price: as we crowd the shore, replacing natural vegetation with structures and pavement, we alter natural systems, increase pollutants and nutrients draining into coastal waters, and decrease the assimilative capacities of wetlands and natural shoreline buffers. The impacts, obvious for years in urbanized areas, are increasingly affecting other, previously pristine, coastal areas. Like the sentinel canary in a coal mine, Rhode Island's iconic crustacean, the quahog, is signaling the impact of our rush to the shore. Over 1,200 acres of Rhode Island's salt ponds, tidal rivers, and embayments are permanently closed to shellfishing because of pollution⁴. In addition to the urbanized upper portion of Narragansett Bay, which has been closed for decades, other, once clean, coastal estuaries have witnessed dramatic residential development along their shores in recent years, and are now showing distressing signs of degradation. Within the past five years, Narrow River and Greenwich Cove have had permanent bans imposed on the taking of shellfish. Other coastal waters threaten to follow suit.

South County's coastal pond region encompasses six major coastal ponds and lands within the ponds' watersheds, south of the glacial moraine that stretches across the state's southern fringe. The resources of this area are crucial to the fisheries, recreation, and tourism that are central to the economy and lifestyle of the region. The aquifers that feed the ponds are also the source of the region's drinking water. The area's allure, however, may also be its undoing: despite having extremely limited wastewater treatment facilities, the salt pond region witnessed a threefold increase in dwellings between 1950 and 1980; and, based on zoning in place, a second tripling of dwelling units and a seven to nine-fold increase in population could readily occur⁵. One has to wonder whether this region--which for generations has epitomized the idyllic life along Rhode Island's seacoast--will be recognizable after another generation of such growth. Will tourists still come?

❖ *Watersheds and Aquifers*

As people and commerce relocate away from Rhode Island's cities and established suburbs, they are increasingly encroaching upon resource lands critical to the state's drinking water supplies. Growth, with its attendant threat of pollution, is occurring in watersheds and over aquifers around the state.

Sizable areas of the state, including the Wood-Pawcatuck Basin, Block Island, and the Hunt River Basin, rely upon a single groundwater source--there is no readily available alternative to replace these "sole-source aquifers" if they are contaminated. These and many of the state's other high-yield-potential aquifers are currently high quality by virtue

⁴ Narragansett Bay Project, Rhode Island Department of Environmental Management and Division of Planning, Rhode Island Department of Administration. *Comprehensive Conservation and Management Plan for Narragansett Bay*. 1992. p. 4.78.

⁵ R.I. Coastal Resources Center. *Rhode Island's Salt Pond Region: A Special Area Management Plan*. 1984. p. 3.

of the sparse development overlying them. They are susceptible, however, to future land use-related degradation; and, as the recent aquifer contamination crises in Westerly and North Kingstown demonstrated, even one contamination incident can have far-reaching and potentially devastating consequences for public water supplies. With the exception of the Big River and upper Wood River aquifers, very small portions of the state's major aquifers are in public ownership. Prevention of land use impacts on water quality rests, largely, with local governments.

Surface drinking water resources are also at acute risk: only 17 percent of Rhode Island's public drinking water supply watersheds and aquifers are protected via public ownership and management. The management plan for the Scituate Reservoir Watershed, the source of drinking water for over half of Rhode Island's population, found towns in the watershed to be growing at a rate eight times the state average⁶. Newport's reservoirs on Aquidneck Island are similarly threatened by commercial and residential development and by agricultural runoff in the stream valleys that feed and connect them. The water used by Woonsocket residents flows an exposed gauntlet beside car dealerships and under major highways before it reaches their lips. Raw water from Pawtucket's system travels eight miles through a stream draining a watershed that suburbanized dramatically in the 1970s and 1980s.

The Scituate Watershed Plan and the protection plans now being developed for other public watersheds in the state are documenting the vulnerability of our public water supplies and recommending steps to safeguard them. These plans, and a growing number of contamination incidents, are making it clear that, as forests fall to subdivisions and farms succumb to retail strips, the public lands protecting our water supplies are an increasingly thin and vulnerable green line.

❖ *Farmland*

Productive agricultural land, for a number of reasons, remains in steep decline throughout the state. Eking out a livelihood from the state's bony soils has never been easy, and being a farmer today in Rhode Island is, in many ways, a punishing and thankless job. The economics are not good: dairy farming has all but vanished, and the fortunes of nurseries and turf farms, which rode high during the 1980s boom, have suffered with the 1990s' decline in construction

According to the New England Agricultural Statistics Service, Rhode Island lost 7,000 acres of farmland since 1990. The state's Agricultural Preservation program saved 2,500 acres over the last 10 years.

⁶ Division of Planning, R.I. Dept. of Administration, Scituate Reservoir Watershed Management Plan, 1990, p.1.5.

activity. The continuity of many traditional family farms is imperiled. The farm may falter because there is no heir desirous of carrying on the farming tradition. Even when there is a will, there may be no way: in situations where no family financial planning has been done, the death of the patriarch may necessitate selling the family's land to settle an estate and pay taxes. After years of hard toil, and with no economic security for old age, save their land, a good many Rhode Island farmers found the fantastic sums proffered by developers during the 1980s boom times impossible to resist.

The problem of farmland loss is not new: the 1981 Report of the Governor's Agricultural Land Preservation Task Force found that Rhode Island had lost over 90 percent of its farmland by 1980. To counter this trend, the report suggested a target of doubling the land in farms from 60,000 to 125,000 acres over twenty to thirty years, and recommended a number of specific initiatives. The Agricultural Land Preservation Commission, created in response to the Task Force's report, has used \$12 million authorized by the state's voters to purchase development rights to over 2,500 farm acres during the last decade. Despite the Commission's best efforts, the downward trend has not been stemmed. A recent estimate found that the state lost 7,000 acres of farmland since 1990⁷.



The shoreline, water resource lands, and farmland are just three of the greenspace resources that are threatened by the very love we profess for amenities they add to our lives. Similar sagas could be told of the effects our commercial strips, housing, and highways are having on our scenic landscapes, forests, rare plants and animals, and historic areas.

3-2 Losing Our Connections

Taken together, recent trends in how we use land and divide up the landscape have weakened the characteristically strong bonds Rhode Islanders have with the state's land and water, and lessened opportunities for future Rhode Islanders to experience the outdoors as we have. Less tangible than the extinction of a species or pollution of a reservoir, but nonetheless real, is loss of our opportunities to connect to greenspace.

Loss and fragmentation of large greenspace tracts are diminishing opportunities for hunting and other forms of recreation that require access to large tracts of land. Our continued enjoyment of linear recreation pursuits such as hiking and horseback riding, traditionally dependent upon the countenance by private owners of public passage across their large tracts, is similarly threatened. One ill-placed development project can permanently sever the continuity of a long-used trail corridor.

The changed landscape has also changed the nature of our relationship with the shoreline. Using the shoreline--often without regard to who owned the upland transited to get to it--is a time-

⁷ New England Agricultural Statistics Service. *New England Agricultural Statistics, 1991*. P. 5

honored Rhode Island custom. But, as coastal farms have given way to subdivisions and condominiums, access enjoyed by the public for generations through the hospitality of landowners has been replaced by "No Trespassing" and "Private Road" signs. Many of the expansive views of farms sweeping down to the ocean, formerly enjoyed for the price of a drive along the coast road, are also gone.

The direct losses are easy to see and appreciate--we all know of special places lost--a trail blocked by condos, a farm gone to subdivision, or woodland turned mini-mall. But other changes are occurring. As suburban development patterns and styles have spread through the state, our landscape has become less diverse. Our mental maps of what is "city" and what is "country" are increasingly indistinct and fuzzy. This town looks like that town; this strip like all the others. Natural landmarks--a peculiar rock outcropping, champion tree, or roadside spring--once offered visual bearings, a sense of comfortable familiarity, to our communities and our journeys. But many such landscape icons have disappeared, or been so thoroughly surrounded and isolated by large-scale development that they are lost to us.

The loss of such cognitive features is significant because so much of Rhode Islanders' experience of greenspace is visual: they know and love the state from years of driving through its familiar landmarks. Indeed, driving for pleasure is the third most popular outdoor recreational activity, engaged in by 60 percent of Rhode Islanders⁸.

As development has spread to rural parts of the state, changes in the landscape have altered the character of such basic outdoor recreation traditions as the pleasurable "drive in the country." Many rural roads, which once held forth visions of expansive farm fields and forests around every bend, are now lined with houses. Rather than develop chunks of land, and keep the view from the road intact, we've strung out our new homes along existing roads because it is easier and cheaper (in the short run) than concentrating them. The very "feel" of back roads has changed as they've been upgraded in response to increased traffic and safety concerns. Those country roads whose twisting and hummocky course and sparse traffic invite a dallied pace and a chance to absorb the passing view are becoming harder and harder to find.

If we allow our greenspace resources to continue to be excessively consumed, fragmented, and endangered by development, the character of our relationship with the land will continue to change. We need to consider carefully if some of the problems besetting our society today do not, at least in small measure, stem from the silent severing of our bonds to the land and to distancing ourselves from nature.

⁸ Rhode Island Division of Planning and R.I. Department of Environmental Management. *Ocean State Outdoor: Rhode Island's Comprehensive Outdoor Recreation Plan*. 1992. p. 4.9.

Today, as the third millennium approaches, we should consider our relationship with the land. Our technology now convenes absolute power over the landscape upon us. We can level hills, move rivers, topple forests as suits our whim. Our knowledge has also grown, however, increasing--perhaps in the nick of time--to reveal the breadth of interrelationships we have with greenspace, and myriad dependencies we have upon it. With better understanding has come the realization that our environmental tampering has the potential to fundamentally, perhaps irreparably, harm our vital interests.



155-4 THE POTENTIAL



**Two roads diverged in a wood, and I--
I took the one less traveled by,
And that has made all the difference.**

The Road Not Taken
Robert Frost

The first three parts of this plan detailed the importance of greenspace to Rhode Island and described how the path Rhode Island's landscape has been on for generations is leading to extinction of the essential values greenspace provides. This part and the remainder of the plan try to illuminate a different, greener, path for Rhode Island's landscape future.



4-1 A Greener Path

We find ourselves at a crossroads in our long journey of progress. We sense, with increasing unease, that the familiar route we have followed for so long leads to a place we don't really want to go.

Must our future growth destroy or endanger critical open space resources and amenities?

Is it inevitable that Rhode Island's greenspace be fragmented, degraded and consumed?

There is another route to Rhode Island's future, which preserves critical resources and reconnects Rhode Islanders with the land. It requires us not to forsake the development, growth, and change we need to progress but, rather, to plan carefully what we need, to be forthright in saying where it belongs, and to be precise in how it fits into the landscape. The other road requires that we establish, analytically, the essential elements of Rhode Island's greenspace, come to consensus about which landscape features must remain immutable, and then be steadfast in our resolve that these critical features persevere.

The state's adopted future land use plan¹ clues us that it is not too late to change direction. It shows that, with planning, it is possible to, in land planner Robert Lemire's parlance... "save what we need to save *and* build what we need to build²".

¹ Rhode Island Department of Administration, Division of Planning. *Land Use 2010. State Land Use Policies and Plan*. June, 1989.

² Lemire, Robert A. *Creative Land Development Bridge to the Future*. 1979. pp. xiii-xiv.

The development trend estimates of the *State Land Use Policies and Plan* indicate that up to 148,000 additional acres could be needed for new development by year 2010. Under this "worst-case" scenario, most new development would go on "raw" land, with very little infilling or redevelopment of urban areas. If we follow such a path, developed land within the state would increase by more than three-quarters over the current level--with tremendous impact on greenspace resources very probable.

In contrast, the Plan's *preferred* 2010 land use future advocates a focused development pattern. Concentrating growth in urban infill areas, along the suburban fringe, and around town and village centers, this focused growth scenario *could spare 45,000 acres from development.*

In short, the State Land Use Plan reveals that we can house, employ, educate, transport, and entertain our people--meet all their spatial needs now and in the future--in one of two ways. One way--the current path--leads us to increasingly consume and fragment our greenspace legacy; the other road--focused growth---affords the chance for its protection.

The land use plan holds out hope, but does not fully illuminate the alternative path. Greenspace and greenways can light the path to that better future landscape.

The choice is ours.

The Promise

What promise does the greener path hold?

Imagine a Rhode Island in 2020: vibrant, confident, and green.

It is a state refocused on its traditional strengths, while vigorously embracing the future. It has made peace with its landscape, protected strategic natural resources, and preserved key links to its past. The special places and environmental features central to the lives of generations of Rhode Islanders have been secured. The landscape now remains forever recognizable, distinctively and quintessentially, *Rhode Island.*

Rhode Islanders of 2020 feel connected to their land. They live in diverse and attractive communities of all sizes. Urban neighborhoods, teeming tapestries of ethnicity, race, and income, bring cultural richness and diversity to everyday life. At the core of each revitalized neighborhood is a green commons, be it park or promenade, riverway or community garden. Village centers, foci of reinvigorated suburbs, are connected to the urban mosaic by greenway trails and bikeways reaching out from the cities. Most of the trails and bikeways were built as community efforts, bringing people of all backgrounds together to work on a common goal. Greenways have become new avenues of social, cultural, and economic intercourse as Rhode Islanders rediscovered bicycling and walking as convenient, healthy, and enjoyable means to get around their small state during much of the year.

Hundreds of thousands of tourists each year come to enjoy Rhode Island's natural and cultural attractions. They are drawn as much by the little things--the attention to detail and design--that make Rhode Island distinctive, as by the state's unrivaled bay and beaches. Many come to ride on the extensive bikeway system that makes "getting around" a part of the vacation fun. They discover Rhode Island has maintained its natural beauty and identity... ties to its origins, time-honored customs, and traditions are evident. In building and re-building its communities, they see the state has skillfully blended the best of the old--natural and built--with the new and innovative.

Thousands of small and mid-sized businesses are the foundation of the state's robust economy, but it has attracted more than its share of corporate headquarters, regional technical support and distribution centers, and "cutting edge" techno-manufacturing operations. Firms are reassured that the resources they need to grow have been providently protected; but more often than not, new and expanding firms also cite the "quality of the environment" or "lifestyle" as the reason they decided to grow in Rhode Island. They realize the importance of such intangibles in attracting and retaining talented and motivated individuals.

A most significant change, however, is in spirit. In moving around the state, one senses a swelling pride in Rhode Islanders, and a sense of community and purpose. Rhode Islanders have solved many seemingly intractable problems during the last generation. In coming to peace with their landscape, they have forged an inclusive and progressive society. They have shown that it is possible to move ahead economically, while healing and nurturing the land; to build connections among people by linking them to common ground; and to embrace the future without losing one's past. Today, their smallest state, long the butt of jokes from outsiders, stands as paradigm of economic, social, and environmental achievement for the rest of the nation.

4-2 The Next Millennium

What should the face of Rhode Island look like in the next millennium? Let us, the current generation of Rhode Islanders, assert that greenspace and greenways not only can, but must, be pivotal elements of Rhode Island's future. Let us decide that protection of natural resources will be instrumental, rather than detrimental, to progress.

A Greenspace & Greenway Goal for Rhode Island

Rhode Island will create a statewide network of greenspaces and greenways to serve as the central organizing element for the state's 21st century growth and physical development.

By 2020, Rhode Island's protected greenspace network should encompass one third of the state's land area. The network will embrace every Rhode Island community. Natural greenways will course throughout the state, following major rivers, farmland belts, island spines, and coastal barriers. An extensive bikeway and trail system will link Rhode Island's natural and cultural features to its people. No Rhode Islander will live more than 15 minutes from a greenway.

The greenspace and greenway network will be instrumental to future state environmental and developmental policy:

- ❖ *It will constitute an environmental safety net protecting the state's irreplaceable legacy of natural and cultural resources.*
- ❖ *Secondly, bikeway and trail greenways will accommodate transportation alternatives, such as bicycling and walking, fostering health and reducing pollution.*
- ❖ *Thirdly, the greenspace network will be available for public use to the fullest extent possible, facilitating access to, enjoyment of, and understanding of the outdoor environment by Rhode Islanders and visitors to the state.*
- ❖ *Finally, the network will be a nucleus for the growth, development, and rejuvenation of diverse, high quality living and working communities, harmoniously and productively blending natural and built environments.*

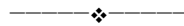
❖

155-5 THE PROCESS



A journey of a thousand miles must begin with a single step.
Lao-tzu

The first step to be taken on the greener path to Rhode Island's future landscape is the definition, geographically, of the areas and features in its present landscape that are essential for the future. Identified and properly preserved, these elements then become the framework of the future greenspace and greenway system. Part Five describes the analytical process.



