

**The Lowell Park Trolley,  
Development and Implementation**

A Thesis

submitted by

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## Table of Contents

Chapter 1	Introduction	6
	1.0.0 The Lowell Park Trolley	8
	1.1.0 Revitalization and the role of the Lowell Park Trolley	10
	1.2.0 Transportation in other national parks	12
	1.3.0 History of the street railway	15
	Footnotes	18
Chapter 2	Evolution of the Lowell Park Trolley	
	2.0.0 Introduction	19
	2.1.0 The rail demonstration project	22
	2.2.0 The availability of operating equipment	25
	2.2.1 The initial search	25
	2.2.2 The build-new option	27
	2.3.0 Engineering consultants and trolley fans	29
	2.4.0 The Boston and Maine Railroad	32
	2.4.1 Lease agreement	33
	2.4.2 Track and right-of-way work	35
	2.4.3 Operating an electric trolley	36
	2.4.4 Conclusion	38
	2.5.0 Federal funding for the Lowell Park Trolley	39
	Footnotes	43
Chapter 3	The Development of Policies for the Lowell Park Trolley	
	3.0.0 Introduction	45
	3.1.0 Origins of the Lowell Park Trolley	48
	3.1.1 Transportation as an interpretation theme	48
	3.1.2 The legislative mandate	50
	3.2.0 Goals of the Lowell Park Trolley	52
	3.2.1 Visitor transportation, the utilitarian side	54
	3.2.2 Historical interpretation, the glamorous side	57
	3.3.0 Policy and Development Process	
	3.3.1 Stages in the Process	57
	3.3.2 Factors that contributed to this approach	58
	A. The core planning group	59
	B. Authority and interests of key agencies	61

	C. The technical consultants and contractors	62
	D. Federal funding	65
3.4.0	Decision-making methodology	66
	Footnotes	69
Chapter 4	Today and Tomorrow for the Lowell Park Trolley	71
4.0.0	Introduction	71
4.1.0	Operating the Lowell Park Trolley	
4.1.1	Costs of Operation	73
4.1.2	Anticipated increases in the cost to operate the basic system	74
4.2.0	Expanding the Lowell Park Trolley	
4.2.1	The goals	75
4.2.2	The equipment	79
A.	The cars	79
B.	The track and overhead line extensions	81
4.3.0	Strategies for future operations	
4.3.1	Operation by a concessionaire	88
4.3.2	Operation by a third party	89
4.3.3	Subsidies by private businesses	90
4.3.4	Purchase of the Boston and Maine tracks and right-of-way	91
	Footnotes	93
Chapter 5	Conclusions, Contributions and Recommendations	
5.0.0	Introduction	94
5.1.0	The trolley renaissance	96
5.2.0	Distinguishing features of the Lowell Park Trolley	100
5.3.0	Contributions made by the Lowell Park Trolley	103
5.4.0	Recommendations for cities considering interpretive transit	105
	Footnotes	110
	Bibliography	111
	Appendix	114

## Abstract

The Lowell Park Trolley system is in the Lowell National Historical Park, Lowell Massachusetts and was jointly developed between 1980 and 1984 by the Lowell Historic Preservation Commission (LHPC) and the National Park Service (NPS), both agencies in the U.S. Department of the Interior. All funding was obtained through Congressional appropriations. The thesis, "Lowell Park Trolley, Development and Implementation," demonstrates that it was the implementation process itself that determined the final form of this trolley system and that the institutional relationships were as problematic as the physical issues.

The system consists of two reproduction 1902 open cars powered by an 550 VDC overhead electric line and runs on one mile of existing railroad tracks owned and operated on daily by the Boston and Maine Railroad and leased to the NPS. The trolleys are operated seven days a week from May through September for the free interpretive park tours.

The selection of the type of cars to operate determined the most important policy for the system. A number of options were considered, including purchasing cars from Europe and leasing from local museums. The approach selected was to build new car bodies and underframes mated with salvaged running equipment from Australian tram cars. During the preparation of the technical specifications, it was decided to build an exact replica of an open car rather than a generic car. This decision lead to the policy that the Lowell Park Trolley was to be an accurate representation of the City's early transit. Other alternatives were eliminated because they did not yeild cars that could withstand constant use or that were uncharacteristic of cars run in Massachusetts in the early 20th century.

Other influential factors: 1) Establishment of a demonstration project to investigate and solve operational problems. 2) Management of the project development by three people representing with broad authority, responsibility and commitment. 3) Advice from the engineering consultants and the trolley enthusiasts, balanced to provide sound engineering and historical accuracy. 4) Ownership of the tracks by the Boston and Maine Railroad required complex negotiations and approvals. 5) Federal funding schedule spread the \$1,300,000 cost over the development period causing implementation to occur in small increments where funds were requested as project components were ready to go for bid; thus some elements were complete while others did not have approved funding.

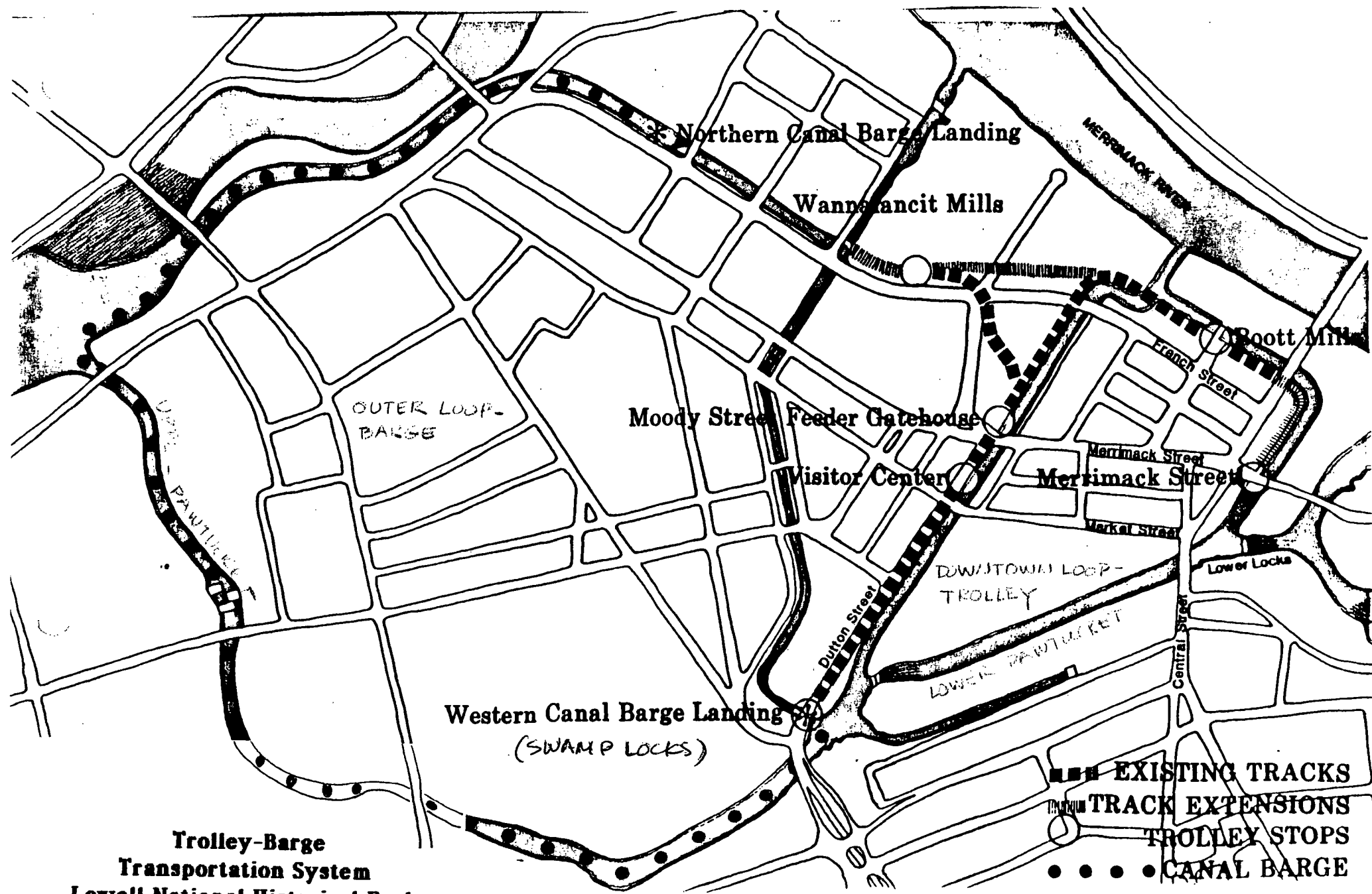
Three track extensions and one closed car will be built in the next developmental phase.

