From Linear Spaces to Linear Places: Recycling Rail Corridors in Urban Areas

by

Eric E. Feldman

B.A.. in Latin American Studies
Vassar College
Poughkeepsie, NY (1996)

Submitted to the Department of Urban Studies and Planning
in partial fulfillment of the requirements for the degree of

Master in City Planning

at the

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

June 2002

Author _____
Department of Urban Studies and Planning
May 16. 2002

Certified by _____
Professor Dennis Frenchman
Department of Urban Studies and Planning
Thesis Supervisor

Accepted by _____
Professor Dennis Frenchman
Chair, MCP Committee
Department of Urban Studies and Planning

Abstract

From Linear Spaces to Linear Places:
Recycling Rail Corridors in Urban Areas

by

Eric E. Feldman

Submitted to the Department of Urban Studies and Planning on May, 16 2002
in partial fulfillment of the requirements for the degree of Master in City Planning at the
Massachusetts Institute of Technology

To date, the reuse of abandoned railroad rights-of-way has occurred primarily in suburban and rural areas. However, a new generation of urban rail corridor conversions appears to be underway. More urban in more places than prior rail-to-trail projects, the next generation of rail corridor conversions reflects a broader and more complex notion of rail-to-trail projects. These urban projects are more likely to begin with goals and assumptions that look beyond the traditional emphasis on recreation and commuting. They also tend to be more sensitive to changing contexts along a single right-of-way, can serve as focal points or catalysts for other development efforts and involve a wide range of actors and funding sources. The unique opportunities and challenges of disused urban rail corridors suggest the need for new ways of designing and interpreting urban linear space, as well as the need for an expanded technical and financial resource base to support these efforts.

This thesis pursues multiple objectives. Chapter 2 reflects on the basic characteristics of urban rail corridors, the linear attributes that make them desirable for reuse and the potential challenges of working in a linear landscape. The second part of this chapter describes the history and evolution of rail corridor conversions as a planning and urban design concept and surveys relevant literature on the subject. Chapter 3 considers existing urban rail-to-trail precedents and describes the most recent generation of urban rail-to-trail projects, drawing on the experience of five ongoing rail-to-trail conversion projects in Boston, Gainesville, Minneapolis, New York City and the District of Columbia. It identifies six typologies for thinking about urban rail-to-trail projects and highlights specific issues encountered in the planning and design of such projects. Chapter 4 contains a more detailed case study of efforts to convert the New Haven, Connecticut segment of the Farmington Canal rail corridor into a greenway. Chapter 5 concludes with a set of guiding principles and action items for future work in this area, as well as proposed directions for further research.

TABLE OF CONTENTS

Chapter 1: Introduction 5

Chapter 2: Disused Rail Corridors as Urban Linear Landscapes 13

Urban Rail Corridors: Characteristics and Contexts 14

The History and Evolution of Greenways 19

The Rails-to-Trails Movement 22

Literature on Rail-to-Trail Conversions and Urban Greenways 26

Chapter 3: The Next Generation of Urban Rail Corridor Conversions 29

Urban Precedents 30

The Next Generation 32

Project Typologies 34

The Planning Process 44

Design Philosophy 49

Chapter 4: The Farmington Canal Corridor 53

Context 54

Existing Conditions 62

The New Haven Rail-to-Trail Project 50

The 1999 Master Plan 72

Current Issues 74

Chapter 5: Redefining Rails-to-Trails for the Future 82

Principles for Action 83

Directions for Further Research 90

Tables 92

Table A: Urban Rail-to-Trail Project Typologies 93

Table B: Farmington Canal Opportunities 94

References 95

Image Credits 103

Acknowledgments

MANY THANKS . . .

To Dennis Frenchman, my advisor, for his astute guidance, enthusiasm and inspiration throughout the thesis process.

To Eran Ben-Joseph, for serving as my reader.

To all of the individuals who took the time to speak with me about my research.

To Mom and Dad, for their ongoing support, encouragement and many trips to the New Haven train station.

To New Haven, my hometown, for continuing to shape how I see the world.

Chapter 1:
Introduction

This thesis began with an old map and an interesting discovery in a place that I thought I knew well. The map, a 1928 map of my hometown of New Haven, Connecticut depicted what appeared to be railroad tracks—part of a rail corridor called the Farmington Canal—running from south to north through the city. This map intrigued me because it initially did not correspond with what Kevin Lynch would have called my "mental map" of the city in which I grew up. After considering the map more systematically, I realized that bits and pieces of the Canal indeed were on my mental map: the railroad tracks that crossed the road near a familiar intersection in Newhallville, the "abyss" at the corner of Prospect and Trumbull streets and its counterpart at the edge of the Audubon Arts District, the hump in the road on Temple street that required me to slow down in order to protect the underside of the car. However, I also questioned why these railroad tracks were called a "canal." (I certainly never imagined that boats might have navigated the city at one time).

According to the map, the Farmington Canal began at New Haven Harbor—at the "Canal Docks"—and then passed in the vicinity of the city's historic railroad station, skirted the edge of what is now the city's Arts District and bisected a mixed commercial and residential area before entering the heart of the Yale University campus. After the university, the corridor passed through the city's Dixwell neighborhood and the site of one the country's first Hope VI housing projects. It then cut through a former industrial area that is now being transformed into a biotechnology center. Finally, it passed through the low-to-middle income neighborhood of Newhallville before crossing the line into the town of Hamden. The right-of-way ultimately continued northward through Connecticut and across the Massachusetts border, ending at the town of Northampton.

After some initial historical research and a stroll through familiar streets, I learned that the right-of-way once served as a 19th Century canal route. The original canal was converted into a railroad later that century and functioned as such until the railroad was abandoned during the early 1980s. More recent maps of the city suggested that the entire length of this right-of-way remained intact.

Aside from revealing a part of the city previously hidden or invisible to me, my discovery of the Canal struck a chord in a more profound and important way. In its linearity, it represented a vestige of continuity and connectivity in a city otherwise

fragmented by urban renewal and socioeconomic divisions. If rediscovered as a form of public space, might the Canal serve as means of reconnecting the disparate uses and communities along the corridor?

In fact, a local group called the Farmington Canal Rails-to-Trails Association had asked the same question years earlier and proposed the idea of redeveloping the Canal into a "greenway." This idea constituted a small part of a larger vision of a continuous greenway beginning at New Haven Harbor and extending north into Massachusetts. Somewhat familiar with the concept of rail-to-trail conversions, I tried to picture something similar in New Haven. I found this vision to be both intriguing and

Figure 1.1: The Farmington Canal Rails-to-Trails Association proposed converting the Farmington Canal (left) into a greenway.

disconcerting since I did not associate rail-to-trail conversions with dense and diverse urban fabrics, such as that which existed in New Haven. Were there other comparable examples of urban rail corridor conversions that might inform such a project in New Haven? And what was the status of the greenway already proposed? What was the intended function of the greenway, and what was it expected to look like when completed? Did all of the different communities through which the right-of-way passed share this vision?

These last questions spawned what is now a thesis. I discovered that, of the 1,174 rail-to-trail conversions completed and the additional 1,190 projects underway, only a very small fraction could be categorized as urban trails. (Rails-to-Trails Conservancy, 2002) As I initially suspected, rail-to-trail conversions have occurred primarily in suburban and rural locations.[1] It is even more difficult to find examples of trails that passed through comparably dense urban fabrics with areas of varying uses, demographics

and income levels. While a few completed projects satisfy these criteria in parts, the overall experience with urban rail corridor conversions is very limited. Not surprisingly, I also found little written on this subject, except for a small body of literature on the broadly defined concept of urban greenways and a series of mostly technical reports on rail-to-trail conversions, none of which focused specifically on cities.

I discovered, however, that a new generation of urban rail corridor conversions appears to be underway, thanks in large part to current funding mechanisms at the federal level. The numerous urban projects in progress across the United States also coincide with evolving efforts to create regional and national greenway networks—such as the East Coast Greenway and Millennium Trails—that one day will link urban areas and include some of the rail corridor conversions planned in cities. At the same time, approximately 160,000 miles of disused rail corridor already exist throughout the United States (Thompson, 80), with an additional 3000 miles of corridor expected to be abandoned each year. (Howser, 1997) Collectively, these trends make this an opportune moment for reflection on the role of urban linear spaces and the potential value of converted rail corridors in cities.

I also observed that while many rail corridors around the country have been converted into very successful open space and recreational corridors, many of those that exist appear to emphasize recreation as a core value and, often, a single or primary purpose. This emphasis has resulted in converted rail corridors that frequently lack multiple dimensions, individual character or linkages—both physical and symbolic—with the communities around their edges. While some projects also incorporate scenic, ecological and historic preservation goals, many rail-to-trail projects feel placeless or generic or narrowly conceived.

While not intending to discredit the value of the existing rail-to-trail conversions, I nevertheless began my own inquiry into this subject with the assumption that it might be possible to get *more* out of rail corridor conversions in urban areas. I hypothesized that an urban context not only presents opportunities for a broader and more creative vision of the use and potential of disused rail corridors, but may even require such an approach to

---

[1] While no precise counts of urban rail-to-trail projects exist, it is possible to gain a general sense of the proportion of trails that pass through urban areas by searching the Rails-to-Trails Conservancy's online

ensure the success of these corridors. If the new wave of urban projects, I asked myself, attempts merely to transpose existing rail-to-trail models to an urban context, might this approach result in a missed opportunity to maximize the potential value of each project, both within each corridor and outside its edges? How might urban politics and the voices of multiple constituencies influence efforts to create valuable linear places in cities? And to what extent might such projects succeed in locations that may be perceived as marginal or blighted?

* * * * *

In this thesis, I pursue multiple objectives. At a most basic level, I intend to begin the process of filling the existing gaps in the literature pertaining to both greenway projects and rail corridor conversions in urban areas. Further, I seek to identify some of the unique opportunities and challenges inherent in urban rail corridor conversions and document some of the approaches—procedural, financial, conceptual and design—that the planners and designers of completed and in-progress urban rail-to-trail projects employ to address and incorporate these issues. From these examples, I identify similarities and differences among urban rail corridor projects and highlight some noteworthy and common approaches. My ultimate goal, however, is to identify ways to maximize the value of rail corridor conversions in urban areas—to cities, nearby communities and the widest range of potential users—while emphasizing the potential urban design implications of these projects.

To identify the elements that produce value in an urban rail corridor conversion, I focus on a range of considerations. First, I examine the nature of the planning process and how it evolves over time, the range of actors involved in the process and the original goals and assumptions of a project—all of which influence the design of a rail-to-trail project. Moreover, I explore the interpretive value of urban rail-trails as places with potential information value that relates to history, culture, ecology and community character. I also reflect on the complex challenge of balancing the need for consistency and continuity in a linear network with the need to address differences—in terms of

---

trails database at http://www.TrailLink.com.

topography and engineering, urban form and adjacent land uses, cultural and socioeconomic composition, interpretations of the terms "greenway" and "linear park"—that distinguish the multiple communities through which an urban linear corridor passes. In addition, I consider the ways in which an urban rail corridor conversion might serve as a focal point for a larger set of urban planning and development goals as well as the institutional and conceptual frameworks that allow for the coordination of multiple goals. In doing so, I hope that this research may prove helpful to the many urban rail-to-trail projects underway by giving those involved a frame of reference to expand the vision of what roles rail-to-trail conversions can serve.

To capture the spectrum of challenges, opportunities and approaches that influence the nature of urban rail corridor conversions and identify typologies to describe these projects, I draw on examples from ongoing rail-to-trail projects in Boston, the District of Columbia, Gainesville, Minneapolis and New York City. As a primary case study and as a means of illustrating the complexities urban rail corridor conversions and changing attitudes regarding these projects, I examine in detail the ongoing efforts to convert the New Haven portion of the Farmington Canal into a greenway. Aside from serving as the original inspiration for this thesis, the Farmington Canal constitutes a particularly rich example that highlights many of the major issues involved in reclaiming urban rail corridors.

Specific questions I attempt to address in the thesis include the following:

- Can we get more value and uses out of rail-to-trail projects in urban areas?
- What are some of the challenges and opportunities—institutional, procedural, financial and design—encountered as part of urban rail corridor projects?
- Are the concepts of "greenway" and "rail-trail" interpreted differently in different places?
- What other planning, design and development efforts might coincide with or follow the development of a trail?
- How might urban rail corridor conversions be phased? What elements of such projects can or should be up front in the process, and what elements might be incorporated as the corridor evolves over time?

- What can current urban rail-to-trail projects learn from one another?

In Chapter 2, I first reflect on the basic characteristics of urban rail corridors, the linear attributes that make them desirable for reuse and the potential challenges of working in a linear landscape. The second part of this chapter describes the history of rail corridor conversions as a planning and urban design concept and surveys relevant literature on the subject. The chapter illustrates how the definitions and accepted purposes of both greenways and rail-to-trail conversions have grown more complex and multi-faceted over time. It also highlights gaps in the literature on these subjects.

In Chapter 3, I briefly consider existing urban rail-to-trail precedents and describe the most recent generation of urban rail-to-trail projects. Drawing on examples from five ongoing projects, I identify six typologies for thinking about urban rail-to-trail projects highlight specific issues encountered in the planning and design of such projects.

In Chapter 4, I examine the specific case of the Farmington Canal in order to illustrate, in a more detailed manner, the nature of the urban rail corridor conversion process. This particular example is valuable in illustrating the difficulty of reconciling the needs of multiple constituencies, different ideas regarding how to plan and design an urban linear space, and how these ideas may change over time. Finally, Chapter 5 concludes with a set of guiding principles for future work in this area, as well as proposed directions for further research.

NOTES ON METHODOLOGY AND SCOPE OF RESEARCH

Methodology

My research methodology consisted of a review of primary and secondary source materials; interviews with planners, academics and community activists; and, to the extent possible, site visits and personal observations. The information for the examples and case studies in Chapters 3 and 4 comes from interviews with project participants, newspaper articles, planning documents, technical materials as well as promotional documents and web sites.

Scope of Research

The scope of this research is limited by a number of factors, both external and self-imposed. First, the research is constrained by the limited number of completed urban projects to serve as examples. Since most of the relevant examples of rail corridor conversions are still in the construction or conceptual stages, this research lacks the benefit of hindsight in assessing success or failure. Instead, my conclusions necessarily stem from incomplete knowledge and educated guesses as to what factors may prove important in the future. Moreover, limited time and resources prevented in-depth site visits to most of the referenced projects other than the Farmington Canal, which I visited on multiple occasions. Consequently, I do not claim to have picked up all of the place-specific nuances of these supporting examples; instead, I simply wish to provide a flavor for these projects.

I also imposed my own definitional limits on my research. First, unlike the Farmington Canal, a number of the projects considered here are not pure examples of converted rail corridors, but rather represent efforts to create hybrid or patchwork linear networks that incorporate other parts of the urban landscape in addition to rail corridors. While I focus on the rail corridor portions of these projects, I also consider the entire projects, which still serve as valuable examples.

Second, the examples offered here are intensely urban examples, whereas a large percentage of the so-called "urban" trails that have been completed are sometimes only partly urban. Although I briefly consider the range of urban precedents, I emphasize rail corridors in central city areas that present a range of challenges and contexts not always in encountered in prior urban rail-to-trail projects.

Chapter 2:
Disused Rail Corridors as Urban Linear Landscapes

URBAN RAIL CORRIDORS: CHARACTERISTICS AND CONTEXTS

Corridor Characteristics

Disused urban rail corridors vary in length, width and in terms of their physical relationship with the surrounding urban fabric. Some corridors bisect entire cities and serve as parts of larger regional networks connecting city with hinterland. Other corridors, fragmented by development and land use changes, amount to discontinuous segments or spurs that might extend for just a mile or two. In some cases, even smaller pieces of rail corridor remain.

Some corridors are just wide enough to have accommodated just a single train, while others contain multiple parallel rights-of-way. Moreover, many urban rail corridors bypass the urban fabric by being depressed below city streets. Others pass at-grade through the city and cross city streets. Still others pass overhead on elevated embankments or viaducts.

Abandoned rail corridors are frequently the city's hidden or forgotten spaces. Kevin Lynch might contend that these spaces exist off the "mental map" of most city residents and therefore lack "imageability." (Lynch 1960) Not surprisingly, if they do exist on the mental map, they are frequently perceived as blighted spaces. Indeed, many of these corridors are mostly fenced-in or otherwise separated from the daily activities of the city. Their separation from the city is reinforced by the common perception of rail corridors as unsafe places, whether this is due to remnant wires, sharp-edged debris, the lingering specter of the trains that once roared through the space, or the occasional illicit activities that have replaced this past use.

Figure 2.1: Abandoned rail corridors are frequently hidden spaces, nestled in the spaces between or behind buildings.

Other characteristics of urban rail corridors are less obvious unless one happens to explore them. For example, contrary to popular misconceptions, many abandoned rail

corridors are by no means dead or stagnant spaces. Even in the absence of regular train travel, rail corridors retain more informal functions and, in fact, often become multipurpose spaces. A portion of a corridor might serve as makeshift pedestrian space, a cut-through to access other destinations or a trampled path along an adjacent service road. Beneath the tracks or above them, the corridor might service infrastructure, providing for the movement of both electricity and information by housing electric wires, telephone cables, fiberoptics or cellular communication towers.

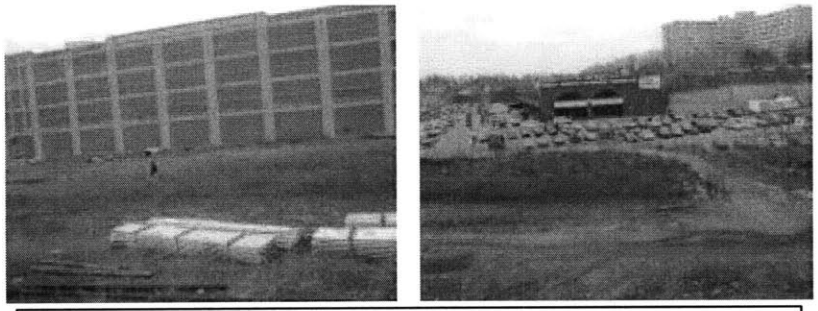


Figure 2.2: Urban rail corridors sometimes serve as informal pedestrian routes or access to destinations, such as shopping.

Even in the densest urban area or grittiest industrial zone, rail corridors frequently function as natural spaces, although often featuring a resilient and adaptable strain of nature that once coexisted with trains or appeared in their absence. Some urban corridors remain wooded to some extent; others are simply overgrown with weeds or wild growth. Many corridors are surrounded by a buffer zone of vegetation—trees, shrubbery, a grassy embankment—that separate them from surrounding uses. Moreover, as Ward notes, "abandoned track may form a peaceful sanctuary." (Ward and Ruff, 7) Largely uninterrupted by city traffic and human incursions, urban rail corridors also tend to attract wildlife, be it feeding birds or stray cats.

Figure 2.3: Urban rail corridor as natural space.

And just as they are not devoid of life or activity, urban rail corridors also retain meaning. Tony Hiss once described this meaning as "the poetry of engineering" in that rail corridors, regardless of their condition and the extent to which physical traces remain, afford us "direct, intimate contact with the accomplishments of 'the other engineers'" and "linking us to tens of thousands of railroad workers (each linear foot of hand-built rail line represents a full day's work by ten men)." (Hiss 1997, 5) As living documents of the history of transportation and engineering, these corridors constitute irreplaceable resources.

Urban rail corridors also provide an opportunity to visit the private spaces and backsides of the city not normally encountered during daily activities. In a sensation similar to that experienced during train travel, the corridor offers glimpses of life from new angles. At the same time, it offers the opportunity to discover hidden spaces, such as the dusty slopes beneath overpasses or concealed urban expression (graffiti beneath underpasses, remnant signage once oriented the railroad, information attached or spray-painted to the backsides of billboards).

Corridor Contexts

Around the same time that historic economic processes led to abandonment of railroad rights-of-way, the railroad also became the object of an intellectual assault from the leading urbanists, who decried its impact on city form. In The Death and Life of Great American Cities (1961), Jane Jacobs implicated railroads in what she called a "curse of the border vacuums," noting the tendency of urban railroads to serve as both social and physical barriers in the city, as well as "zones of low value and decay" and "vacuums of use" (in terms of both the numbers of users and uses of the space) that tend to arise alongside railroad rights-of-way. (Jacobs, 257-259) That same year, Lewis Mumford noted that, historically, "every mistake in urban design that could be made was made by the new railroad engineers, for whom the movement of trains was more important than the human objects achieved by that movement." (Mumford, 461)

To this day, active or abandoned, the railroad retains its role as barrier and border vacuum. A sad yet significant role of the urban rail corridor in the history of American

cities remains its role as a symbolic border zone separating one side of the tracks from the disparate "other." Before urban renewal and highway development achieved the same effect, urban railroads fragmented and separated neighborhoods. In other instances, the railroad both spawned new land uses and carved a border between uses.