The Greenspace project followed a straightforward, three-part methodology in delineating the future greenspace and greenway network:

- ❖ First, a values-based *critical geography* of greenspace was prepared, defining and mapping areas supporting the distinct values and functions of greenspace.
- ❖ Second, areas identified as critical to each separate value were combined to find *multi-functional greenspace resource areas*, the core areas of the future network.
- ❖ Lastly, *greenway opportunities* were identified linking the core areas to each other, to existing public open spaces, and to populated areas, forming an integrated network.

5-1 Technology and Data

The Greenspace planning process brought the latest resource data and the best available analytical technology to bear on development of a recommended greenspace system. It used the Rhode Island Geographic Information System (RIGIS), a computerized spatial database developed by the University of Rhode Island's Environmental Data Center and cooperating state agencies, and administered by the Division of Planning.

5-2 Methodology

5-2-1 Step 1: Defining Critical Geography

For reasons touched upon in Part One, it was imperative that the Greenspace and Greenways Plan be grounded upon a values-based approach to open space, one that embraced protection of as many of the distinct functions greenspace provides to Rhode Islanders as possible in a comprehensive assessment.

A Mapping Subcommittee of the Greenspace Advisory Committee (see Preface) was created in May 1991. Comprised of resource managers and researchers, the subcommittee worked with Division of Planning staff to identify key values of greenspace and to define discrete, mappable resource areas that support each of the values.

A highly detailed delineation of critical geography was originally agreed upon. It categorically ranked the relative significance of some 50 subsets of areas and resources contributing to four major greenspace valuation themes: public health, safety, and welfare; environmental quality; economics; and quality of life. These first criteria proved unmappable, however, given the status of data, techniques, and resource availability during 1991-92. This necessitated adoption of a simplified approach, utilizing criteria developed with a fuller understanding of operational and technical constraints. Revised criteria, devised late in 1991, recognized twelve geographic/resource types supporting six value themes--pure water, hazard avoidance, forests, agriculture, biodiversity, and recreation and culture.

The second version of the greenspace valuation criteria was successfully mapped using thirteen resource coverages (spatially-referenced datasets) available through the RIGIS. This process yielded composite coverages for each of the six value themes depicting geographic areas identified as critical to each.

The six valuation themes, parameters, and spatial extent of the critical geography defined and mapped for each are listed in Table 155-5(1). Critical geographic areas identified for each greenspace valuation theme are shown in Figures 155-5(1) and 155-5(2).

Scenic areas identified in the Rhode Island Scenic Landscape Inventory, such as Stillwater Reservoir, shown above, were included in the Greenspace valuation analysis.

Critical Geographic Areas Supporting Essential Greenspace Values in Rhode Island

RESOURCE VALUE THEME: PURE WATER

Critical geography:

Public water supplies (surface): Watersheds of existing surface reservoirs used for public supply.

Groundwater: All areas classified as "GAA" by the R.I. Department of Environmental Management; includes aquifers (reservoirs and recharge areas) and wellhead protection zones of community supply wells

Wetlands: All types identified in the RIGIS Wetlands dataset

Areal extent (combined): 307,000 acres Percent of state land area: 45

HAZARD AVOIDANCE

Critical geography:

Flood Hazard Areas: All "V" and "A" Flood Hazard Areas delineated by the Federal Emergency Management Agency

Areal extent: 107,000 acres Percent of state land area: 16

FORESTS

Critical geography:

Major Forest Tracts: All contiguous forested tracts greater than 300 acres in size, regardless of forest type, derived from the RIGIS Land Use/Cover dataset

Areal extent: 125,000 acres Percent of state land area: 18

AGRICULTURE

Critical geography:

Active Farms: All active agricultural land uses identified in the RIGIS Land Use/Cover dataset

Agriculturally-significant soils: All soils classified as "Prime" or "Statewide significant" agricultural soils by the U.S. Soil Conservation Service

Areal extent (combined): 217,000 acres Percent of state land area: 32

BIODIVERSITY AND WILDLIFE

Critical geography:

Rare Species: All critical habitats of federally or state endangered species, as identified by the R.I. Natural Heritage Program

Areal extent: 50,000 acres Percent of state land area: 7

RECREATION AND CULTURE

Critical geography:

Scenic Landscapes: All scenic landscape areas identified by the Scenic Landscape Inventory as "Distinctive" or "Noteworthy"

Historic Sites: All National Register Historic Districts

Archaeological Resources: All Archaeologically significant areas identified by the R.I. Historical Preservation Commission

Recreational Beaches: All major coastal beaches identified in the RIGIS Land Use/Cover dataset

Areal extent (combined): 145,000 acres Percent of state land area: 21

FIGURES 155-5(1)

and

155-5(2)

TO BE INCLUDED IN FINAL PLAN
AS PAGES 5.4-5.5

11x17 Fold out Color Plates

5-2-2 Step 2: Finding Common Ground

The delineation of critical geography revealed that upwards of 80 percent of the state's land area was critically important for at least one function of greenspace. While a significant finding, this left the dilemma of how to devise a greenspace network that was sufficiently focused, spatially, so as to structure a future landscape, while simultaneously affording protection to as much critical geography as possible. The solution lay, as is often the case, in finding common ground.

Two assumptions were made in the search to find the common ground of Rhode Island's valuable greenspace--those areas which could be considered most valuable, overall:

- ❖ that the social value of greenspace is additive: the more separate values or functions a particular parcel identifiably supports, the greater its value; and
- ❖ that there is rough equivalence to society among the different functional values of greenspace; that, for instance, a parcel critical for pure water should be equally weighted with a tract sustaining forestry.

Use of any yardstick for comparing the "apples and oranges" of greenspace to the "best" overall is fraught with perils. It is akin to asking a parent to pick her favorite child. But, for a number of reasons, the limited abilities of government and private greenspace protection efforts being not the least, such a focus is necessary if the vision of a future greenspace network is to be achieved.

Thus, for good or bad, the Greenspace analysis looks at "best" from a multi-functional basis. Its assumptions say that, all things being equal, the areas that do the most for us are the most valuable to us, and to those who will follow us. Admittedly, these precepts are challengeable; but the alternatives (setting priorities only within each functional category, setting no priorities at all) also present dilemmas¹.

¹ The first assumption incurs a risk of wrongly discounting the social importance of greenspace which support only one or two value(s). It is not the intent of this plan that such areas be written off as unworthy of protection. To the contrary, the identification of areas as critical geography, and their very inclusion in the Greenspace analysis is recognition of their exceptional importance to the value they support, and an acknowledgement that they must be accorded protection if the values are to endure. From a single dimensional viewpoint, a parcel deemed critical as habitat for an endangered species is no less important to that species if it has no other coincident values than if it has five. It still must be protected and carefully managed if the species it supports is to survive.

The second assumption is equally arguable; but the alternative of setting differential weights on the broadscale social benefits of greenspace is also fraught with difficulties. For instance, many observers might instinctively presume lands supporting pure drinking water to be more valuable than those supporting, say, an obscure, endangered wild plant. But how much more? ...twice, three times? ...and who decides? What if the rare plant turns out to yield a chemotherapeutic derivative which cures cancer or AIDS?

A further methodological caveat: most of the data used in the Greenspace analysis to delineate critical geography and the best greenspace are terrestrially-oriented. They neglect, in some respects, the marine environment in general, and specifically, what many would argue is Rhode Island's most precious open space: Narragansett Bay. This "oversight" was not felt to be critical, however, since the centrality of the Bay to Rhode Island's future, and the needs concerning its protection were being addressed by the Narragansett Bay Project.

The virtue of the Greenspace multi-functional definition of the "best" lies in its identification of common ground where disparate values and functions intersect. This will be key to directing the (habitually constrained) abilities of governmental and private greenspace protectors to where they will do the most "good" for the least effort. It illustrates where expenditure of limited resources will accomplish multiple objectives; where individual efforts can synergistically complement one other, multiplying their effectiveness. It provides the big picture in which all greenspace players have a stake, and which all should consider when ordering their individual, more specific objectives and priorities.

Identification of the "best" open space for the Greenspace and Greenways Plan was achieved via integration of the six thematic data layers, each separately having a value of one. While the Greenspace procedure was automated using RIGIS's ARC/INFO software capabilities, the approach is straightforward: a technological update of the "overlay mapping" pioneered by Ian McHarg and other early landscape ecologists.

The process used a simple ranking scheme that counted the number of separate value themes each parcel supported. The six thematic value coverages were integrated in an unweighted matrix, yielding a synthesis map indicating the number of open space values (0 through 6) present in any given parcel of land. (See Figure 155-5(2)(d) on page 5.5.)

The valuation analysis was performed on a regional basis for technical reasons relating to input dataset size and complexity. Analysis and mapping of an initial "test" region (consisting of Aquidneck and Prudence Islands) was completed in April 1992, and the map products were reviewed by the Greenspace Advisory Committee at a meeting in May 1992. Minor changes in the valuation analysis methodology and in presentation format were made, and the valuation analysis was completed for the entire state during the summer of 1992.

A statistical breakdown of the results of the statewide Open Space Valuation Analysis is given in Table 155-5(2).

Table 155-5(2)
Results of Greenspace Valuation Analysis

AREAS HAVING...	Acres	% of state
No identified values	113,000	16.4
1 or more identified value(s)	576,000	83.6
2 or more identified values	297,000	43.1
3 or more identified values	93,000	13.5
4 or more identified values	18,000	2.6
5 or more identified values	1,200	0.1
6 identified values	< 100	---

Based upon the areal distribution of greenspace values, analysis of the regional valuation maps, and input from the Greenspace Advisory Committee, multiple resource value areas with three or more coinciding values were selected as representing the "best" greenspace--critical areas that would constitute the core of the recommended future system. These "3+" multiple resource value areas, are shown on Figure 155-5(3) as *Greenspace Resource Areas*.

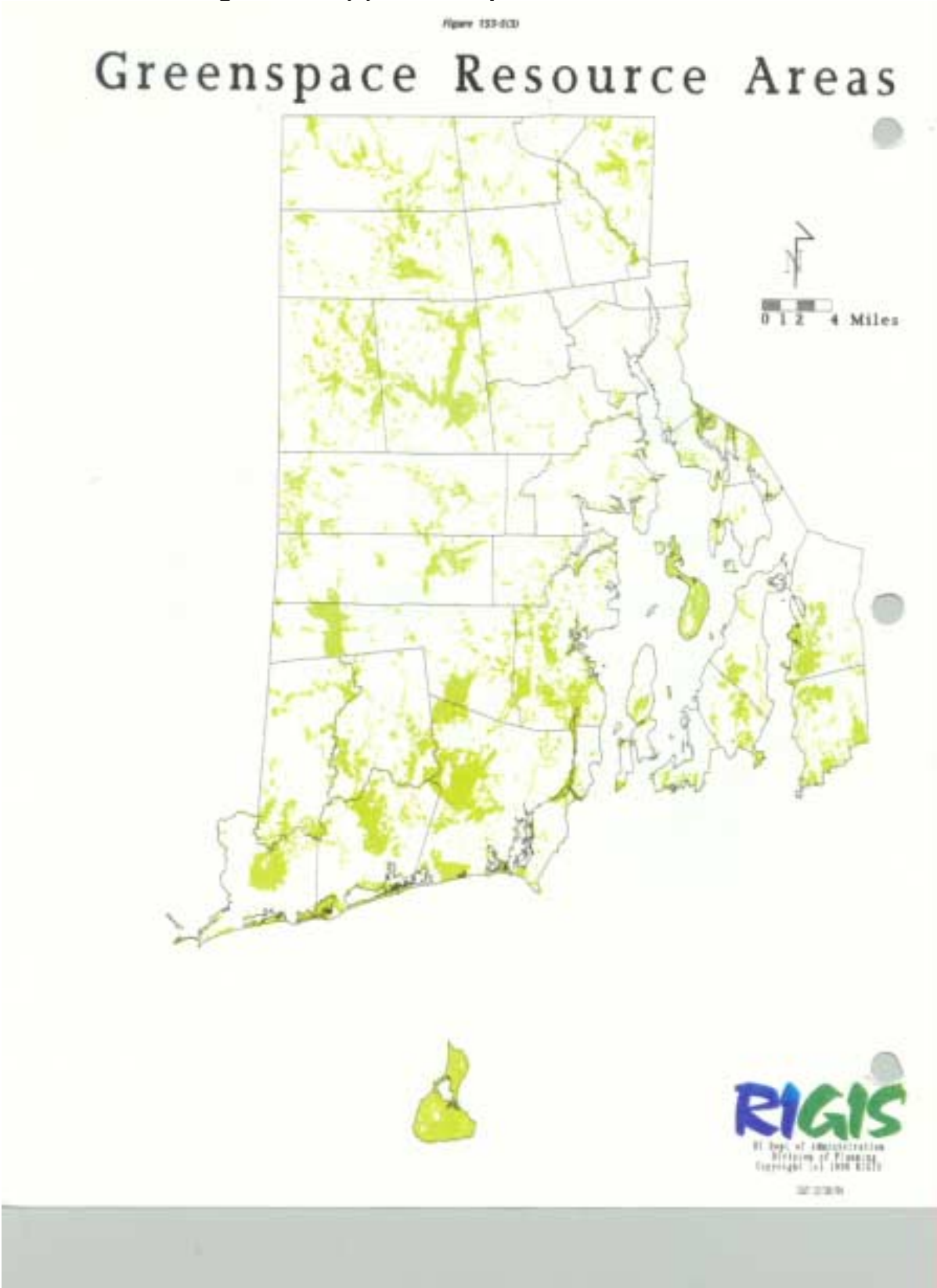
5-2-3 Step 3: Identifying Greenway Connections

The second fundamental goal of the Greenspace project was identification of a multi-functional greenway system that would link critical greenspaces, existing protected open space, and populated areas together in a unified network.

Development of the greenways component of the Greenspace plan was a joint effort of the Division of Planning, the Department of Environmental Management (DEM), Save The Bay (the state's largest private, non-profit environmental group), and The Conservation Fund (a national non-profit group dedicated to promotion of greenways). In late 1991, this consortium undertook development of a greenways concept plan for the state, for inclusion in the Greenspace plan.

For planning purposes, a functional topology of four classes of potential greenways was devised: natural corridors, bikeways, recreational trails, and scenic highways. (Identification of scenic highway opportunities was subsequently dropped from the Greenspace project, in deference to a more comprehensive study being undertaken by the Rhode Island Scenic Highway Board.) Both existing and proposed greenways were identified wherever possible.

Figure 155-5(3) Greenspace Resource Areas



Inputs

Inputs used in the delineation of greenway corridors for the plan included the following:

Greenspace linkage analysis:

The Division of Planning used maps of the Greenspace Core Areas (identified in the Greenspace valuation analysis), existing public open space, and developed land use to define potential greenway corridors, following major natural features where possible, which linked greenspace components together.

State agency greenway proposals:

The Rhode Island Department of Transportation's (RIDOT) draft Statewide Bikeways Plan and DEM preliminary plans for a North-South Trail were analyzed for their relationship and integration with the Greenspace plan.

Inventory of local government greenway proposals:

As part of the Greenspace Project a survey of local governments was conducted in 1991. Designated comprehensive planning coordinators were requested to identify local priority open space tracts and plans for greenways. The results of this survey were corroborated and expanded via interviews with local planning and conservation officials during the summer of 1992. Greenway proposals and local priority open space sites identified were mapped on U.S. Geological Survey 1:24,000 scale base maps.

Draft Greenways Concept Plan

An initial draft conceptual greenways plan was produced in late 1991 by (manually) combining all Greenspace project single-factor thematic mapping then available, local plans for greenways, nineteenth century urban parkways, scenic highway segments, and proposals for long distance hiking or bicycling facilities. This draft Greenways concept plan was presented in January 1992 at a statewide Greenways Conference sponsored by Save The Bay. Comments on the plan were obtained from many of the approximately two hundred persons in attendance. With additional support from The Conservation Fund, the draft Greenways plan was revised during summer 1992 to reflect comments received at the Greenways Conference, input from the Greenspace survey of local governments, and information from newly-completed local comprehensive plans.