## INTRODUCTION

To a group of senior citizens visiting the Lowell National Historical Park on a hot July morning, a ride on car 1601 or 1602 takes them one-half mile away to the Suffolk Mill Turbine exhibit and later to the Swamp Locks boat landing. Walking is impossible for some; for others, shuttle busses are awkward and too institutional, too "government." But there is something else about the Lowell Park Trolley: the seniors talk about riding cars "just like this one" to Revere or Merrimack Park and they talk about their relatives who drove them, collected fares, or jumped on the running boards. The Lowell Park Trolley is the experience of riding open trolley cars at the turn of the century. Although trolleys ran a dense network around and through Lowell from the late 1800's to the 1940's, every car and piece of track is gone now. The Lowell Park Trolley is new, but designed to look, sound and feel old, to support the themes and policies of the Lowell National Historical Park.

This year, thousands of visitors to the Lowell National Historical Park rode the Lowell Park Trolley, one-mile of electrified track with two reproduction 1902 electric vehicles that connects with three canal barges to make a 4 mile transportation loop around the Park. The Lowell Park Trolley was designed to replicate a small portion of the trolley system that criss-crossed the city in the early 1900's.

This thesis begins with the genesis of the Lowell Park Trolley in the early Park plans in the mid-1970's and takes it through the implementation phase in the early 1980's to its second phase expansion in 1985 and 1986. It examines the institutional framework and the decision-making process that determined the physical development of the system. It illustrates the goals of the Lowell Historic Preservation Commission and the National Park Service, the two agencies who implemented the system, and the dilemmas that influenced how these goals were achieved. It is an analysis of the evolution of a project and how the very act of implementation created unanticipated situations that required modification of the original plans. The second phase of the Lowell Park Trolley is also examined and demonstrates that it has become an indigenous entity, no longer only a novelty reserved for visitors to the Lowell National Historical Park, but with the potential to serve the needs of commuters--the very group that the original trolley system served. The thesis concludes with a distillation of the distinguishing features of the trolley, the lessons learned from its planning and implementation and a set of recommendations for cities nation-wide that are investigating their roots in the 'trolley mania' of the 1900's and the possibility that its renaissance can help to bolster their downtowns.



**Trolley-Barge  
Transportation System  
Lowell National Historical Park**

**Map 3-1 North ▲**

TRANSPORTATION  
INTERPRETATION

- ▬▬▬ EXISTING TRACKS
- ▬▬▬ TRACK EXTENSIONS
- TROLLEY STOPS
- CANAL BARGE

—| 300 FT.



### **1.0.0 The Lowell Park Trolley**

The Lowell Park Trolley runs in Lowell, Massachusetts on 1.2 miles of freight tracks built in the 1800's to serve the city's mill complexes. It was established as part of the development plan for the Lowell National Historical Park to shuttle visitors from various locations in the park and began as a demonstration project in 1980. The tracks were electrified in 1983-4 and electric vehicles started operation in May 1984. The tracks are owned by the Boston and Maine railroad and the trolley system operates jointly with the railroad.

The system's primary purpose is two-fold: to transport visitors who have reserved spaces in the National Park Service's many daily tours and to interpret a transit experience of Lowellians in the early 1900's. It serves these purposes daily, from 9:00 AM to 5:00 PM, from Memorial Day to Columbus Day. In addition, the physical structure of the system is very similar to that of light rail vehicles that serve the needs of urban transportation in many cities. The tracks are separated from street traffic, the vehicles are light and the quality of the service is greater than on busses.

The National Park Service, U.S. Department of the Interior, operates the trolley system and does not charge fares for rides. Currently, the Lowell Park Trolley and the Lowell Regional Transit Authority, the public agency that provides local bus service, are completely separate, indicative of the different purposes and funding sources. As will be discussed later, this situation may change in several ways if it is more cost effective for the LRTA or for-profit

organization to operate the trolleys on selected runs.

The Lowell Historic Preservation Commission, an agency also within the Department of the Interior, was the developer of the physical components of the system. All the capital funds came directly from Congressional appropriations to the Commission; thus, the cars and the overhead equipment are entirely owned by the federal government. This is another significant difference between the Lowell Park Trolley and conventional light rail vehicle systems which are generally funded with a combination of private, state and federal funds.

While it is beyond the scope of this thesis to analyze the feasibility of, and program for, the Lowell Park Trolley expansion, it is important to note that three extensions are in the preliminary engineering phase. A third and possibly a fourth car will be built by the Summer of 1986. With this work so imminent, the Lowell Park Trolley will be a hybrid system that is part novelty or specialty and part light rail vehicle. The system may actually serve computer programmers and microchip assemblers who are employed in the same mills that once employed weavers and spinners who rode this very type of trolley cars.

My role with the Lowell Park Trolley was that of planner and later project manager while employed by the Lowell Historic Preservation Commission from 1980 to 1985. I was one of three core planners, two from the Commission and one from the National Park Service, responsible for all aspects of the trolley system and therefore, I am able to write this thesis from direct experience. The advantages of this past role are that I have access to all background information and that I was directly involved from start to finish.

The disadvantage is the difficulty of balancing objectivity and opinion when this was personally and professionally a satisfying project.

### **1.1.0 Revitalization and the role of the Lowell Park Trolley**

During the last five years Lowell's economy has seen remarkable revitalization. Over \$170 million of public and private preservation money has been invested since 1974 and the unemployment rate is 3.0 %, the lowest in the state. A report published by the Lowell Historic Preservation Commission states that every dollar of public funding has leveraged approximately fourteen dollars of private money. (1) As further proof of Lowell's 'rebirth,' Governor Michael Dukakis frequently points to Lowell as an example of what he would like to see happen to other depressed mill towns in Massachusetts.

How much of this development depended on the implementation of the Lowell Park Trolley? It is unlikely that any public or private investment has occurred directly because of the trolley, and no analysis has been made to link future investment to the trolley. However, there is clear evidence that the trolleys are desirable commodities to some downtown developers. The developer of the Lowell Hilton has been very enthusiastic about the tracks being extended to the hotel; the trolley stop will be a short walk away and the waiting trolley car will be prominently visible from the lobby and restaurants. The hotel features a sketch of the trolley to promote its "historic weekend" packages even though the tracks won't be built until late 1986 or early 1987.

The tracks will also be extended in the opposite direction to a mill building that houses a key water power interpretive exhibit and a high technology

company. The developer of this facility is also interested in the promotion value of the trolleys to attract tenants to his building but has a practical interest, as well, since the trolley could be used to shuttle employees to and from a new parking garage. Furthermore, the state Department of Environmental Management is building a new \$4 million park and requested that one of the proposed extensions be re-routed through it.