Just as Jacobs noted, the railroad also has served as a form of parasite, extracting liveliness and value from the edges of corridors. Along an urban rail corridor, one is likely to find any combination of the backsides or back corners of buildings, backyards, drainage ditches, smoke stacks, loading docks and parking lots, electric meters or gas and chemical tanks. In other places, one is likely to find dead-end streets, "edge streets" bordered on one side by development and the other by the corridor with empty space in between.

Figure 2.4: The edges of rail corridors frequently feature dead end streets, the backsides of buildings and an industrial character.

Along the length of an urban rail corridor, the edges are frequently characterized by a succession of different uses and, in the case of adjacent residential areas, communities of different character. Given that railroads developed to serve urban industries, rail corridors are likely to pass through existing or former industrial areas. Furthermore, the "other side of the tracks" cliché holds true to some extent in that urban rail corridors often pass through or alongside lower income and/or minority neighborhoods.

From Rails to Trails: The Value and Challenges of Linearity

In a 1997 article for Atlantic Monthly on the emerging rails-to-trails trend, Tony Hiss noted the "unusually good fit between the needs of locomotives and the needs of legs pumping bicycle pedals" as a central logic to the movement. (Hiss 1997, 5) While the land at the edges of a rail corridor might be characterized by haphazard diversity in terrain, structures and land uses, and sometimes harsh transitions between them, the corridor itself maintains consistency of grade, gentle curves and slopes—all

specifications that meet the needs of trains but also happen to quite desirable for recreational use. The rail-to-trail concept also benefited from what Robert Searns describes as the "human fascination with following a path . . .especially if there is a sense of change, even mystery, and new experiences, perspectives and information are revealed sequentially along the way." (Searns, 66) Linear routes are especially valuable when enhanced by scenic vistas or the lure of water, which is partly why places like Boston's Esplanade, Chicago's Lake Shore Drive paths, San Antonio's Riverwalk and the C&O Canal in Washington, DC succeed as popular destinations.

From a planning and urban design perspective, the value of linearity is well-documented. Unlike most public spaces, linear spaces have the advantage of being able to distribute their benefits to a greater number of people because they carry more edge and touch more communities than a traditional park. In addition, the reuse of linear spaces also can provide connectivity, stitching together disparate communities and land uses once separated by breaks or barriers in the urban fabric. Moreover, "as linear features that transect neighborhoods, urban greenways may be viewed as new types of public space specifically designed to overcome the constraints and obstacles posed by difference." (Lindsey et al 2001, 344) Linear networks also might link the local and the regional—the city and suburbs—through transportation and recreation in much the same way that railroads once linked city and hinterland through commerce.

However, linearity also may result in new challenges. Some urbanists believe that, rather than connecting communities, linear landscapes may in fact be perceived as barriers or "green walls," when they happen to divide communities that are different from one another. (Solecki and Welch; Gobster) In addition, a linear space might not retain some of its inherent value if its surrounding context is not scenic, in the traditional sense of the word, or might be perceived as even vaguely threatening.

Furthermore, the value of linearity is easily compromised if continuous linearity is lost, even for a short distance. In this respect, a greenway or rail-to-trail conversion operates much like an infrastructure project that affords little scope for compromise before its function and value substantially diminish. (Plattus, personal communication) Finally, due to its consistency and continuity, it may be tempting to plan a linear corridor in an equally uniform and consistent manner, even if that which surrounds the corridor

lacks uniformity or homogeneity. As discussed in later chapters, uniform treatment of linear landscapes in such instances can be a lost opportunity from an urban design perspective.

The remainder of this thesis will illustrate how this tension between the value and potential liabilities of linearity is particularly acute in the urban context.

THE HISTORY AND EVOLUTION OF GREENWAYS

Origins of the Greenway Movement

Much of the literature on greenways traces the early origins of greenways to Frederick Law Olmsted and his concepts of the stream valley park, parkway and carriage path. A central component of these early greenway forms was the idea of bringing the parks and parkways into daily experiences along with the resulting health and recreational benefits and business or real estate opportunities. Olmsted believed that no part of a town should be more than a many minutes' walk from a park element so as to foster passing through them and accruing recreational benefits. (Walmsley, 84)

Another early predecessor of greenways was the greenbelt concept, first proposed by Alfred Marshall, the British economist, who called for "intermediate stretches" of open space to prevent towns from growing into one another. Ebeneezer Howard, meanwhile, proposed "country belts" as part of his Garden City ideal. These linear open spaces, later given the name "green belts" by Raymond Unwin, were adopted both around London and elsewhere in England as part of new town plans. (Little, 15-16)

Less clear, however, is when greenways became the focus of a well-defined movement. Some suggest that the greenway movement began around 1987, when President Reagan's Commission on Americans Outdoors issued a report calling for a "giant circulation system" of greenways nationwide. (President's Commission on Americans Outdoors) Others credit Charles Little's book Greenways for America for popularizing the greenway movement. (Fabos, 2)

While the early roots of greenway planning include park planning, open space planning and, later, the combination of conservation and recreation planning, greenway

planning also has roots in cluster and planned unit development and the British new town and "common law footpath" concepts. Recent pedestrian corridor projects, such as the Southwest Corridor Project and the C&O Canal towpath, and the National Park Service's "heritage corridor" concept have further shaped and diversified the greenway movement. As Julius Gy. Fabos suggests, "the greenways literature appears to reflect a transitional period from a diffuse state of greenway-type activities to a well-defined greenway planning era." (Fabos, 2)

Greenway Definitions and Typologies

In general, definitions of greenways vary because greenways can be interpreted in many ways and because the concept continues to evolve over time. While most definitions contain some reference to recreation, nature and the idea of movement through a linear space, greenway interpretations vary beyond this point. Over time, with each successive layer of interpretation, the definitions of greenways have grown more complex and now encompass multiple facets of life, from ecology to cultural heritage to urban form to economic development.

The earliest definitions of greenways tend to emphasize recreation and open space. In Greenways for America, perhaps the first work to consider the U.S. greenway movement at length, Charles E. Little includes four separate definitions of a greenway. Deconstructing the etymology of the word, Little described the "general idea" of a greenway as "a natural, green way based on protected linear corridors which will improve environmental quality and provide for outdoor recreation" (Little, 4) The more popular interpretation remained along the lines of Tony Hiss' 1990 description of a greenway as "a hiking and biking trail that could also be used for horseback riding and cross-country skiing." (Hiss 1990, 172)

Later definitions expanded the concept of greenways to include their ecological, historical and educational aspects. Daniel S. Smith, for example, describes a greenway as "a corridor composed of natural vegetation or at least vegetation that is *more* natural than in surrounding areas." (Smith, xi) The book that Smith co-edited, Ecology of Greenways, explored the role of linear corridors in maintaining important ecological processes,

building on the ideas of writers such as Philip Lewis, Jr., Ian McHarg and Richard T.T. Forman. The book also calls attention to the ways in which linear corridors are susceptible to invasive species and predators. For these reasons, the authors argue, ecological goals must be incorporated into all linear parks, regardless of use or location. (Smith and Hellmund)

At the same time, recent definitions emphasize additional functions of greenways, at which Little's definitions first hinted. Robert M. Searns' contention that greenways offer an important way to "preserve history and educate the public about nature and foster a broad-based sense of stewardship for the land" is echoed elsewhere in the literature. (Searns, 66) In addition, Bischoff argues that greenways can serve as "vehicles for expression" of "[p]ersonal, patriotic, commemorative, cultural, [and] social-political" ideas through such activities as public art and the symbolism expressed through the design of landscapes. (Bischoff, 318)

Still other definitions emphasized the role of greenways as an adaptive response to past changes in the built environment. Searns, for example, notes that "greenways represent an adaptation—a response to the physical and psychological pressures of urbanization" and serve as a way to mitigate the loss of nature in the landscape. (Searns, 65) Anthony Walmsley, discussing greenways as an element of urban form, describes greenways as a "formative device for stitching together fragmenting cities and their hinterlands." (Walmsley, 81)

Several authors attempt to organize greenways according to a set of typologies. Little, for example, offers five types of greenways: 1. Urban riverside greenways; 2. Recreational greenways (paths and trails); 3. Ecologically significant natural corridors; 4. Scenic and historic routes; and 5. Comprehensive greenways systems or networks (natural land forms or "opportunistic assemblage" of greenways and open space to create "green infrastructure"). (Little, 4-5) Fabos condenses these categories into three types: ecologically significant corridors and natural systems, recreational greenways (often those with a scenic element) and greenways with historical heritage and cultural values (which include benefits ranging from education to tourism to flood control and "infrastructure for commuting)." (Fabos, 10)

Finally, in the same 1995 volume, Searns describes three "generations" of greenways, organized by historical period and growing increasingly complex with each successive generation. The first generation (pre-1700 to c.1960) consisted of "the axes, boulevards and parkways that first linked urban spaces." The second generation (c.1960 – c.1985) constituted "trail-oriented, primarily recreational, greenways and linear parks that provide access to rivers, streams, ridgelines, railbeds, and other corridors within the urban fabric." Searns describes the third, and current, generation as "emerging 'multi-objective' greenways that address needs of wildlife, flood damage reduction, water quality, education and other infrastructure needs in addition to urban beautification and recreation." (Searns, 67-74)

While instructive in identifying the range of possible ways to interpret the role of a greenway, these typologies may obscure the fact that a single greenway may embody the characteristics of multiple typologies. Moreover, these attempts at greenway classification fail to address specifically the role of greenways in the urban landscape and how an urban context may restructure or expand upon the greenway categories or objectives.

THE RAILS-TO-TRAILS MOVEMENT

The Origins and Growth of the Movement

Railroad mileage in the United States peaked at 254,000 miles in 1916 and has declined steadily since the 1920s, which marked the beginning of the national highway movement. (Hiss 1997, 4) Railroad mileage has decreased markedly from 1970s onward—from 192,000 miles in 1975 to 108,000 miles in 1995—as a number of big eastern railroad companies went bankrupt, largely the result of overextension and competition from interstate trucking and air cargo. One prediction holds that the amount of mileage may stabilize within twenty years at between 70,000 and 75,000 miles, with ownership of rail networks consolidated in the hands of as few as two major companies. (Hiss 1997, 4) Nevertheless, an additional 3000 miles of track are being abandoned

every year (Howser, 5), and, according to a recent estimate, approximately 160,000 miles of abandoned rail corridor exist nationwide. (Thompson, 80)

Early rail-to-trail projects date back to the 1960s, when the rail-to-trail movement began "quietly, gradually, hesitatingly" as something of a "Midwestern phenomenon." (Nevel and Harnik, 1) In one of the first examples from the mid-1960s, the nature writer May Theilgaard Watts proposed what became the Illinois Prairie Path in a letter to the Chicago Tribune. The National Trails Systems Act of 1968 later directed federal agencies to promote the development of trail systems near urban and scenic areas and encourage

Figure 2.5: The C&O Canal in Washington, DC, a precedent for the reuse of linear spaces.

states to consider trail needs as part of comprehensive recreational plans and in their use of funding from Land and Water Conservation Fund. Also during the 1960s, some regions initiated efforts to revitalize disused canal systems, such as the C&O Canal and Delaware & Raritan Canals, as linear parks. These efforts received much national attention and set an important precedent for the reuse of linear spaces.

The idea of rail-to-trail conversions entered planning literature when William Whyte, in the 1968 book The Last Landscape noted that "[t]hroughout our metropolitan areas there is a reserve of linear strips awaiting rediscovery" He called for more inventive use of smaller spaces, particularly rediscovering the "overlooked odds and ends," the "gritty realities"and "the smaller spaces, the irregular ones, and the maligned bits and pieces." In this context, Whyte observed that "we are going to have to rediscover the obsolescent rights of way that thread the metropolitan area" and that "a tremendous amount of mileage lies unused and weedy that with not too much expense could be rehabilitated into a system of trails and walkways" He cautioned, however, that "it takes a hard core of screwballs to see this kind of project through." (Whyte, 11-12 and 197-199) In 1975, the Citizens' Advisory Committee on Environmental Quality, for whom Whyte

served as a consultant, followed with what may have been the first policy report on rails-to-trails. (Citizens' Advisory Committee on Environmental Quality)

In 1976, Congress enacted the Railroad Revitalization and Regulatory Reform Act, which included a "small, little-noticed" section that established a Rails-to-Trails Grant Program within the US Department of Interior. (Nevel and Harnik, 6) The new program provided assistance to a struggling railroad industry in the form of opportunities to abandon rail lines if they proved to be financial burdens. At the same time, the program would ensure the preservation of existing rights-of-way for future public uses, which could include not only eventual reactivation of rail service but also recreation and conservation uses in the interim. The grant program lasted only one funding cycle, but provided financing for nine trails, served as a catalyst for the rails-to-trails movement and gave it legitimacy. (Nevel and Harnik, 7)

The next watershed moment came with a 1983 amendment to the 1968 National Trails Systems Act that authorized the Interstate Commerce Commision to "bank" abandoned rail corridors for possible future railroad use. Railroad rights-of-way could be transferred to a state, locality or public group to be preserved for possible future transportation uses, if economically viable. In the meantime, the right-of-way could be developed for trail use. This Act was significant in providing a mechanism to preserve intact rights-of-way that might otherwise have ended up in the hands of multiple private interests.

The ICC oversees two kinds of proceedings, depending on whether a rail corridor remains in service or whether it has been out of use for more than two years. No economic studies are required for out-of-use corridors, and the railroad requires 30-day notice before abandonment. The ICC is required to publish notice of an upcoming abandonment in the *Federal Register* and the legal section of local newspapers of towns through which the right-of-way travels. Afterwards communities can request Public Use Condition within 20 days. (Alderman and Wieken, 6-7)

During the 1980s, scattered rail-to-trail efforts coalesced into a national movement. The first step was the 1985 formation of the Rails-to-Trails Conservancy (RTC), a nonprofit organization based in Washington, DC that devoted itself to the conservation of abandoned rail corridors and their conversion into trails. Two years later,

the rails-to-trails idea entered the mainstream after the President's Commission on the American Outdoors (PCAO) recommended a national system of greenways and subsequently endorsed the Rails-to-Trails Conservancy's recommendation that disused rail corridors serve as a blueprint for the network. A 1990 Supreme Court decision secured a victory for rail-to-trail advocates against one of their primary adversaries, property rights proponents, who challenged whether railroad rights-of-way could be transferred to public use instead of reverting back to previous owners of the land. The court decision stated that railbanking is a valid use of congressional power and that neither the principles of statutory "takings" nor reversionary property rights applied in such cases.[2]

In 1991, Congress passed the Intermodal Surface Transportation Efficiency Act (ISTEA), which was reauthorized as Transportation Equity Act for the 21st Century (TEA-21). This "transportation enhancements" provision was the first federal law to specifically allow bicycling and walking as viable forms of transportation. Moreover, the program pursued the diverse goals of strengthening the cultural, aesthetic and environmental aspects of the national intermodal transportation system while encouraging diverse modes of travel, increasing the community benefits of transportation investment, strengthening partnerships between State and local governments and promoting citizen involvement in transportation decisions. Three billion dollars was authorized for 10 enhancement categories, which included: bike and pedestrian facilities, acquisition of scenic easements or historic sites, historic preservation, rehabilitation and operation of historic transportation buildings, structures, or facilities including historic railroad facilities and canals and preservation of abandoned railway corridors (including conversion and use as trails). (Howser, 5) While the Federal Highway Administration

[2] Property rights concerns and their offspring, NIMBYism, nevertheless remain key challenges to rail corridor conversions. For the purposes of this thesis, however, and at the risk of oversimplification, I will not dwell at length on property rights issues. Nevertheless, assembling title to all or parts of a corridor constitutes perhaps the major obstacle to redevelopment of rail corridors, and a significant body of legal provisions and precedents has developed during the past several decades. Moreover, the property rights aspect of rail-to-trail conversions has become such a sensitive issues that it has spawned at least one national organization whose sole mission is to oppose rails-to-trails on the grounds of reversionary property rights, a belief that ownership of rights-of-way should revert to the original owners of the land. As Whyte notes in The Last Landscape, " it is a rare right-of-way which does not have an incredibly complicated legal and political history behind it, and unsnarling questions of title and jurisdiction is difficult under the best of circumstances" (Whyte, 199)

manages enhancement funds, it apportions money to each state transportation departments, which in turn distribute the funds to statewide projects.

Clearly, rail-to-trail projects constitute ideal candidates for enhancements funding, and the program has played an important role in the growth of the rails-to-trails movement. In 1995, for example, 15.4%, or $200,401,400, of ISTEA funds supported rail-to-trail conversions nationwide. (Chan, 19) In addition to providing considerable funding for rail-to-trail projects, these funds also increased the quality of these projects by requiring a higher engineering standard than traditional recreation funds as well as a "finished linear park quality" and additional "utiltatarian" purposes beyond recreation. (Della Penna, personal communication)

According to Martin J. Rosen, President of the Trust for Public Land, the rails-to-trails movement remains "one of the most rapidly accelerating land-acquisition movements in American History" (quoted in Hiss 1997, 3) with 11,000 miles of corridor converted since the movement began in the 1960s and another 19,000 miles under construction. (Thompson, 80)

LITERATURE ON RAIL-TO-TRAIL CONVERSIONS AND URBAN GREENWAYS

Rail-to-Trail Literature

Although generally included in the greenway literature, rail-to-trail conversions usually are grouped with other types of greenway projects with little attempt to differentiate among them. Aside from the early mention of the rail-to-trail concept in Whyte's writing, very little of an academic or theoretical nature addresses rail corridor conversions. Little however, devotes a short section of his book to rail-to-trail projects, including assessing the extent to which they qualify as greenways. (Little) Moreover, from a British perspective, Ward and Ruff provides a framework, for reusing rail corridors as linear landscapes. (Ward and Ruff)

The remaining rail-to-trail literature consists mainly of the numerous works published by RTC and the popular press coverage spawned by rails-to-trails projects.

The RTC materials include several planning, design and maintenance manuals, a legal manual and reports on a range of subjects related to rail trails, including the impact of rail-to-trail projects on property values and crime and vandalism as well as technical manuals on issues ranging from acquisition to maintenance to tunnels on trails.[3] In general, however, these works emphasize "how-to" issues: the technical aspects of acquiring a right-of-way, strategies for building a coalition, securing public and private support and paving the corridor. The design-related publications offer suggestions for standard design elements and design approaches for special situations, such as tunnels and at-grade crossings. However, these publications do not address the extent to which the process, goals and design approaches of rail corridor conversions are shaped by the location of the corridor. Particularly absent is any consideration of issues and approaches unique to urban areas, which to date have experienced few rail corridor conversions.

Urban Greenways

The literature on urban greenways, a small subset of an already limited body of literature, offers insights into some aspects of urban linear spaces that can apply to urban rail corridor conversions. However, this literature does not distinguish between rail-to-trail projects and deals insufficiently with the challenges of planning and designing linear spaces in the city.

Some of the urban greenway literature focuses on the characteristics and use patterns of urban greenway users. (Lindsey 1999; Shafer) A subset of these studies address issues of access to urban greenways for individual communities and associated equity issues. (Lindsey et al 2001) Other related work includes a study of trail users' willingness to pay for urban greenways (Lindsey and Knaap) and publications on planned and existing metropolitan greenway systems. (City of Vancouver; Indy Greenways) In addition, the comparatively large body of literature devoted to security issues on urban greenways includes some studies that specifically consider rail-to-trail projects. (Schneider; Luymes)

---

[3] The Trails and Grenways Clearinghouse (htttp://www.trailsandgreenways.org) provides either direct links to or bibliographic information for all Rails-to-Trails Conservancy publications.

Particularly relevant to this thesis is an emerging branch of the literature that examines the relationship between greenways and urban form. (Walmsley; Searns) Moreover, a 1997 University of Michigan study analyzes metropolitan greenway systems in a manner similar to the analysis of rail-to-trail planning processes in Chapters 3 and 4. (Erickson) However, this study considers greenway systems (some of which include rail-to-trail projects) in the aggregate and addresses neither design aspects nor the relationship between the planning process and the resulting character of a greenway project.

In summary, nothing close to the work attempted in this thesis exists in the literature at this time. To date, urban linear landscapes, and particularly urban rail corridor conversions, have received insufficient attention in the literature, particularly as they relate to urban form and recycled rights-of-way. This thesis therefore constitutes a first step in filling this gap in the literature.

Chapter 3:
The Next Generation of Urban Rail Corridor Conversions

URBAN PRECEDENTS

The decision to select five ongoing projects as examples for thesis emerged out of my initial difficulty finding relevant comparisons to the Farmington Canal project discussed in Chapter 4. The existing U.S. examples of so-called "urban" rail-to-trail conversions—of which there are strikingly few as it is—proved only partially applicable to the New Haven case, in some respects requiring a stretch of the imagination to make the desired connections and comparisons.