Synthesis: Building a System

All greenway opportunities and plans identified were digitally entered into the RIGIS at the Division of Planning for further analysis with Greenspace resource areas and RIGIS databases of developed land use and protected open space.

For the final plan, potential greenways of the various types were reorganized into a two-level system reflecting differences in their scale and significance to the overall system:

- ❖ Major or state-system greenways were defined as corridors integral to unifying the overall Greenspace system.
- ❖ Minor or local-system greenways for the most part reflected corridors proposed by local governments, and generally involving only one or two communities.

Bikeway opportunities, such as the East Bay Bikeway shown here, were assessed in the planning process to link people to greenspace, while providing recreation and alternative transportation opportunities.



155-6 THE PLAN



Make no small plans; they have no magic to stir men's blood, and probably themselves will not be realized. Make big plans: aim high in hope and work, remembering that a noble, logical diagram, once recorded, will never die.

Daniel Burnham

Greenspaces and Greenways can and should be the path to Rhode Island's future landscape. Both components--the multi-functional greenspace resource areas identified in the valuation analysis and the linear corridors connecting greenspaces, existing public open space, and populated areas--are needed. Neither element alone can adequately stem the erosion of critical resources, repair the disintegration of natural systems, or guarantee access to the outdoors; but together they offer the promise of a future landscape in which critical resources and Rhode Islanders' links to their land are secure.

Presented graphically and described in this part is a plan for Rhode Island's future greenspace and greenway network.



6-1 Building Blocks

The proposed greenspace and greenway system is composed of three elemental building blocks:

❖ *Currently Protected Open Space*

The 87,000 acres of public and securely-protected private open space constitute the starting point, or backdrop, for the future system.

❖ *Greenspace Resource Areas*

Greenspaces, the multi-functional resource areas identified through the Greenspace Valuation Analysis (described in Part Five) constitute the plan's second element. These areas, large and small, are scattered across the state but are not entirely random in distribution. Not surprisingly, many coincide with linear geographic features such as riverine wetland systems, coastal beach and pond systems, and island cores. Multi-functional greenspace resource areas total approximately 93,000 acres.

❖ Greenways

Greenways are the third, but in many ways most significant, element of the plan (see box). They are crucial because they offer connection. Greenways are proposed to unify the entire greenspace system and offer a means for structuring Rhode Island's future landscape. By uniting otherwise disconnected open space areas, multi-functional greenspaces, and populated areas into linear systems, greenways offer the promise of reconnecting Rhode Island's fragmented landscape and reconnecting Rhode Islanders with their land.

With greenways connecting them, open spaces, rather than existing as islands increasingly surrounded and cut off by development, are linked together forming a network or matrix. This connectivity facilitates movement, a fundamental requirement of both ecological and human systems. It allows water to flow, unimpeded, at its own pace through wetland systems; it allows wildlife populations to move for foraging and breeding, or to escape predators and habitat disruptions; and it allows people new options (or, more correctly, old options rediscovered) for movement as well--places to walk and bicycle safely, opportunities for long-distance hiking.

Three major types of greenways are proposed by the plan: natural corridors, bikeway corridors, and trail corridors. The public interest in each type differs, as do the protection objectives, access, and management regimes for each.

The Big Picture

A Nationwide Living Network of Greenways

"Imagine walking out your front door, getting on a bicycle, a horse, or a trail bike, or simply donning a backpack, and within minutes of your home, setting off on a continuous network of recreation corridors which could lead across the country.

Greenways are your vehicle for this imaginary trip of the future, reaching out from communities all across America to link cities, towns, farms, ranches, parks, refuges, deserts, alpine areas, wetlands, and forests into a vast and varied network of open spaces.

Greenways are a way to provide open recreation spaces for every American, close to home. Greenways are our vision for the future"*.

As It Did With *Highways* A Generation Ago, Rhode Island Can Lead The Way Nationally With *Greenways*

Nearly half a century ago, similar plans for a nationwide network--the National System of Interstate and Defense Highways--were being devised. Rhode Island chose to be a pioneer in that movement. Its leaders, and its people saw great potential for social and economic progress in the concept. Rather than proceeding at the slow pace of other states, Rhode Island expedited completion of its portion of the Interstate System using (borrowed) State funds in advance of federal reimbursement. It became one of the first states to complete all its parts of the Interstate System.

Today, Rhode Island could again lead the nation. As the smallest state, it could become the first state to complete its portion of the national greenway network envisioned by the President's Commission on Americans Outdoors. Other states--Maryland, Florida--have laid out plans for extensive state greenway systems. Armed now with its own plan, and small size, Rhode Island could, with spirited implementation, outpace other states in getting its system 'on the ground'.

* Report of the President's Commission on Americans Outdoors, 1987. p. 142

Natural Corridors

Natural corridor greenways are proposed, linking existing protected open space and greenspace areas, and extending into developed (populated) areas. Natural corridors reflect the inherent linearity found in the distribution of multifunctional greenspace areas; their courses follow the state's major river systems, coastal barriers, major islands, and agricultural belts.

The principal purpose of natural corridor greenways is to preserve the greenspace resource values inherent in them. Reservation of broad bands of natural vegetation and wetlands along rivers and coastlines will protect water quality and help preserve and restore many wildlife species. While secondary to preservation objectives, fostering public access to and usage of the resources of natural corridors is also a goal of the greenspace system. With appropriate limitations, natural greenways designated in the plan can and should provide opportunities for hiking and other trail use, or accommodate canoeing and other water-based recreation on the rivers and coastal waters they embody, without endangering resources they contain. This does not mean that all natural corridors, by definition, will accept or encourage public access or use.

Major and minor natural greenways are included in the plan. Major natural corridors are, by definition, routes of high significance to the overall state plan. Major natural corridors in the plan include a mid-state greenbelt, primary, and secondary greenways.

The *mid-state greenbelt*, proposed to traverse the state on a generally north-south axis, would link the Black Hut Management Area, Scituate Reservoir watershed, Big River Management Area, and major greenspace areas via a broad intervening band of open space. It would constitute a distinct break in Rhode Island's future landscape, separating areas which would be primarily urban in scale and intensity from areas which would remain generally more rural in character. Protection of greenspace tracts which add to, consolidate (by eliminating in-holdings), or link together the (existing) extensive public land holdings along and to the west of the mid-state greenbelt would be encouraged.

Aligned with the state's principal rivers, coastline features, and island spines, *primary natural corridors* comprise the fundamental linkages of the unified natural system. While less crucial to the unity of the overall plan, *secondary corridors*--following small streams and brooks--are proposed as significant opportunities for greenspace resource linkages complementing the primary connections. Minor, or local, natural corridors are shorter routes proposed by local governments affecting only one or two communities.

The creation of natural corridor greenways, while an important component of the overall plan, must not be seen as a panacea for conservation. Narrow linear corridors cannot substitute for the large tracts of uninterrupted habitat needed by many wildlife species for foraging and breeding; and efforts to protect large contiguous tracts of greenspace must accompany greenway creation. Care must also be taken to insure that the connections created by greenway corridors do not detrimentally impact the management of rare or endangered species by providing pathways for competitors, predators, or diseases to reach presently isolated populations.

Bikeway Corridors

Greenways can also become the backbone of a future alternative transportation network. Bikeway corridors--separate from roadways wherever possible--will offer not only safe, but aesthetic opportunities for Rhode Islanders to leave their cars at home. That lifestyle choice already exists for Rhode Islanders who live or work in the East Bay communities--a statewide network of bikeways would properly extend it to all of the state's citizens in the future. Adoption of alternative ways to travel by increasing numbers of Rhode Islanders will also have a positive effect for the state's imperiled greenspace: each avoided auto trip reduces air and water pollution. Over time, as the alternative transportation momentum grows, some of the bikeway corridors--especially those proposed along abandoned rail lines--might eventually accommodate public transit, and obviate the need for new or expanded highways.

Like natural corridors, two scales of bikeways are contemplated:

Major bikeway corridors are proposed to constitute a unified bikeway system spanning the state. These proposals are largely based upon the state bikeway system planning underway at RIDOT, but they differ in several respects from the draft State Bikeway Plan circulated by RIDOT in 1992. In distinction to the RIDOT plan, the Greenspace plan focuses only on those bikeways being studied or proposed as independent bikeways. These routes, for the most part, propose use of abandoned rail rights-of-way and other routes separate from the highway system (Class I bikeways) wherever feasible. The bike routes proposed in the RIDOT plan as on-highway (Class II or III) bikeways are (for the most part) not considered in this plan. A second departure is that the Greenspace plan proposes a bicycle link between Jamestown and Newport, across the Pell Bridge. The desirability of such a connection has long been discussed by bicycle-interest groups and is considered important to the connectivity of a statewide bicycle system.

Independent (Class I) bikeways should also be designed to safely accommodate walking, jogging, wheelchairs, and other forms of human-powered transportation/recreation that are growing in popularity (skateboarding, rollerblading). However, the primary purpose of bicycle transportation should retain priority.

A number of the plan's major bikeways are proposed to follow the corridors of abandoned rail lines. Some of these routes may hold promise for future revival of transit use. A recent national survey by the Rails to Trails Conservancy found favorable experience and few problems with 16 combined rails-with-trails corridors in 11 states¹, indicating that, with proper design and management, rail and trail uses can co-exist in a single corridor. Indeed, portions of the Blackstone Bikeway, now being designed, will be co-located with an active freight line. The design of other Greenspace system bikeways along abandoned rail rights-of-way should also accommodate the possibility of future co-location of active rail or bus transit lines with the bikeway.

¹ "Study Shows Sharing Corridors A Growing Trend for the 1990s" in *Rails With Trails Bulletin*. Summer/Fall 1993 issue. National Park Service, Rivers, Trails and Conservation Assistance Program.

Minor bikeway routes are included in the local plan component. These routes, of which there are approximately 135 miles (again with some overlap with major bikeway corridors), were proposed by local governments. In many cases they link with major bikeway corridors, but some proposals are unconnected to the state system. This category includes not only on-road (Class II and III) proposals but also several routes that would be independent (Class I) facilities.

Trail Corridors

Trail corridors are proposed as the other principal way in which people may connect to the greenspace network. Trails are envisioned to be principally unsurfaced paths designed for walking and hiking. Some trails (or segments of longer trails) may also accommodate horseback riding; non-motorized, off-road (mountain) biking; and wheelchair users. Some portions of a statewide trail system might also accommodate motorized trail users, but these uses are not encouraged, due to the difficulties of managing detrimental impacts of motorized recreation on environmental resources and other trail users.

The plan includes the 66-mile-long North-South Trail concept as a major, or state-system corridor; 115 miles of existing trails; and 70 miles of locally-proposed trails. As is the case with natural corridors and bikeways, it is likely that numerous additional trail opportunities exist beyond those enumerated in the plan. Many foot paths, used informally for centuries, exist in every corner of the state. These need documentation, and the development of formal protection and management regimes in some instances. While beyond the scope of this initial broad-brushed survey, an intensive and comprehensive survey and plan for Rhode Island's trails is needed. Funding for such an effort may be available from the National Recreational Trails Fund authorized by the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991.



*Providence's Woonasquatucket River
Greenway proposal to restore parks and
create a new bikeway and riverwalks
(such as in downtown's Waterplace Park
-- shown here) could become a model
for greenway-inspired revitalization of
distressed city neighborhoods.*

6-2 Composite Systems

The elements identified above are organized as two planned systems: a State System and a complementary Local System. Table 155-6(1) provides summary information on each system's component greenways.

6-2-1 The State Greenspace and Greenway System

The recommended State Greenspace and Greenway System includes approximately 400 miles of natural greenways, 190 miles of bikeway corridors, and 66 miles of major trail corridor. Major natural greenways are proposed along the Blackstone, Moosup, Pawtuxet, Potowomet, Ten Mile, Wood-Pawcatuck River, and Woonasquatucket river systems; following the state's ocean-fronting barrier beach/pond systems and rocky shorelines; and down the centers of Aquidneck, Conanicut, Block, and Prudence islands.

Major bikeways encompassed by the plan include the 14-mile East Bay Bikeway, already in operation, and several independent bikeways, either under, or proposed for study. Bikeways currently under feasibility or design study are: the Blackstone, Aquidneck Island, West Bay and Block Island Bikeways. Routes proposed for future study include: the Narragansett Pier, Northwest, Route 116, South Shoreline, and Providence-Coventry Bikeways.

The North-South Trail, a long-distance hiking trail connecting existing trails and public lands along the length of the state's western tier of rural communities, is the only major trail corridor proposed in the State system. However, as noted in the prior sections, bikeway corridors will provide walking, jogging, and other non-motorized trail-related opportunities, and many natural corridors could also accommodate trails. Figure 155-6(1) shows the proposed state system.

The North-South Trail corridor, proposed to stretch 66 miles through rural western Rhode Island, would provide hiking and other trail-based recreation and link large areas of protected greenspace.

Figure 155-6(1)

**State of Rhode Island
Greenspace and Greenway Plan
State Greenspace and Greenway System**

11x17 Fold-out Color Plate

6-2-2 The Local Greenspace and Greenway System

If greenspace is to be readily accessible and integral to the lives of Rhode Islanders, it is essential that a companion system of local greenways and protected greenspace complement the State Greenspace system. To begin to form this integrated system, the plan includes an inventory of local proposals as of the summer of 1992. The local system is not complete. Some communities did not respond to the survey, but may have plans. Others, which may presently have no plans for greenways, may come to see wisdom in embracing the idea in their jurisdictions, particularly if they see possibilities of connecting with greenways in the state system and proposed by neighboring communities. The plan must remain flexible to allow such growth of the concept.

The Local Greenspace and Greenway System shown on Figure 155-6(2), includes the following elements:

Locally-Significant Greenspaces

Cities and towns were asked in the 1991 Greenspace Survey to identify their five most important open space resources. Responses varied from broadly identified resource categories to specific areas and parcels. Some communities, although they had specific protection objectives, did not wish to have the sites identified or mapped for inclusion in the plan. Some of the locally-significant areas overlap with multi-functional greenspaces of the state system, and these should be given priority for cooperative state/local protection projects and resources.

Local Natural Corridor Greenways

Approximately 10 communities are planning natural greenways. Several locally-proposed natural corridors correspond with natural corridors in the state-proposed system, especially along major rivers such as the Blackstone and Wood-Pawcatuck; and most of the remaining proposals are along smaller rivers and streams. Two local natural corridors are proposed following public utility corridors. A total of 115 miles of natural corridor have been identified by local governments, and again some of the local proposals coincide with major corridors of the state system.

Local Bikeways

Rhode Island communities are proposing a total of 135 miles of bikeways and bike routes as alternative transportation resources and recreational amenities. Both Class I (independent) and Class II and III (shared roadway) facilities are contemplated. Independent bikeway corridor proposals include routes following the Ten Mile, Runnins, and Woonasquatucket Rivers and along abandoned rail rights-of-way in Burrillville, Bristol, Cranston, Narragansett, North Kingstown, and Warren. On-road bike routes are proposed by Barrington, Coventry, Cranston, East Greenwich, Exeter, Jamestown, Middletown, Narragansett, Newport, North Providence, and South Kingstown. Warwick, which did not propose any bicycle route greenways at the time of the survey, is currently studying a comprehensive city-wide system of bicycle routes, which could be added to the local system upon completion of the local plans.

Figure 155-6(2) Local Greenspace and Greenway System



Local Trails

Opportunities for local trails greenways have been identified by approximately half of Rhode Island's communities. Extensive, community-wide trail systems are being proposed by Bristol and East Greenwich, and a number of other towns have plans for creating new trails, or formalizing and protecting existing trails. In total, approximately 100 miles of existing trails and 70 miles of proposed trails are identified in the plan. Many of the existing trails are encompassed within the confines of existing public open space, especially within the extensive state management areas of western Rhode Island. The North-South Trail, proposed as a state-system trail corridor greenway, could link several of these now-discrete trails into a long-distance system of through, feeder, and side-loop trails.