In addition, The Lowell Plan, an influential consortium of businesses, has featured the trolley in its ambitious promotion campaign for the city that included a four-color brochure, newspaper and magazine ads. The City Council took out a one-page ad in the local paper welcoming the trolleys back to Lowell. The Lowell High School alumni committee is using the trolley as the theme for the 1985 reunions. Even local artists are using the cars as a favorite 'motif.'

In conclusion, the Lowell Park Trolley is playing a complementary role in the City's revitalization. So much of the development was in place before the trolley project was implemented that it would be unrealistic to say that there was a direct relationship between the trolley *per se* and investment. The financially sound investments simply did not require the trolley "ambiance" to make or break their projects. However, the trolley's physical presence is a tangible reminder of the 19th century setting that is the essence of Lowell's story. And because it promises to link major historic and economic centers within the City, it will become a visible and attractive organizing element: the trolley cars themselves will be seen at all the major downtown developments. The Lowell Park Trolley demonstrates that Lowell values its history enough not only to preserve its buildings and build new ones that are complementary but also to build complementary transportation infrastructure.

### 1.2.0 Transit in other national parks

There are two contexts in which the Lowell Park Trolley could be analyzed: as a shuttle system within a national park, such as Rocky Mountain or Yosemite National Park where vehicular congestion and pollution threaten the resources and actually limit the numbers of people that can get from one point to another in the park. In fact, visitors in Lowell could not all get from point to point if they had to use their own cars and it is from this perspective that the Lowell experience is relevant to other parks. The other context is as an urban light rail, novelty transit system in a congested city with a select ridership now, but an at-large ridership in the near future. While this thesis concentrates on the latter course, I will discuss briefly the trolley system in terms of current National Park Service policy. The policies for establishing new Visitor Transportation Systems and expanding existing ones are clarified in a document titled, "Draft Guidelines--Visitor Transportation Systems, October 26, 1984." (2) These guidelines are for use by the National Park Service when it is the lead agency in developing the transportation program. It is important to note that in Lowell the NPS did not develop the trolley system. It was funded and built by the Lowell Historic Preservation Commission, also a federal agency, but entirely independent of the NPS. The Commission was given the legislation mandate for the transportation program because park planners felt that an urban transit system was outside of the traditional responsibilities of the NPS, namely protection and interpretation of resources. Furthermore, the Commission was much more flexible in its policy structure and could implement a transportation program more quickly.

Based on the NPS Visitor Transportation Systems guidelines, a good case can be made that, in spite of its unconventional development by a separate federal agency but for the use of the National Park Service, the Lowell Park Trolley meets most of the criteria set forth in them. Yet, the trolley system is unique within the national park system, primarily because of the role the vehicles themselves play in resource interpretation as well as in functional circulation. The recommendations in Chapter 5 are geared to cities considering trolley transit to enhance revitalization efforts, but they could apply to other parks as well.

An excerpt from the policy in the guidelines states, "The Service will provide safe visitor transportation services...where visitor transportation services will improve park experiences by: offering new and/or improved interpretive opportunities; reducing traffic congestion; reducing noise and air pollution; conserving energy; improving visitor use patterns; better resource protection."

(3) In deciding whether or not to implement a new visitor transportation service, the guidelines are very clear that resource protection is the primary goal. Visitor control with a "cost-effective" visitor transportation service is the secondary goal, especially if it produces a better quality park experience. (4)

Cost-effectiveness is, of course, the key. Under "Funding, Operation and Ownership Alternatives," the guidelines state that the visitor transportation service should be self-supporting if it eliminates the need for "costly road improvements, building and maintaining parking lots, etc." or where "ridership fees support the total cost of operation of the system." (5) Any park contemplating a visitor transportation system must submit for approval a detailed comparison of the costs for alternative vehicle ownership and operation of the service in order to justify that the approach has the best

cost-benefit ratio.

I submit that though the above policies and guidelines seem to justify the construction of the Lowell Park Trolley, they were established primarily for parks that are self-contained units and not part of an urban setting that itself is the resource. The horse trolley followed by the electric trolley were the first forms of mass transit in the nation's early industrial cities and were as indigenous to the city as moose and hawks are to the western parks. The use of the multi-passenger trolley today instead of the private automobile is a protective measure: by not using government vans or even city busses, traffic on streets is avoided because the trolley cars run on a separate right-of-way. Lowell city officials even argue that the trolleys improve the "natural resource," the local urban landscape.

Cost-effectiveness in the guidelines considers only the cost to the National Park Service and not the less tangible costs and negative impacts a visitor transportation service may have on the immediate community. When that community is a mountain range, any vehicle is an intrusion and one bus can be as detrimental as another. When the community is a city, the choice of transportation system is also important, but the choices of where it runs, what it looks like, and how it sounds can produce a system that enhances the environs or merely adds to the general urban cacaphony. The Lowell Park Trolley is not self-supporting since fares are not charged, but the Park and Commission officials in Lowell believe that, for the present, the cost is justified by the benefits it brings to the City and its visitors. Fares and the ramifications thereof are discussed through out the thesis.

### 1.3.0 History of the Street Railway

The most important reason for the choice of vehicle style for the Lowell Park Trolley was the fact that during the heyday of the street railway (the more technically correct term for trolleys), 1910, Lowell was supplied with tracks on every major street. Over one-hundred units of rolling stock were operating in Lowell during this time and equipment rosters state that virtually all types of cars ran there. The first street railway to run there was the Lowell Horse Railroad Company, 1863 followed by the Lowell and Dracut Street Railway in 1886. This company was eventually reorganized into the Boston and Northern Street Railway Company in 1901, then into the Bay State Street Railway Company in 1911, serving all of eastern Massachusetts (which had merged seventy-two separate operating companies). By 1918, the Commonwealth of Massachusetts had three thousand miles of tracks. (6) In 1918 the Bay State went into receivership and was again reorganized into the Eastern Massachusetts Street Railway; this company ran electric cars until the mid-1930's when busses replaced all the trolley cars.

In 1912, the Bay State Street Railway, had "938.76 miles of track which their promoters claimed made it the largest street railway system in the world." (7) Even earlier, a 1904 map, "Bird's eye view of trolley routes in New England," shows Lowell, Lawrence, Fitchburg, Worcester, Providence, and Fall River as major street railway destinations. (8) They are directly connected with each other, with points in between and to Boston and with points north, south and west. The map also shows over twenty-five amusement parks, most of which owned and operated by the street railway companies, in eastern



Massachusetts, New Hampshire and Rhode Island, that were served by the trolley routes. Canobie Lake, New Hampshire, is one of the few that is still an amusement park, albeit without the trolleys.

Aside from the allure to early trolley buffs of the technical inventory of the street railway, i.e. how many cars, built by which company, running on which routes, there was another kind of attraction which went beyond the fascination of the equipment: the general public's trolley *mania*. During the first three decades of this century, street rail fans issued elaborate brochures describing "Where and How to Trolley" "...a list of principal parks, groves and outing places, maps, descriptive matter and illustrations of some of the most desirable trolley trips..." (9)

From the purple prose of the day, trolley travel embodied a romance and an opportunity for higher, more noble goals, "Thousands each succeeding year are awakening to its great possibilities as a means for attaining health, pleasure and education....The trolley at small expense, at one's own convenience, whisks one by pleasant ways on long or short trips as circumstances permit, or desire dictates." (10)

The Lowell Park Trolley is not technically a street railway, but it has a similar purpose. Historically, the trolleys' appeal lay in their being an escape from the congestion of industrial cities to the countryside and to "the most famous of all historical and educational centres..."(11) In Lowell today, the trolleys transport visitors around to the points of interest in the National Park and thereby allow escape from the day-to-day routine, from the familiar and from the tyranny of traffic congestion. By being on a separate right-of-way, the

trolleys often move faster than the street traffic, giving a brief illusion that real escape might be possible.