Figure 3.1: The Pinellas Trail, which extends from St. Petersburg to Tarpon Springs in western Florida, helped a establish a precedent for urban rail-to-trail conversions.

In many cases, the earliest urban projects contain some urban portions in addition to some large surburban segments and other sections consisting of scenic or borderline bucolic surroundings. Many of these projects also passed through more than one municipality. For example, the Pinellas Trail, which was completed in 1993, begins in St. Petersburg, Florida and continues for 35 miles through 8 municipalities. The Minuteman Bikeway, also completed in 1993, extends through 4 localities in the Boston metropolitan area. The Burke-Gilman Trail in Seattle, of which the original 12.1 miles were constructed during the 1970s, holds the distinction of being one of the earliest rail-to-trail projects of any sort. A urban trail, the Burke-Gilman retains a scenic quality throughout much of its, benefiting from proximity to the water's edge while connecting a series of open spaces. The 11-mile Capital Crescent Trail, moreover, spans a state boundary, linking the Georgetown section of the District of Columbia with the Maryland suburb of Bethesda.

These are urban trails, for sure, but not intensely so. They are more likely to benefit from scenery—for example, the wooded and riverfront portions of the Capital Crescent Trail and the waterfront portions of the Burke-Gilman and Pinellas Trails—and, more often than not, serve affluent city neighborhoods and suburbs, as in the case of the Capital Crescent and the Minuteman Commuter Bikeway. While the Capital Crescent

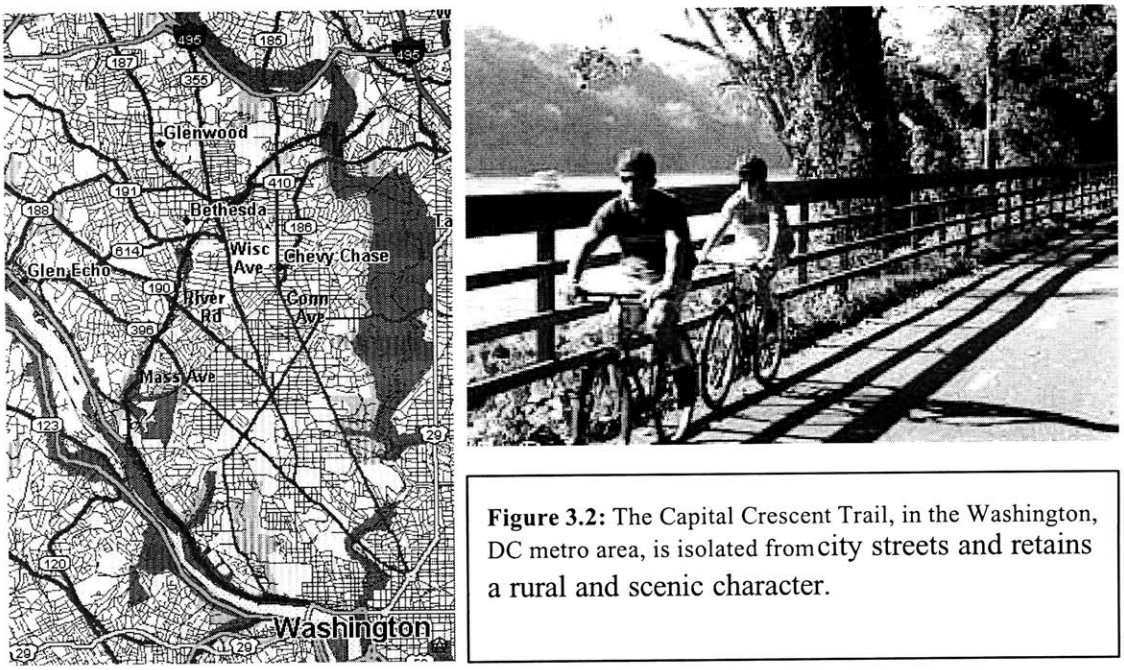


Figure 3.2: The Capital Crescent Trail, in the Washington, DC metro area, is isolated from city streets and retains a rural and scenic character.

Trail begins in a very urban portion of the District of Columbia, the most urban sections are separated from the urban fabric by a buffer of open space and also is flanked by the Potomac River and Canal for much of the way to Bethesda. In addition, these trails generally do not pass through areas with a variety of land uses nor do they connect residential communities of different demographic and socioeconomic characteristics. Most importantly, they mainly connect parts of the metropolitan area that are already desirable locations in which to live and to visit.

Perhaps a reflection of the more single-minded goals of the projects and the specialized engineers and recreational planners who designed them, these trails pursued the limited objectives of recreation and, in some cases, alternative transportation. And because many of these trails have existed for a while, the projects developed in different cultural, institutional and funding contexts and, more generally, a world that was less familiar with the concept of rail-to-trail conversions.

In terms of context, the corridors and their edges did not always closely resemble the urban character of the Farmington Canal. Moreover, designed in mostly uniform fashion throughout the length of the corridor, the corridors did not look much different than the more suburban and rural examples that I observed in person and in photographs

or more generic asphalt bicycle paths that one might find anywhere. In short, this was not necessarily how I imagined the Farmington Canal might look or function one day.

THE NEXT GENERATION

This remainder of this chapter draws on examples from five ongoing rail-to-trail conversion projects in urban areas. These projects, which represent the next generation of urban rail-to-trail projects, include:

- *The East Boston Greenway*: A planned 3.5 mile linear park in the East Boston section of Boston, Massachusetts. The Greenway, which passes through a largely working class residential neighborhood with a large number of children and seniors as well as a growing Hispanic population, will connect the Boston Harbor waterfront with Belle Isle Marsh at the northern edge of the city. A 1.2 mile segment (between Marginal and Porter streets) of the park will occupy a former Conrail right-of-way. The first half-mile segment opened in the summer 2001.

- *The Depot Avenue Rail Trail*: The conversion of a 2.1 mile corridor in Gainesville, Florida, this eco-history trail project centers on the rehabilitation of an historic train depot building along the right-of-way. The corridor passes through primarily low-income African American neighborhoods and industrial areas. A portion of the corridor is a brownfields site that is scheduled for environmental cleanup in 2003. The project received funding from the National Endowment for the Arts to conduct a design competition for the trail in 2002.

- *The Midtown Greenway*: This corridor, of which 2.8 miles have been constructed, will extend for 5.5 miles in a below-grade railroad trench through multiple neighborhoods in the South Side of Minneapolis. The project, which is tied to a public-private partnership to revitalize neighborhoods along the corridor, also includes an effort to convert a parallel right-of-way into a bus or light-rail route in the future.

- *The High Line*: Still in the conceptual stages, this abandoned rail viaduct is envisioned as an elevated pedestrian promenade through Manhattan's lower west side. Approximately one and a half miles in length, the corridor passes directly adjacent to and, in some cases through, existing structures. It connects the 30th Street Rail Yards and industrial West Chelsea, while passing through New York's evolving Meatpacking District.

- *The Metropolitan Branch Trail*: In Metropolitan Washington, DC, this proposed 7.7 mile trail will connect Union Station in the District of Columbia with Silver Spring, Maryland while connecting the District's underserved Northeast quadrant with 7 transit stations and the trail systems that already exist in other parts of the city. The project will piece together a variety of rights-of-way, including over two miles in abandoned rail rights-of-way adjacent to an active rail line.

The projects that comprise the next generation of urban rail corridor conversions reflect a broader and more complex notion of the elements that comprise a rail-to-trail project. For the most part, these projects remain works in progress at the time of this writing, either partly constructed or still in the planning and design stages. For this reason, it is not possible to analyze success or failure; however, examining the way these projects are conceived and evolve over time does provide some insights into how urban areas are thinking about these projects and how these ideas may change over time. An analysis of these examples can provide ongoing and future efforts with some frame of reference and new ideas for design or implementation strategies. Finally, these projects already offer some lessons and principles to guide future work in this area.

These urban rail-to-trail projects share some basic characteristics. Their contexts are more urban in more places than any prior rail-to-trail project. They pass through neglected, underserved or otherwise marginalized areas of the city, and therefore are more likely to have stigmas or safety concerns attached to them. In most cases, they are relatively short in length, but more expensive to develop on a per-foot basis. Some constitute segments of larger greenway systems that plan to knit together multiple rights-of-way and property types into a continuous whole. Arguably, all of these projects might not have been proposed at all if it were not for the advent of Transportation Enhancements funding over a decade ago.

All of the surveyed projects began with goals and assumptions that looked beyond recreation and commuting as the main functions of a trail. In many cases, these projects include an effort to attach meaning to the corridor through historic preservation, interpretation and use of the corridors for a variety of arts uses. In general, these projects tend to be more sensitive to context and contain many different contexts along the length of their edges. In some cases, the projects serve as focal points catalysts for other

development efforts. In all cases, a range of actors and funding sources converge together in not-always-fluid planning processes that are frequently riddled with competing visions for the same space. Along the way, the planning processes require grappling with new design issues and multiple normative ideas of the role of rail-to-trail conversions.

The purpose of this section is to survey some ongoing projects, highlight the differences among them, and extract some common issues and approaches. This chapter examines five examples of ongoing projects, using a framework of components to characterize the new generation of rail-to-trail conversions. This framework is divided into three components: Project Typologies; the Planning Process; and Design Philosophy. The New Haven case study in the following chapter will illustrate in greater detail the nature of the issues confronting current urban rail-to-trail projects, including changing priorities and planning and design approaches, as well as the difficulty of developing and sustaining a common vision for an urban corridor.

PROJECT TYPOLOGIES

By setting their sights beyond recreation, the five projects collectively suggest at least six other ways of thinking about urban rail-to-trail projects. One might interpret an urban rail-to-trail conversion as:

- Refuge, open space and natural space;
- Moving system and connector;
- Focal point and catalyst;
- Main street;
- Artifact and information space; and
- Landscapes of continuity and difference.

While further interpretations of these projects are possible, the five projects serve more than one of the roles listed above. **(See Table A)**

Refuge, Open Space and Natural Space

Although more traditional roles for greenways and rail-to-trail projects, the concepts of refuge and open space take on new meaning in an urban context. Converted rail corridors might provide the "sanctuary" suggested by Ward and Ruff or, in a purely functional way, provide refuge from urban traffic and other daily obstacles that might hinder passage from one point to another. The latter can be of great importance in cities where many residents do not rely on automobiles as a primary means of transportation.

Moreover, converted rail corridors indeed do operate as a form of open space. In the case of projects such as these, however, it is often open space for areas of the city that historically have been underserved in this regard. For example, open space provision constitutes a central goal of the East Boston Greenway project because the neighborhood not only has very little open space relative to other areas of Boston but also insufficient access to the open space that does exist. The neighborhood has a history of fighting over open space that began when East Boston lost Wood Island Park and adjoining marshland to Boston's Logan Airport in 1969. Similarly, one goal of the Metropolitan Branch Trail in the District of Columbia is to provide open space for the underserved Northeast quadrant of the city, while Midtown Greenway proponents view the project as a way to provide much-needed recreational space in the South Side of Minneapolis.

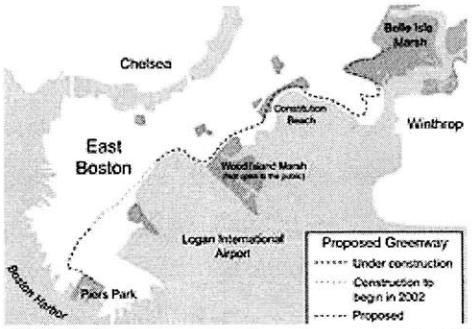


Figure 3.3: The East Boston Greenway will provide much-needed open space opportunities for the East Boston neighborhood.

It is worth noting however, that open space provision sometimes elicits mixed reactions in high-crime neighborhoods, where residents may perceive parks as dangerous places. As described in Chapter 4, some New Haven residents expressed this concern during the planning process for the Farmington Canal right-of-way.

Finally, as noted earlier, urban rail corridors can be "natural" places, and this aspect may be emphasized as part of a rail corridor conversion. The High Line in New York City, for example, has developed a new layer of grass and wildflowers that took over the space after the trains stopped running. Many in the area would like to see these natural features retained to some extent in any future corridor design.

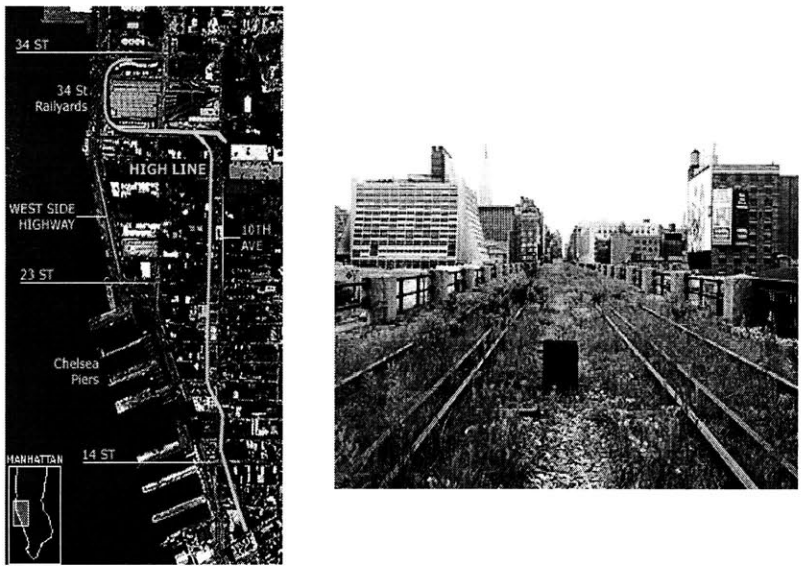


Figure 3.4: The High Line, an elevated viaduct in Manhattan's lower west side, is envisioned as a future pedestrian promenade. It offers possible connections to adjacent buildings and natural features, which emerged after the corridor was abandoned.

In the District of Columbia, the rail right-of-way between Union Station and Catholic University—lined with industrial uses, assorted debris and back edges of parking lots—currently functions as a gritty gateway to the nation's capital for those arriving from Maryland. However, the Concept Plan for this segment of the Metropolitan Branch Trail envisions this space as a future "green hub" that provides a more graceful transition into the District. In East Boston, moreover, the Greenway's open space concept derives much of its value from surrounding natural features, such as the aforementioned marshland.

Moving System and Connector

Another traditional interpretation of greenways and rail-to-trail projects, alternative transportation takes on greater importance in urban areas where many residents do not own automobiles and where a bicycle ride or walk to work might serve as a welcome substitute to navigating city traffic or public transportation. In the case of the Metropolitan Branch Trail—for which alternative transportation throughout the DC metropolitan area is a central goal—the trail not only will link Union Station and the Capitol with the Maryland Suburbs, but it also will connect 7 transit stations along METRO's Red Line and provide access to 28 schools, 5 colleges and universities, 7 transit stations, 4 post offices, 5 shopping centers and 47 places of worship. (Metropolitan Branch Trail Concept Plan, 23)

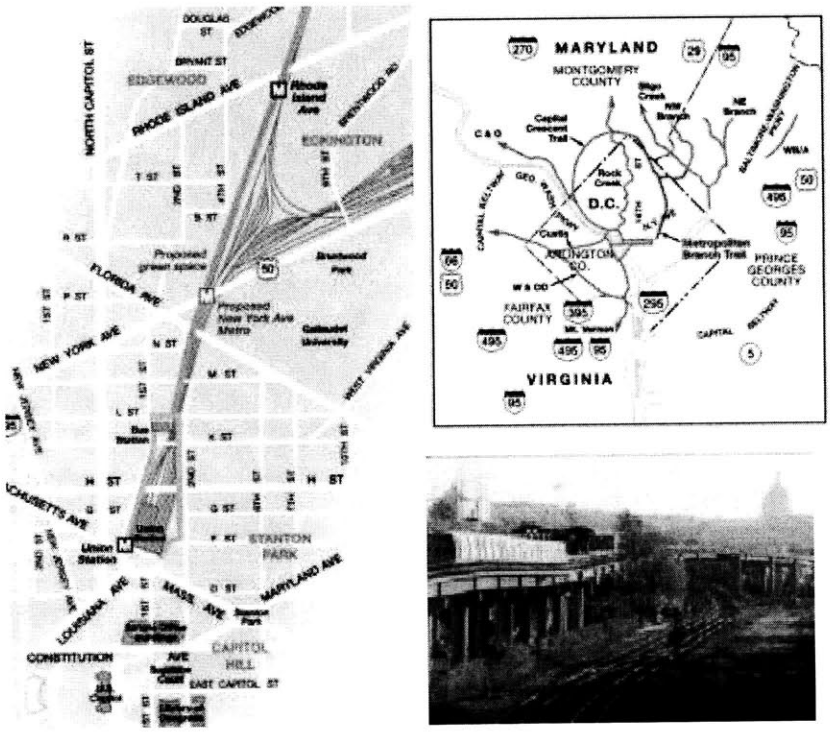


Figure 3.5: The Metropolitan Branch Trail, in the District of Columbia, will serve as a "green gateway" to the nation's capital, while linking many destinations and transit stations along its route.

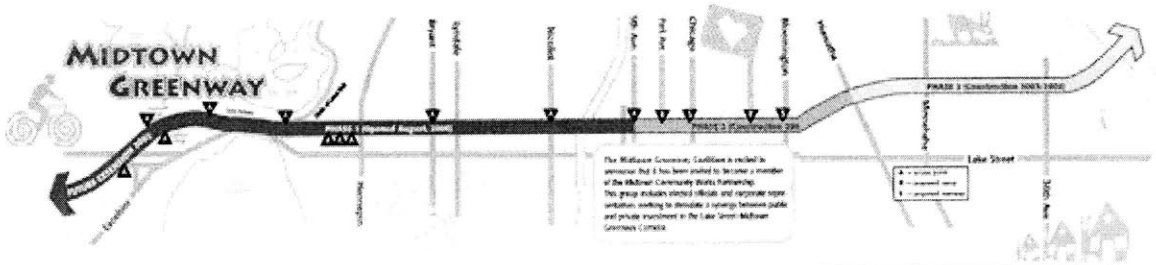
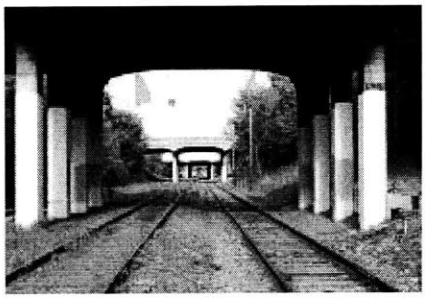


Figure 3.6: The Midtown Greenway, in Minneapolis, connects neighborhoods in sections of the city undergoing a revitalization.



A converted rail corridor might also connect disparate urban areas, as well as communities and resources, long separated from one another as a result of past development decisions or other factors, such as trains. In East Boston, a neighborhood surrounded on three sides by water, residents have surprisingly poor access to the waterfront, and the Greenway is regarded as an opportunity to provide a connection not only to the waterfront but also between other open spaces, such as a recent waterfront park project, Piers Park, and another park to be constructed as part of the Central Artery Project. Moreover, as noted in the next chapter, the Farmington Canal is viewed as an opportunity to connect fragmented areas of the city and establish new ties between the proximate but psychologically distant city and suburbs.

It is likely that many of the urban rail-to-trail projects also will address horizontal connections, between the two sides of a rail corridor. These connections might already exist, as in case of bridge crossings targeted for rehabilitation and artistic redesign as part of the Midtown Greenway project. However, unlike active rail corridors, pedestrian paths also can accommodate lateral movement directly across the right-of-way. Despite their importance, strategies to address lateral connections did not figure as prominently as linear connections in initial plans for these projects.

Focal Point and Catalyst

The perceived conflict between trail development and economic development constitutes a frequent tension in the redevelopment of urban railroad rights-of-way, especially when an abandoned rail corridor contains the last remaining buildable space in a particular area. The Rails-to-Trails Conservancy and the National Park Service have addressed this issue by highlighting examples of trails that over time contributed in one way or another to economic development. (See, for example, Moore et al) Nevertheless, in urban and even some suburban areas where property values are higher, some pro-development constituencies regard economic development and trail development as mutually exclusive strategies.

A more creative approach might find ways for the two to coexist in the same space: new construction might straddle two sides of a right-of-way instead of blocking it, or the users of a linear park might visit restaurants and retail establishments—or a new bicycle shop—located just off the corridor. In the District of Columbia, lobbying efforts by Metropolitan Branch Trail advocates succeeded in convincing the Washington Metropolitan Area Transit Authority to incorporate the trail in the design of a new transit station at New York Avenue. By design, the trail right-of-way will pass through the new station, adjacent to the train tracks.