Table 155-6-(1)

Greenspace and Greenway System Statistics

STATE SYSTEM ELEMENTS	Corridor Miles	Average Width (ft)*	Approx. Acreage†
1. Greenspace Resource Areas	na	na	93,000
2. Primary Natural Corridor Greenways	400	1,200	57,800
3. Primary Natural System (1 & 2 combined)	400	1,200	126,700
4. Secondary Natural Corridors	122	1,200	21,200
5. Mid-State Greenbelt	50	4,800	27,800
6. Bikeway Corridors	195	100	28,800
7. North-South Trail Corridor	66	200	1,600
LOCAL SYSTEM ELEMENTS			
1. Locally Significant Greenspaces	na	na	45,400
2. Natural Greenways	115	600	8,300
3. Bikeways	135	100	1,600
4. Trails	165	200	3,800

* design width for planning purposes--see text

† acreage figures include overlaps between system components



6-3 Greenway Corridor Width

For display purposes, Figures 155-6(1) and 155-6(2) depict greenways as bands of uniform width for each category of corridor. The conceptual corridor depictions on the maps translate into a 4,800 foot width for the mid-state greenbelt, 1,200-foot-wide swaths for primary and secondary natural corridors, and 600-foot-wide minor corridors; but there is no magic in these widths.

Collected wisdom on optimum greenway width is growing, but there are still as many unknowns as there are variables². Other states and studies have suggested minimum greenway widths of between 150 and 1,000 feet to protect water quality³. Widths of greenways aimed at preserving wildlife vary with the species of interest, ranging from mere feet up to several miles for large predators (not currently a concern for Rhode Island). Wildlife corridors for many mammalian and bird species generally should have at least as much interior habitat (the core area unaffected by light, wind, predators, and human disturbances present along the greenways edges) as edge habitat. Since edge effects have been shown to penetrate 100 feet or more into a temperate forest, wildlife corridor greenways in such habitats would need to be at least 400 feet in width: 200 feet of interior habitat sandwiched between two 100-foot edge habitats⁴.

For macro-planning of the greenspace system, the corridor widths listed in Table 155-6-(1) were used. However, real-world greenway corridor widths will vary considerably from corridor to corridor, and for different segments of individual corridors. The following considerations should guide implementation planning:

❖ *Natural Corridors*

For natural greenways the width of each corridor created will vary along its length, with differing preservation objectives (e.g., water quality, wildlife, agriculture, hazard avoidance), land use options available, and the context of the surrounding landscape the corridor passes through. A 1,200-foot corridor width makes sense for natural corridors if regarded as a minimum protection envelope within which planning, regulatory, acquisition, and other resources are brought to bear to give the greenspace system protection objectives the maximum expression possible within the constraints of the situation.

In the most rural parts of the state--for example, westernmost Rhode Island, or southern Tiverton and Little Compton--it is still possible to guide development so it avoids natural corridors and greenspace areas, and a preserved 1,200-foot-wide corridor could be a legitimate objective. In some cases, adequate protection of the resources involved may require going beyond a 1,200 foot corridor. For example, where corridors transect large (wider than 1,200 feet) multi-functional greenspaces, the objective should be to embrace protection of the entire greenspace that supports the valuable functions identified.

² See Smith, D.S. and Hellmund, P.C. *Ecology of Greenways: Design and Function of Linear Conservation Areas*. 1993. U. Minn. Press. Ch. 3-5.

³ Schwarz, L.(ed.) Flink, C.A., and Searns, R.M. *Greenways: A Guide to Planning, Design, and Development*. Island Press. 1993. p. 150.

⁴ Labaree, J.M. *How Greenways Work: A Handbook on Ecology*. 1992. p. 18.

The other extreme is where natural corridors are proposed to pass through areas that are already intensively developed, as is the case for the corridors that follow major rivers flowing through the Providence metropolitan area. In such areas, the corridors become, in effect, urban greenways; and their design width and other parameters must be quite different from natural greenways in rural parts of the state. The 1,200-foot-width goal translates more into a sphere of critical influence, in which all proposed land use activities would be scrutinized to avoid adverse effects, to capture opportunities for preserving (and restoring) natural vegetation and habitat continuity, and to promote opportunities for expanded public access and usage, in manners consistent with resource protection. In all cases, however, the paramount goal for natural corridors should be to provide a continuous corridor of preserved greenspace (land, water, wetlands) that supports ecological functions and protects the public resource values embodied in it.

❖ *Bikeway Corridors*

Class I bikeway corridors can be as narrow as 25 feet where space is tight. A 100-foot minimum corridor width is, however, preferable, especially in urban areas to allow retention of vegetation for visual screening of adjacent land uses. Class II and III bikeways are generally constructed within the rights-of-way of existing roads and highways; most should not require any new "corridor" acquisition.

❖ *Trail Corridors*

Trail corridors, like other greenways, will necessarily vary in width. Recommended minimum widths of 50 feet in urban environs and 200 feet in rural areas should be design objectives. Corridors (or segments) designed to accommodate separate treads for different uses (e.g., hikers, horses, mountain bikes) should be wider still, optimally 200 feet per tread, to provide visual and auditory separation of users, and options for tread rest and relocation.



6-4 Natural System Protection Analysis

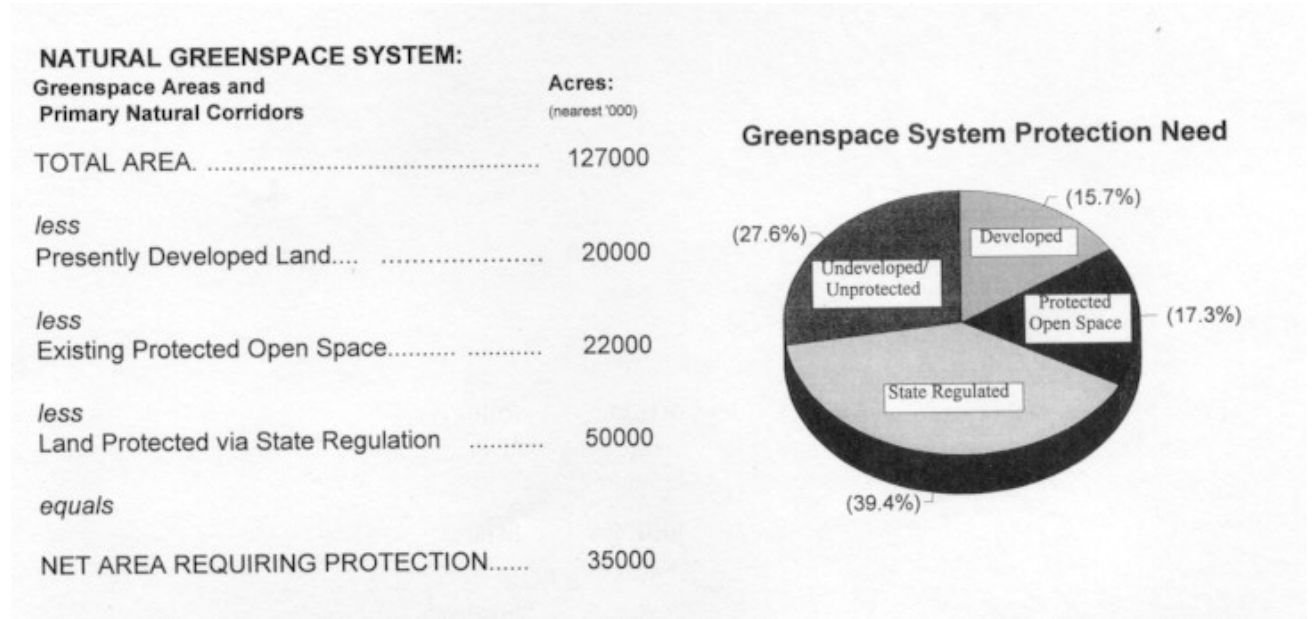
In order to quantify land protection investment needs and focus future efforts on the most vulnerable areas, the major elements of the state natural system were further analyzed using RIGIS capabilities and data. This analysis sought to assess the availability and protection status of primary system areas (greenspace resource areas and primary natural corridors) via identification and quantification of:

- ❖ portions of the primary natural system presently occupied by developed land uses;
- ❖ portions of the primary natural system within currently protected open space areas; and
- ❖ portions of the primary natural system encompassed within areas subject to state regulation under the Freshwater Wetlands Act or the Coastal Resources Management Act.

Conceptually, the analysis consisted of sequential subtraction of developed, protected, and regulated land from the primary natural system area. The results of the protection analysis of the primary

natural system are presented in Figure 155-6(3). First priority for protection investments should be given to the 28 percent of the primary natural system that is undeveloped and unprotected (i.e., neither protected open space nor state-regulated areas). These most vulnerable 35,000 acres of the natural system are the focus of the land protection program developed in Part Eight.

Figure 155-6-(3)
Greenspace and Greenway System
Assessment of Land Protection Opportunities and Needs



155-7 THE POLICIES



**To accomplish great things, we must not only act
but also dream, not only plan but also believe.**

Anatole France

The preceding parts of this plan have developed a vision of a greenspace and greenway network as a central element of Rhode Island's future landscape, and an important component of the lives of its citizens. This vision is a goal that will require the concerted efforts of all Rhode Islanders to effect. This part of the plan enunciates policies intended to assist the integration of greenspace and greenways into future landscape decision making.



The policies of this part are established to promote the creation of the statewide greenspace and greenway system recommended by the plan, to advance protection of the essential natural and cultural values greenspace provides to Rhode Island, and to expand opportunities to enjoy the benefits of greenspace for present and future Rhode Islanders. Policies are intended to provide general guidance to State, local and private efforts undertaken in support of the plan, and to also provide a foundation for assessing the consistency of future proposals which may (positively or negatively) impact upon attainment of the goals and objectives of the plan. Policies are grouped under a general category and four topical themes, which represent critical spheres of human interaction and impact upon greenspace. (Note: Policy numbering is for reference only, and does not connote differential priority or importance.)

❖ *General Policies for Greenspace and Greenways*

- G-1 Promote compact development patterns, urban/suburban infill and reuse, and clustered, village-centered rural growth. Foster a land conservation ethic by stressing space- and resource-efficient designs in order to minimize unnecessary fragmentation of greenspace.
- G-2 Emphasize creation of the greenspace system in state land protection and acquisition investments. Give priority to projects that directly advance realization of the greenspace system.
- G-3 Utilize the diverse array of land protection techniques available (i.e., creative development, regulation, private-public partnerships, purchase of easements and other less-than-fee-simple instruments, and full acquisition) to best advantage in safeguarding the values of greenspace in the most effective and cost-efficient manner.
- G-4 Manage the public portions of the greenspace system to realize multiple values and social benefits, wherever possible. Avoid restricting public lands to an exclusive use, except where warranted by public safety, or resource protection and sustainability concerns (e.g., certain water supply resources, rare species habitats, and other fragile areas).

- G-5 Encourage local promotion of creative development techniques that conserve land, respect natural and cultural landscape features, provide publicly-usable open space, and produce aesthetically and environmentally harmonious communities.
- G-6 Use the local comprehensive planning process to insure local cognizance of state goals and policies for the greenspace and greenway system, and to provide for effective and consistent municipal participation in creating the system.
- G-7 Provide a sustainable revenue source affording dependable and adequate funding for a public greenspace purchase program.
- G-8 Direct new growth and development to areas and locations that minimize the potential for negative impacts upon the greenspace system.
- G-9 Incorporate a greenspace buffer within major new developments whenever the potential for discordance exists between the type, scale, or effects of the new facility and existing or planned adjacent land uses.
- G-10 Nurture partnerships with private sector greenspace protectors and others who have a stake in the greenspace system.

❖ *Greenspace's ecological functions:* Greenspace is, and must remain, Rhode Island's web of life. Home to plant and animal, and host to environmental cycles requisite to human life, the greenspace and greenway network will be an increasingly crucial environmental safety net as more of Rhode Island becomes developed in the future. Policies must safeguard the critical ecological functions of greenspace for their intrinsic value, as well as their utility to human environmental needs.

- E-1 Protect the physical and biological integrity of ecological systems and natural landscape units. Where possible, protect large, contiguous tracts of greenspace to meet the needs of certain wildlife species. Establish greenway corridors linking discrete parcels where such connections would not jeopardize management objectives for rare, endangered, or other species or communities of concern.
- E-2 Restore or re-establish natural greenspace values where they have been disturbed by development, especially within urban and suburban areas.
- E-3 Maximize reliance upon greenspace and greenways as *natural infrastructure* for non-structural solutions to water management problems, including: public water supply/demand management, water quality maintenance and restoration, and stormwater runoff and flood control.
- E-4 In state natural resource regulatory programs, apply a high standard of protection to greenspace and greenway areas.

- E-5 Actively assert and fulfill the State's duty under the Public Trust Doctrine to protect public trust interests in areas historically subject to the ebb and flow of the tides, navigable freshwaters, and areas that influence these resources.
- E-6 Develop a greenspace monitoring system to quantify and track vital parameters of the state's environment.
- E-7 Encourage localities to develop and adopt woodland and street tree management ordinances and programs.

❖ *Greenspace and people*: In addition to its primary virtue as protector of natural and cultural resources essential to Rhode Island's future, it is vital that the greenspace and greenway system be relevant to the lives of present and future Rhode Islanders. Public policy must afford opportunities for people to access, enjoy and learn about the environment they live in. It should also strive to improve their social well-being and enrich their lives by offering recreation, leisure, and aesthetic character in the places they live and work.

- P-1 Particularly within urban areas where it is lacking, make retention, enhancement, or re-establishment of greenspace a priority consideration in all physical development and revitalization projects. Make provision or expansion of public access to greenspace and greenways a fundamental aspect of community and economic revitalization efforts.
- P-2 Promote public access to and usage of the greenspace system, wherever feasible and consistent with protection of the system's resource values.
- P-3 Use various aspects of greenspace and greenway projects as vehicles for advancing public environmental education, promoting public service and volunteerism, and providing job training/creation endeavors.
- P-4 Encourage Rhode Islanders to play a pro-active role in defining the future of their landscape through participation in land use planning and decision-making, support of "watchdog" and advocacy groups concerned with land use issues, and self-education in land use and environmental issues.
- P-5 Emphasize, in public health and social service programs, the connections between active public recreational use and aesthetic enjoyment of greenspace and personal health and vigor and social well-being.

❖ *Greenspace and the economy:* Greenspace has always been, and will continue to be, instrumental to economic growth. However, as recounted in Part Two, much of our economic gain throughout history has come at the expense of a diminished greenspace resource. Luckily, however, the last 20 years have witnessed a revolution in thinking about the relationship between a healthy economy and a healthy environment. Significant progress has been made--particularly in the developed world--on some environmental protection and restoration fronts. But, as the United Nation's 1992 *Conference on Environment and Development (Earth Summit)* made clear the time to change is growing perilously short. *Agenda21*, the report of the *Earth Summit*, throws down the gauntlet, in effect saying: we must embrace sustainable growth and reconcile economic needs with environmental capabilities, or suffer the consequences on a global scale. Taking a lead from this global initiative, Rhode Island's 21st century economy must emphasize not only productivity and growth--but also sustainability, compatibility with the landscape and the communities it serves, and minimum impact on critical greenspace resources.

- EC-1 Develop a statewide or regional, cooperative approach to the siting of new large-scale developments, which benefits all participants and reduces potential for duplicative and environmentally wasteful local "competition" for industrial and other growth. Seek ways to minimize the pressure that the existing property taxation system creates for conversion of open space to "higher value", developed land uses.
- EC-2 Avoid direct and indirect public subsidization or support of projects which would significantly and negatively affect greenspace areas or greenways. The federal Coastal Barrier Resources Act provides a statutory model for how such a limitation could work.
- EC-3 Encourage a "green as you grow" approach that links expansion of the greenspace and greenway system to community growth and development.
- EC-4 Recognize the connection between greenspace system resources and a vibrant tourism sector by making greenspace protection a vital *plank* of state economic development policy. Protect and promote, consistent with their sustainability, Rhode Island's natural areas and features as eco-tourism resources, and insure that tourism-associated impacts upon greenspace resources are avoided or minimized.
- EC-5 Encourage private sector investment in the provision and maintenance of public greenspace and greenway amenities, as a corporate/civic responsibility.
- EC-6 Where appropriate, link the granting of tax credits/holidays and other public subsidies to private enterprises to the avoidance of adverse impacts on greenspace, and/or creation of public greenspace or greenway amenities.