Chapter 5 of this thesis explores why cities today are considering some form of trolley-like vehicle to enhance their urban centers or historic districts. The roots of this renaissance lie simply in the continued fondness for the first form of transportation that was fun and seemingly effortless for the passenger as well as visually appealing and symbolic of a less complicated time.

In the following chapters, I will discuss the policy and decision-making processes and compare the early plans with the actual components of the Lowell Park Trolley and the factors that influenced them. Finally, I will analyze the actual, operating system, future expansion and recommendations for other cities considering similar systems.

**Footnotes**

## Chapter 1

1. Lowell Historic Preservation Commission, Revitalization Through Partnership: Public and Private Sector Investment in Lowell, Massachusetts, 1984, p. 3.
2. Chief, Visitor Services Division, "Draft Guidelines-Visitor Transportation Systems, October 26, 1984.
3. Ibid., Chapter 1, p. 1.
4. Ibid., Chapter 4, p. 1.
5. Ibid., Chapter 5, p. 1.
6. John Barr, The Historical Development and Economic Problems of the Street Railway as Shown by a Study of the Eastern Massachusetts Street Railway Co., 1932, p. 14.
7. Trips by Trolley Along Bay State Street Railway Co. Lines and Connections (Boston, Mass.: Bay State Street Railway Co., 1912), p. 17.
8. Trolley Wayfinder, Birds Eye View of Trolley Routes in New England (Boston, Mass.: New England Street Railway Club, 1904).
9. Trips by Trolley, p. 17.
10. Ibid.
11. Ibid., 18.

## Evolution of the Lowell Park Trolley

### 2.0.0 Introduction

In this chapter, I want to demonstrate how the Lowell Historic Preservation Commission and the National Park Service moved from the early conceptual plans to the implementation of the Lowell Park Trolley in operation now. Chapter 2 is a picture of the give and take between certain influences that presented dilemma after dilemma and the staff of these two agencies who were responsible for implementing the project.

Essentially, the implementation was a process of trial and error to bring all the components together. It was also a process of evolution where the staffs' relationship to other agencies and consultants changed as the project proceeded. Throughout the project's development, we were faced with problems that required choices to be made--no differently than any other construction project--that ultimately determined the course of the project.

Five major influences that affected the Lowell Park Trolley will be discussed in this chapter:

- \* Setting up and assessing the self-powered railcar demonstration project. We set this up to raise issues and then to give us experience in resolving them: joint use of the tracks with the Boston and Maine railroad, staff operation, visitor response, tour design, to name a few. The railcar provided a dry run situation to flush out problems. Its success in doing that was due primarily to the fact that its scope and operating characteristics closely resembled the final system, i.e. we did not run a trolley-like bus on the streets and call it a 'demonstration project.'

\* Determining the type of car to operate in the final system. This dilemma was extremely problematical initially because there did not seem to be an ideal choice. For example, antique cars had the 'look' we wanted, yet they were difficult to find and buy; imported cars were possible, but they were not compatible with the City's architecture; new 'old' cars, our ultimate decision, were untried territory; furthermore, any car we ran had to be durable and easy to maintain.

\* Balancing the advice we got from our paid consultants and trolley fans. This constituted an on-going dilemma for two reasons: the two groups often had differing opinions, much as architects and contractors differ and, we needed information from both to fully develop a 1984 system with a 1902 style.

\* Developing a working relationship with the Boston and Maine railroad. The B&M has operated on the Lowell tracks for 150 years and has complete control over them. Our ability to also become an operating entity required many months of negotiation. Problems continue to arise today when we need to make changes to the tracks or within the right-of-way. The B&M has to approve every action and determining who makes the approvals and how to influence their decisions remains a challenge today.

\* Adapting the project schedule to the federal fiscal year cycle and to the uncertainty of continued funding. The dilemma we faced from the beginning of the project was whether or not to take the risk and start part of the construction, knowing that the next phase might not be forthcoming. Even though a strong Congressional delegation virtually assured that funding would continue, we developed a strategy to increase the chances of yearly funding. We justified additional funding requests by stating that they were necessary to protect the investments already made in the trolley system.

The five sections that follow demonstrate how each of these factors influenced the Lowell Park Trolley and will illustrate the often convoluted path we followed to implement the project.

### 2.1.0 The Rail Demonstration Project

The goal of the demonstration project was spelled out in a 1979 memorandum written by Mr. John Debo, Assistant Superintendent of the Lowell National Historical Park, "To demonstrate the feasibility of using Lowell's existing rail lines for the purpose of transporting Park Visitors by trolley car." This was the first step towards implementing the transportation program that was legislated by Public Law 95-290 and envisioned by the authors of the Brown Book (please refer to the discussion in Chapter 3). Mr. Debo, working with Sarah Peskin, Planning Director, for the Lowell Historic Preservation Commission, wanted a project that could be started right away to give practical answers to some of the questions inherent in a full-fledged Park trolley system. He cited in his memo the need for a car that could transport at least 25 passengers (the number of people on the Park tours), was either self-, horse-, or locomotive-powered, and whose operation could resolve these issues (1):

- \* safety of the tracks for passenger service
- \* safety at the road crossings: trolley/automobile conflicts
- \* insurance liability
- \* legal and institutional arrangements, including the Boston and Maine right-of-way and conflicts with their freight deliveries
- \* routine maintenance and over-night storage
- \* procurement and availability of equipment
- \* operational requirements for National Park Service staffing
- \* handicap access

The overall goal, of course, was to provide the public with an interesting ride that was complementary to the park tours and would transport visitors to points of interest within the park.

The second step after establishing these parameters for the demonstration project was to find a vehicle that met the criteria. The Park Service found such a car, a 1915 wooden passenger rail car equipped with an automobile engine that drove the wheels--the subject of an early patent--at the Stasburg Railroad Museum. The car was non-operational and badly in need of restoration and its repair was beyond the capabilities of the Museum personnel. Mr. Debo worked out an arrangement whereby the Park paid the Museum to repair the running equipment and the Park restored the interior and exterior in exchange for its use for the next four visitor seasons, 1980 to 1983. In Lowell, the car, named "The Whistler" after the Lowell-born painter, was draped with bunting and unveiled on Memorial Day 1980. The demonstration project was underway.

The project was not intended to resolve some of issues that revenue systems face: is the ridership there, how much will people pay to ride, how will land uses be affected, will it enhance downtown revitalization, and if so, how? The General Management Plan (please refer to the discussion in Chapter 3) predicted that by 1990, there would be between 700,000 and 1,000,000 visitors annually to the park, based on a study of eleven comparable parks. (2) Therefore, planners assumed that the park had a built-in audience and, since fee structure was in flux and it was uncertain whether or not fees charged by the National Park Service would go directly to the General Treasury, the NPS did not charge for the rides. Furthermore, the operational arrangements had to be resolved first before determining whether or not the trolley system attracted attention on its own or contributed to revitalization efforts.

Mr. Debo and the National Park Service solicitor negotiated a temporary agreement with the Boston and Maine railroad for joint use of the tracks that



set a precedent for union, track repair, insurance, and logistical arrangements that were incorporated into the permanent lease agreement.

It gave the visitor services staff four years of experience in working out the details of visitor tour programs and incorporating the car's history into the interpretive program. The maintenance staff demonstrated that they could keep the antique car running seven days a week. By October 1980, there had been 56,712 passenger trips on the rail car and informal surveys concluded that people were beginning to come to Lowell for the barge and trolley rides--confirming the benefit of 'novelty' authentic vehicles.