In the most enlightened cases, an urban trail may serve as a focal point or catalyst for future development. A prime example of this phenomenon is occurring in Minneapolis, where the Midtown Greenway project has spawned a public-private partnership devoted to coordinating and promoting redevelopment along a portion of the corridor. At the same time, the corridor has experienced a series of development projects along the Greenway. The so-called Urban Village project, a residential development with 200 housing units, was motivated by what the developer perceived as "the potential of the greenway." (Brandt, 1B) As part of the redevelopment of the Nicollet and Lake area, the design of a Kmart store, relocated from a nearby parcel, will incorporate the Greenway while its new location will allow for the reopening of street closed with the construction

of the former store. The design of the new store incorporates the Greenway through the orientation of the building, the location of parking away from the Greenway and by providing access to additional mixed use development planned for the below-grade Greenway level. Other new development along the Greenway includes the rehabilitation of an historic mill building and another mixed-use development.

A rail-to-trail conversion also might serve as a catalyst for other efforts, such as environmental cleanup. Such is the case with past remediation efforts in the East Boston right-of-way and future plans for the area around the rail corridor in Gainesville. In the case of Gainesville, the project includes the goal of highlighting the impact of industrial activities on nearby African-American communities and addressing environmental issues in the area, both through the cleanup and environmental education programs.

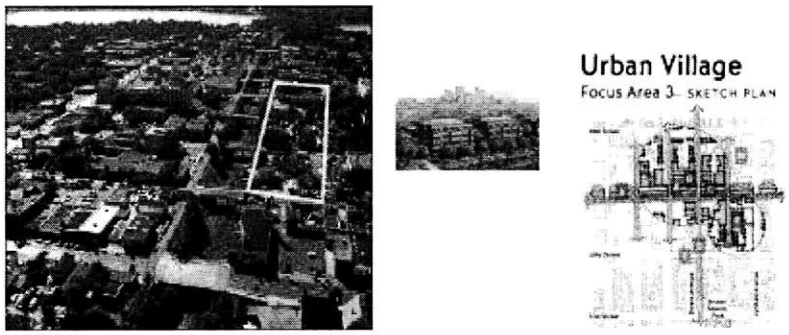


Figure 3.7: Urban rail-to-trail conversions can serve as catalysts or focal points for new development, as in the case of the Urban Village housing development pictured here.

Main Street

In places where a converted rail corridor serves as a focal point and catalyst, the corridor eventually might acquire a street-like character. If new construction at the corridor edges is oriented to the right-of-way and the rears of buildings are adapted to provide access and amenities to the corridor, the right-of-way can make the transition from marginal space to main street. In some neighborhoods where safety is a concern,

such an environment may be preferable to a more sheltered path by providing a variation on the "eyes upon the street." (Jacobs, 35; see also Lindsey et al 2001, 444)

In Minneapolis, the development occurring around the Midtown Greenway likely will foster a main street environment. Adding to this image of the corridor will be its intended future use as an intermodal transportation center. The city and county plan to use a right-of-way adjacent to the Greenway as either a bus or light rail route, a topic of much controversy and debate regarding the appropriate mode of transportation for this location.

In New York, High Line advocates envision the corridor as a two-level main street. A planning study prepared by the Design Trust for Public Space suggests that the surface of the viaduct serve as an elevated pedestrian promenade, modeled after the Promenade Plantée in Paris, that incorporates art and performance space, small retail and a botanical garden. The opportunities for such uses are enhanced by the design of the original rail line, which sought to "connect to or encompass" the corridor by passing immediately adjacent to or, in three instances, directly though structures along the route. The Design Trust believes that this function could continue with pedestrians replacing trains. (Design Trust for Public Space, 14) Moreover, the plan also considers ways to preserve and enhance the existing street environment below the High Line while providing access points between the two levels.

Artifact and Information Space

A converted rail corridor, especially one in a city, also might serve as what Manuel Castells calls, in a different context, a "space of flows." (Castells) While Castells' term refers to the role of information technology in fostering the flow of information, people and goods through space, it is possible to recycle rail corridors as spaces for the flow of not only people but also information. The flow of information results when a corridor serves as a narrative or pedagogic landscape. Many urban rail corridors, for example, contain a rich history that is expressed in physical traces of past uses, extant railroad architecture and historic buildings on or near the corridor. Frequently, these historical clues might have been forgotten or hidden over time and

therefore would require uncovering or rediscovery. In addition, linear landscapes also might provide information about communities or activities located at the edges of the corridor. In both cases, interpretive displays, public art and simple signage all can communicate information and stories.

In Gainesville, an historic train depot building serves as a focal point for a design strategy that aims to tell the story of the railroad's impact on the development of a particular community. In order to develop guidelines for an upcoming design competition, the project director arranged a series of videotaped neighborhood meetings at which residents recounted stories about the years when the railroad operated. (Brad Guy) In New York, many view the High Line as part of a larger vision of the city as a "palimpsest" with "corridors that preserve traces of the past even as they accommodate new interpretations of how space should be used." (Design Trust for Public Space [afterward by Elizabeth Barlow Rogers], 82-83)

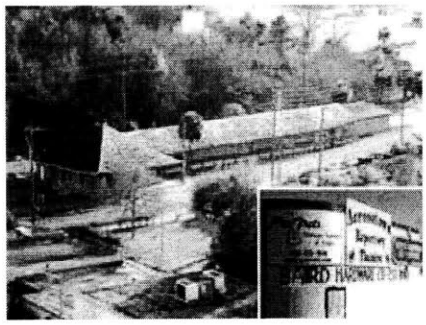


Figure 3.8: An historic train depot building serves as a focal point for eco-history trail in Gainesville, Florida. A design competition will draw on oral histories of the railroad's impact on adjacent communities.

In Minneapolis, the emerging main street character of the Midtown Greenway and the revitalization of the Lake and Nicollet is fueled by memories of the time when this area served of the city's principal main streets. Moreover, as part of the Greenway effort, project planners hired art consultants to develop a Public Art Master Plan to outline ways that future public art that can be integrated into the design of the corridor. The consultant then asked the Midtown Greenway Coalition to conduct a "character mapping" effort to incorporate images and stories from surrounding communities so that the art may serve as a bridge between the Greenway and adjacent communities. Based on this information, the Coaltion's Art and Design Committee drafted project review criteria for public art. (Midtown Community Works)

The narrative and educational aspects of a former rail corridor need not be limited to historical, community and artistic expression. As noted earlier, the Gainesville project also includes information on environmental issues as a second component of the

proposed eco-history trail. In East Boston, the environmental cleanup activities and adjacent natural features likely will serve environmental education purposes for local students.

Landscapes of Continuity and Difference

Linking information with context creates challenges in a linear space that might have multiple contexts. Different historical legacies, land uses, racial and ethnic compositions and socioeconomic characteristics may occur along the edges of corridor, or might even overlap in places. This challenge is most pronounced in the dense urban fabric, where many communities and activities may exist within a relative short distance. From these different contexts may emerge different interpretations of, for instance, what functions a "greenway" should serve, *whom* it should serve, which destinations it should serve and what image or narrative it should project.

On a more functional level, urban rail corridor projects are also likely to encounter differences in topography: below-grade trench environments, tunnels, viaducts, or at-grade crossings; narrow rights-of-way that give way to wider corridors; view

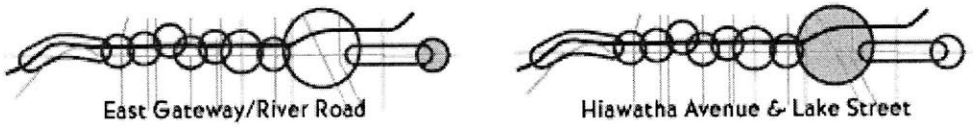


Figure 3.9: To address continuity and difference within a linear space, the Midtown Greenway project divides development of the corridor into a series of zones and nodes of different character and uses.

corridors in some locations but total seclusion in others. As a result of past efforts to separate trains from city traffic and structures, one is also likely to find many combinations of corridor topography in urban areas. A design approach for such environments must address the logistical and functional challenges of such environments, the unique design opportunities that each creates as well as any real or perceived safety concerns associated with them.

Together, these differences present planners and designers with the post-modern dilemma of maintaining consistency and continuity through space while also responding to differences. As a result of these differences, it may be necessary to design linear Spaces as a series of distinct zones and nodes while also retaining continuity in features such as pavement, signage, lighting and amenities. Early conceptual plans for the Gainesville and High Line projects both incorporate this notion of zones and nodes, while the Midtown Greenway seeks to achieve this effect through both art that reflects its context and individual nodes of development along the right-of-way.

In a less interpretive and more practical way, the Metropolitan Branch Trail serves as a striking post-modern example of an effort to unite a variety of disjointed landscape elements—rail corridors, drainage ditches, sidewalks, city streets—into a continuous linear network united by a common purpose. The role of the converted rail corridor as post-modern space will be revisited in further detail as part of the Farmington Canal case study in the next chapter.

THE PLANNING PROCESS

Although these projects remain in the early stages of implementation, they do suggest the nature of the more "nuts and bolts" aspects of the planning process for the next generation of urban rail corridor conversions. As with most rail-to-trail projects, the participants and processes required to assemble a project are different for each individual case and shaped by local realities and unique opportunities or challenges. At the same time, the collective experience of these projects suggests some common issues and approaches that lead to success.

Common Origins

It is noteworthy that all of the projects, including the New Haven example in the following chapter, began as grassroots efforts. The Metropolitan Branch Trail and the Midtown Greenway, for example, both began as initiatives promoted by loose coalitions of bicycle advocates. The East Boston Greenway was initially sparked by a grant for

urban parklands from the Lila Wallace-Reader's Digest Fund to the City of Boston, but immediately tapped into local efforts to lobby for open space. These efforts eventually coalesced into the East Boston Greenway Council while a local non-profit organization, the Boston Natural Areas Fund, was asked by the funders to oversee the project. In New York, a local group—the Friends of the High Line (FHL)—continues to be the central actor pushing for redevelopment of the corridor. In Gainesville, the University of Florida's Center for Construction and Environment spearheaded trail development efforts.

Many Different Actors

Furthermore, the planning process for these urban projects tends to involve many different actors from a variety of sectors and with a diverse array of specializations and perspectives. However, the overall composition of the planning teams is unique to each project.

The grassroots organizations spearheading the trail efforts can evolve over time: from loose coalitions to incorporated non-profits, from volunteer organizations to full-time staffs, and from specialized advocacy groups (i.e., a bicycle coalition) to more sophisticated organizations that address a range of issues. The Midtown Greenway Coalition, for example, evolved from a grassroots, volunteer organization comprised primarily of bicycle advocates to a non-profit organization with a full time staff and a broader mission of using the Midtown Greenway as an "organizing tool to increase the capacity collectively of the neighborhoods it serves." (Midtown Greenway Coalition) The Coalition's activities now address not only the Greenway itself but a range of related activities, including land use planning, greenspace planning, transit planning for the adjacent right-of-way, public art and adopt-a-greenway programs.

All of the projects involve municipal, regional and state government entities to varying extents, with the federal government also playing a role in most cases. The East Boston Greenway project, for example, benefited from the personal involvement of the Mayor of Boston as a project advocate and featured the participation or financial assistance of the the Boston Parks Department, the Massachusetts Highway Department,

the Massachusetts Turnpike Authority, a state-run park management agency called the Metropolitan District Commission and the Massachusetts Port Authority (as an adjacent landowner). The United States Environmental Protection Agency, meanwhile, coordinated the environmental remediation of the former rail corridor.

In Massachusetts, as in Connecticut (see chapter 4) a system of local control precluded the involvement of any county government. County government, however, has played a significant role in Midtown Greenway project. Through a county program called Community Works—a "comprehensive planning tool available to all units of government, designed to assist in the coordination, planning, and effective use of multi-jurisdictional transit-related infrastructure and economic investments"—the county served as the largest single funding source by contributing $1.5. million to the project. Moreover, the county and the City of Minneapolis jointly founded Midtown Community Works Partnership, a public-private partnership designed to "bring clout" to the redevelopment efforts while coordinating multiple projects along 29th Street and Lake Street and establishing redevelopment priorities. (Midtown Community Works) City agencies involved include the city planning office, the city's public works department and the Minneapolis Arts Commission.

Due to its location in the nation's capital, the Metropolitan Branch Trail benefited from its access to federal resources and support. The District's Representative to Congress, Eleanor Holmes Norton, succeeded in securing the extra funding and publicity resulting from the project's selection as a special TEA-21 demonstration project. Moreover, the National Park Service, which owns a portion of the land that the trail will occupy, also lent its support. The project also has required the participation of the DC Office of Planning, the DC Departments of Public Works and Transportation (both of which are playing lead roles in the city's construction and planning efforts), two county governments in Maryland as well as the regional transit authority and the CSX Corporation, both of which own rail rights-of-way adjacent to the proposed route of the trail.

The Gainesville project has involved the city's public works and community development departments, U.S. EPA assistance with environmental cleanup, the National Endowment for the Arts (which is providing funding and technical assistance for the

design competition) and some financial assistance from the since-discontinued Florida Preservation 2000 program. The High Line project, meanwhile, has yet to develop an official planning process, although the Mayor of New York has voiced his support for the project and authored a preface to the most recent planning study for the corridor. (Design Trust for Public Space)

Particularly noteworthy is the significant involvement of both academic or non-profit design organizations. As noted, the University of Florida's Center for Construction and Environment is the key creative and coordinating actor of the Gainesville project, in which the Florida Center for Community Design and Research at the University of South Florida also became involved. The Midtown Greenway benefited from the participation of the University of Minnesota's Design Center for the American Urban Landscape, which coordinated the bridge design competition. In New York, the Design Trust for Public Space authored the planning study for the High Line and sponsored two fellowships for architects to engage in work related to the project.

Finally, also worth noting is the role of both the Lila Wallace-Reader's Digest Fund and the Trust for Public Land (TPL) as intermediaries in coordinating the different physical and institution pieces of the East Boston Greenway project. TPL, which persuaded Conrail to donate its right-of-way to the project, also played a crucial role in the assembling of land for the Farmington Canal project, as discussed in Chapter 4.

Multiple Funding Sources

Funding for the next generation of urban rail corridor conversions comes from a range of public and private entities. All of the projects rely on federal Transportation Enhancements funding (ISTEA or its successor, TEA-21), further testament to the program's essential role in both providing financial support for and catalyzing these types of projects. All of the projects also pieced together funds from variety of governmental entities at all levels of government. Sometimes these funds come from unlikely sources, such as the National Endowment for the Arts or a state highway department. More often they come from sources such as state and local transportation, transit and public works agencies (all of which channel federal funds to local projects) and state conservation

programs. In addition, at least one project, the Metropolitan Branch Trail, received federal Congestion Mitigation and Air Qulaity (CMAQ) funds. Those projects with environmental issues also benefited from federal environmental cleanup funds.

The Midtown Greenway is noteworthy for being able to tap private sector funding both through the Community Works public-private partnership and through private developers contributing to the project by building at the corridor's edges. In addition, many projects also rely on private donors. In this respect, the High Line project is particularly fortunate to have lineup of celebrity advocates, who provide free publicity.

Arguably, some of the most important funding—not necessarily in terms of the amount of funds provided but in terms of filling small yet specific funding gaps or providing visibility for the project—comes from private foundations. The roles of the Lila Wallace-Reader's Digest Fund and the Design Trust for Public Space in East Boston Greenway and High Line projects already have been noted. In addition, the Bush Foundation funded the Midtown Greenway's Public Art Master Plan with a $100,000 grant. Morevoer, the Conservation Fund's DuPont Greenways Award program provided financial support for the production of the Metrpolitan Branch Trail's Concept Plan. Although it is not a private foundation, the NEA played a similar role in providing support for the Gainesville design competition.

Leadership and Priorities

Ultimately, however, the key factor that will determine both the implementation and the overall nature of an urban rail corridor conversion is the existence of effective and determined leadership, especially in the public sector, that values and prioritizes such a project enough to make a sufficient investment in it. The Midtown Greenway, potentially a model for other similar projects to follow, has benefited from significant city and county resources and by the fact that the project has dovetailed with other planning priorities. The East Boston Greenway, moreover, benefited from the Mayor declaring open space as a city priority and personally advocating for the project. Finally, the Metropolitan Branch Trail has benefited from both local persistence and eventual federal

attention and resources. The New Haven case study in Chapter 4 will illustrate in greater detail how changes in leadership and public priorities may affect plans and design.

DESIGN PHILOSOPHY

As early as 1986, Ward and Ruff made the generally true statement that "the disused railway is a new resource without a new design philosophy." (Ward and Ruff, 21) In the urban context, however, there appears to be a much greater attention to design issues, both for interpreting the particular role, character or meaning of a project and for creatively addressing the functional challenges that may arise. The frequent involvement of design-oriented organizations is one indication of the greater role for—or, perhaps, a greater appreciation for—design issues in urban rail corridor conversion than in their suburban or rural predecessors.

Evolutionary Approach vs. Comprehensively Planned Approach

The projects vary in the nature and the extent to which they are designed. Some projects, such as the Metropolitan Branch Trail, appear to view the linear landscape as an evolutionary space, for which the essential design element in the early stages of the project is simply securing a continuous right-of-way and laying down the pavement. In contrast, other projects clearly recognize the value of design up front in the planning. The Midtown Greenway provides a good example of this

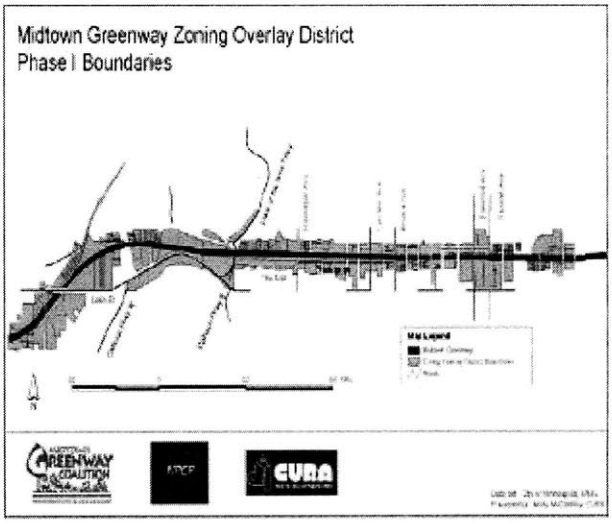


Figure 3.10: A zoning overlay and urban design guidelines were developed as a way of shaping both the character of the corridor and development at its edges.

latter approach, both in its use of Public Art guidelines and efforts on behalf of the Midtown Greenway Coalition to prepare urban design guidelines and a zoning overlay for the corridor to shape the nature of future development along the Greenway. In Gainesville, a segment of railroad right-of-way was previously paved in one location, but the project's concept-driven approach and design competition point towards a more ambitious program with more components to be designed. The tension between an evolutionary approach and comprehensively planned approach is also discussed as part of the Farmington Canal case study in the following chapter.

Design Challenges

The combination of working in urban areas and attempting to adapt new uses to a preexisting landscape gives rise to a number of complex design challenges for urban rail corridor conversions. While many of these issues are too complicated and site-specific in nature to consider in detail here, it is nevertheless worth highlighting some of the common issues faced by more than one project. These challenges range from the physical to the environmental to the conceptual. A crosscutting theme driving each of these challenges concerns the issue of safety.

Physical challenges faced by these projects often relate to the unique design features of urban railways mentioned previously: below grade (trench) segments, at-grade crossings, elevated segments. Important design questions include: What can designers do with these spaces? What liabilities do they present? And, equally important, what design opportunities do they present? To date, none of the projects have answers to all of these questions, nor have they had the chance to test any design solutions over a period of time.

Safety and Security

In Minneapolis, trench segments in a high-crime area elicited particular attention to personal safety. Design responses include lighting, security cameras, emergency phones as well as landscaping to soften the harsh edges of the corridor without having a mass or height that might provide hiding places for potential "predators." Another

response, and perhaps the best solution, is simply fostering "eyes on the trench" through adjacent development, efforts to attract many Greenway users or simply through security patrols.

Another challenge faced by the Metropolitan Branch Trail and others is achieving compliance with existing standards, such as the AASHTO bicycle guidelines, while working within a space not originally meant for such uses; or, as with the Midtown Greenway, trying to plan for transit, pedestrian and bicycle passage in the narrow space under overpasses.

At-Grade Crossings

A challenge to be confronted in Gainesville, the District of Columbia and in one neighborhood in New Haven (see Chapter 4) is how to not only cope with but also maximize the potential of at-grade crossings. Finally, although resolved in some of the projects discussed here, reconciling the need for a continuous right-of-way with adjacent or obstructing private (or even public) property remains a thorny issue for the Metropolitan Branch Trail, the East Boston Greenway, the High Line and likely the other projects as well.

Environmental Contamination

Another common challenge that affects the timing and overall approach of design is the presence of environmental contamination, which results either directly from past railroad uses or from adjacent industrial uses. The East Boston and Gainesville project were particularly affected by this issue. At the same time, however, environmental contamination presents the opportunity to tap into new sources of funding. (Villa; Brasswell)

Image Transformation

Finally, a more abstract but vitally important design challenge is the larger issue of how to transform the image of a previously marginalized or blighted space to the

extent that people will choose to visit this place in the future. A formerly contaminated site in East Boston, a known hangout for prostitutes in Gainesville, a Minneapolis corridor known for its graffiti and occasional gang activity, drug dealing, prostitution, transients and use for dumping bodies: How do such places become attractive destinations? There exists no definitive answer to this question nor many successful models after which these communities might model their own efforts. However, these issues require much further thought as part of the process of creating special linear places in the city.