❖ *Greenspace and transportation:* Our present transportation system--with its emphasis on the highway mode--has been instrumental to much of our past social and economic growth. Increasingly, however, the "costs" of our reliance upon the automobile are also being seen by many as exacting too high a price upon the environment (via air and water pollution), our communities (increased traffic and modified landscapes), and our lives (in terms of the time-penalties and frustration of long-distance commuting and congestion). This realization has not yet reached a threshold level necessary to stimulate more than a few of us to routinely make personal choices designed to reduce or avoid our reliance upon the automobile; however, it has begun to be evidenced via a policy shift on the federal level. Congressional enactment of the Intermodal Surface Transportation Efficiency Act of 1991 represents a clarion call for setting a new direction towards a more diverse transportation system. It offers considerable opportunity for a "greener" transportation future, which would support attainment of the greenspace system.

- T-1 Give high priority to transportation system investments that expand modal choice, offer potential for reducing pollution and energy consumption, and have minimal impacts upon greenspace.
- T-2 Accelerate development of the statewide bikeway network component of the greenspace system to provide a low-energy-use, low-polluting transportation option for Rhode Island.
- T-3 Plan and develop a statewide, interconnected system of state, local, and/or private walkways.
- T-4 Encourage community and volunteer efforts in planning, designing, constructing, and operating/maintaining trails and bikeways as a means to reduce cost and accelerate completion of the statewide bikeway/trail network.
- T-5 Promote bicycling, walking and other non-polluting, energy conserving travel choices by providing information, constructing or subsidizing facilities and services, and encouraging employers' support and advocacy of such mode choices.
- T-6 Require all major new developments to provide for alternative transportation features and facilities (bikeways, trails, bike parking/storage), wherever appropriate, as a supplement to, or (in certain instances) replacements for automobile facilities (roads, parking areas).
- T-7 Discourage municipal abandonment of minimum maintenance (e.g., dirt) rural roads or public ways that now or could function as components of a municipal or statewide trail network. Similarly, discourage the unnecessary paving and upgrading of such facilities that would decrease their utility or desirability for non-motorized travel modes, unless non-motorized usage is provided for.
- T-8 Consider the relationship of roads to the greenspace system as a favorable criterion in the designation of scenic highways.
- T-9 Develop and instill a greenspace ethic in design and engineering of the transportation system. Avoid transportation infrastructure projects that would directly or indirectly significantly harm, diminish, or destroy the identified resource values embodied in the greenspace system. Require the preservation or protection of important natural and cultural resources embedded in the greenspace

system, the mitigation of detrimental impacts upon them, and the replacement of any resource values destroyed or irretrievably damaged by transportation infrastructure.

T-10 Manage utility corridors to enhance their value as greenspace and to capture their potential, wherever possible, for linear recreational opportunities.

T-11 Avoid disposal of state-owned highway corridor land that affords open space value to the community, or which absorbs pollutants and buffers adjoining land uses from the highway-related impacts.



155-8 THE PROGRAM



Anyone who has watched a child's eyes wander into sleep knows what posterity is. Posterity is the world to come. The world for whom we hold our ideals, from whom we have borrowed our planet and to whom we bear sacred responsibility.

President William E. Clinton, *Inaugural Speech*, January 20, 1993

By the time children born today reach maturity, the destiny of much of Rhode Island's landscape will have been permanently ordained. The landscape-structuring decisions made during the coming thirty-odd years ahead will have great power over the lives of future generations. The landscape created will dictate the relationship of future Rhode Islanders to their environment and affect many characteristics of their everyday lives. The choices made, beginning today, will ordain how fully future citizens of Rhode Island will be able to enjoy the benefits of the state's bounty of natural resources. These decisions will foretell if the generations which follow us will live in a built environment that integrates and respects essential natural systems, or one that denigrates and neglects them. The investments we make, or fail to make, from this point forward, will ordain if our successors will live in cohesive communities which honor the cultural icons and historical artifacts connecting generations to each other across time, and to the common bond of the state's land and water; or if they will live in an incongruous landscape jumble, ignorant of history and traditions, and devoid of a land ethic.

Our "sacred responsibility" to posterity requires that we make our landscape-structuring choices with vision, with deference to the needs and possibilities of the future, and with the conviction that the beauty, diversity and wonder of Rhode Island's natural treasures, remain for discovery by our children and our children's children.

This part of the plan describes a recommended program for implementing the Greenspace and Greenways System. It outlines a series of broad initiatives and specific actions to be taken by governmental and private entities to advance the plan, estimates the potential costs of creating the System, and describes resources available to the task.



8-1 Realizing the Vision: The Greenspace and Greenways Implementation Program

The vision advanced by this plan issues a challenge to a crucial generation. If Rhode Island vigorously embarks on a journey down *a greener path*, its future can be brightened by a 127,000 acre, 400 mile natural greenspace/greenway system safeguarding essential resources, and by an alternative transportation infrastructure of 200 miles of bikeways and 70 miles of trails spanning and linking the state. This part of the plan outlines the broad parameters of a generation-long (25 year) effort aimed at bringing the Greenspace and Greenway System into existence, and helping us reach that future.

8-1-1 Program Initiatives

The Greenspace and Greenways Implementation Program proposes activities under three major initiatives.

1. *Green as We Grow: Greenspace Protection for a Sustainable Landscape*

The primary thrust of the program would unite the State of Rhode Island, its communities, and public and private sector partners in a structured, 25-year land protection program to safeguard the resources of the state Greenspace and Greenway System. The sustainable landscape philosophy guiding this initiative would have the state and its communities maintain a rough proportionality between the rate at which we convert land for current needs, and the rate at which we protect it for the future.

Protection of system resources would be advanced on two parallel, interrelated tracks: (1) by standards requiring appropriate protection and public availability of greenspace as an integral design feature of every project that significantly structures the landscape; and (2) via a public investment program that recognizes the desirability of regularly-programmed investments in greenspace as a public good to achieve long-term goals.

The protection program would encompass the following features:

- ❖ **Regulatory vigilance:** Rigorous application of existing regulatory authority must be the front line of defense for the natural elements of the Greenspace and Greenway System. Regulation alone should be the principal avenue of protection for the 40 percent of the system subject to the state Freshwater Wetlands Act or the Coastal Resources Management Act. Regulatory schemes should give added priority to resource protection and restoration within the Greenspace and Greenway System and could enhance protection of key areas by directing mitigation/remediation investments (required in connection with permitted activities outside the Greenspace System) to benefit protection of the system.
- ❖ **Corridor planning:** *Greenway Corridor Conservation, Restoration and Management Plans* would be completed covering the 400 miles of major natural greenway corridors in the system. Modeled on the National Park Service's/National Association of Floodplain Managers' Multiple Objective River Corridor planning process, the resultant plans would provide detailed examination of the resource protection and management issues; identify threats and opportunities; and develop protection, restoration, and management strategies and priorities to guide investments. Plans would be developed with multi-community participation; and would be coordinated with the comprehensive planning process.

- ❖ **Focused acquisition:** Purchase of land (and interests in land) would be used to protect Greenspace and Greenway System areas that regulation alone could not adequately safeguard, to provide connectivity of the system and to accommodate public usage. The Greenspace acquisition program would focus Rhode Island's land protection programs upon the 28 percent (35,000 acres) of the 127,000 acre natural Greenspace System that is undeveloped, unprotected, and not subject to state regulation. Acreage goals of the Greenspace/Greenways Protection Program are as follows:

Table 155-8(1)(a)
**Targets for Greenspace and Greenways System Protection
 by Technique**

	<u>Acres</u>	<u>% of Total Program</u>
◆ Regulation	50,000	59
◆ Acquisition	35,000	41
PROGRAM TOTALS :	85,000	100

Table 155-8(1)(b)
**Targets for Greenspace and Greenways System Acquisition
 by Acquiring Entity**

	<u>Acres</u>	<u>% of Acq.Program</u>
ACQUISITION (all forms)	35,000	100
◆ Direct federal acquisition	1,400	4
◆ Direct state acquisition	17,850	51
◆ Direct local government acquisition	8,750	25
◆ Direct private conservation acquisition	1,750	5
◆ Donations via creative development	3,500	10
◆ Conservation donations/transfers	1,750	5
PROGRAM TOTALS :	35,000	100

- ❖ **Protection partnerships:** The protection program should utilize the capabilities of existing land protection programs and resources and should include participation by all partners traditionally allied with state land protection efforts (e.g., federal and local governments, and private conservation organizations). Partnership acquisition projects should be cost-shared at a 50 percent state/ 50 percent non-state ratio.
- ❖ **Creative development contributions:** The Program would develop a *green as we grow theme* by including a goal of protecting at least 10 percent of vulnerable Greenspace System acres via creative development techniques without significant public outlays. To achieve this, state contributions to local acquisition programs would encourage adoption and enforcement of local development regulations and requirements designed to protect Greenspace/Greenway System areas and stimulate creative private sector initiatives for preserving system land as a normal part of the (land) development process. While all localities would remain eligible for state funding, local partners exceeding a 10 percent private protection goal on an annual basis could be rewarded either with increased priority for

selection of their projects or by counting the value of the extra donations as local matching funds in the succeeding year's competition.

The efficacy of the protection program should be monitored using tracking indicators. Every five years, program assumptions and progress should be reassessed, and adjustments made where needed. For instance, if tracking indicators reveal that the program's reliance upon regulatory measures is providing inadequate protection for system resources, expansion of the acquisition element will be necessary, adding to overall program cost. Similarly, adjustments to the acquisition program may be necessary if program targets are not being met, or if costs exceed estimates.

2. *Reweaving the Natural Web: Greenspace Reclamation*

Restoring the values of degraded greenspace, where opportunities allow, is the second step Rhode Island must take along the greener path. This initiative seeks to apply remedial measures to restore damaged or broken links in the greenspace chain. Steps would be taken to re-introduce greenspace where it is in desperately diminished supply--our urban areas. Other actions would be aimed at controlling or minimizing the detrimental impacts of developed land uses where they imperil crucial system resources.

Greenspace reclamation programs would include:

- ❖ **Re-green the city:** The restoration of greenspace in cities and the creation of urban greenways must be a particular focus of greenspace reclamation efforts. Because they were largely developed prior to the modern era, Rhode Island's urban core cities are significantly deficient in public greenspace compared to contemporary national standards. Success in expanding public greenspace in urban environments is critical to achieving a more equitable distribution of public greenspace and expanding access to greenspace for tens of thousands of low income Rhode Islanders concentrated within our cities--for whom close-to-home recreation may be the only recreation. For these reasons, it is crucial that the greenspace and greenway network extend into and through our cities.
- ◆ *Water's Edge--restoring waterways for people:* Massive public investments in wastewater treatment facilities and combined sewer overflow abatement authorized by Rhode Islanders in recent years will dramatically improve water quality of the rivers and tidal waters of the state's metropolitan core by early in the coming century. Public policy and investments in greenspace must insure that the renaissance of land use fronting urban waterways, cleaned up at public expense, benefits the public by way of opportunities for access and enjoyment of the waters and the water's edge. Providence's Waterplace provides the ultimate model, demonstrating the great promise that greenways along neglected rivers and shorefronts offer for restoring the urban public's access and enjoyment of water resources from which it has long been alienated. Recent studies have pointed to a potential for similar urban greenways along reaches of the Woonasquatucket, Moshassuck, West, and Pawtuxet rivers; and these possibilities should be pursued.

- ◆ *Nurturing Neighborhood Greenspace*: Successful ventures in several of the state's cities have demonstrated the positive contributions made by provision or improvement of small-scale greenspaces in neighborhoods. Creation of community gardens, institution of street tree planting programs, volunteer clean-ups of vacant lots and drainage ways, and the adoption and beautification of neglected common spaces (traffic islands, small parks, historic cemeteries) are simple and relatively inexpensive measures that have been successfully employed at the grassroots level in various urban communities. Other non-traditional solutions that could add to the supply of neighborhood greenery, include management of utility corridors for multiple purposes, and reclaiming unused or underused urban land (both unused/derelict and underutilized developed areas such as "excess" parking/paved areas) in strategic locations within greenway corridors.

This strategy would seek to replicate successful models in urban environs throughout the State by promotion, providing information exchange, and demonstration and start-up grants to community groups. Standards requiring incorporation of sufficient usable greenspace in all new/revitalized neighborhood facilities should also play a role in expanding the quantity of greenspace in our cities, and restoring urban residents' connections to a more natural landscape.

- ◆ *Community involvement*: Especially in economically disadvantaged neighborhoods, the very process of building the Greenspace System should be instrumental to a larger goal of restoring hope and pride. Programs should encourage grassroots, bootstrap efforts to reclaim community greenspace. A recognition that neglected natural resources can be rejuvenated through community action can be a source of empowerment and inspiration for downtrodden communities, laying the groundwork for other creative, cooperative efforts. Giving neighborhoods a stake in creating their parks or community spaces also provides a powerful deterrent to misuse and vandalism.
- ◆ *Loss avoidance*: A first priority in greenspace-deficient urban areas is to avoid the unnecessary loss of existing and potential public open space. Abandonment of public park land, even if budget restrictions limit its regular maintenance, should not be a serious option given the shortage of open space in most urban communities. Even small irregular parcels along highway corridors, residuals from large tracts condemned to create the roadway and seemingly without public value, provide critically scarce open space and should not be sold off just to provide cash flow. To safeguard the present supply of public greenspace, the program would condition state funding for future local greenspace acquisitions on certification that all public open space presently owned by the jurisdiction would be retained, and execution of a public interest review prior to the surplusing of public land.

Over time, our efforts in urban areas should seek to re-stitch the natural fabric of greenspace, repairing, when opportunities avail, the rips and tatters we have made through the decades.

- ❖ **Wetland Restoration**: In our past dealings with greenspace, water resources often suffered particular neglect. It was expedient to fill wetlands and wall off the public from our urban

rivers, even to the point of interring some lengthy portions of our watercourses in subterranean conduits when they "got in the way." It is possible, with today's technology, to use created wetlands as wastewater treatment facilities, or for runoff and flood water storage. As future opportunities arise, we should stand ready to rescue our entombed rivers and streams, restore damaged wetlands and advantageously re-employ their natural functions. To encourage this, the Program includes a goal of restoring at least 100 acres of damaged wetlands and associated riparian land per year.

- ❖ **Arresting Degradation Threats:** In certain instances it will not be feasible to repair the fabric and restore the values of greenspace without intervention to stem pollution sources from adjoining developed land. In most instances, this effort would entail removing part of a paved parking lot that slopes into a river, and replacing it with a vegetative buffer strip or sedimentation basin. In other, likely limited, cases, it might necessitate purchase and removal of a land use that poses an unacceptable threat to a critical greenspace value--an auto graveyard adjoining a tributary feeding a drinking water supply, for instance.

3. *Pedaling Mobility: Greening the Path from Here to There*

The third major focus of the Greenspace and Greenways Implementation Program is transportation. For decades, our mobility needs have often been met at the expense of greenspace. The Greenspace program seeks to promote initiatives that will expand mobility options for people in an environmentally sound and health-promoting manner, and that promise to reduce auto congestion and pollution in the process.

Development of the statewide bikeway and trail greenway network as an alternative transportation infrastructure is the main impetus.

- ❖ **Accelerated Bikeway and Trail System Construction:** The accelerated development of a statewide system of independent bikeways would be accomplished under this initiative. The Program goal would be construction of an average of over seven miles of new independent bikeway per year, completing a 200-mile system by 2020. Interim goals of completing the North-South Trail by 2000 and Rhode Island's segments of the East Coast Greenway/bikeway by 2005 would make the state a leader in the *greening* of transportation networks.
- ❖ **Greenspace Enhancements:** Beyond an accelerated push to develop a statewide bikeway and trail network, Rhode Island should undertake a greenspace enhancement program as a regular part of its transportation programming. This program would include greenspace protection and mitigation measures associated with all new major transportation projects, as well as projects aimed at remediation for past impacts of transportation infrastructure upon the environment. Possible initiatives include:

- ◆ *Main Street Survival/Revival:* Combining multi-modal transportation/infrastructure upgrading with integration of greenspace and

aesthetic/beautification features and pedestrian facilities, these enhancement projects would examine mobility needs of the state's traditional "main streets" within the context of supporting or re-asserting the area as a vital center of the community's social and economic life.

- ◆ *Urban Boulevards and Scenic Byways*: By linking transportation improvements with greenspace preservation and land use controls this program would seek to enhance the value of travel corridors to the communities they serve, produce streetscapes more conducive to pedestrian and bicycle travel, and safeguard (or restore) the pleasurable visual experience of driving.