We used the demonstration project to give credence to our ability to carry out a complex project as stated in the following excerpt from the Preservation Plan, the document describing the 10-year plan for the Lowell Historic Preservation Commission:

In May of 1980 a demonstration program...began operation...In its first week of operation the trolley carried 6000 people and is considered a great success. The demonstration project was an excellent example of the type of collaborative effort that is essential for realizing transportation goals. The City obtained all necessary permits and assisted with street crossings. The NPS provided \$35,000 to refurbish the car and is currently operating the system. The Commission contributed another \$35,000 needed to upgrade the tracks and helped to negotiate an agreement with the Boston and Maine Railroad (B&M)...The trolley service is expected to encourage visitors to leave their cars at an intercept parking lot for the duration of their visit.

(3)

We also wanted to build up a constituency for the trolley project while we were in the design and construction phase by having something close to the final system in operation. This also assisted us in the justification for additional funding. For example, the following statement about the

demonstration project was included in an April 1, 1981 "Summary, Trolley Engineering Services" to the Lowell Historic Preservation Commission members to justify additional consultant services:

A demonstration project using a self powered 1915 antique rail car proved to be a very popular part of the National Park program this past summer. The demonstration, which will continue as an interim service until the electrified system is put into place, was intended to test recommendations contained in a feasibility study completed in 1979 by Storch Associates and Gordon Fay Associates. Based on the success of the project, the Commission and National Park service are proceeding with design and engineering for the expanded system. (4)

This demonstration project was successful because its parameters were designed to investigate the problems that would be incurred in the final system. It would have been of little benefit to run a rubber-tired 'trolley' bus on the city streets to help work out a lease agreement with the railroad. Nor would it have worked to use horse-drawn buggies that held four people to assist the staff plan Park tours. And finally, because we could keep it for so long, it provided a tangible link between planning and implementation.

## **2.2.0 The Availability of Operating Equipment**

### **2.2.1 The initial search**

The source and type of cars for the Lowell Park Trolley were the most crucial issues in planning the system because of the cars' high visibility. This section will show why we chose to build the electric cars that now operate on the system.

While the Strasburg Railroad Museum personnel were restoring the "Whistler" for use in Lowell (Winter, 1980), we began a search for electric trolley cars to operate in Lowell. From the feasibility study prepared in 1979

by Storch and Associates, we knew that antique trolley cars of various styles were possibly available from trolley museums, transit systems and from Europe, primarily Portugal. Our search was aided by the engineering consultants, Louis T. Klauder and Associates (see the following section for the details of their involvement), who had been selected for the implementation phase of the Lowell Park Trolley.

In March of 1980, John Woodman, a Scottish economist and trolley car aficionado, contacted the Commission with an offer to sell eight European trolley cars he owned in Brussels, Amsterdam, Rotterdam and Vienna. Our enthusiasm was sufficient to send an engineer from Louis T. Klauder to Europe to investigate the cars and to convince the Lowell City Council to appropriate \$95,000 to ship them to Lowell.

A June 24, 1980 article in the Lowell Sun stated engineer's less than positive findings:

- \* the capacity on some vehicles was only 20 passengers
- \* they could operate in only one direction; we needed them to be propelled from either end
- \* they had been modernized to disguise their historic features
- \* their tramway wheels would have to be replaced before they could operate on the B&M tracks (5)

We also found out that the cars were not really owned by Mr. Woodman, in spite of his claims. In any event, had we been able to purchase the cars, it would have been difficult to maintain and operate the system and the vehicles would have looked very out of place in a 19th century New England city.

The incident spurred a new, comprehensive search for cars. In a July 18, 1980 memorandum, "Trolley Equipment: Goals and Strategy," I spelled out the requirements: durability, 1900-30 style, simple to maintain American-type running equipment, and seating capacity of 50-60; our opportunities: foreign countries, lease or purchase from museums, purchase from the MBTA and build "from the wheels up" using salvaged running equipment; and finally, the strategies for acquisition: investigate all the opportunities, evaluate and proceed.(6)

All but the last option was eliminated because museums did not want to sell their vintage cars, long term leasing was not practical, and the MBTA equipment turned out to be difficult to maintain and not the right style.

### **2.2.2 The build-new option**

We determined that the foreign country route was really not feasible with one exception: the Melbourne and Metropolitan Tramways Board in Australia was taking several hundred 1920's vintage trams out of service. The running equipment was mostly General Electric and Westinghouse design and was the type commonly used in U.S. trolleys.

The result of the equipment analysis showed that the preferred option was to "Build new 'old' cars on salvaged running gear." where the only disadvantages to this approach were: "few firms have expertise to build cars; may take 6 mo. to 1 yr. to build each car [and we] May have problems piecing running gear components together." The advantages were that all the running equipment could be obtained from Australia and was compatible with the freight tracks, all cars would be identical mechanically and of known technology,

THE NEW CAR, #1601, BUILT FOR  
THE LOWELL PARK TROLLEY BY THE  
GONALD CORPORATION.



plans for vintage cars were available, and we could "build as many cars as needed." (7)

We adopted this approach officially in the fall of 1980 by stating in the Preservation Plan, "The cars are to be reconstructions or [as a back-up] selected from...New England area trolley museums." (8) and sending a funding request memorandum to the Commission: "Items for which funds will be needed soon are...for preliminary engineering and design for the electrified system and reconstruction of trolley equipment." (9)

By July 1982, the four sets (two for use in cars right away, a third for a later car and one set for spare parts) at \$7,500 of Australian equipment had been purchased and delivered to the Commission; the technical specifications for the car had been completed for a generic open summer car, circa 1902, and the bid period was underway for the construction of the 'build-new option.' We received eight bids, with a range of prices from \$190,000 (this bid was eliminated for technical reasons) to \$800,000 for one car.

The contract for the construction of one 15 bench open trolley car was awarded to the GOMACO Corporation in September 1982 for \$225,000 for the first car and an option for the second car at \$190,000 to be exercised by December 15, 1983. It was an opportunity that was literally the luck of the draw: the GOMACO Corporation was, in contract terminology, the "qualified responsive" low bidder and we had to accept its bid. At the pre-construction conference in October 1982, all parties, including the president of GOMACO, Harold Godberson, agreed on the goal of an "authentic reproduction." It was serendipitous that he accepted the challenge of recreating an open car and to call upon the necessary craftsmen to accomplish it. His willingness to work

out all the details was the most significant breakthrough in the Lowell Park Trolley.

### **2.3.0 Engineering Consultants and Trolley Fans**

We needed assistance from two sources of information during the process of developing the Lowell Park Trolley: paid and unpaid, i.e. engineering consultants and trolley (or more accurately, street railway) fans. The consultants were hired through the federal Architect and Engineering solicitation and selection process. The latter group included people with both technical and historical expertise who offered assistance or from whom we sought advice in an effort to learn what a 1902 trolley system looked like. The dilemma we faced during this process was how to balance the cost-effective approach of the consultants with the 'purist' approach of the fans.

The engineering firm of Louis T. Klauder and Associates (LTK & A) of Philadelphia was hired in 1981 to prepare the technical specifications for the trolley cars, the overhead electric system and track work. Through a series of contract modifications for construction monitoring and testing services, the contract is still in effect as of Spring of 1985 and has increased from the initial \$61,000 to \$130,000 or about 15% of the \$870,000 construction budget for the basic system.

When the contract was signed, LTK & A was to prepare "modified performance specifications for a thirteen to fifteen bench, double truck open trolley car representative of the type which used to operate in the Lowell area." This approach attempted to combine the goal of constructing "historically accurate trolley cars" and allowing "a contractor reasonable leeway in the car construction" so he would have some flexibility in incorporating the salvaged

running equipment into the cars. Later in the Summer and Fall of 1981, we changed our minds about this approach. (10) We realized that we were going out for bid for a car whose appearance seemed much too dependent on the whims of a contractor. Since we would have no choice in the contractor, we feared a worse case: a hodge-podge car. Thus, in October, we redefined the technical specification from the "representative" car to a specific car, identified by its original equipment roster number, 1597, initiating a conflict with LTK&A.