Chapter 4:
The Farmington Canal Corridor

The ongoing effort to redevelop the Farmington Canal right-of-way in New Haven, Connecticut serves as an instructive example of the next generation of urban rail corridor conversions. First, it illustrates not only the complex planning and design issues facing an historic rail corridor conversion in a diverse urban context, but also the long and difficult process of gaining support for such a goal in the first place. The history of the project to date illustrates how the urban planning and design process—with its multiple actors, political and financial constraints, unique concerns and changing priorities—can impact both the progress and, potentially, the final product of an urban rail-to-trail conversion.

Second, the project also exemplifies the multiple challenges presented by the existing physical characteristics of an urban corridor and a diverse surrounding context that changes along the length of the corridor. The project serves as a useful reference for other urban rail corridor conversion projects in that, in the absence of relevant examples of other urban projects, it has generated new yet conflicting ways of thinking about linear space. The project is representative of many of the issues highlighted in the previous chapter while also illustrating how a project is shaped by its own unique context.

CONTEXT

A city of just over 123,000 people (US Census, 2000), New Haven borders one edge of Long Island Sound in Southern Connecticut. Built around an original city plan that consisted of nine square blocks and a central green, New Haven remains a compact and largely walkable city with a modest land area of 18.9 square miles. (US Census, 1990) Due to the legacy of highway construction and urban renewal projects, the city currently functions as a fragmented version of its former self. It is a waterfront city, although new development and highway construction now isolate the waterfront from the rest of the city. Once a shipping port and industrial center, the city retains an active harbor but otherwise few working vestiges of its industrial past. It is a city of distinct neighborhoods, but these areas now constitute segmented, disparate parts while some neighborhoods have been replaced by urban renewal schemes. The city serves as a world class center of intellectual life and culture, home to Yale University, nationally

recognized theaters and museums, and an annual international arts festival. At the same time, an entirely different New Haven coexists alongside the education and culture, a city in which poverty and crime rank high by national standards.

In contrast to the city's physical, social and economic divisions, the Farmington

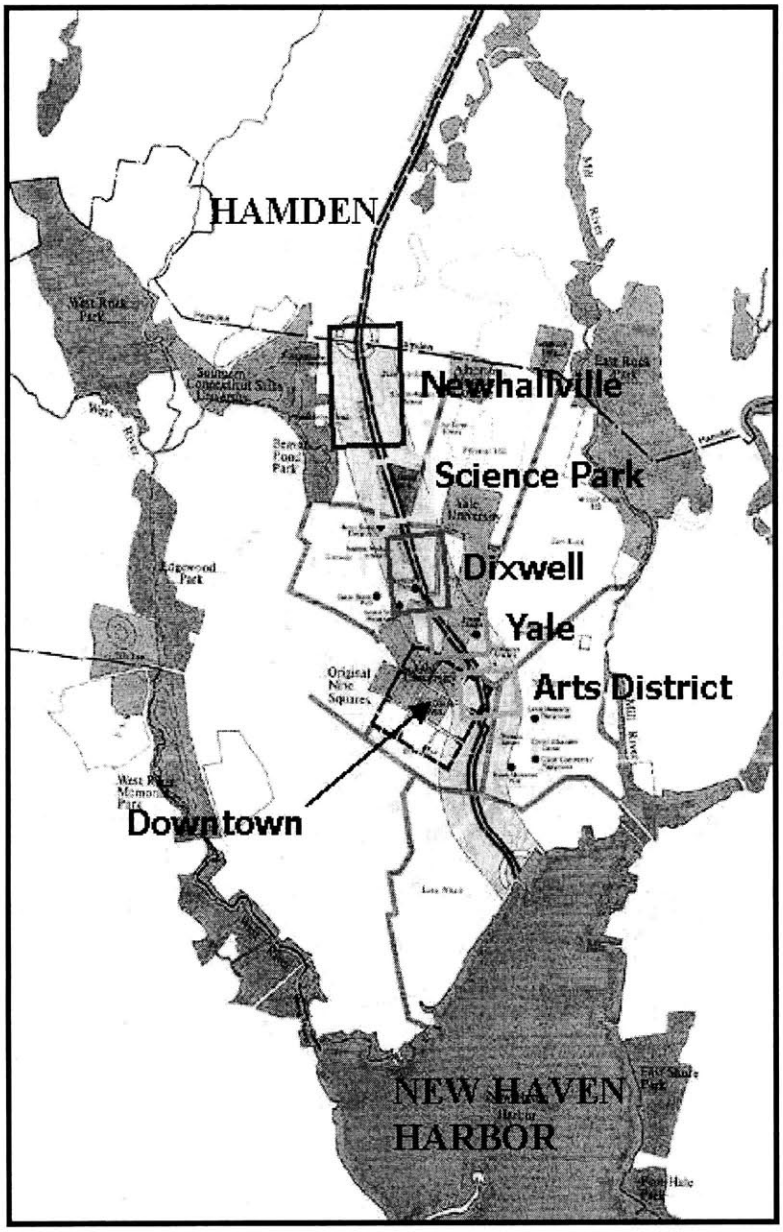


Figure 4.1: Context map of Canal route.

Canal constitutes a single thread of continuity and consistency that ties together diverse areas of the city. Although it once connected with the Canal Docks at New Haven Harbor, much of the southern portion of the right-of-way has disappeared over time as a result of new development. However, the corridor remains continuous from the southeastern edge of downtown, northward through Connecticut and into Massachusetts, where it ends at Northampton.

EXISTING CONDITIONS

In its current state, the Farmington Canal right-of-way stretches 2.6 miles from Orange and Grove Streets northward to the Hamden town line at the edge of the Newhallville neighborhood. The width of the corridor between property lines ranges from 50 to 75 feet throughout the New Haven portion (Milone & MacBroom, 9), while the flat surface area where the railroad tracks once rested varies between 25 and 45 feet. The southern segment of the right-of-way, approximately one-half mile from Orange Street through the Yale campus and ending at Lock Street, runs approximately 10 to 20 feet below grade.

Southern Segment (Audubon Arts District)

Due to past renovations on State Street and the recent construction of a Federal Bureau of Investigation building (for which the FBI insisted on filling the Canal trench for security reasons in the wake of the Oklahoma City bombing), the southern segment of the right-of-way now begins at the corner of Orange and Grove Streets on the edge of New Haven's small Arts District. This segment first passes through a parking structure (constructed in a way that preserves the right-of-way) and then below a small park that adjoins with the Arts District. In its longest covered section, a 200-foot tunnel (Milone & MacBroom, 12) the right-of-way passes beneath Whitney Avenue, an infill townhouse development and Temple Street before emerging in a trench on the edge of the Yale University campus.

Figure 4.2: Views of the southern segment of the Farmington Canal and the adjacent Arts District.

Yale University

After passing beneath Temple street, corridor continues below grade between Yale University buildings until it reaches Hillhouse Avenue, the heart of the Yale campus. After passing beneath Hillhouse Avenue, the Canal traverses a northern portion of the campus in a segment of the right-of-way lined with trees. From this point, the corridor continues underneath Prospect Street to the corner of Canal Street, the future site of a new engineering building designed by Cesar Pelli.

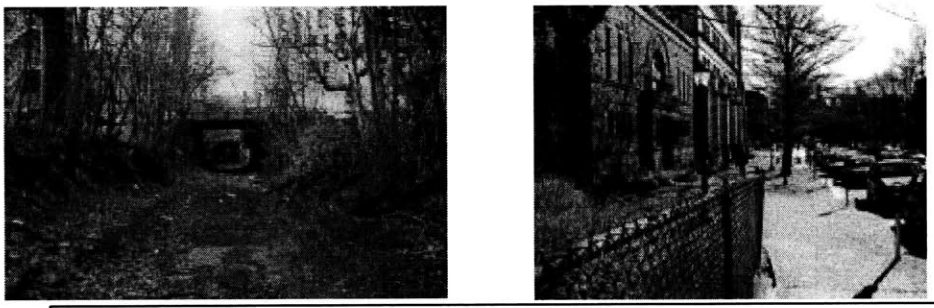


Figure 4.3: A segment of the Canal near at the Yale campus (left) and an underpass beneath Hillhouse Avenue, the heart of the campus

Dixwell

As it continues north, the right-of-way gradually rises to grade level in the low-to-middle income and predominantly African-American Dixwell neighborhood. The corridor passes at-grade alongside a community garden and a new Hope VI public housing development being constructed in place of the former Elm Haven Housing Project. At the eastern edge of the right-of-way, the neighborhood begins a transition from a residential character to a former industrial area with commercial and a few retail uses.

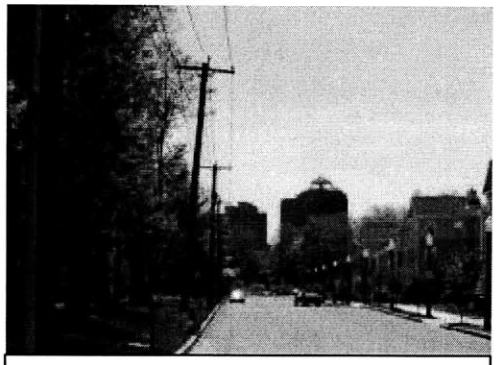


Figure 4.4 : At left, the Canal right-of-way; to the right, a new Hope VI housing project.

Science Park

At the northern edge of the Dixwell neighborhood, the right-of-way enters the Science Park complex, an emerging technology incubator center for office, light industrial and biotechnology uses. In this segment, the right-of-way, now mostly enclosed in chain link fence, passes alongside former industrial warehouses and newer structures that comprise an office park environment. At least one of the warehouses, which once served the Winchester Repeating Arms, will be rehabilitated and adapted as part of a planned biotechnology expansion.

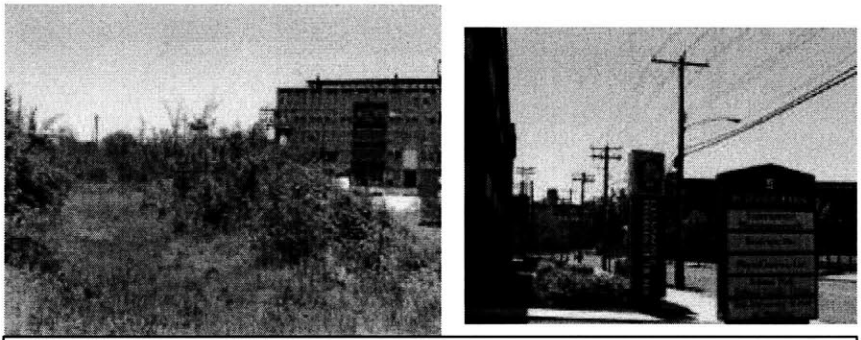


Figure 4.5: The Canal right-of-way near Science Park.

Newhallville

North of Science Park, the corridor enters the Newhallville neighborhood, a low-to-middle income and primarily African American residential neighborhood. The neighborhood's collection of triple-decker "tenements" were constructed around the turn of the century to house those who once worked at the nearby factories. The adjacent one- and two-family structures, many of which sit just up the hill from the Science Park area, once housed middle- and upper-level management. (Brown, 169) This segment of the right-of-way is unique in that it crosses city streets at seven different at-grade intersections.

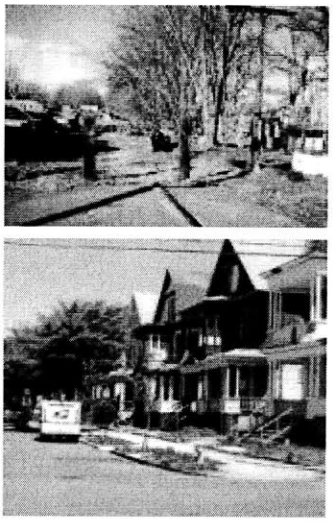


Figure 4.6: Newhallville at-grade crossing and typical housing typology.

HISTORY

The Farmington Canal's nomination for the National Register of Historic Places in 1985 reflects its rich history and importance to Connecticut's physical and economic development. In New Haven, the Canal's development and operation amounted to a relatively short episode in the city's history. A bold plan that resulted in financial failure, the Canal nevertheless shaped the development of the city in a significant way.

Named for the Farmington River, the source of its water, the Canal grew out of New Haven's desire to assert itself as a maritime center and compete with rival cities, such as Hartford and New York, to be a center for commerce in the northeastern United States. As New Haven's answer to the recently constructed Erie Canal, the Farmington Canal would extend for approximately 80 miles between New Haven and Northampton, Massachusetts. By design, it would bypass Hartford while providing a means of transporting goods from New Haven Harbor to central Massachusetts and, potentially, northern New England. As such, the Farmington Canal would serve as a "meeting ground

for foreign and domestic traffic" and constituted a "small example of a nationwide phenomenon popularly labeled the 'canal epidemic.'" (Porter, 49-50)

Following an initial plan for the Canal in1823 and a sale of stock offerings to finance the project, construction began in 1825. At the groundbreaking for the Canal on July 4, 1825, the ceremonial spade of Governor Oliver Wolcott allegedly broke as well and, in hindsight, represented an omen of events to follow. The groundbreaking elicited much excitement and optimism, including a ceremonial canal boat on wheels built for the occasion and witnessed by thousands of people. (Trout, 4)

Local contractors, supported by hired friends and neighbors as well as migrant labor, built the Canal in sections. The plans stipulated that the Canal trench would be 4 feet deep with 25 feet across at the bottom and 36 feet across at the top. The embankments of the Canal included a 10-foot-wide tow path on one side and sturdy walls—or berms—to hold in the water. The length of the Canal also included 28 locks, which were required for consistent water flow along the grade rise between New Haven and Granby, Connecticut. (Trout, 5)Until its completion in 1835, Canal construction experienced delays resulting from accidents and natural events—including washouts, droughts, banks that caved in and vandalism—thereby increasing the cost of construction.

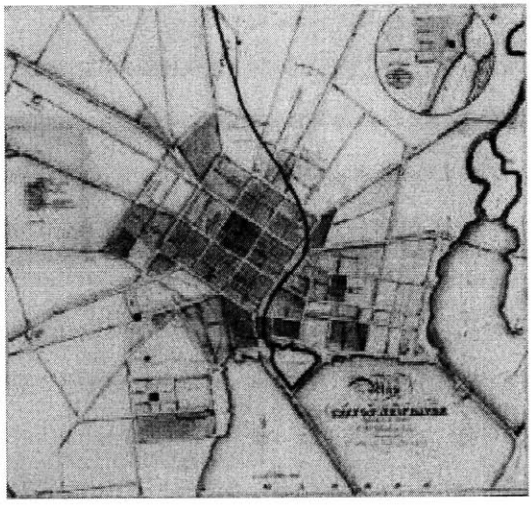
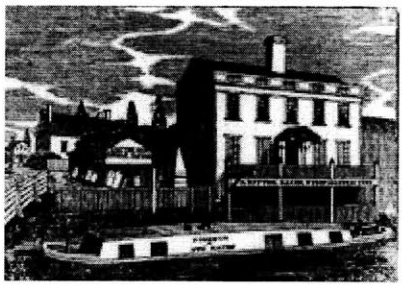


Figure 4.7: An 1830 map highlighting Farmington Canal route from New Haven Harbor and along the edge of New Haven's original nine squares.

In its early years, beginning as early as 1828, the Canal mainly served a recreational purpose. "Packet boats," used for pleasure excursions to northern towns, left from Hillhouse Basin (between Whitney Avenue and Temple Streets) or from the market once located between Olive and State streets. Later, cargo boats stopped at Union Market (near where the city's train station sits today) and at wharves alongside the Canal Basin at the Harbor. The Canal-based commerce fostered the creation of new businesses and construction along the Canal. During the period (1828-1848) that the Canal remained in operation, new stores, mills and hotels emerged alongside and nearby the canal route, catering to those who used the Canal.



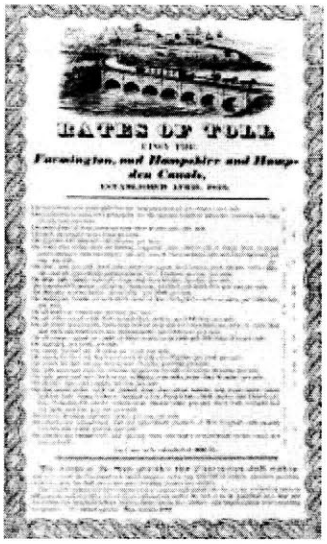


Figure 4.8: Canal boat excursions.

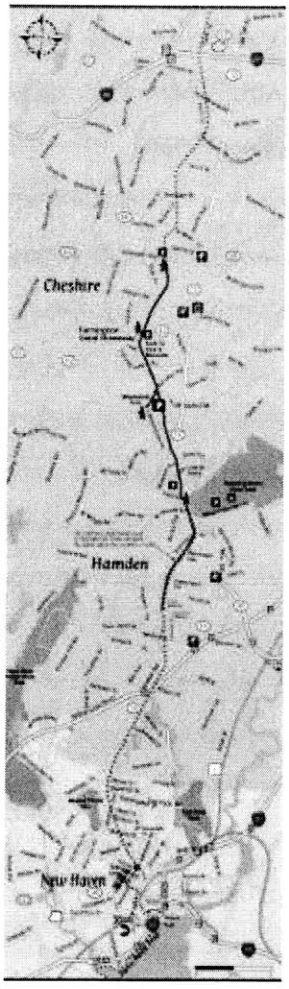
The lack of state subsidies (allegedly because of the rivalry with Hartford, the state capital), insufficient financing, continued maintenance problems and the periodic freezing or drying of the Canal all combined to bring on the demise of the Canal, which became financially insolvent by 1846. At the same time, the country was experiencing a transition to railroad travel, which by 1840 included 3,328 miles of track. Noting the increased speed and capacity of railroad travel, the Canal financiers signed a charter to convert the Canal into a railroad that, in most places, would follow the canal route "almost exactly" in either the canal bed itself or the adjoining towpath. (Trout, 17)

During its operation, the railroad served the industrial core of New Haven that was centered where Science Park exists today. At this location, the Winchester Repeating Arms Company manufactured guns and munitions alongside a number of other factories that it later absorbed. After its inception in 1870, the Winchester company became the city's largest industry and thrived between the turn of the century and the 1920s, prompting the development of much the area that surrounded the industrial complex.

Abandonment of the rail corridor began as early as the 1960s, when interstate trucking and highway construction began to supplant the railroad as the preferred means of transporting cargo. Approximately 130 years after the railroad began operation in the Canal right-of-way, floods in the Spring of 1983 forced the Boston and Maine Railroad to abandon its remaining rail service between New Haven and Cheshire. Meanwhile, particularly in New Haven, most traces of the old canal have largely disappeared or deteriorated over time.

THE NEW HAVEN RAIL-TO-TRAIL PROJECT

Farmington Canal Greenway Precedents



Local governments along the Canal pondered alternate uses for the corridor as early as 1972, when a proposal to use the canal line for express bus service received governmental support but elicited some significant neighborhood opposition. (Millea, 2B) In 1976, a report by the Connecticut Department of Environmental Protection noted the potential of the Canal to serve as part of a system of recreational trails and historical interpretation of a "'fascinating but little known aspect of Connecticut's heritage.'" (Alderman and Wieken, 10)

Figure 4.9: Portions of the Canal have been converted to greenway in Cheshire and Hamden

However, these recommendations for the Canal found few readers at the time and would not resurface until more than a decade later, when the idea of a Farmington Canal greenway gathered momentum and grassroots support.

Portions of the corridor have since been transformed into stretches of greenway, guided by the grand vision of a

continuous greenway running through the entire state of Connecticut and into Massachusetts. The first conversion occurred in Cheshire, where the Connecticut DEP purchased a three-mile segment of the corridor for $600,000 in 1990. Aided by $900,000 in Intermodal Surface Transportation Efficiency Act (ISTEA) funds, among the first such funds distributed nationwide, the town of Cheshire was able to construct the Farmington Canal Linear Park, which includes a Canal museum alongside one of the few remaining locks from the original Canal. (Chan, 53) Shortly thereafter, the town of Hamden constructed a 2.5-mile greenway. A final segment in Hamden, close to the New Haven border, is currently in the design stages. Further to the north, the towns of Simsbury, Avon and Farmington also began construction on 15 miles of greenway, with additional segments in these and nearby towns planned for the future.