In urbanized areas, greenspace-themed restoration of major arteries, boulevards, and parkways, would seek to enhance their aesthetics, urbanity, and desirability for pedestrians and bicyclists. Traffic improvements (re-signalization, channelization and pavement marking, traffic calming devices, parking restrictions) can be skillfully combined with reintroduced greenery (street trees, flowerbeds, landscaped medians and shoulders, etc.), streetscape amenities (brick or cobble pavers, historically appropriate lighting, signage) and pedestrian and bicycle enhancements (improved/widened sidewalks, benches, trash receptacles, drinking water fountains, bicycle racks and lockers) Urban corridor revitalization would also include options for transit improvements such as priority bus lanes, turnouts and turnarounds with improved bus stops (information kiosks, consistent route signage programs, shelters, etc.) or creation of Class II or III (shared-roadway) bicycle routes, whenever appropriate.

Scenic parkway and byway programs would apply similar comprehensive treatment (landscaping, distinctive designs for roadway appurtenances, purchase of visual easements, local land use and advertising controls) to suburban or rural roads designated as visually or culturally noteworthy.

Enhancement projects have not and should not be undertaken solely as state transportation system initiatives. Their true potential lies in sparking a revitalization of neighborhoods and business districts. To achieve that promise, they must be the product of concerted state, local, business and community commitments to focus available resources on activities contributing not only to a comprehensive upgrading of the transportation infrastructure, but also to stabilizing and improving surrounding land uses and community facilities.

Accordingly, priorities for projects should be based upon the willingness of the sponsoring local government and affected property owners to commit to changes in land use controls (enactment of new local land management controls (zoning, design review, signage) and other policies (such as enforceable maintenance agreements) necessary to insure that the publicly-financed improvements endure. Local partners should also be expected to bring resources (funds, volunteer labor, donation of land

for proposed enhancements) to the project to supplement state and federal transportation investments in achieving a comprehensive revitalization effort.

8-1-2 Action Recommendations

This section presents a series of more detailed recommendations for actions supporting the major initiatives of the Greenspace and Greenways Implementation Program. Actions are organized under seven general categorical headings, and are numbered solely for ease of reference. The recommendations, in most instances, do not specify which agency(ies), organization(s), or entity(ies) should assume responsibility for implementation. In most cases, achievement of the action will require concerted efforts of a number of greenspace partners.

[Leadership and Coordination

1. Establish a state Greenspace & Greenways Council to lead and coordinate public and private efforts in creating the Greenspace and Greenways System. The Council should be multi-disciplinary, comprised of federal, state, local, and private entities with interests in resource protection and development of the System.
2. Work closely with private non-profit organizations and grassroots citizens' groups advocating greenways at the community level. Insure that these groups are aware of the state Greenspace and Greenways Plan, and encourage efforts that relate to its implementation.
3. Build partnerships between Rhode Island's land preservation interests and the economic development community (e.g., Chambers of Commerce, builders, realtors, and designers groups) grounded on the common interest implicit in the System.

t Funding

4. Develop a Greenspace Investment Program providing dependable funding sources capable of implementing the greenspace program. This will include insuring that existing revenue sources are used to full advantage, and instituting new sources of revenue. A combination of existing and new sources in a dedicated Greenspace Trust Fund should also be explored.
5. Encourage the federal government to become a full partner with the states in preserving greenspace and building greenway systems for 21st century America. Congress should consider consolidating the numerous (under-funded) land resource protection programs under a (more fully-funded) umbrella program, which would allow states flexibility in administration and direction of funds to priority areas and would offer funding incentives to states that have adopted integrated, multiple-objective greenways plans. In the meantime, seek increased funding for the Land and Water Conservation Fund, Forest Legacy Program, Intermodal Surface Transportation Efficiency Act, and similar categorical protection /system development programs.
6. Direct available land acquisition/protection resources to projects supporting protection and sound management of vulnerable portions of the Greenspace and Greenway System. Where needed, modify program guidelines and criteria to give priority to projects in the System. Encourage private land protection partners to give similar emphasis to the system in projects they fund.
7. Provide sustainable funding and continuity in state land protection grant and loan programs to encourage and maintain participation by local government and private non-profit conservation groups in projects which support the Greenspace System.

h Landowner Incentives

8. Develop a Greenspace Stewardship program giving recognition and incentives to cooperating private owners of undeveloped land with Greenspace value. Owners who entered the program and agreed to preserve their land for an extended period would be rewarded with a comprehensive package of services and incentives (might include: public recognition; resource management/reclamation technical assistance; estate planning, automatic qualification for Farm, Forest, Open Space tax assessments; priority for future acquisition, state-guaranteed loans for development of *green*, (resource protection-oriented) economic development ventures, etc.).
9. Study changes to the Farm, Forest and Open Space Act that would give greater impetus to private conservation of the Greenspace System. These could include requiring automatic certification of privately-owned unimproved land within the System as farm, forest or open space (as appropriate) for tax purposes; establishing uniform statewide

valuations for farm, forest, and open space categories; linking the program to the phased purchase of key parcels (or of development rights) over time, and stiffening penalties for early withdrawal from the program.

10. Work to provide estate planning assistance for large-tract private landowners (especially in the Greenspace System), to ensure that landowners are aware of the possible financial benefits of conservation donations, and encourage land protection via donations.

T Planning & Technical Assistance

11. Provide greenway planning, land protection, and design advice to local governments and greenway groups.
12. Develop detailed plans for implementing Greenspace Program initiatives. Greenway Corridor Conservation, Restoration, and Management Plans would be produced in a partnership program between the Greenways Council and consortiums of local and private partners (cities and towns, watershed organizations, land trusts, etc.). Plans would examine, using a multiple-objective methodology and RIGIS data, resource management and reclamation needs; implementation possibilities for trails, bikeways, and transportation enhancements; and threats to greenspace resources. Protection priorities, resource management recommendations, and facility development schedules unique to each corridor would be produced.
13. Revise and update the *State Land Use Plan* (map) using current geographic data and analysis tools available via the RIGIS. This update should incorporate the results of the Greenspace and Greenways Plan and should designate areas for preservation or development based upon a land capability and infrastructure analysis utilizing the most recent natural resource, cultural resource, and public services and facilities datasets and information from local comprehensive plans.
14. Revise the guidance documents provided to local governments concerning the comprehensive planning process and local recreation planning to include information on the Greenspace and Greenways Plan, encourage local planning that reflects state greenspace goals, and encourage local projects and activities that support creation of the system.
15. Review local comprehensive plans to insure recognition of, and support for, the Greenspace Plan's goal, policies, and recommendations.
16. Develop a *State of the State's Land* report to accompany the annual *State of the State's Waters*, presenting a statistical portrait of the status of key greenspace resources and tracking implementation of the Greenspace Program. Develop new environmental indicators, such as forestland cleared, wetlands modified, land covered by impervious surfaces, acreage preserved, etc. Investigate the use of data sources such as development permit records and satellite imagery to provide better real-time tracking of key indicators.

17. Assess vacant land in urban areas for relationship to the greenspace system or as neighborhood greenspace. Identify high priority sites for acquisition as public greenspace.
18. Work with local governments and greenway groups to identify priority sites for greenspace reclamation efforts, including wetland restoration, reforestation, runoff and erosion control, flood storage/conveyance restoration, and containment or removal of degrading land uses.

) Fostering Creative Development

19. Investigate the integration of mitigation transfer and banking techniques within state regulatory programs. Under mitigation banking, state wetlands and coastal management (and possibly other) regulatory programs could allow more flexibility for creative development in non-critical areas (generally more suitable for development), while directing protection and reclamation efforts towards critical Greenspace System areas.
20. Provide technical assistance and professional education in creative development techniques. Develop a handbook providing guidelines, criteria, and models for employing creative development as a way to preserve greenspace and assemble greenways, while producing landscape-compatible, community-supportable development.
21. Investigate creation of a Community Landbanking Program to encourage creative development. Under such a program, local governments could enter the land market to shape future development of critical lands. Parcels would be purchased by a town using a capital source (perhaps revenue bonds), and conditions attached requiring reliance upon creative development techniques to safeguard sensitive portions of the site. The land would then be sold for private development, presumably at a profit if it had been "banked" for some time, or if infrastructure had been upgraded in the interim. Proceeds (after debt service) would be available to continue and expand the program.
22. Encourage communities to employ mandatory cluster/planned development, transfer of development rights, site plan review, buffer and landscaping requirements, and other inducements to creative development in their land management ordinances.
23. Study the establishment of regulatory criteria allowing carefully-controlled use of innovative community or district-operated, small-scale (package) wastewater treatment and disposal systems in order to encourage creative development in appropriate areas. At minimum, criteria should require designation of service districts and greenspace preservation areas (density receiving and sending zones) in local comprehensive plans and land management ordinances, approval by state as consistent with State Guide Plan,

and designation of a responsible municipal (or regional) entity to own, operate, manage and maintain the facilities. Explore having the R.I. Clean Water Finance Agency and the Narragansett Bay Commission collaborate in creating a village-service district program that would assist localities in establishing, funding, and operating package plant services that could gain regulatory approval.

24. Require redevelopment projects in urban greenspace areas to assess reclamation opportunities (removal of excess paving, landscaping enhancements, runoff control, wetlands restoration, etc.) and include prudent measures where feasible.
25. Encourage localities to require the identification of existing trails as part of the development review process, and to insure their protection, especially where they relate to a community or state trail proposal.
26. Encourage land development standards that promote bicycle and pedestrian mobility via inclusion of appropriate on-site facilities and amenities (storage and locking, signage, sidewalks, benches, etc.). Consider allowing reductions in parking requirements in exchange for provision of bicycle and pedestrian facilities. Insure coordination of new developments to facilitate connection of off-road bikeways and trails at property lines.

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Community Involvement

27. Involve conservation commissions with developing and implementing local greenspace/greenway systems. Charge commissions with coordinating implementation efforts of local agencies and private land protection partners, and with monitoring the status of greenspace in their jurisdictions. Encourage commissions to review proposed new development and provide recommendations to the local Planning Board on the effects on greenspace resources and development techniques that could lessen impacts.
28. Develop bikeway and trail construction standards that allow use of low-cost techniques, volunteer labor, and local government resources (public works equipment and labor, etc.) where feasible, to minimize costs, accelerate completion, and maximize community participation in local independent projects.
29. Develop a community farming/gardening initiative to provide technical assistance (via URI Cooperative Extension, or similar program) and small "seed" grants to community action programs, neighborhood groups, land trusts, food banks, and similar non-profit organizations for establishment of community gardening programs. Assess unused public land (excess highway right-of-way, under-used portions of parks, etc.) for potentially suitable garden plots.
30. Utilize the National Community Service Corporation's volunteer jobs program to help create the Greenspace System, while providing a learning experience. Coordinate with the Rhode Island Commission on National and Community Service to create a RI

GreenCorps volunteer program involving trail construction, greenspace reclamation, and public greenspace maintenance endeavors.

31. Investigate developing a structured "Boot Camp" program for non-violent juvenile offenders involving work on greenspace reclamation or facility construction/maintenance, and offering natural resource/environmental career training.

DAsset Management

32. Avoid the unnecessary loss of greenspace currently within the public domain. Ensure that State surplus property disposal include an assessment of the greenspace value and relationship to the Greenspace/greenways system of all properties proposed for disposal as surplus. Such review should require *agencies proposing* surplus land to detail the public greenspace values, if any, that the land provides; to assess the need for public greenspace within the vicinity of the parcel; and to describe its potential for reclamation as beneficial greenspace and/or utility to creation of the greenway network. The assessment would also include recommendations for management and protection criteria required as restrictions upon the parcel, if disposal were approved.
33. All state and quasi-state agencies should review land that they manage for its relationship to the System and should identify conservation, restoration and management measures that advance protection and/or reclamation of parcels having high greenspace value. They should allow maximum public realization of greenspace values consistent with agency operations and missions. The review should also assess candidate areas for enrollment in the Natural Heritage Reserves Program. Public agencies managing land designated as public open space should also review their holdings to assess opportunities for sale, exchange, or jurisdictional transfer of unencumbered land having no greenspace value and no relationship to the proposed system.
34. Encourage public utilities to manage right-of-way corridors as greenways, including public trails and bikeways, where practical.

8-2 Estimated Costs of the Greenspace and Greenways Program

Creation of a statewide system of greenspace and greenways envisioned by this plan will require sizable investments of public and private funds over a considerable time period. Estimation of costs for time periods extending well beyond the 3-5 year timeframes of conventional economic models is more art than science; and can be subject to wide variances depending upon the underlying assumptions used to produce the estimate. Given the utter impossibility of seeing 25 to 35 years "down the road" with any clarity, perhaps the most that can be presently proffered is an explicit statement of assumptions, so that their reasonableness can be adjudged.

Implementation of the Greenspace and Greenways Program will incur both capital and operational costs. Significant investments of capital will be required for land acquisition under the Greenspace Protection initiative and for bikeway and trail development under the Pedaling Mobility initiative. Forecasting the cost for these program investments is relatively straightforward, given that the desired program outcomes (e.g., acres to be acquired, miles of bikeway and trail to be constructed) have been well quantified, and that considerable experience is available on which to base present costs for these activities. Although Greenspace Reclamation efforts will also require capital investments, the cost dimensions of this initiative are difficult to estimate at present. Operational costs will also be incurred during implementation of each of the three program elements.

8-2-1 Land Acquisition Costs

The Greenspace Acquisition Program represents the largest potential capital requirement for implementing the Greenspace and Greenways System. To estimate the magnitude of costs for the acquisition element of the program, a model was developed which distributes total targeted land purchases (35,000 acres) into even annual increments over two program option periods: 25 and 35 years.

High, medium, and low estimates for both program length options were developed using three assumed values (4%, 6%, and 8%) for the average annual *land cost inflation rate*, or year-to-year average increase in the price of undeveloped land. These inflation factors were applied to the base year per acre acquisition cost figure (\$5,000), derived by averaging state (DEM) fee simple open space acquisitions completed since 1980.

The model assumes that distribution of responsibilities and reliance upon various acquisition tools in future land protection endeavors will resemble past patterns in many respects, but should also differ in key ways. Jurisdictional and technique allocations in the model are made to the following seven land protection techniques and jurisdictions: (1) federal acquisition, (2) state fee simple acquisition, (3) state acquisition of less-than-fee-simple interest, (4) local fee simple acquisition, (5) local less-than-fee-simple acquisition, (6) private conservation organization acquisition, and (7) protection via private creative development (protecting valuable portions of parcels as they are developed, using techniques as clustering, transfer of development rights, dedication to open space, and donations).

The model's protection *mix target* factor, representing a goal for the proportion of total program acreage to be protected by the jurisdiction/technique, assumed that future protection efforts would be based closely upon the proportional jurisdictional representation of past protection efforts (as evidenced by current patterns of ownership/management of protected open space) but should also reflect expectations relative to future increases or decreases in jurisdictional participation in land protection efforts. For example, compared to past efforts, the model's protection mix assumptions predict that: federal acquisition will increase (via the Forest Legacy Program), but remain a small part of the total mix (4%); state and local governmental efforts will continue to constitute the bulk (about 75% combined) of acquisition efforts; and private

conservation efforts, including land protection through creative development, will grow substantially (from 8% to 20%).

The assumptions of proportional jurisdictional and technique mix were used to distribute estimated costs among participating entities in the protection program. State cost-sharing of one-half of acquisition costs with local and private non-profit conservation partners is assumed in the model, based upon past practice, and as an impetus to stimulating participation.

Table 155-8(2)(a) presents high, medium and low estimates of total program cost, in aggregate and distributed by jurisdiction/technique, for the 25 and 35 year program options. Estimates of costs for the first ten years of each program option are provided in Table 155-(8)(2)(b). The figures output by the model represent one-time capital costs, and do not include potential debt service costs, administrative and carrying charges, and land management/operations costs.