In an October 8, 1981 memorandum to Mr. Debo and Ms. Peskin, I made an argument for making the style decision then rather than later. I stated our desire for a car specification that "leaves very little to interpretation by the car builder." (11) LTK & A responded by stating that "we appreciate John Debo's concern that a single type of car should be specified to avoid possible misinterpretation by the potential carbuilders but we believe that that is what we have done in the draft specifications now in your hands." (12) In November letter to LTK & A, I transmitted our comments on the technical specification and stated, "The comments also reflect the decision to define a single car for reproduction, namely number 1597." (13) This decision obviously affected the car's appearance, but more importantly, gave rise to a policy that directed decisions from then on: the cars are to be authentic reproductions as a rule, with deviations being the exception.

On November 13, 1981, LTK&A responded:

At the time of our Contract negotiations it was our understanding that the open trolley design was to be an historically accurate representation of one of a number of appropriate types which operated through Lowell around the turn of the century over routes of various operating companies. The object of this approach was to develop general performance specifications which would



allow the potential carbuilders a wide range of design possibilities based on available skills and hardware.

Over the course of the summer it appears that this direction was somewhat changed and we are now at the point where a single specific car, # 1597, of a specific operating company, Eastern Massachusetts Street Railway, is desired. (14)

By February 1982, the technical specifications were completed. In a letter to the Commission, LTK & A estimated that the Commission would pay a premium of \$15,000 per car for the 'exact' carbody than for a generic open car. (15) A specific car would require patterns and molds for reproduction while a generic car's production would be less exacting. In fact, their prediction was correct.

When the car contract was awarded in September 1982, several trolley fans located excellent photographs of 1597 and an identical car, 1600, that became valuable references for hardware, proportions and painting details. Mr. Edward Blossom, Dushore Car Company in Pennsylvania, donated seat brackets for casting models, Seashore Trolley Museum donated bench posts, seat ends, curtains and other items to use as patterns. Mr. John Barr, a former Lowell street railway motorman, donated memorabilia and gave us an historical perspective of the Lowell street railway systems.



1577, BUILT IN 1902

THE ORIGINAL CAR USED AS A MODEL FOR  
THE LOWELL VALLEY TROLLEY CARS

The painting scheme was determined by Mr. Theodore Santarelli, a banker and Trustee of the Seashore Trolley Museum and the color of 1601 was determined by scraping eleven coats to find the original paint on an original bench end owned by a local rail fan.

We soon found that having too many experts gave us many differing opinions that had to be balanced with the reality of constructing a trolley car within our budget. For example, historically, the walking surface was individually cut and installed in wooden wear strips--a highly labor intensive task. We compromised, against the advice of the museum representatives, with grooved boards that were easier to make, to install and that would last longer.

Another example involves the handicap access. Most rail fans did not support our installing wheelchair tie-downs on each end of the car because there was no historical precedent and it required altering the appearance of the front bench ends.

After the cars were completed, one person observed that the curve on the seat bottoms was not correct; another pointed out that the ceiling molding was not cut accurately. Most fans now agree that the results of the Lowell Park Trolley are admirable.

#### **2.4.0 The Boston and Maine Railroad**

Two out of the three key components of the Lowell Park Trolley are owned and operated by the federal government: the cars and the overhead electrical system. The industrial spur railroad trackage and right-of-way upon which the Lowell Park Trolley operates, however, are owned by the Boston and Maine Railroad (B&M) now a division of Guilford Transportation Industries

Companies. The railroad has served the Lowell mills for about one hundred and fifty years and now makes one daily delivery to the Courier Corporation, manufacturer of telephone directories (please refer to the map in this chapter). It is this ownership that has posed the most constraints and has shaped the trolley's operations more than any other single factor.

The basic dilemma we faced is how to integrate an independent, non-freight, non-railroad operation into an extremely complex system of rules and regulations. It is a situation where two institutions with completely different styles, customs and products to deliver are attempting to operate in the same place at the same time. The railroad has more than a century of procedures that are highly specialized while the National Park Service has never been in the street railway business and was only beginning to develop its procedures. In fairness to the B&M, the management has always supported the Lowell Park Trolley, but this support is not always readily translated into compromises to accommodate our operations.

Over the last four years of working with the B&M, first with the demonstration project and then with the electrified Lowell Park Trolley, three issues have arisen--the lease agreements, work in the right-of-way, and the special problems of combining a freight service with an overhead electric line--that illustrate the relationship between the B&M and the Lowell Park Trolley.

#### **2.4.1 Lease Agreement**

One of the objectives of setting up the demonstration project with the self-powered rail car was to develop the terms of temporary and permanent operating agreements with the B&M. The temporary agreement granted a

license for the May to October visitor season and spelled out the type of trolley car, hours and dates of operation of the trolley car, section of trackage to be used, improvements and maintenance to be made by B&M and reimbursed by the National Park Service, operating and emergency procedures, and liability coverage for the B&M, also reimbursed by the National Park Service. Most crucially, it set forth the basic principle of joint B&M and Lowell Park Trolley operation, that the tracks must be cleared of one before the other operates. (16)

The terms of the permanent lease were developed over months of negotiations among 1) Mr. John Debo, representing the Lowell National Historical Park, 2) Abner Cooper, Esq., for the Office of the Regional Solicitor, Department of the Interior and 3) Trustees of the Boston and Maine Corporation. The lease went into effect in 1983 and is renewable for five five-year periods. Its cost is made up of three components, insurance, basic rental and maintenance costs, with the latter two escalating at 8% per year. While a lower rate of escalation would have been preferable, the agreement did accomplish one goal for the Park, namely securing a reasonably permanent interest in the right-of-way. Mr. Cooper wanted assurance that our capital improvements (the car and the electrical system) would be used for at least 25 years.

Prior to negotiating this agreement, the Park and Commission staffs attempted an alternate strategy: to convince the B&M to sell the spur trackage to the government with the proviso that it would continue to serve its customer. At the time, the B&M was in bankruptcy proceedings and the trustees did not want to divest themselves of a potential asset when a new owner was likely. The issue was not pursued again until 1985 when management representatives indicated that the railroad might be a willing

seller. Government purchase would put the Park squarely in the railroad business in addition to the park business, a situation that the Solicitor's office cautions against. For the foreseeable future, then, the lease will be the basis for the relationship between the Lowell Park Trolley and the B&M. Please refer to Appendix 1 for the text of the lease.

#### **2.4.2 Track and right-of-way work**

The B&M, owner of the track and right-of-way, has reserved the right to do any and all work on its property, primarily due to pressure from the railroad unions. One of the on-going challenges of the Lowell Park Trolley-B&M relationship has been to work out smooth procedures for getting certain maintenance and repair work done in order to keep the trolley running safely. Depending on what the work involves, the B&M can elect to do it themselves or can authorize the Park or Commission to contract for the work or to do it with in-house staff. In any event, we notify the Engineering Division before any work is done, e.g. regauging, switch repair, sign installation, overhead line installation, etc. If the B&M does it with railroad personnel, the Commission prepares the specification and the B&M gives us a cost for doing the work. The B&M costs are generally negotiable. If they determine that one of the government's contractors can perform the work, then we pay the B&M for review of our plans, for field inspection, insurance for our contractor, and for flag men if necessary. The contractor must also sign a separate contract with the B&M whereby he agrees to abide by B&M requirements for work done in the right-of-way. If Park crews do the work, then a separate contract is not required.

The construction of the loading platforms was a typical situation where the B&M had the right to perform the work, but opted not to. We wanted the

platform to be simple wood plank construction, 50' long and about 10' wide adjacent to the B&M's right-of-way. The railroad's Engineering Department determined that they would build them at a cost of \$34,000 for five such platforms. (17) The National Park Service could build them for \$7,000 using in-house employees. The B&M allowed the Park crews to build the ramps because the platforms would eventually be turned into handicap ramps, a more complicated item than the B&M could build within our timeframe.