Conflicting Goals: Greenway Development and Economic Development

The emergence of the canal right-of-way as a cause for community activists occurred almost by accident in the mid-1980s, when activists mobilizing in opposition to a proposed shopping mall in the town of Hamden discovered that a portion of the development would occupy the Canal right-of-way. The ecological, open space and historic value of the corridor became central to the group's strategy for opposing the mall. Subsequently, preservation of the entire Canal right-of-way through New Haven itself emerged as a cause for a loose coalition of activists, who recognized the corridor's potential as a recreational amenity and historic landmark.

At the same time, the Boston and Maine railroad company sought permission from the ICC to abandon the rail line and sell it off in segments to willing buyers. The Hamden mall developers planned to purchase one segment; meanwhile, in New Haven, the city actively targeted two areas adjacent to the Canal for development and anticipated that the developers of both projects would the corresponding portions of the corridor. The two proposed New Haven projects—a $90 million condominium and commercial development on the so-called Arena Block (alongside the State Street portion of the Canal right-of-way) and the proposed Science Park technology and research center—

together comprised the central focus of the city's economic development strategy at the time.

In 1987, the ICC initially imposed a moratorium on the abandonment and sale of segments of the right-of-way to allow time for the consideration of historic preservation and environmental concerns. In December of the same year, however, the ICC approved the abandonment of the 14.4 mile portion of the Canal between Cheshire and New Haven. To oppose the abandonment decision, the coalition of environmental and preservation activists, acting in opposition to the abandonment decision, hired a lawyer to challenge the ICC in court. After an initial, unsuccessful court challenge, the coalition appealed to the U.S. Court of Appeals in 1988 and lost this appeal as well.

Meanwhile, the Mayor of New Haven, Biagio DeLieto, proposed an alternative route for a "walking trail" that would begin at East Rock Park, bypass downtown New Haven and link up with portions of the Canal right-of-way in Cheshire. This counter-proposal reflected the city's unwillingness to compromise on plans for the Arena Block and Science Park. City Hall did not believe that the economic development plans could coincide with plans to transform the Canal into a greenway. As such, DeLieto allegedly would not agree to meet with the newly incorporated non-profit, the Farmington Canal Rails to Trails Association (FCRTA), which grew out of the original activist coalition. (Alderman and Wieken, 13)

Another obstacle to the FCRTA's efforts was a general unfamiliarity with the concept of greenways, both in New Haven and throughout Connecticut, which lagged behind other states in open space planning. (Alderman and Wieken, 20) Moreover, while the state was generally supportive of the greenway project, it would not act on it as long as New Haven sought to use the land for other means. (Alderman and Wieken, 13) Meanwhile, pressure in favor of the greenway came from the federal government. Two US Senators and a Congressman all embraced the Canal project and applied pressure on both the ICC and Connecticut DEP. Moreover, the National Park Service also committed to assist the project through its Rivers and Trails program.

Regionally, while Cheshire acted on its own to develop a greenway, the greenway idea was only just beginning to take root in Hamden. A new mayor, John Carusone, reversed the stance of his predecessor by suggesting that a linear park indeed could

coexist with development. He vowed to prevent the sale of the Hamden segment of the canal to private developers, noting that "'we can't afford to lose this canal line. It's so important to the town of Hamden.'" (Povinelli; Dematteo 1989, A3)

Back in New Haven, the greenway idea met with initial resistance from some stakeholders. In the Dixwell neighborhood, the Dixwell Community Development Corporation voiced support for the City's economic development plans as well as its resentment that the greenway proposal originated outside of the neighborhood and the city. In a New Haven Register article, the director of the organization dismissed the greenway idea as belonging to a "'small vocal group of suburbanites . . .planning for someone else's neighborhood," and called the efforts "'presumptuous, callous and outrageous." The Dixwell CDC regarded abandonment of the corridor as a means of achieving improvements in the neighborhood and described the abandoned rail line as a "'blighting influence'" (Dematteo 1988, 19)

More moderate voices also began to emerge. In a January 24, 1988 New Haven Register op-ed piece, Yale professor Robin Winks advocated for reconciliation of what he called the amenity value and economic development value of the Canal. (Winks, B3) He noted the potential of a Canal greenway project to engage the history of transportation in the region as well as the history of the Winchester Repeating Arms factory. Winks also raised the possibility that the proposed trail could be incorporated into a mall idea, noting: "All that is called for is imagination, a little patience, some skill in design and the desire."

The FCRTA continued to lobby city government with new tactics. On February 27, 1988 the group led ten city aldermen on a walking tour of the Canal. According to a newspaper account of the event, the tour spurred more talk of differences that were "not necessarily irreconcilable" and discussion of the possibility of an urban history trail. (Blumenkrantz, A3)

In March of 1988, the Court upheld the ICC's decision to allow for abandonment and sale of the corridor. Meanwhile, the activist coalition threatened to appeal the case all the way to the Supreme Court. The following week, the coalition filed another appeal on the grounds that the ICC failed to follow its own rules requiring and environmental impact statement before allowing the sale. During the same week, the state legislature's

Transportation Committee approved a package of bond authorizations that would enable New Haven to buy the Canal right-of-way.

Master Plan as Marketing: The First Farmington Canal Greenway Plan

The FCRTA recognized, however, that selling the idea of the greenway would require a strategy that extended beyond legal challenges and lobbying. According to one participant in the greenway advocacy efforts, "[i]t became clear that if the association were going to be successful in New Haven, it needed concrete plans of what the trail would look like as it went through the city." (Alderman and Wieken, 13) For this reason, the FCRTA applied for a grant to the Carolyn Foundation in 1988, asking for funds to pay for a Canal design project. When the FCRTA successfully secured the funding, it hired the landscape architect Diana Balmori of the New Haven firm Cesar Pelli & Associates, who then enlisted Alan Plattus of the Yale School of Architecture as an urban design consultant.

The FCRTA charged the design team with the task of preparing a plan for the "development [of the] Farmington Canal into a linear park and heritage trail within the city dedicated to hiking, biking, jogging and the preservation of open spaces." (Farmington Canal Rails-to-Trails Association, 3) What the FCRTA received in return, however—in addition to attractive renderings of a linear park concept that could sell the project—was a concept that was much more thought-provoking and innovative than the FCRTA's original vision.

Continuity and Contextualism

Based on the underlying premise of "continuity and contextualism," the plan proposed "not a trail," but a "new prototype of open public space in America" and a tool to "transform the American city." (Balmori 1998, 18) The design team envisioned a linear park comprised of multiple, distinct sections that would respond the part of the city surrounding it, rather than a "homogeneous ribbon applied generically." The concept plan distinguished between continuous elements and discontinuous or singular elements that would relate to a series of distinct zones and nodes along the route. The corridor would

serve as a "spine on which to hang projects" and also "reconnect parts of the city in a new way." (Balmori 1998, 19) A "new linear civic center based on urban recreational activity" the Canal would provide recreational opportunities, transportation connections (including a new light rail route connecting Yale and the Union Station), train terminal and, a "town green" environment in some locations and museum and art displays at selected sites. (Balmori Associates, Inc. 1999, 1)

While preserving linearity and movement through the entire corridor, the plan treated different sections in different ways. The Science Park section, for example, would include a road with cars and house a museum. The Newhallville segment would include a pedestrian boulevard and a central neighborhood green. The beleaguered Elm Haven public housing project (which pre-dated its HOPE IV replacement and was scheduled for demolition) was replaced in the plan with a community green. The plan also included a multilevel pedestrian arcade with shops, restaurants and structured parking at the southern end of the corridor. The latter feature served as an important statement that economic development indeed could coexist with a park-like amenity.

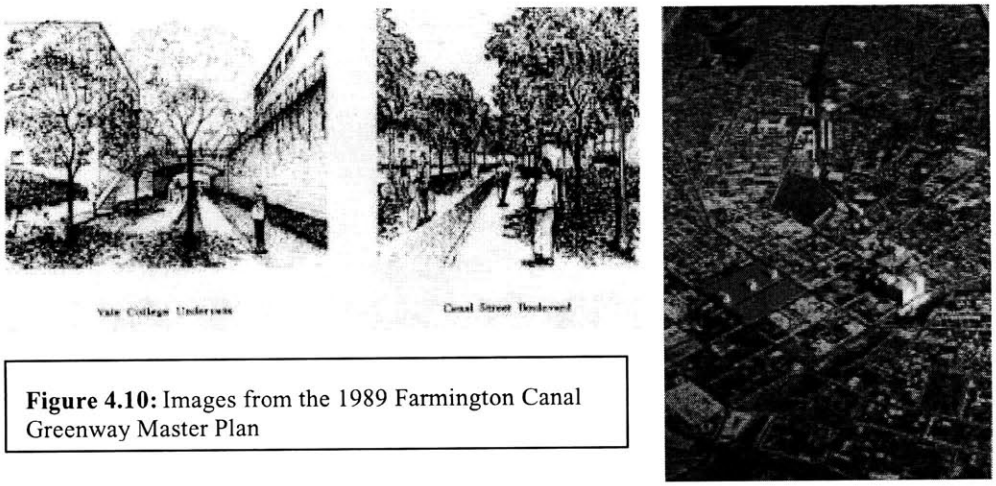


Figure 4.10: Images from the 1989 Farmington Canal Greenway Master Plan

Generated during the meetings with the different neighborhoods through which the Canal passed, internal planning documents produced as part of the process reflect some uneasiness with term "greenway" and its purely recreational and suburban connotations. A short piece described an alternative concept that the design team called a "greenline," an "urban linear park alternative to the Olmsted Park" and the "Adirondack-like" rail-to-trail design." The final document ultimately settled on the term "greenway,"

but interpreted the concept in the proposed linear civic center idea. (Balmori Associates, Inc. documents)

The re-thinking of the "geenway" concept reflects, in part, the initial preference of some Dixwell residents for a corridor that resembled an "urban boulevard." Balmori found that some neighborhood residents preferred a more urban and street-like environment over a recreational, park-like atmosphere because they associated streets with safety and parks with danger.(Balmori 1990, 64) In contrast, Newhallville residents preferred a more park-like open space. This preference may have been related to the higher rate of owner-occupancy in the neighborhood as well as the alignment of the right-of-way, which bisected the neighborhood through the middle of city blocks and crossed seven streets. In general, however, Newhallville residents were much more concerned with eliminating drug dealing in the vicinity of the Canal than creating a park. (Burrell 14 April 1989, 1)

In hindsight, the plan was essentially a visionary document addressed more pragmatic concerns—such as cost, feasibility, safety, implementation and maintenance—to limited extent, perhaps because these concerns fell out of the scope of the plan's main intentions. Moreover, its inclusion of a light rail scheme for the below-grade sections of the Canal was far-fetched and financially questionable and, by occupying a considerable portion of the right-of-way, might have created conflicts among the corridor's other intended users.

On the other hand, the plan was important and valuable in that it provided a clear vision of a previously unfamiliar concept. Advocates could point to the plan to further their agenda; skeptics, meanwhile, had something specific to which they could react, as well as an opportunity to reconsider prior misgivings. In this respect the plan provided a tool that was necessary in order for the project to move forward.

In the process, the plan offered bold new way of looking at linear space by addressing the Post-modern challenge of maintaining continuity and consistency while also addressing differences. At the same time, it began a process of rethinking the prevailing idea of the recreational trail. Even if the specifics of the plan's vision do not survive, the plan nevertheless played crucial role in the survival of a more general vision for the Farmington Canal in the years that followed.

On April 14, 1989, the design team presented the plans for the Canal, and the response was slightly less resistance from the city but also new concerns about financing maintenance and safety. Meanwhile, the Boston and Maine Railroad, frustrated by delays in the city's purchase of the Canal and ongoing talk of linear park plans, threatened to sell the land to other potential purchasers. The City then decided to condemn the land and go to court to settle on a price.

By 1993, the city had experienced a complete change of heart and now sought to purchase the entire corridor, but the current administration under Mayor John Daniels also lacked the institutional capacity to do so. The city therefore recruited the Trust for Public Land (TPL) as an intermediary to purchase the corridor with funds from the Department of Environmental Protection, with the intention of reselling it to the city afterwards. (Alderman and Wieken, 16) TPL also purchased below grade rights in order to ensure possible revenue streams from cable, fiberoptics and utility companies that might wish to use the corridor for their services. The Connecticut Department of Economic and Community Development, meanwhile, assisted with the purchase of the Science Park and Arena Block portions of the corridor so that these parcels could be used as the city wished in the future. At Science Park, the purchase included a negotiated easement to allow the right-of-way to remain continuous.

The future use of the land purchased with DEP funds was partly determined by the DEP's stipulation that the corridor should serve only recreational purposes. Recognizing this fact in late 1995, Mayor John Destefano appointed a former parks administrator to head a newly established Farmington Canal Advisory Committee, which would oversee an eventual second planning process. In the fall of 1996, the city entered a contract with the planning, engineering and landscape architecture firm Milone and MacBroome for a new Master Plan for the Farmington Canal. At this time, the Advisory Committee met for the first time.

Prior to 1997, the only neighborhood-level discussions that did occur resulted from the efforts of members of the Yale community. Students and faculty from the Yale Forestry School, which periodically uses the Canal for educational purposes, organized discussions that of the Canal that included representatives of Dixwell, Newhallville and Science Park. Yale students also circulated a petition, gathering 1,349 signatures in favor

of the greenway. (Burrell 15 May 1989, B1) In 1997, however, the city and Milone and MacBroome began a series of four public meetings on the Canal, each in a different part of the city.

Linear Space as a Symbol of Town-Gown Relations

The Canal became a contested symbol of Yale University's relationship with the rest of New Haven. Despite considerable involvement in the greenway effort by multiple factions of the Yale community, the new momentum in favor of a Canal greenway represented a threat to the university's future plans. For its part, Yale regarded the Canal as an "important building site for the central campus, for which we need to retain the highest degree of flexibility." Refusing to allow the greenway to continue through the campus, the University instead proposed a path on "city streets proximate to the campus" as an alternative to existing below grade cut. (Lormer) Yale also cited liability concerns as a factor in this decision.

Yale's opposition to the greenway garnered criticism from both in and outside of the university. To its strongest critics, Yale was acting in way that was on the verge of being racist. Others noted that the Canal project represented an opportunity for the University to make an important gesture to the New Haven community. In an April 1996, letter to the New Haven Register, Yale professor William Burch, natural resources specialist, contested that, despite the rhetoric to the contrary, Yale's main goal was really to create a "buffer zone of middle class housing, of blocked pathways, and of industries that benefit most of the intellectual classes" In the current economic landscape of the city, Yale represented the "employer of last resort" and the "Winchester factory of its time" and therefore had a responsibility act in the interests of the communities that surrounded it. (Burch)

In other letters to the Yale administration, some contested the university's decision to remove a "field resource" used by the Yale Forestry School and accused Yale of sending the message that the values and education that is gained by students working in local communities are "not significant or important." (Shemitz; Hausam) Vocal supporters of the Canal project within the Yale community also included the architectural

historian Vincent Scully and historian Gaddis Smith. In addition, Yale students helped clean the Canal and raise consciousness in the community. (Alderman and Wieken, 14)

Ultimately, the Yale standoff was resolved in early September 1998 through the combination of a change in leadership (Richard Levin's appointment as President of Yale), continued lobbying from within the university and concerted efforts on the part of the master planning team to illustrate ways in which Yale's future campus development and preservation of the Canal right-of-way could coexist. In the latter case, the consultants illustrated how a new Yale building might straddle both sides of the Canal while retaining an entry plaza in the right-of-way that would allow users of the corridor to pass through uninterrupted.

The FCRTA's attention turned back to city, which it accused of becoming bogged down in studies and discussions regarding maintenance, security, operations and lighting. From the city's perspective, however, the aforementioned concerns were central to the feasibility and success of the Canal project, and the city instructed the master planning team to research maintenance and security as part of the planning process.

In rhetoric if not in spirit, the multiple voices of the New Haven community moved closer together with regard to the Canal project. In particular, the different actors all shared the vision that the proposed greenway eventually would constitute something more than just a recreational amenity. This vision contrasted with the original vision offered by the FCRTA and the press coverage of the Canal project through the years, which repeatedly referred to the greenway as a "walking trail" or "jogging trail." In a Sept. 23 1998 Op-Ed, one New Haven Register columnist noted: "The greenway will be a link to the city's past as well as a bridge to its future by connecting disparate parts of New Haven," from the Harbor and Harborwalk to Yale and Science Park. (Beach 20 September 1998, B1) Mayor John DeStefano, meanwhile, adopted the stance that "the New Haven portion [of the Canal] will offer rich cultural and historical experiences as well as recreational benefits to all users." He also cited "local access for New Haven residents to a recreational resource of statewide significance" as an important benefit. He asserted, moreover, that the trail constituted a "vitally important project for New Haven and the region" that would foster "positive connections between the City and its suburban neighbors." (DeStefano)

THE 1999 MASTER PLAN

A Simple Plan

The Master Plan submitted to the city in 1999 reflected in large part the city's priorities, and it was different from the 1989 plan in a number of respects. While the 1989 plan was a visionary document that lacked a grounding in practical concerns, the 1999 plan focused primarily on the practical concerns: how a Canal trail would function and sustain itself over time, safety considerations and maintenance issues. At the City's request, it considered in great detail the financial and administrative implications of maintenance and security concerns, drawing on the experience of other trails nationwide in these regards.

The plan embraced the notion that "simple is better" to control the cost of construction and maintenance as well as provide a "transportation connection that is in harmony with its environment and surrounding land uses and faithful to its historic nature." (Milone & MacBroom, iii) The design for the corridor emphasized durability, resistance to vandalism, landscaping and other trail amenities that would foster a sense of security. In the absence of a light rail scheme, the plan also called for a wider trail to accommodate multiple users.

The plan envisioned that the greenway would serve a number of functions: creating a "relaxing environment"; providing recreational access; serving as a "potential venue for future regional transportation concepts" as well as alternative transportation routes locally; connecting the city with other trails to and along the waterfront; and creating potential economic development opportunities. The plan pointed out opportunities for outdoor cafés and other businesses or destinations in specific locations, but did not belabor these points. Similarly, it noted the potential for interpretative diplays along the greenway, both in terms of highlighting the history of the Canal and providing a venue for the community to showcase works of art. It also highlighted future opportunities to involve adjacent communities in "adopt-a-trail" efforts to contribute to greenway maintenance. Again, however, the plan mentions these opportunities only

passing and considered such activities to be a later phase of greenway development. (Milone & MacBroom)

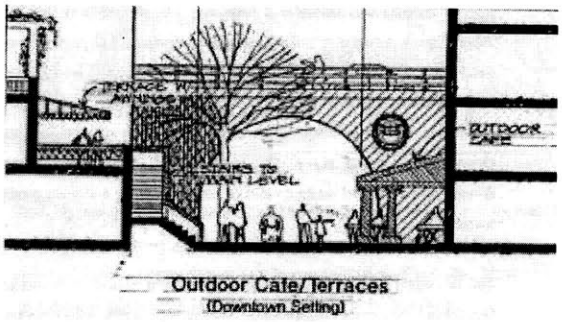
The 1999 Master Plan's contention that many opportunities along the Canal constituted a later phase of development reflected the biases of its client, the City of New Haven. The City approached the project under the assumption that many of these aspirations could be filled in later after doing the bare-bone basics. The city and the plan both suggested that all ancillary uses and amenities—art and interpretation, community adoption, signage, education and other ancillary uses—did not have to happen right away and therefore would occur after the primary goal of paving the trail had been completed. The city believed that community "ownership" issues were addressed to some extent through the series of forums on the project and by the fact that some aspects of the plan—the inclusion of a "soft path" and changes concerning fence quality in the Dixwell neighborhood—were altered as a result of neighborhood pressure.

Finally, neither the city nor the master planner found the need for a change in zoning because existing regulations allow for compatible uses. For example, a sidewalk café would be a possibility in locations where such a use would fit into the landscape. (Barone)

Design Challenges

The Master Plan also discussed approaches for resolving the design challenges related to the physical features of the Canal right-of-way. Plans for the seven at-grade crossings, for example, included grassy shoulders and ornamental plantings at the intersections as well as different types of physical separation to reinforce the separation of the greenway from surrounding uses. According to the master planner, the original vision was to make each at-grade intersection serve as a neighborhood gathering point. By continuing the right-of-way at-grade through the intersection, with a slight hump in the street, the trail and gathering areas would serve a traffic calming function. Examples of such intersection treatments already existed elsewhere; for example, in Boulder, Colorado. The city's public works department, however, regarded this approach as too expensive. (McDermott)

The below-grade segment of the Canal presented the challenges of providing adequate access and linkages to the trail, and as well as safety concerns resulting from the secluded feel in these locations. The plan suggests an "urban plaza" environment in downtown areas, where "adjacent land uses and the Greenway will appear as one." (At a later date, the master planner noted the opportunity for "ornamental transitions" between the Canal and the street level, as in Boulder and Denver, Colorado) (McDermott) For the "critical" below-grade portion through the Yale campus, the plan suggests access to buildings from the greenway by means of a plaza level "if desired by Yale." The plan also proposes lighting for the segments where the right-of-way passes beneath streets or buildings. (Milone & MacBroom, 25-26)



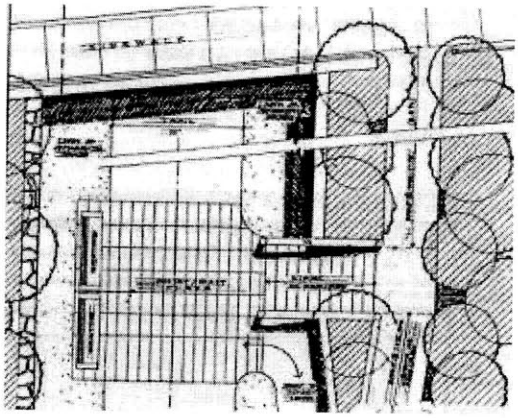


Figure 4.11: Images from the 1999 Master Plan depicting opportunities for economic activities (left) and "urban plaza" entrances along the below-grade portions of the Canal.