Table 155-8(2)(a)						
Range of Estimated Total Costs for Greenspace Acquisition Program						
PROGRAM LENGTH (YRS):	25			35		
LAND INFLATION RATE:	4%	6%	8%	4%	6%	8%
<i>Figures in millions</i>						
TOTAL PROGRAM COST :	\$259.1	\$341.4	\$455.0	\$327.4	\$495.3	\$765.9
COST BY JURISDICTION:						
FEDERAL	11.6	15.4	20.5	14.7	22.3	34.5
STATE	186.3	245.4	327.0	235.3	356.0	550.6
LOCAL	34.3	45.1	60.1	43.3	65.5	101.2
PRIVATE	27.0	35.5	47.4	34.1	51.5	79.7

Table 155-8(2)(b)
Greenspace Acquisition Program Estimated Cost: First 10 Years

PROGRAM LENGTH (YRS):	25			35		
	4%	6%	8%	4%	6%	8%
LAND INFLATION RATE:						
<i>Figures in millions</i>						
YEARS 1-10 COST :	\$ 74.7	\$ 82.0	\$90.1	\$53.4	\$58.6	\$64.4
COST BY JURISDICTION:						
FEDERAL	3.4	3.7	4.1	2.4	2.6	2.9
STATE	53.7	59.0	64.8	38.4	42.1	46.3
LOCAL	9.9	10.8	11.9	7.1	7.7	8.5
PRIVATE	7.8	8.5	9.4	5.5	6.1	6.7

The 35 year program offers lower initial costs, but dramatically higher total program costs than the 25 year program option, particularly for the high inflation rate scenario. In terms of costs to state government, the 25 year program's starting cost of \$4.5 million, is comparable to current (1993) state investments in open space purchases, which totaled \$4.6 million. Under the medium inflation scenario, the investment of state funds required during the 25 year program approximates \$10 per Rhode Islander per year.

8-2-2 Bikeway System Development Costs

Completion of an (approximately) 200 mile independent bikeway system constitutes the second major "new" capital cost of the Greenspace and Greenways Implementation Program. To estimate the potential cost of this initiative, a cost projection similar to that performed for the land acquisition program was developed. This model distributed total new independent bikeway construction miles (180) into a 25 year level program calling for completion of 7.2 miles annually. A year one starting cost per mile of bikeway was estimated at \$500,000, based upon Rhode Island's experience in construction of the East Bay Bikeway (built during the late 1980s) and upon preliminary estimates of the average per mile construction cost of the Blackstone River Bikeway project (now in preliminary design). Construction cost estimates include planning, design and construction, but exclude right-of-way acquisition. Future construction was costed for both low (2%) and moderate (4%) average annual inflation conditions. Distribution of costs to participants assumed that construction of the independent system would continued be funded at 80% federal, 20% state, as currently provided for under the Intermodal Surface Transportation Efficiency Act.

Projected costs, by participant for the bikeway construction program are presented in Table 155-8(3)(a) for a 25 year program period, and for the first ten years of the program in Table 155-8(3)(b).

Table 155-8(3)(a)
Estimated Cost for Bikeway Construction Program

PROGRAM LENGTH (YRS):	25	25
AVG. INFLATION RATE:	2%	4%
<i>Figures in millions</i>		
TOTAL PROGRAM COST :	\$ 115.3	\$149.9
COST BY JURISDICTION:		
FEDERAL	92.2	119.9
STATE	23.1	30.0

Table 155-8(3)(b)
**Bikeway Construction Program Estimated Cost:
 First 10 Program Years**

PROGRAM LENGTH (YRS):	25	25
AVG. INFLATION RATE:	2%	4%
<i>Figures in millions</i>		
YEARS 1-10 COST :	\$ 39.4	\$43.2
COST BY JURISDICTION:		
FEDERAL	31.5	34.6
STATE	7.9	8.6

8-2-3 Reclamation Costs

Estimating the cost of reclaiming damaged or degraded greenspace is complicated by uncertainty concerning the nature and extent of restoration efforts needed, and a relative lack of experience in natural resource reclamation. Moreover, reclamation costs will likely be highly project- and site-specific, varying considerably depending on the current and historic uses of the land to be restored and the restoration goal(s) for the site. Replacing pavement in a river-fronting parking lot with grass and trees to create a greenway buffer would presumably cost much less than reclaiming a similar riverine greenway parcel on which hazardous-waste had been disposed. Another consideration is the probability that most greenspace reclamation will likely occur on an incremental basis in connection with projects having other principal purposes.

One area of reclamation for which a body of experience *has* been amassed over the last decade is the restoration of wetlands. A recent survey research study that examined approximately 1,000 wetland restoration projects of varying sizes, scopes, and complexities throughout the nation found the *average* per acre cost for restoration to range from a low of \$1,000 per acre for agricultural conversion projects, to over \$75,000 per acre for forested freshwater wetland projects¹. Assuming a \$50,000 per acre cost estimate and a 100 acre/year restoration goal recommended in the Greenspace Reclamation Program yields an annual cost of \$5.0 million in the

¹ King, D and Bohlen, C. *Estimating the Costs of Restoration in National Wetlands Newsletter* v.16. n.3 May/June 1994.

first year. Under a 4 percent annual inflation assumption, the cost of this program element would grow to \$19.2 million in Program Year 25. The total cost for the 25 year wetlands restoration effort would be \$268 million. Federal and private sector participation would be expected to defray a portion of these costs.

8-3 Marshaling Resources

Realization of the Greenspace and Greenway Program will require a marshaling of energy and resources, likely transcending those traditionally available for land protection. Beyond support from all levels of government, it must inspire private participation and contributions--from the smallest grassroots citizens' group up through national organizations. Successful implementation will also require achieving greenspace goals as ancillary benefits of programs having other principal purposes. Finally, and most critically, if the vision of a statewide Greenspace and Greenways system is to be realized, public and private funds--adequate in size and dependability--must be secured to support orderly, programmed execution of the plan.

This section catalogues existing and potential resources that may be deployed to support implementation of the recommended Greenspace and Greenways System. Resources are described in three general categories: *Tools and Techniques*, a compendium of the legal mechanisms available to protect greenspace resources; *Institutions and Programs*, a listing of agencies, organizations, and programs whose missions make them likely participants in implementing the Greenspace network; and *Funding Alternatives*, a description of existing and potential sources of financing.

8-3-1 Tools and Techniques: The Land Protection Toolbox

Table 155-8(4) (which follows page 8.21) lists the predominant measures utilized to protect land having natural or cultural resource value. The panoply of tools fall into two general headings: (1) *acquisition techniques* and (2) *regulatory techniques*. While specific techniques vary greatly, depending on the nature of the public value to be conserved and the degree of control required or desired to accomplish the protection objective, several generalities can be stated relative to the broad categories.

Acquisition techniques, in general, are more costly than regulatory approaches; but they provide greater guarantee of permanent protection and more flexibility in management. Acquisition, generally of full title, is often required (or preferred) for lands on which public usage is contemplated. Ordinarily the result of consensual agreement between government agency and private landowner, acquisition is also much less adversarial than regulation, which involves unilateral application of governmental power upon landowners.

Further distinguishing the two categories are differences in how the legal environment regards their utilization by governments in pursuit of land protection goals. In public acquisition programs, government becomes *just another buyer* in the private land market. (Although its

authority to invoke eminent domain condemnation distinguishes it from other buyers, in actuality, this coercive measure is relied upon relatively infrequently, generally only as a last resort.) As a participant in the land market, governmental acquisitions are governed by the ancient precepts of property law. Although specific techniques may have archaic requirements, requiring expertise and careful execution, the law of property acquisition can be navigated with relative ease by governments--as long as they have sufficient funds to participate in the market.

Properly run government acquisition programs operate on legal *terra-firma* compared to the uncertain terrain of regulation. In regulation, governments act on behalf of the public good in exercising the police power to enjoin landowners from making certain uses of their land. Regulation is restrained by the limits placed on governmental actions by the Constitution, most particularly the prohibition of the Fifth Amendment against the *taking of private property without compensation*. Regulations must also meet high legal standards relative to purpose, propriety, and equity.

While the legality of public regulation is well-settled in principle, in practice, governments must continually walk a tightrope in crafting rules that achieve the desired effect for the public welfare, without going too far in denying individual owners the enjoyment of their property. In recent decades, governments have responded to increased public demands for control of development impacts and for enhanced protection of resources by becoming more activist in their reliance upon regulatory techniques, and more exacting in their demands on private landowners. Recent Supreme Court decisions have narrowed the discretion of regulators, requiring that their rules demonstrate a connection, or *nexus*, between ends and means, and that there be a "rough proportionality" between impacts being regulated and the burdens placed upon landowners by the regulations².

Successful implementation of a greenspace system must utilize acquisition and regulatory techniques hand-in-hand, using each to optimum advantage in particular situations. A cost-effective strategy would employ (lower cost) regulatory measures in a broad-reaching defense of threatened resources categories (wetlands, watersheds, agricultural land), allied with a public acquisition program focusing on the most critical system components, areas where public access and usage is desired, and parcels where regulation alone either would be insufficient to protect the vital public interest or would necessitate imposition of Constitutionally-suspect conditions upon private owners. In practice, this boils down to maintaining as vigorous a regulatory defense of greenspace resources as possible, while simultaneously maintaining as vigorous a public acquisition program as resources allow.

² See *Nollan v. California Coastal Commission* (U.S. SupCt. 1988) and *Dolan v. City of Tigard* (U.S. SupCt. 1994).

8-3-2 Getting *Greenbacks* for Greenways: Sources of Funding to Invest in Greenspace and Greenways

The costs outlined in section 8-2 for the Greenspace and Greenways Program would be daunting in the best of times; they appear more so in the current times as the state pulls itself up from the economic distress of 1991-2. The costs, while challenging, are not insurmountable--particularly if they are seen as investments which will yield benefits not only for today, but for "all time to come". If Rhode Islanders are *determined* to save the essential features of their landscape and create new avenues for enjoying the outdoors, they *will* find the necessary wherewithal to invest in greenspace and greenways.

Table 155-8(5), which follows Table 155-8(4), catalogues financial resources which could be considered as investment capital for greenspace and greenways and identifies a number of existing and potential sources of revenue which could, if the public wills, be directed to support the Greenspace and Greenways Program.

**The Courage to Ask:
Finding Funds for ...
"an enterprise which is
for all time to come".**

The Commission is most reluctant at this time to ask the State for further appropriation, for the recent financial depression has been felt by the General Treasury. Yet it can not forget that the condition of the public balance at any time has but small bearing upon an enterprise which is for all time to come, and which is to be paid for almost wholly by future generations; and which will cost these generations very much more money for very much less desirable results, if the work is not now provided for. The Commission feels pitifully helpless as it sees splendid opportunities about to escape unless aid is given now. ³

8-3-3 Institutions and Programs

From a narrow perspective, implementation of the statewide greenspace and greenway system could be defined as a series of specific tasks assigned to one or several existing agencies having land protection as their principle mission. But the network is based on the premise of cutting across many jurisdictions and narrowly-defined responsibilities. If the system is to provide as wide an umbrella of benefits as it is capable of--resource protection, alternative transportation, tourism and economic development, recreation, education, community revitalization--it must engage the participation of diverse agencies and entities, including many traditionally seen as distinct from, and sometimes even opposed to, land protection.

Table 155-8(6), which follows Table 155-8(5), lists and describes organizations that are logically instrumental to the task of building the statewide greenspace system. This identification begins the process of building a coalition of entities, public and private, that should play a role in threading the network of greenways through Rhode Island's future landscape.

³ Metropolitan Park Commission of Providence Plantations. *Fifth Annual Report to the General Assembly*. 1909. p. 15.

The generational process of building a greenspace and greenway network may also cause us to re-think the validity of some of our present institutional arrangements. Maybe, it will turn out, people who live along the same riverway, but in different towns, have more common objectives to work towards than do people who live in the same town, but in different watersheds. Perhaps we will have our schools teach our children their ecological addresses, as well as their mailing addresses. Such realizations will dawn slowly; but as the greenspace and greenway system gradually becomes an organizing feature of the future landscape, it will come to shape our perceptions of time and distance, affect how we live our lives, and perhaps, ultimately influence our mental definitions of communities and identification with geopolitical constructs.

8-4 Conclusion.....Setting Foot Down the Greener Path

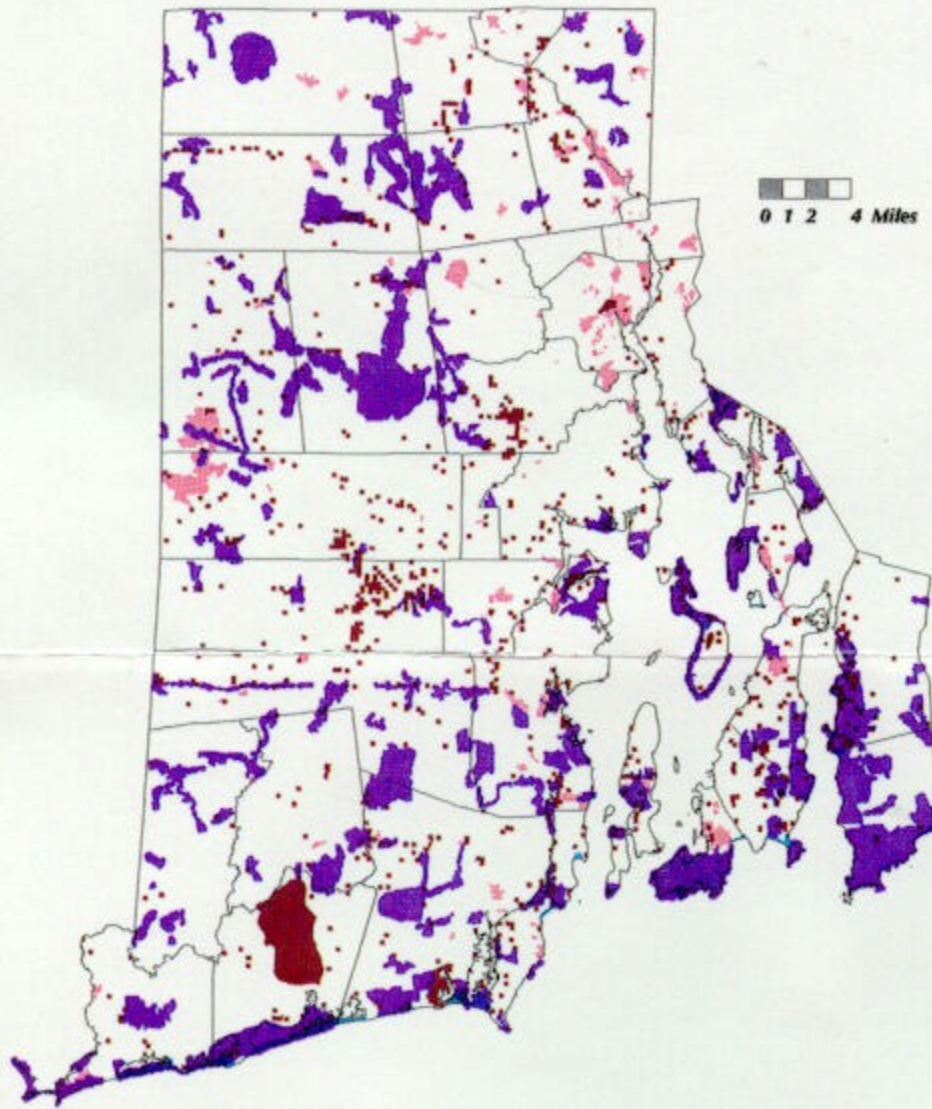
The vision offered by *A Greener Path* is of a different Rhode Island in the future. A statewide system of greenspace and greenways would constitute a totally new *infrastructure* for the state, the very creation of which would inspire sweeping changes in how Rhode Islanders relate to the land and how we get around the state.

Adoption of this plan by state government provides important standing and benefits to the statewide greenspace and greenway system vision. The plan confers official stature to the greenspace and greenway system, disseminates information about it, and broadens discussion of it. The state plan offers leadership, a goal, and policies to focus available resources for optimum impact.

But mere adoption of the plan will not insure realization of the vision it holds forth. What is truly required to effect such fundamental change is a movement. If Rhode Island's future is to be built around a system of greenspace and greenways, the vision must be embraced broadly by the citizens of Rhode Island. To the extent that it supports the efforts already underway by scores of citizen groups throughout the state to protect greenspace and create greenways, this plan can serve as an important coalescing point for the energy, commitment, and idealism being invested by hundreds of Rhode Islanders on behalf of a new, *greener* vision for their state's future.