The problem facing the Park and the B&M now is the need for more standardized procedures dealing with the interface between the two so the Park can perform certain routine maintenance tasks without official permission from the B&M. The Park has proposed that some work, such as platform repair, be included in a supplemental agreement so it could be performed regularly without the delays that are currently experienced in obtaining approvals.

### **2.4.3 Operating an electric trolley**

The overhead line system was located within the B&M right-of-way and thus the plans and specifications required its approval. The 'overhead line' is a copper wire strung about 18-19' above the tracks and is supported approximately every 100 feet by either metal or wooden poles. The electric current goes along the wire, down through the car via the trolley pole and returns back to the power source via the tracks. Rail bonds, short copper cables, are installed to bridge the gap between rail sections to insure efficient current return. The B&M's primary concerns were the horizontal and vertical clearances as well as the safety of their employees *v/s a v/s* the electric line.

This brief example illustrates the give-and-take between the B&M and the Commission and Park that occurred during and after the implementation of the Lowell Park Trolley and may suggest a strategy for dealing with other railroads.

The B&M initially informed us that the vertical clearance between the top of rail and any structures, including the electric wire, had to be 22' 6" according to the American National Standard, 1981 edition, rule 232. The engineers preparing the overhead line specifications, believed that this was unreasonably high--there is a 17' bridge leading into the city and MBTA wires are rarely higher than 18'6" (apparently an exception to the ANS). However, it wasn't until the car was under construction that we discovered that the Australian-supplied trolley poles, the long rod that connects the car with the overhead wire, would only reach to 18'6" without stressing the roof of the car. They would not reach 22' at all.

To avoid buying new poles and redesigning the roof--and compromising the historical appearance--we appealed this requirement in a letter to the B&M which included factual arguments, "Furthermore, it is our understanding that current railroad practice does not require personnel to walk on top of freight cars and that ladders allowing this have been eliminated..." and noted that the lease required freight cars off the tracks when the system was energized.

(18) The railroad reinterpreted the rule 232 and in an internal letter from V.R. Terrill, Vice President- Engineering, allowed the lower height on the condition that we install a fail-safe warning light at the juncture point between the electrified track and the in-coming freight track. (19)



In addition to the warning light requirement, the B&M required a specific procedure for daily start-up of the Lowell Park Trolley: "...the trolley conductor call Lowell tower or the appropriate dispatcher before going on the line to assure that there are no freight vehicles or B&M inspection units or any on-track equipment on the line before they energize the system.... We should also ensure that the Transportation Department has a bulletin covering both of these items." (20)

We spent about \$9,000 to finally obtain this approval: changes in specification, \$2,000; design and fabrication of the fail-safe light, \$5,000; and review of design and field inspections, \$1,932. In this case, each institution 'gave' where it could: the cars would have been unseable had the B&M not lowered their overhead wire requirements; however the safety of the B&M employees was at risk had we not installed the warning light. The lesson for future cases is that each agency can compromise in order to protect the operations or the safety of the other, but it will not compromise when its own operations or safety are at stake.

#### **2.4.4 Conclusion**

The above discussion points out that the B&M ownership has influenced practically every aspect of the Lowell Park Trolley and we have learned that railroads do not take lightly the use of their tracks by 'others'. Specifically, the thrust of the B&M's influence has been to institutionalize the separation of freight and trolley operations so that they never operate at the same time on the electrified tracks.

Over the last five years, the Commission and Park have succeeded in establishing good relationships with the engineering, lands, labor relations

and maintenance shop divisions that have made it possible to implement the Lowell Park Trolley and clearly, the trolley project is supported on the executive level as well. However, an institutional problem still remains: the B&M is a cumbersome organization with fairly autonomous departments; decisions are not made quickly and the work done for the Lowell Park Trolley is often bumped for higher priority projects. The net result has been complicated approvals, leasing costs that escalate at 8% per year and significant amounts of time delays required for the B&M to complete the trolley-related track work. This has lead the Commission and the National Park Service to reopen the issue of purchasing the trackage used by the Lowell Park Trolley and this option will be seriously explored with B&M in the next year.

### **2.5.0 Federal Funding for Lowell Park Trolley**

The entire Lowell Park Trolley capital development and operations have been funded with federal funds obtained through annual Congressional appropriations for the Lowell Historic Preservation Commission and the Lowell National Historical Park; the Commission funded the development and the Park funded the operations. From fiscal year 1979 to 1985, lobbying efforts on the part of the Massachusetts delegation were successful in obtaining almost \$14,731,000 in Congressional appropriations for the Commission and \$14,381,000 for the Park. (21) Table 2-1 is a summary of the Commissions' development budget and funding for the Lowell Park Trolley and shows that from 1979 to 1984, the development costs were \$1,058,000. (22) The development costs obligated as of June 1985 are \$82,663 for engineering services for the third trolley car and track and overhead line extensions. We anticipate obligating an additional \$250,000 for the third car in fiscal year

## Federal Funding

### Table 2-1

Summary of the Lowell Historic Preservation Commission Development  
Budget and the Funds Used for the Lowell Park Trolley

Fiscal Year	Total Development Appropriations Received from Congress	Development Funds Used for the Lowell the trolley	Funded Items
1979	\$500,000	\$30,000	feasibility study
1980	933,000	67,000	track upgrading
1981	2,500,000	3,208 41,000	feasibility study salvaged equip- ment purchase
1982	580,000	225,000	trolley car 1601
1983	1,850,000	35,000 190,000 309,000	track upgrading trolley car 1602 overhead line
1984	2,610,000	136,743  15, 000	engineering for total system* platforms
1985	5,758,000	10, 000  72,663	third car engineering extensions engineering
TOTALS	<u>\$14,731,000</u>	<u>\$1,134,614</u>	

\*total for 1982-84, included car and overhead line engineering

1985, bringing the total 1979-1985 trolley development costs to \$1, 381,400 or about 9% of the Commission's total appropriations.

While the Congressional delegation, primarily through the work of Senator Paul Tsongas and Representative James Shannon, has been successful beyond all expectations in bringing federal money to the Park and the Commission, we were uncertain from year to year whether or not the budget as requested would be approved. As is the case with every federal agency, we could have been funded to build part of the system one year and not receive funds in subsequent years to complete it. Fortunately, however, all our budget requests were approved.

One alternative to the 'incremental' budget requests discussed in Chapter 3 that might have minimized this uncertainty would have been to sequentially structure the two major project components, engineering and construction. For example, by completing all the engineering first then putting the cars and the overhead line system out for bid at the same time, we could have had only two major budget requests to make for the trolley. This "all the eggs in one basket" approach was a gamble because each request would have been so large and we could have lost everything. If we had received partial funds, which is exactly what we did receive, we would have to stagger the work anyway.

Our strategy was that the Commission was much more likely to be funded incrementally than all at once and that the "one basket" approach was actually the riskier avenue. As a result, the Commission had a continuous stream of obligations (to assign funds to a specific project) from 1979 to 1985 and justified each year's request on the success of the previous one and the

probable detrimental effect if the next request was not approved. The net result was that the cars were built before the overhead line was constructed and the track upgrading was complete before the cars were on line, but all components evolved into the Lowell Park Trolley by May 26, 1984.