CURRENT ISSUES

Yale

The Canal project's main adversary for many years, Yale University now appears to be an ally. With the Cesar Pelli-designed engineering building, Yale embraced the notion building a structure that straddles and preserves the right-of-way by means of an entry plaza at the below-grade level of the Canal. In addition, the recently-released *Framework for Campus Planning* foresees the Canal right-of-way as a key open space

and circulation element for the campus as well as a key spatial feature promoting relationships with surrounding neighborhoods. (Cooper, Robertson & Partners, 148-149) However, a countervailing perspective voiced by members of the community holds that Yale will not contribute fully to the project until the Canal trail reaches the campus.

Figure 4.12: Yale's Framework for Campus Planning includes the Canal greenway in its future plans. As pictured here, the Canal (upper left) serves as a key element in fostering neighborhood connections.

Dixwell

While the Canal plan initially elicited fear and suspicion because the project evolved from the outside and raised safety concerns, planned improvements around to the roads and property around the Canal caused Dixwell residents to drop their objections. (Langdon, 76) While safety remains a concern in the neighborhood, residents see the project as a way to make the Canal a "positive rather than a negative." (Tureck)

The recent construction of the Hope VI project preserved the Canal right-of-way, which forms a natural border to one portion of the development. However, the Canal's alignment is such that the right of way passes on the "wrong side of the street" along the back ends of the residences. (McDermott) Meanwhile, residents of the owner-occupied condominiums on the Science Park side of the development insisted on installing fences as a barrier to separate the backs of the private property from the public right-of-way. The master planner, however, believes that these residents might regret this decision, questioning in this case the difference between the sidewalk that passes the front of the residences and the trail passing the rear.

Figure 4.13: Dixwell residents expressed hope that the Canal project would serve as a catalyst for improvements to an adjacent park.

Two planned projects in vicinity of the Canal have the potential for enhancing the edges of the Canal, but these efforts thus far do not appear to be coordinated with the Canal project. First, Dixwell residents expressed hope that the Canal project would serve as a catalyst for much-needed improvements to the Scantlebury Park, which sits adjacent to the Canal at the southern edge of the neighborhood. The neighborhood believed that these efforts should occur concurrently with the development of the trail rather than at a later date, as currently planned. (Tureck) Meanwhile, in an empty one-block parcel just west of the Canal, Yale plans to build a new police facility and student housing, which still have the potential to dovetail with the first quarter-mile segment of the Canal to be constructed in the summer of 2002 between Sachem and Munson Streets.

Science Park

Science Park management and development agendas changed three times since activists first proposed the idea of Canal greenway. Lyme Properties, the current developer of the site adjacent to the Canal, became involved in late 2000 and has exhibited enthusiasm about the Canal. At one point, senior managers from the development company walked the length of the proposed trail. Most indications suggest that the developers continue to be supportive of the trail project, which is included in the developer's master plan for the site. However, the current state of the corridor—wrapped in chain link fencing—suggests otherwise.

Time will tell whether Science Park is dragged "kicking and screaming" into incorporating the trail, as some anticipate, or whether it embraces this opportunity. Both the city and community remain optimistic that Lyme Properties will pursue the opportunity to provide access and amenities for employees and the community, while also taking advantage of the Canal an alternate transportation route for employees. (Tureck; McDermott; Barone)

The developer's intentions aside, the Science Park segment offers perhaps the greatest opportunity for the corridor to serve as a multifaceted urban amenity and a potential destination for trail users, the Yale and New Haven communities and Science Park employees alike. Wider than other Canal segments and at-grade, the Science Park segment offers the one the best opportunities to orient economic activities, such as food or beverage vendors, to the corridor, while also providing a vital transportation link for an underserved population and outdoor amenities of Science Park employees.

Finally, the remnants of the Winchester factory on the site, including the former warehouse building slated for adaptive reuse, create further opportunity. The importance of the Winchester factory in the development of the New Haven has great potential for historical interpretation or a small museum at this site, which might tap into either New Haven's industrial history or the history of the railroad and its impact on the city.

Newhallville

Newhallville residents continue to regarded the trail as a recreational and open space opportunity, a perspective perhaps influenced by the combination of exiting visual blight posed by the debris-ridden right-of-way and the high percentage of owner-occupancy in the neighborhood. Due proximity to Hamden, its residents' more frequent visits to Hamden for shopping and other purposes, people not only wanted a linkage to Hamden but wanted something "like Hamden." Moreover, as a design issue, Newhallville maintains "its own style," which is expressed through an historic district signage motif and the overall historic feel of the neighborhood. Designs for this segment of the Canal will need to incorporate the Newhallville style. (McDermott)

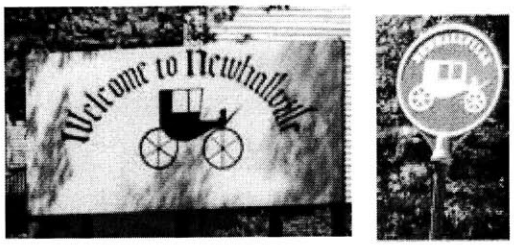


Figure 4.14: "Newhallville style" neighborhood signage.

Safety

The New Haven Police Department was actively involved in the design of the trail and approached the master planner with a list of items that it believed should be incorporated into the design. The police, however, saw the trail as an "opportunity to do a better job." (McDermott) Preferred design elements included such features as open fencing of a certain height, avoidance of right angles, and low vegetation. Policing and how to integrate the Canal into regular patrols became a budgeting consideration. The master plan also referred to Crime Prevention Through Environmental Design (CPTED) guidelines, which are based on the idea that crime can be mitigated by certain design interventions. The planners also recognized that involving neighborhoods in building and maintaining the trail also might be able to address safety issues.

Maintenance

A stumbling block for the FCRTA's efforts in 1987, maintenance remained an obstacle and issue of great importance to the city in 1999. Of greatest concern was the challenge of balancing scarce maintenance resources with the imperative of keeping the trail clean. By 1999, it was clear that funds for maintenance would not come from the state: the Department of Environmental Protection could not provide money for maintenance, while the Department of Transportation would not do so either because maintenance issues fell outside of the scope of Enhancements funding. Previously, the FCRTA highlighted a local example, Sleeping Giant park, as a model for successful maintenance in its reliance on consortium of state and local government as well as volunteer efforts. (Alderman and Wiken, 17) It envisioned a greater reliance on volunteer efforts in New Haven in the hope that communities and churches might take ownership of nearby portions of the Canal.

The city's Chief Administrative Office, who pushed for the emphasis on security and maintenance, hired a sub-consultant for a maintenance study. This issue sparked a debate over whether or not to include a "soft trail" alongside the hardscape trail. Residents demanded a soft trail to accommodate conflicts between slow-moving pedestrians and those on bicycles, roller blades or jogging. The city and master planner, however, regard the soft trail as a maintenance nuisance due to the difficulty of cleaning up litter and weeds.

Neighborhood Adoption and Interpretation

While the substantial public involvement during the master planning process appears to be developed neighborhood consensus for the project, it still appears that community involvement in development of the trail will come later, once the initial paving has been completed. While some residents and church groups have proposed community and youth involvement in the construction of the trail, the city and master planner believe that these initial efforts are best left to professionals.

Moreover, although various independent entities expressed interest in projects to interpret the Canal historically and artistically, it appears that the funding would have to come from sources other than the city and state, especially considering that interpretation is not a fundable item under TEA-21. The ideas expressed included an African-American history and Amistad display (the freed slaves traveled the Canal route after their trial) as well as a timeline of Canal History and revolving art display underneath the townhouses and children's art activities. The Yale Forestry School, meanwhile, expressed interest in initiating some ecological interpretation of the trail. In addition, the Arts District portion of the Canal offers perhaps the most obvious opportunities for arts projects in Canal trench and the public park above.

Most compelling, however, are the site-specific opportunities for historic preservation. The aforementioned remnants of the Winchester factory at Science Park constitute one such opportunity. Moreover, traces of the original railroad retaining walls exist near Hillhouse Avenue in the Yale campus and at the southern end of the right-of-way near Grove Street. The existing bridges over the right of way, also offer opportunities for creative reuse, however such activities may depend on the resolution of purported safety issues with some of the bridges in the Yale campus. (Milone & MacBroom)

Linkages

The future greenway is regarded as a "spine of opportunities" for the city of New Haven as result of the its potential linkages to a variety of destinations. (Barone) Potential connections between the Canal and adjacent or nearby open spaces constitute one opportunity, as do the proposed connection between the Canal and the Vision and Harbor trails, which would create a continuous route to the waterfront. Moreover, the right-of-way is lined with numerous churches and several schools. The right-of-way also passes within easy reach of two other universities other than Yale, Southern Connecticut State University and Albertus Magnus College. In addition the connection to downtown offers access to range of activities and destinations, among them arts attractions in the Arts District and downtown as well as several museums (the focal point of a proposed

Impressionist Art Trail, a Millennium Trail linking ten museums throughout the state of Connecticut).

Funding

The scarcity of funding continues to be the primary cause of delays in construction and modest goals for the first phase of the project. Although the city expects construction of the first segment of the trail in the summer of 2002 at a cost of $550,000, the city has not yet assembled all of the funding necessary for development of the remainder of the right-of-way. The city estimates the total cost of construction at $5.2, while to it has secured only a $700,000 ISTEA grant to start the project as well as what remains of a state bonding authorization. However, the city remains in search of the approximately $4 million required to complete the project. (Barone)

Chapter 5:
Redefining Rails-to-Trails for the Future

Early evidence from the rail corridor conversion projects currently underway in urban areas suggests that rail-to-trail conversions indeed can serve urban purposes. However, the term "rail-to-trail" risks oversimplifying the nature of these urban projects and the multiple ways planners, designers and communities might reinterpret abandoned rights-of-way. As this thesis illustrates, it is possible to reinterpret urban rail corridors as: refuge, open space and natural space; moving systems and connectors; focal points and catalysts for adjacent development; artifacts and information space; and landscapes of continuity and difference. However, my decision to use the term "rail-to-trail" in this thesis is largely a testament to the work of the Rails-to-Trails Conservancy and local advocates in giving this term its widespread recognition and supporting it with a considerable body of knowledge and experience. Nevertheless, it is time to update both the definition of "rails-to-trails" and the types of projects typically associated with the term.

The Conservancy and policymakers alike face the challenge and opportunity of redefining rails-to-trails for 21st Century cities and selling these ideas to a new constituency. The challenge consists of accumulating a new body of knowledge that pertains more directly to urban areas, furthering its understanding of the many ways in which cities interpret and implement the rail-to-trail concept, and translating this new understanding into a more targeted form of technical assistance to cities. Equally important, they face the challenge of marketing urban rail corridor conversions to those institutions that might contribute resources to such endeavors as well as to those constituencies that might benefit from these projects.

PRINCIPLES FOR ACTION

Based on the findings of this thesis, the following principles and associated action items provide a framework and checklist for thinking about the reuse of urban rail corridors as public space. Given the unique characteristics of each urban rail corridor and its physical and institutional context, there exists neither a single set of solutions nor a

definitive sequential approach for proceeding with a rail corridor conversion. However, these principles for action constitute a general toolbox that may prove useful to both local rail-to-trail efforts and national non-profits and governmental agencies providing support for these projects.

The Value—and Challenges—of Linearity

While an urban setting may enhance the value of linearity, it also poses more obstacles to assembling a continuous right-of-way. Individual property owners and entire neighborhoods can jeopardize a project that they perceive either as a threat to their interests or as someone else's idea. Moreover, as the Farmington Canal and other projects illustrate, linearity presents the additional challenge of reconciling a desire for continuity and consistency with the realities of multiple identities and physical realities along a linear space. Urban rail-to-trail conversions therefore require outreach to all major stakeholders early in the process to build support for a project and preserve linearity while also identifying the unique characteristics of each segment of the corridor.

Action Items:

- *Identify land ownership patterns*, including ownership of the right-of-way itself and the land adjacent to it.

- *Assess similarities and differences* in land uses, community composition and physical characteristics along the length of a corridor, identifying key segments that share common characteristics and institutions.

- Early in the planning process, *engage all interested parties* for each corridor segment in initial discussions to identify both shared and conflicting visions for the corridor.

- *Identify potential linkages* to a range of destinations: parks and open spaces, major employers, schools and universities, places of worship, shopping opportunities, cultural destinations and waterfronts.

- Translate visions for the corridor into a *conceptual plan* to test assumptions and market the idea of a rail corridor conversion.

Thinking Beyond the Pavement

A central challenge of urban rail-to-trail projects is reconciling the need to transform the image of a corridor with the limited resources available to do so. In a previously vacant if not blighted space, pavement alone may not cultivate a new sense of place and attract new users. Rather, transforming a corridor may require fostering a greater sense of meaning and community ownership in the early stages of the project. At the same time, existing financial and institutional resources—or simply political priorities—may not allow for much more than simply paving a corridor.

In some cases, if the primary value of a corridor stems from its open space or transportation potential, a simple stretch of blacktop may prove sufficient if the space is properly programmed and people choose to visit it. The Metropolitan Branch Trail, for instance, is likely to benefit from its transit connections, a lack of nearby open space and a regional context in which a large segment of the population does not use automobiles on a daily basis. In other cases, additional layers of development or interpretation may be necessary to transform the image of the corridor, maximize its value and transform the urban space into an urban place. High Line users will require other reasons to climb the stairs from street to viaduct; New Haven residents a reason other than employment to travel from downtown to Science Park or stop there on the way to downtown.

Less clear, however, is the appropriate timing of these additional layers. As in Gainesville, some projects may incorporate sophisticated design and programming concepts early in the planning and development process. Other projects, such as the Midtown Greenway, may choose to establish detailed frameworks for future development early on in the process. This approach is particularly important in rapidly evolving areas

where there exists a special need to shape future development of the corridor and its edges in the short-term. Other projects, as in the case of the Farmington Canal, may prefer a simpler approach that is accomplished sooner and less expensively, followed by gradual enhancement and interpretation of the project over time.

A simple approach with tangible, short-term results makes sense when, as in New Haven, the planning process has dragged on for years and when project constituents are likely to acquire a sense of planning fatigue. However, a lack of a strong framework and vision for future improvements can compromise the ultimate potential of a project. While every good urban project of any sort should allow for evolution over time, an ad hoc approach that passively relies on outside initiatives for future improvements risks a partial, or prolonged, transition from linear space to linear place.

Action Items:

- *Identify historical assets* along the right-of-way. These may include existing physical traces or narratives of past railroad or other activities that once occurred along the corridor.

- *Identify ecological assets* along the right-of-way.

- *Identify key community assets*, including both community character (what distinguishes a particular area of the city) and community resources (places of worship, schools, neighborhood organizations, youth groups, arts organizations, businesses, technical and construction skills).

- *Synthesize opportunities for interpretation* in a framework and design guidelines for future corridor development.

Framing Design Challenges As Opportunities

Efforts to make places out of disused rail corridors and their edges confront the physical and conceptual challenges posed by the urban context. Rail trenches, viaducts, tunnels, bridges, at-grade crossings: all may challenge an ideal or generalized vision linear landscape and how it ought to function. However, if adapted creatively, collaboratively and from a multidisciplinary perspective, these challenges also may offer opportunities.

For example, existing standards that currently shape designs for linear spaces—how wide a space must be for a certain activity, design features that foster security and a score of others relating to the functional aspects of linear spaces—may be incompatible with the realities of urban rail corridors. Moreover, competing priorities regarding the allocation of scarce financial resources may limit the extent and nature of design responses to these challenges.

However, while many urban rail-to-trail projects require a high-minded conceptual approach, the nuts-and-bolts of a project do matter. Safety concerns must be incorporated in design concepts. Maintenance concerns may necessitate simplicity in design. The challenge is not letting these concerns detract significantly from the character of rail-to-trail project while also giving them the substantial attention that they deserve.

For these reasons, it is important to involve early in the planning process all of the individuals who shape design: not just the planners, designers, and community members, but also the city engineers, public works specialists, police departments and those whose manage city budgets. Although their diverse perspectives may conflict with one another, it is also important for these planning participants to understand the larger picture that their decisions will affect. Only then will it be possible to convert at-grade intersections into public spaces, viaducts into vibrant promenades, tunnels and trenches into art and history displays, and "unsafe" wooded sections of rail corridor into urban environmental education opportunities.

Action Items:

- Early in the planning process, *identify any environmental contamination issues* that might forestall further trail development until addressed.

- *Identify physical opportunities and challenges* along the corridor as they relate to topography, existing structures, tunnels, bridges, below-grade segments, at-grade crossings, separation or integration of public and private property.

- *Convene a multidisciplinary advisory committee* to discuss possible design approaches. Participants in these discussions might include: architects, landcape architects, urban planners and designers, engineers, public works specialists, police and security personnel, city administrators, parks and recreation specialists and environmental specialists.

- *Identify existing standards* that might apply to the right-of-way (i.e., AASHTO bicycle and pedestrian standards, CPTED crime prevention design guidelines, engineering standards) while also *evaluating the extent to which these standards apply* to the unique context of a given corridor or might inhibit opportunities to maximize the potential of a corridor.

Building a Technical and Financial Resource Base

Successful urban rail corridor conversions require leadership and shared priorities from city, regional, state and federal governments. While substantial public sector support and resources are necessary in order to maximize the value of urban rail corridors, the public sector is generally unlikely to initiate urban rail-to-trail projects and may lack the capacity to bring about particularly valuable projects on its own. For this reason, there exists a vital role for communities, grassroots and non-profit organizations, design centers, academic institutions, and private foundations to contribute value and

expertise to these projects. Project organizers therefore should seek out these potential resources early on in the project.

The Rails-to-Trails Conservancy is uniquely positioned to foster such collaborations as part of its outreach and marketing activities. Private foundations and academic institutions are particularly worthy targets of outreach efforts. Foundations may provide vital funding for interpretive displays or initial design concepts; academic institutions may offer valuable expertise and organizational capacity, potentially at minimal or no cost to the public sector. Meanwhile, nascent efforts to convert urban rail corridors would benefit from compiled resources by metropolitan area of all organizations and institutions that have provided, or might be able to provide, financial or technical assistance. While such resources likely exist already, they should be updated to encompass the wider range of actors in an urban context.

Finally, while constituting only a small part of project budgets, TEA-21 (and, previously, ISTEA) serves as an important catalyst for urban rail-to-trail projects. Without such funding in the future, fewer cities may benefit from transformed rail corridors. On a policy level, it is essential to preserve access to this type of funding. In addition, the US Department of Transportation, perhaps in collaboration with other federal agencies, might consider expanding the range of activities that may be eligible for and encouraged by such funding. Enhancements funding will be most effective if it is tied to, rather than isolated from, larger urban redevelopment concerns.

Action Items:

- *Explore potential sources of funding* for the corridor project. Sources may include not only the public sector but also private foundations (local, regional and national) and private sector interests.

- *Explore potential technical and logistical or organizational resources* at the local level, including colleges and universities (especially planning, design and environmental studies departments), design organizations and

other non-profits, and specialized consultants in related fields (art, design, planning, landscape, ecology).

- *Engage both sets of potential collaborators* in discussions about possible projects along the corridor.

Uniting Trail Development and Real Estate Development

The six ongoing projects illustrate that while rail-to-trail and economic development priorities may be at odds with one another, the two are by no means mutually exclusive. Rather, with greater creativity and more collaboration, urban rail-to-trail projects may serve as catalysts for development or focal points around which further development and revitalization efforts may be oriented. Moreover, as the Midtown Greenway project illustrates, the resulting value creation may be mutually reinforcing: a rail corridor conversion might make a larger development project more desirable, while the additional resources and corridor improvements resulting from the development efforts can enhance the quality and appeal of the corridor. Finally, as in the case of the Farmington Canal, a further challenge is coordinating the two efforts as part of a single vision rather than independent activities proceeding on different time schedules.

Action Items:

- *Identify any planned development* at or near the edge of the corridor and engage developers in discussions of development plans as they relate to the corridor.

- *Identify opportunities for future development* at the edge of the corridor.