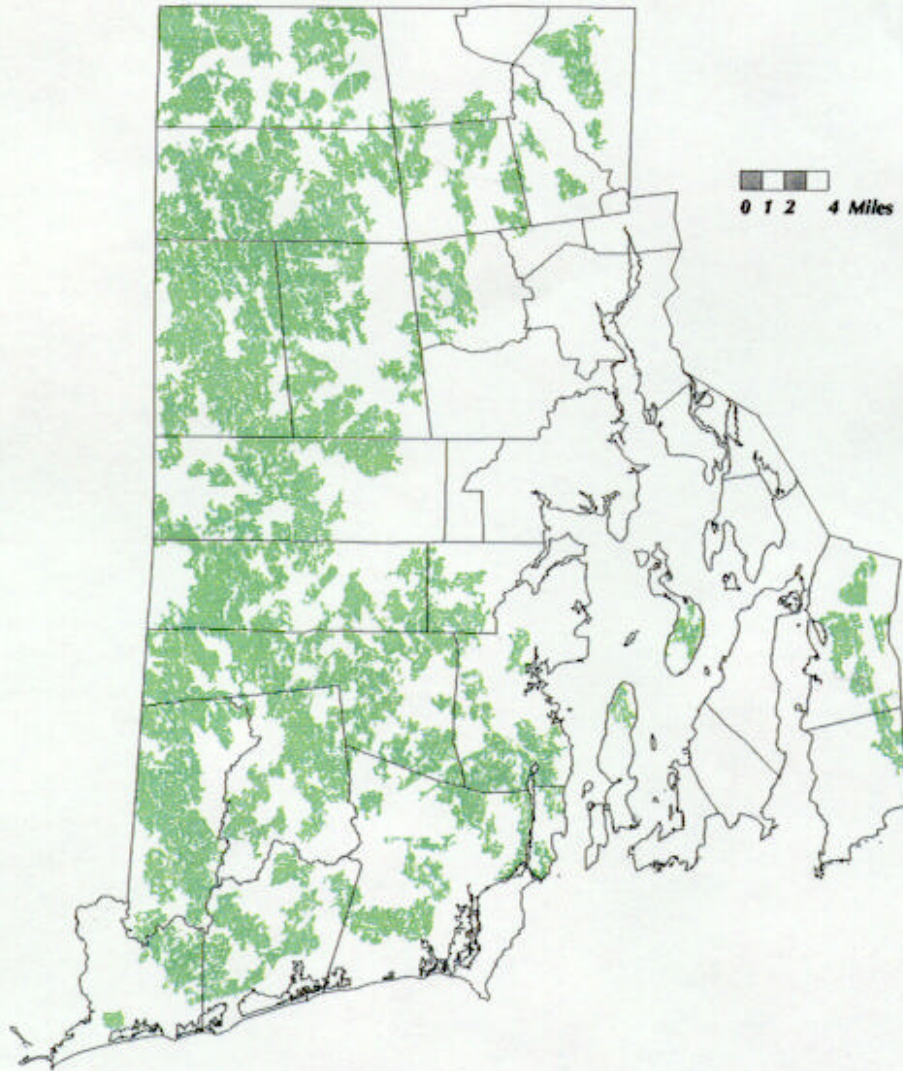
THEME 6: RECREATION AND CULTURE



RECREATION and CULTURAL AREAS: Scenic, Archeological, Historical, and Major Beach Areas



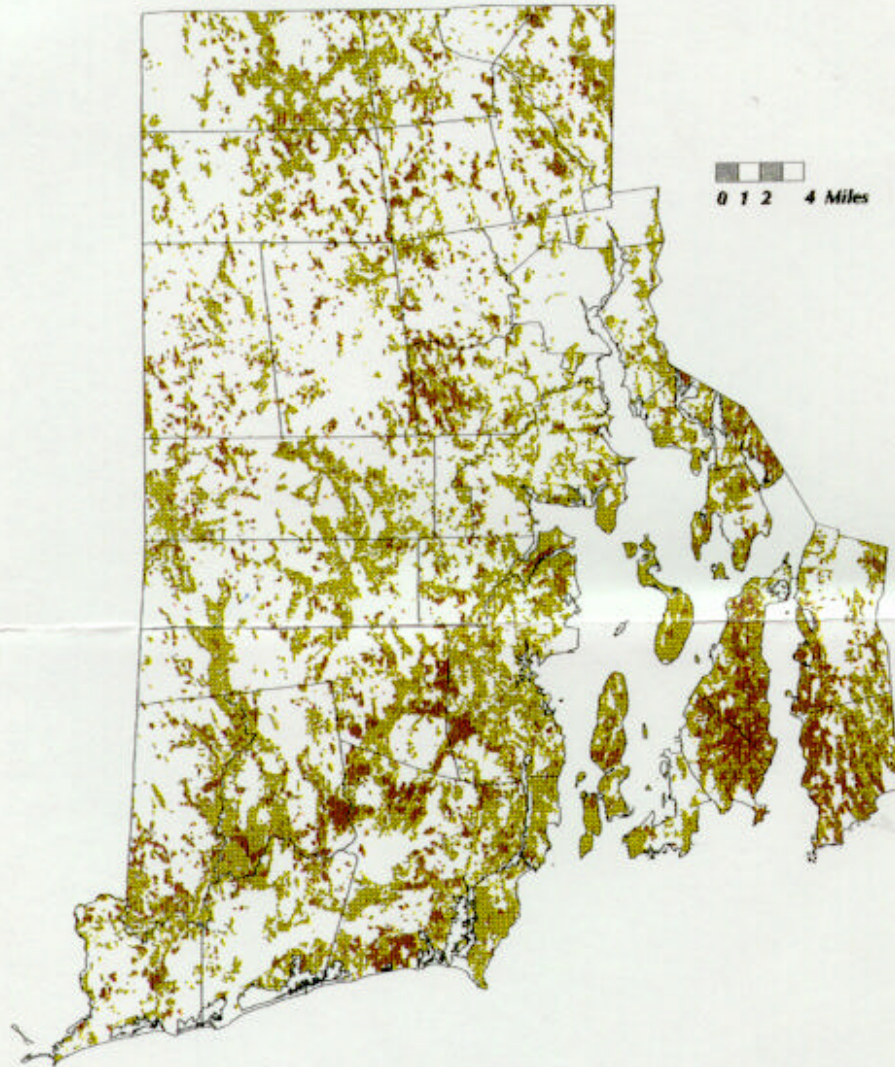
THEME 4: FOREST RESOURCES



MAJOR FOREST TRACTS: Deciduous, Evergreen, and Mixed Types. Areas 300 ACRES or GREATER



THEME 3: AGRICULTURAL RESOURCES



**PRIME and SIGNIFICANT AGRICULTURAL SOILS
or LAND IN AGRICULTURAL PRODUCTION**

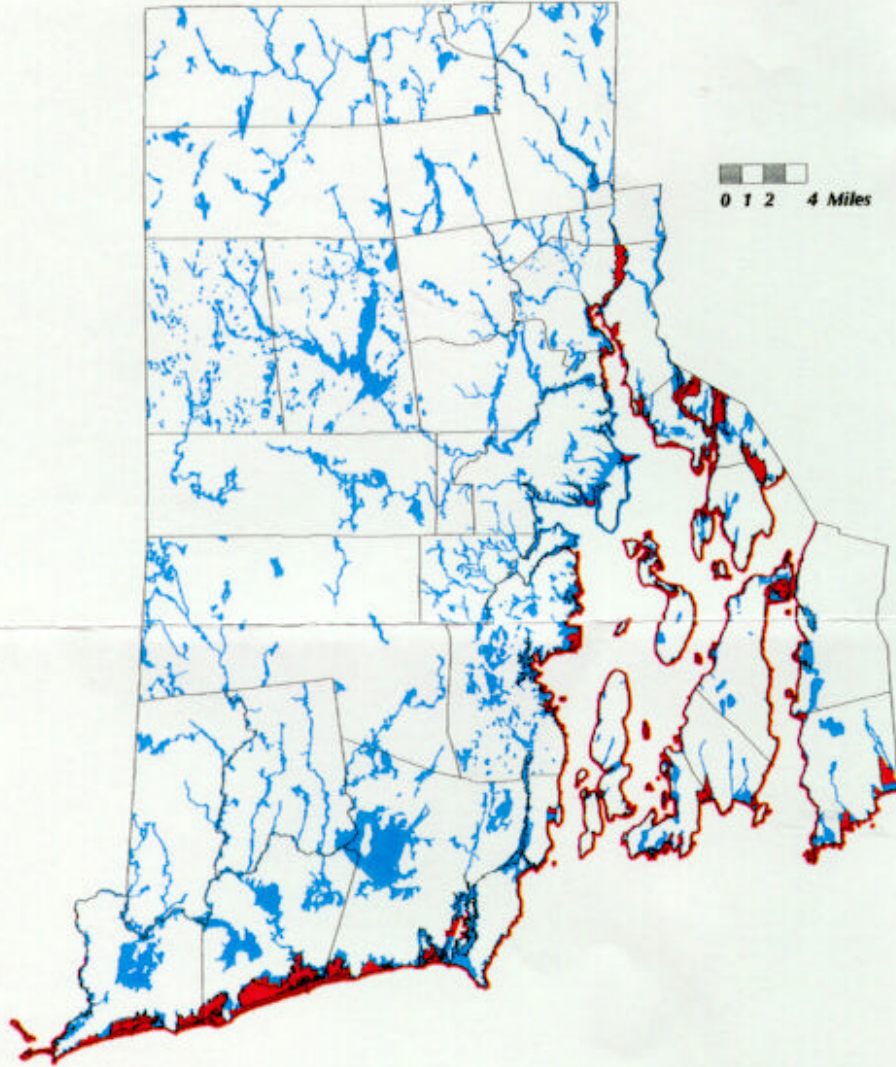


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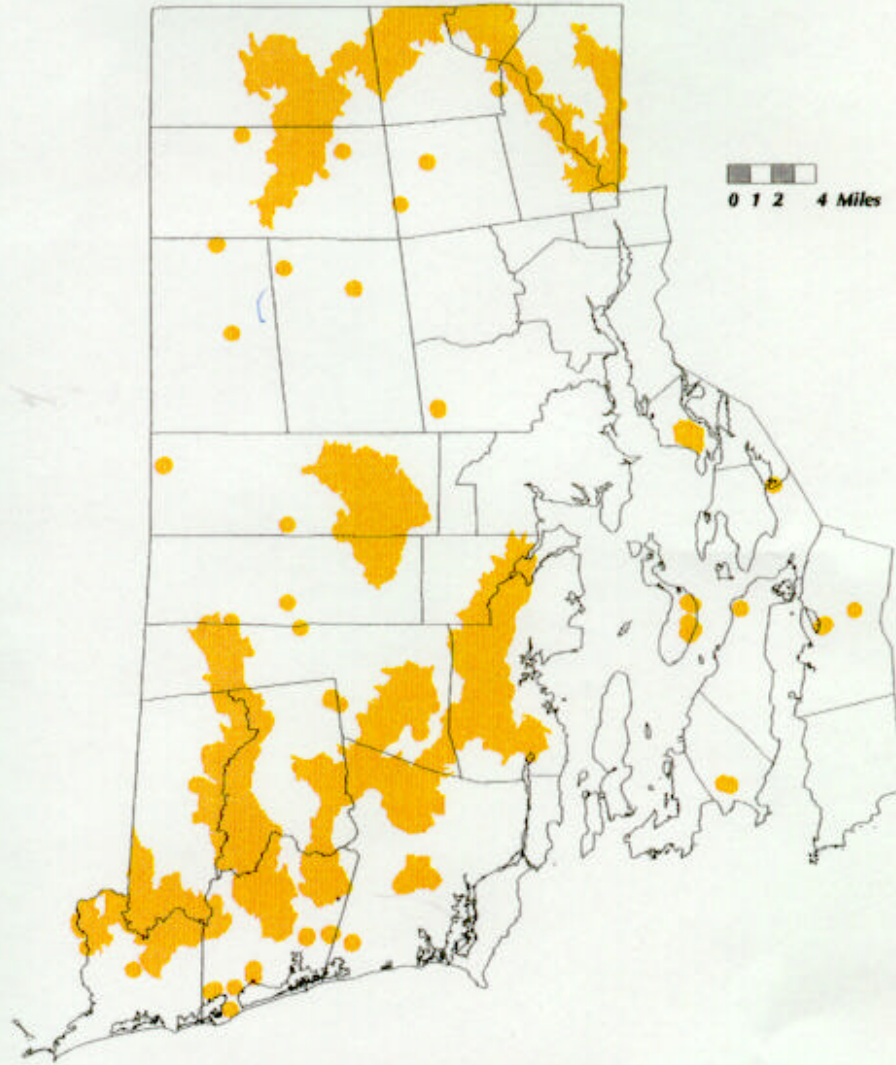
THEME 2: HAZARD AVOIDANCE



***FLOOD HAZARD AREAS: A Zones and V Zones from
Federal Emergency Management Agency Delineations***



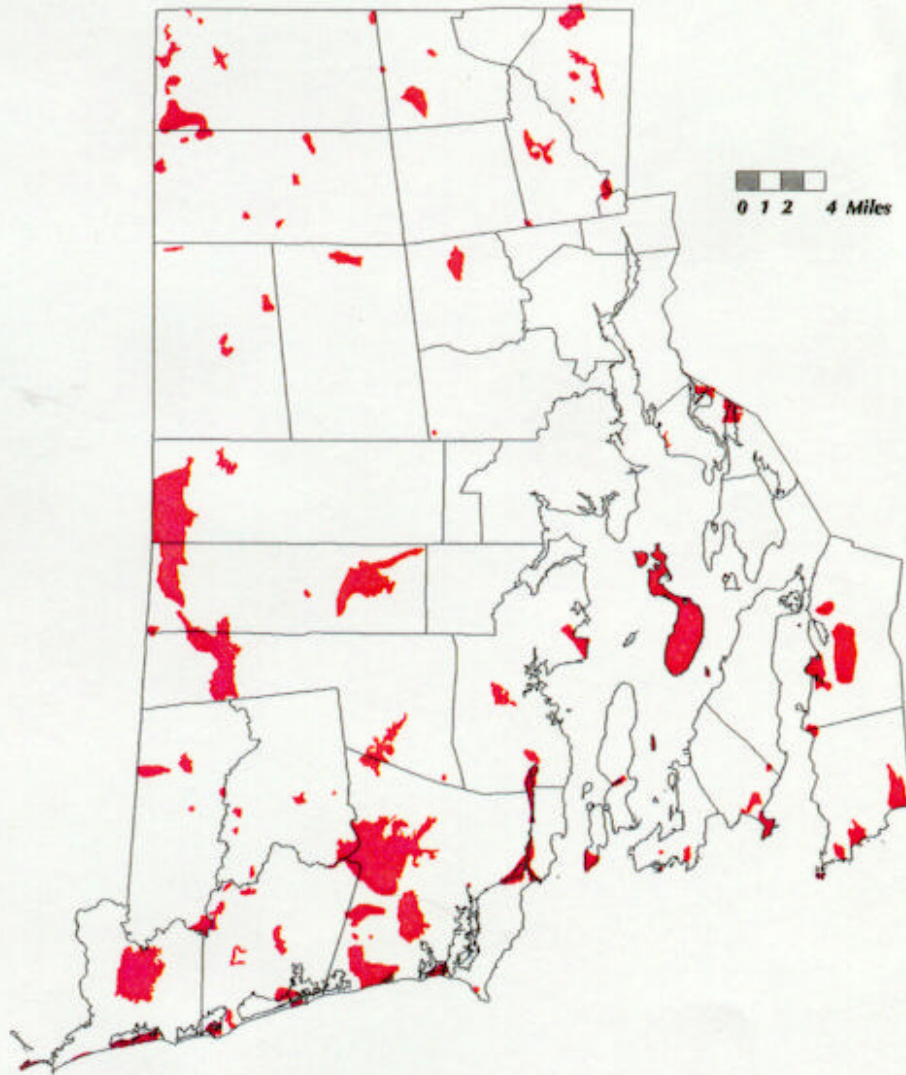
THEME 1b: PURE WATER RESOURCES



**GROUND WATER RESOURCES: Aquifers and Well Sites
Classified as Drinking Water Quality (GAA)
by RI Dept. of Environmental Management**



THEME 5: BIODIVERSITY AND WILDLIFE



***RARE SPECIES: Critical Habitats Delineated by RI Natural
Heritage Program, RI Dept. of Environmental Management***