- *Develop guidelines for future development* that address issues such as land uses, building heights and orientation, access to the corridor, overall corridor character and design treatments.

- *Explore potential partnerships* with private developers, public-private initiatives and neighborhood revitalization schemes.

- *Market the potential of the corridor* to all potential development interests through meetings and promotional materials,

DIRECTIONS FOR FURTHER RESEARCH

In closing, the evolving nature of existing urban rail-to-trail projects and the lack of proven models leaves some important questions unanswered. On a most basic level, studies should revisit these projects as they evolve over time. This research might offer most conclusive answers to the question of whether disused urban rail corridors indeed can succeed as public space and, if so, whether they might constitute an entirely new type of public space. The answers to these questions might help answer the more difficult question of the extent to which these projects merit their substantial costs and effort in light of their potential to revert back to more traditional transportation uses.

Future research also might consider the process of transforming the image of formerly marginal or blighted space, including the types of approaches and activities that are necessary to achieve such a change. On a related note, there remains a critical need for closer study of rail-to-trail projects in lower-income and high-crime areas, as well as further insight into how such communities interpret the "greenway." Lastly, it is worth considering how to address safety and security concerns through design that explores alternatives to simply following existing design standards.

Tables

TABLE A: Urban Rail-to-Trail Project Typologies

TABLE B: Farmington Canal Opportunities

: Urban Rail-to-Trail Project Typologies

	East Boston Greenway (Boston, MA)	Depot Ave./6th Street Rail Trails (Gainesville, FL)	Midtown Greenway (Minneapolis, MN)	Metropolitan Branch Trail (Washington, DC)	The High I (New York,
:N SPACE .L SPACE	*Open space for underserved neighborhood.		*Sorely needed recreational space for South Side of Minneapolis.	*Open space for DC's underserved Northeast quadrant. *Green gateway to nation's capital	*New layer of vegeta viaduct as natural spa
'EM AND	*Access to waterfront, connecting open spaces.		*Lateral connections through bridge redesign.	*Alternative transportation, transit connections, linking destinations.	
' AND	*Catalyst for environmental cleanup efforts.	*Catalyst for environmental cleanup efforts.	*Greenway as focal point for public-private partnership and catalyst for edge development	*Incorporation of trail in transit station design.	
I			*Development at greenway level and oriented towards greenway		*Two-level main stre *Elevated pedestrian with multiple uses *Connections to buil
ID)N SPACE	*Environmental education	*Eco-history trail, using historic train depot as focal point *Design competition guided by community oral histories of railroad	*Public Art Master Plan based on community "character mapping" *Revitalizing a former main street		*Part of vision of city "palimpsest"
OF ' AND :		*Zones and nodes along linear space	*Public art that reflects context *Nodes of development	*Piecing together diverse landscape elements as linear space	*Zones and nodes al space

TABLE B: Farmington Canal Opportunities

	Farmington Canal Greenway (New Haven, CT)
REFUGE, OPEN SPACE AND NATURAL SPACE	▪ Wooded segments as natural space and refuge ▪ Below-grade segments as refuge ▪ Newhallville open space opportunities
MOVING SYSTEM AND CONNECTOR	▪ Linkages to churches, schools, open space, cultural destinations, downtown. ▪ Connections between city and suburb ▪ Connections between disparate areas of city
FOCAL POINT AND CATALYST	▪ Yale University engineering building ▪ Scantlebury Park redesign (Dixwell) ▪ Lyme Properties development at Science Park
MAIN STREET	▪ Yale University campus ▪ Science Park ▪ Urban plazas in below-grade segments
ARTIFACT AND INFORMATION SPACE	▪ Canal history ▪ Winchester Factory and railroad history ▪ Physical traces of railroad retaining walls ▪ Public art in Arts District, tunnel, neighborhoods
LANDSCAPES OF CONTINUITY AND DIFFERENCE	▪ 5 corridor segments ▪ Below-grade and at-grade segments ▪ Wooded segments, urban segments

References

"A Greenway in East Boston." Editorial. *Boston Globe* 12 December 1998: A22.

"Metropolitan Branch Bike Trail." Narr. James Rea. Metro Connection News Report. WAMU, Washington, DC. 18 November 2000.

Alderman, Nancy. Farmington Canal Rails to Trails Association. Telephone interview. 18 March 2002.

Alderman, Nancy and Jim Wieken. "The Farmington Canal Greenway: A Rail-to-Trail Project." *Journal of the New Haven Colony Historical Society* 42 Spring 1996: 2-20.

Balmori Associates, Inc. *Farmington Canal Greenway Master Plan* New Haven, CT: 1989.

Balmori Associates, Inc. Miscellaneous documents from master planning process. New Haven Colony Historical Society Library.

Balmori, Diana. "A Path in the City, A Path in the Woods." *Places* 6, 1990: 50-67.

Balmori, Diana. "Farmington Canal Master Plan." *Process: architecture* January 1998: 18-21.

Baris, Mackenzie. "Architects Suggest Farmington Canal Plans." *Yale Daily News* 25 September 1998.

Barone, David. New Haven City Plan Department. Telephone interview. 8 April 2002.

Beach, Randall. "New Haven to Develop Its Portion of the Canal Trail" *New Haven Register* 29 November 2000: A7.

Beach, Randall. "Town, Gown Come Together in Doing Right" New Haven Register 20 September 1998: B1.

Beach, Randall. "Yalies Push to Keep Trail's Original Path." *New Haven Register* 2 March 1998: A1.

Bischoff, Annaliese. "Greenways as Vehicles for Expression." in Julius Gy. Fabos and Jack Ahern, eds. *Greenways: The Beginning of an International Movement*. Amsterdam: Elsevier, 1996.

Blumenkrantz, Phil. "Aldermen Walk Along Canal Line." *New Haven Register* 28 February 1988: A3.

Brasswell, Barbara J. "Brownfields and Bikeways: Making a Clean Start" *Public Roads* 62 March/April 1999.

Brown, Elizabeth Mills. *New Haven: A Guide to Architecture and Urban Design* New Haven: Yale University Press, 1976.

Burch, William. Letter to *New Haven Register*. 11 April 1996. New Haven Colony Historical Society.

Burns, Valerie. "The Community's Role in Sustaining Urban Parks" in *Proceedings of the 1998 National Planning Conference* Chicago: AICP Press, 1998.

Burrell, Beth. "Canal Line Arguments Before Appeals Court." *New Haven Register* 29 January 1988: 3.

Burrell, Beth. "City Seeks to Buy Slice of Farmington Canal." *New Haven Register* 26 October 1988: 3.

Burrell, Beth. "City's Delays Could Kill Canal Line Park" *New Haven Register* 19 April 1989: 1.

Burrell, Beth. "Petition Supports Canal Line as a Park" *New Haven Register* 15 May 1989: B1.

Burrell, Beth. "Plans Unveiled for Idyllic, Winding Canal Line Park" *New Haven Register* 14 April 1989: 1.

Burrell, Beth. "Walking Trail Proposed for Canal Line." *New Haven Register* 6 January 1988: 3.

Brandt, Steve. "Greenway May Be Path to Redevelopment." *Minneapolis Star Tribune* 11 August 2000: 1B.

Castells, Manuel. *The Rise of the Network Society.* Cambridge: Blackwell Publishers, 1996.

Chan, I Mei, ed. *Building on the Past, Traveling to the Future.* Washington, DC: National Trust for Historic Preservation and Federal Highway Administration, 1995.

Ciabotti, Jeff. Rails-to-Trails Conservancy. Personal interview. 26 March 2002.

City of Vancouver. Urban Landscape Task Force. *Greenways, Public Ways.* Final Report, May 1992.

Coalition for the Capital Crescent Trail. *Milestones 1986-1996: A Chronology of the First Ten Years.* Washington, DC: Coalition for the Capital Crescent Trail, 1996.

Coburn, Karen Ann. "Trails on Trial." Governing August 1996: 43.

Cooper, Robertson & Partners. *Yale University: A Framework for Campus Planning* New Haven, CT: 2000.

Citizens' Advisory Committee on Environmental Quality. *From Rails to Trails.* Washington, DC: Citizens' Advisory Committee on Environmental Quality, 1975.

Della Penna, Craig. Rails-to-Trails Conservancy, New England Office.Telephone interview. 12 February 2002.

Dematteo, Ann. "Dixwell Group Opposes Park Plan for Canal Line." *New Haven Register* 15 January 1988: 19.

Dematteo, Ann. "Support for Trail Sought." *New Haven Register* 10 January 1989: A3.

Design Trust for Public Space. *Reclaiming the High Line.* New York: Design Trust for Public Space, 2002.

DeStefano, John. Letter to State Representative Howard Scipio. 19 March 1999. New Haven Colony Historical Society.

Dumanoski, Dianne. "Parks, Lost and Found." *Land and People* Spring 2001.

Dutill, Sue. Pinellas County Department of Planning. Telephone interview. 7 March 2002.

Erickson, Donna L. and Anneke F. Louisse. *Greenway Implementation in Metropolitan Regions: A Comparative Case Study of North American Examples.* Ann Arbor: University of Michigan, School of Natural Resources and Environment, 1997.

Fabos, Julius Gy. "Introduction and Overview: The Greenway Movement, Uses and Potentials of Greenways." in Julius Gy. Fabos and Jack Ahern, eds. *Greenways: The Beginning of an International Movement.* Amsterdam: Elsevier, 1996. 1-13.

Farmington Canal Rails-to-Trails Association. "History of the Farmington Canal Rails-to-Trails Association" New Haven Colony Historical Society.

Findley, Lisa R. "Paths: The Nature of Linear Public Space" *Places* 8(4), 1992: 72-75.

Freola, Carolyn. "Plans for Long-Sought Bike Path Divide Takoma Park." *Washington Post* 3 March 2001: H1.

Garvin, Alexander and Gayle Berens. *Urban Parks and Open Space.* Washington, DC: Urban Land Institute, 1997.

Gobster, Paul H. "Urban Parks as Green Walls or Green Magnets? Interracial Relations in Neighborhood Boundary Parks" *Landscape and Urban Planning* 41 (1998): 43-55.

Grove, Noel. "Greenways: Those Long, Skinny, Green Parks." *Land and People* Fall 1994.

Guy, Brad. Center for Construction and Environment, University of Florida.Telephone interview. 4 March 2002.

Hare, Patrick. "Rail and Trail Coexist in D.C." *Planning* December 1998: 10-11.

Hausam, Sharon. Letter to Daisy Rodriguez. 11 April 1996. New Haven Colony Historical Society.

Hiss, Tony. *The Experience of Place*. New York: Vintage Books, 1990.

Hiss, Tony. "Rails to Trails." *Atlantic Monthly* December 1997.

Honeyman, Leonard J. and Matt Nozzollo. "Canal Line Abandonment Approved." *New Haven Register* 1 December 1987: 45.

Howser, Beth Miller. "Putting Value on Rail-Trails." *Public Management* April 1997: 4-9.

Jacobs, Jane. *The Death and Life of Great American Cities*. New York: Random House, 1961.

Judd, Harry A. "The Farmington Canal." *Connecticut Circle* January 1947: 22-24, 40.

Langdon, Philip. "The Leading Edge of Parks." *Landscape Architecture* March 1985: 74-78.

Lazarus, Bill. "The Lost Waterway Under City's Streets." *New Haven Register* 13 May 1983: 39.

Lindsey, Greg. "Use of Urban Greeways: Insights from Indianapolis." *Landscape and Urban Planning* 45 (1999): 145-157.

Lindsey, Greg and Gerrit Knaap. "Willingness to Pay for Urban Greenway Projects." *Journal of the American Planning Association* 65 (1999): 297-313.

Lindsey, Greg et al. "Access, Equity and Urban Greenways: An Exploratory Investigation." *The Professional Geographer* 53 (2001): 332-345.

Little, Charles E. *Greenways for America*. Baltimore: Johns Hopkins University Press, 1990.

Lormer, Linda. Letter to Nancy Alderman. 17 April 1996. New Haven Colony Historical Society.

Luymes, Don T and Ken Tamminga. "Integrating Public Safety and Use Into Planning Urban Greenways." in Julius Gy. Fabos and Jack Ahern, eds. *Greenways: The Beginning of an International Movement*. Amsterdam: Elsevier, 1996. 391-400.

Lynch, Kevin. *Good City Form*. Cambridge: The MIT Press, 1981.

Lynch, Kevin. *The Image of the City*. Cambridge: The MIT Press, 1960.

Mann, Roy B. "Boston's Southwest Corridor: From Urban Battleground to Paths of Peace" *Places* 7(3), 1991: 47-61.

McDermott, Vince. Milone & MacBroom. Personal interview. 6 March 2002.

Midtown Community Works. "The Evolution of the Midtown Greenway" *Midtown Community Works Newsletter* May 2001: 1, 4.

Midtown Community Works. "Resonant Journey: The Public Art Master Plan for the Midotwn Greenway Corridor" *Midtown Community Works Newsletter* May 2001: 5.

Midtown Community Works. "Urban Renewal at Lake and Nicollet" *Midtown Community Works Newsletter* October 2001: 2-5.

Millea, Jack. "Rumble of Canal Line Project Can Be Heard in Cheshire." *New Haven Register* 3 February 1972: 2B.

Milone & MacBroom. *Master Plan for Farmington Canal Greenway* New Haven, CT: 1999.

Montagne, Charles H. *Preserving Abandoned Railroad Right-of-Way for Public Use: A Legal Manual*. Washington, DC: Rails-to-Trails Conservancy, 1989.

Moore, Roger L. et al. *The Impacts of Rail-Trails: A Study of the Users and Property Owners from Three Trails*. Washington, DC: Rivers, Trails and Conservation Assistance Program, National Parks Service, 1992.

Morris, Hugh. Rails-to-Trails Conservancy. Personal interview. 26 March 2002.

Motavelli, Jim. "Rails to Trails." *E: the environmental magazine* January/February 2001: 16-20.

Mumford, Lewis. *The City in History*. New York: Harcourt Brace Jovanovich, 1961.

Nevel, Bonnie and Peter Harnik. *Railroads Recycled.* Washington, DC: Rails-to-Trails Conservancy, 1990.

O'Connell, Kim A. "Missing Links." *Landscape Architecture* April 2001: 76-79, 97-99.

Pinellas County Department of Planning. *History of the Pinellas Trail.* Pinellas County, Florida, 2000.

Pinellas County Department of Planning. *Report on the Pinellas Trail* Pinellas County, Florida, 1996?

Plattus, Alan. Yale University, School of Architecture. Personal interview. 11 February 2002.

Polochanin, David. "Neponset River, East Boston Park Plans Get a Big Boost." *Boston Globe* 19 November 1994: 43.

Porter, William. "The Farmington Canal: New Haven's Contribution to the 'Canal Epidemic.'" *Journal of the New Haven Colony Historical Society* 20 October 1971: 49-67.

Povinelli, Nick. "Officials Vow Support to Preserve Canal Line." *New Haven Register* 17 January 1988.

President's Commission on Americans Outdoors. *Americans Outdoors: The Legacy, The Challenge.* Covelo, CA: Island Press, 1987.

Quayle, Moura and Tilo C. Driessen van der Lieck. "Growing Community: A Case for Hybrid Landscapes." *Landscape and Urban Planning* 39 (1997): 99-107.

Ryan, Karen-Lee, ed. *Trails for the Twenty-First Century: Planning, Design and Management Manual for Multi-Use Trails.* Washington, DC: Island Press, 1993.

Ryan, Karen-Lee and Julie A. Winterich. *Successful Rail Trails: An Acquisition and Organizing Manual for Converting Rails into Trails.* Washington, DC: Rails-to-Trails Conservancy, 1993.

Schneider, Tod. "Bike Path Phobia: Selling Skeptics on Urban Greenway Bike Path Safety." *Parks and Recreation* August 2000: 62-69

Searns, Robert M. "The Evolution of Greenways as an Adaptive Urban Landscape Form." in Julius Gy. Fabos and Jack Ahern, eds. *Greenways: The Beginning of an International Movement.* Amsterdam: Elsevier, 1996. 65-80.

Shafer, C. Scott et al. "A Tale of Three Greenway Trails: User Perceptions Related to Quality of Life." *Landscape and Urban Planning* 49 (2000): 163-178.

Shemitz, Leigh. Letter to Linda Lormer. 11 April 1996. New Haven Colony Historical Society.

Smith, Daniel S. "Introduction" in Daniel S. Smith and Paul Caewood Hellmund. *Ecology of Greenways*. Minneapolis: University of Minnesota Press, 1993. xi-xvi.

Smith, Daniel S. and Paul Caewood Hellmund. *Ecology of Greenways*. Minneapolis: University of Minnesota Press, 1993.

Smith, Darren W. Rails-to-Trails Conservancy. Personal interview. 26 March 2002.

Smith, Elizabeth A.T. and Russell Ferguson, eds. *Urban Revisions: Current Projects for the Public Realm*. Los Angeles and Cambridge: Museum of Contemporary Art and The MIT Press, 1994.

Smith, Ken. "Linear Landscapes: Corridors, Conduits, Strips, Edges, and Segues." *Harvard Design Magazine* Winter/Spring 1999.

Spellerberg, Ian and Martin Gaywood. "Linear Landscape Features." *Landscape Design* September 1993: 19-21.

Sokol, David. "Meatpacker Chic." *GRID* July/August 2001.

Solecki, William D. and Joan M. Welch. "Urban Parks: Green Spaces or Green Walls?" *Landscape and Urban Planning* 32 (1995): 93-106.

Spirn, Anne Whiston. *The Granite Garden: Urban Nature and Human Design* New York: Basic Books, 1984.

Thompson, J. William. "Getting Trails on Track." *Landscape Architecture* June 2000: 80-85, 98.

Trout, Amy L. *The Story of the Farmington Canal* New Haven: New Haven Colony Historical Society, 1995.

Tuhus, Melinda. "A Serene, Long Trail and a Push to Pave It." *New York Times* 7 January 2001 sec. 14CN: 13.

Tureck, Jerry. Dixwell neighborhood, New Haven. 17 April 2002.

Villa, Clifford J. "Cleaning Up at the Tracks: Superfund Meets Rails-to-Trails." *Harvard Environmental Law Review* 481 (2001): 481-534.

Walmsley, Anthony. "Greenways and the Making of Urban Form." in Julius Gy. Fabos and Jack Ahern, eds. *Greenways: The Beginning of an International Movement*. Amsterdam: Elsevier, 1996. 81-127.

Ward, Jane and Allan Ruff. *Linear Landscape: Design for Disused Railways*. University of Manchester Department of Town and Country Planning, Occasional Paper Number 15 (1986).

Washington Area Bicyclist Association and Coalition for the Metropolitan Branch Trail. *Metropolitan Branch Trail Concept Plan*. Washington, DC, 1999.

Whyte, William H. *The Last Landscape*. Garden City: Anchor Books, 1968.

Winks, Robin W. "Business, Conservationists Can Both Win on Canal Line Plan" Editorial. New Haven *Register* 24 January 1988: B3.

Workers of the Writers' Program of the Work Projects Administration in the State of Connecticut. *Boats Across New England Hills: The Story of the Farmington Canal*. Hartford: State Department of Education, 1941.

Wright, J.R. et al. *Planning for Urban Recreational Open Space: Towards Community-Specific Standards*. Toronto: Ontario Ministry of Housing, 1976.

Image Credits

FIGURE #	SOURCE
2.3	Friends of the High Line (http://www.thehighline.org)
3.1	Pinellas County Department of Planning (http://www.co.pinellas.fl.us)
3.2	(left) BikeWashington web site (http://bikewashington.org) (right) Washington Area Bicyclist Association (http://www.waba.org)
3.3	(top) Dianne Dumanoski. " Parks, Lost and Found." *Land and People* Spring 2001 (bottom) Merrill S. Shea
3.4	Friends of the High Line (http://www.thehighline.org)
3.5	Washington Area Bicyclist Association (http://www.waba.org)
3.6	(map) Midtown Greenway Coalition (http://www.midtowngreenway.org) (photo) The Green Institute (http://www.greeninstitute.org)
3.7	Midtown Community Works (http://www.midtowncommunityworks.org)
3.8	Center for Construction & Environment, University of Florida (http://www.cce.ufl.edu)
3.9	Midtown Community Works (http://www.midtowncommunityworks.org)
3.10	Midtown Greenway Coalition (http://www.midtowngreenway.org)
4.1	Base map courtesy of Milone & MacBroom
4.3	(left) Balmori & Associates, Inc. Amy L. Trout. *The Story of the Farmington Canal* New Haven: New Haven Colony Historical Society, 1995: 13.
4.7	Amy L. Trout. *The Story of the Farmington Canal* New Haven: New Haven Colony Historical Society, 1995: 12, 20.
4.8	(map) East Coast Greenway (htttp://www.greenway.org)
4.10	Balmori Associates, Inc.
4.11	Milone & MacBroom
4.12	Cooper, Robertson & Partners