**Footnotes**

## Chapter 2

1. John Debo, Memorandum, November 1979.
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3. Lowell Historic Preservation Commission, United States Department of the Interior. Preservation Plan (Lowell, MA, 1980), p. 57.
4. Lowell Historic Preservation Commission, United States Department of the Interior. "Summary, Trolley Engineering Services." April 1, 1981.
5. "European trolleys out, alternatives sought." Lowell Sun, June 24, 1980.
6. Nancy Bellows. Memorandum, "Trolley Equipment: Goals and Strategy," July 18, 1980.
7. "Attachment A, Summary: Sources of Trolley Equipment." Memorandum, "Trolley Implementation Schedule and Costs, August 14, 1980.
8. Preservation Plan, p. 57.
9. Sarah Peskin. "Status of the Trolley System, Memorandum to the Planning Committee." November 13, 1980.
10. Louis T. Klauder and Associates. "Part One--Trolley Car Specification, Suggested LTK&A Deliverables." April 6, 1981.
11. Nancy Bellows. Memorandum to John Debo, Sarah Peskin regarding car style, October 8, 1981.
12. Louis T. Klauder and Associates. Letter to the Lowell Historic Preservation Commission, October 8, 1981.
13. Lowell Historic Preservation Commission. Letter to Louis T. Klauder and Associates, November 3, 1981

14. Louis T. Klauder and Associates. Letter to the Lowell Historic Preservation Commission, November 13, 1981
15. ----- . Letter to the Lowell Historic Preservation Commission, February 3, 1982.
16. "Agreement between the National Park Service and the Boston and Maine Corporation." April 22, 1981.
17. "Estimate to install 5 passenger platforms." Boston and Maine Engineering Department. September 4, 1983.
18. Lowell Historic Preservation Commission. Letter to the Boston and Maine Railroad, April 14, 1983.
19. "Clearances for the Lowell Trolley Line to be operated by the Lowell Historic Preservation Commission." Memorandum to W.J. Rennie from V.R. Terrill, Boston and Maine Railroad. April 22, 1983.
20. "Clearances for the Lowell Trolley Line."
21. "Summary of Lowell National Historical Park and Lowell Historic Preservation Commission Funding Projects, February 11, 1985."
22. "Trolley Project-Budget History 1979-1984." Sarah Peskin, Lowell Historic Preservation Commission.

## **The Development of Policies for the Lowell Park Trolley**

### **3.0.0 Introduction**

In June 1985, the Lowell Park Trolley consisted of two open 1902 vintage trolley cars and about 6,000 feet of electrified track; it is a unique and unusual system for the federal government to own and operate. It is a project undertaken by two cooperating agencies in the U.S. Department of the Interior, the Lowell Historic Preservation Commission and the National Park Service, Lowell National Historical Park. The project was paid for with 100% federal funds that were appropriated directly to these agencies. Since no funds were received from the Urban Mass Transit Administration (UMTA), we were able to avoid much of the red tape that complicates other transportation projects. As discussed in the previous chapter, the newly formed Commission was the lead agency for the development and was able to use a streamlined process for project implementation; it also had a 10-year life span with a list of specific projects to complete during this period. It is within this context that Chapter 3 will present the background for and process of development of policies for the Lowell Park Trolley.

Specifically, I will examine the history of transportation in Lowell and how visionary planners in the mid-1970's developed this as an interpretive theme for the future Lowell National Historical Park. I will then examine the legal framework for the park and trolley system and how, from this we formulated policies "as needed" to shape the system. I will discuss what these policies



were and how we wrote our planning documents to reflect them and to set the stage for future development of the system. To illustrate that the relationship between the policies and the process of development was quite non-linear, I will highlight some of the key factors that shaped them, including the Park and Commission staff and the federal funding cycle. Finally, I will argue that our decisions and the decisions we requested that our superiors make were rarely "big picture" ones; more often they were small commitments that required the work of others down the road for full implementation. This is an example of the disjointed incrementalism theory of decision-making and I will show that under the circumstances this was the most effective and realistic approach to implement the trolley system.

A brief review of the history of the development of the Lowell National Historical Park and the Lowell Heritage State Park, is necessary to put the Lowell Park Trolley into perspective as one of many components of the overall revitalization scheme. Lowell has a rich heritage as the nation's first planned industrial city with many historical buildings, canals and artifacts still standing. These structures, their preservation and the people that live in the city are the backbone of the successful revitalization. The electric street railway disappeared decades ago from the city streets and its return was conceived of as complementary to preservation efforts of other 19th century artifacts. The fact that it did turn out to be an important, visible element will be demonstrated throughout the thesis.

The idea for national park grew out of Lowell's Model Cities program that developed a set of objectives around which downtown and neighborhood revitalization could rally:

- \* use of the city as a learning laboratory

- \* improvement of the environment to reinforce its historical aspects
- \* increased respect for the cultural heritage of Lowell's people
- \* preservation and enhancement of historic resources as a strategy for economic revitalization (1)

In 1971, the Human Services Corporation was established by the city to develop programs that carried out the objectives. In 1972, with the momentum increasing, the City Council adopted a resolution designating the cultural park concept as the "focal point for local planning efforts." (2) These actions were lead by Dr. Patrick Mogan, a Lowell educator, former Congressman and Senator, Paul Tsongas, and Frank Keefe, as former Director of the City Planning and Development Department; their vision ultimately had major impacts: the establishment of the Lowell National Historical Park as a means of attracting millions of federal funds and stopping local attempts to tear the mill buildings down and fill the canals. The latter efforts represented the deep-seated insecurity Lowellians had about their city--it was a place to leave, not to be proud of. As almost any one growing up in Massachusetts will attest, Lowell in the '40's, 50's and 60's was tough and depressed, economically and physically.

The overriding goals of the City of Lowell and its supporters, then, were to develop strategies for economic development and revitalization. The city's physical and cultural resources were comprehensively inventoried and strategies devised developed for their preservation, interpretation, and use. Again, the Lowell Park Trolley was part of this vision; the following discussion will show how two of the agencies responsible for revitalization began to translate concepts into the real thing.

### 3.1.0 Origins of the Lowell Park Trolley

#### 3.1.1 Transportation as an Interpretation Theme

The Lowell Historic Canal District Commission issued a Report, known as the Brown Book, to the Ninety Fifth Congress that inventoried Lowell's historical and cultural resources, defined its national significance, the planning and restoration activities to date, and spelled out a set of site specific concepts entitled, "What would the Park be like?" It also defined agency involvement roles for the National Park Service, the Massachusetts Department of Environmental Management and an interim Commission, later named the Lowell Historic Preservation Commission. The Commission's goal was to convince Congress that "the creation of a Lowell National Cultural Park by Congress is the appropriate action for the federal government to take in order to preserve Lowell's historical and cultural resources and to interpret the city's special role in the American Industrial Revolution." (3)

Transportation was one of the interpretative themes because Lowell historically was a water, rail, and road hub for New England; today it is still served by a direct rail link to Boston and is at the intersection of routes 3 and 495 and not far from 93. In the late 1700's, the Pawtucket Canal was built as a route around the Pawtucket Falls so goods could be shipped down the Merrimack River to Newburyport. Later the Middlesex Canal was built as a direct route to Boston, but was put out of business when the railroad tracks were laid in the early 1830's. The railroad was faster--and did not freeze in the winter. Hydropower from the falls ran the mills, but railroads were crucial to their survival: the raw materials came in by train and went out as finished goods. Passenger travel to and from Boston via the train was lively with Huntington Hall as the city's terminus and lecture hall. The Lowell

Machine Shops, run by the father of Lowell's renowned painter, James Abbott McNeill Whistler, were distinguished for the locomotives built on the premises. Electric trolley service to surrounding towns starting in the 1880's, allowed them to develop as new bedroom suburbs; in the early 1900, service extended to communities all over Massachusetts and points beyond.

In order to translate this transportation heritage into something tangible, the consultants hired to write the Brown Book recommended barges and trains to move visitors around the park in two loops: the downtown canal loop and the outlying canal loop. In fact, the Brown Book stated that the "barge itself will be one of the most important interpretive devices in the park." (4) The downtown loop started at Swamp Locks, the main control point for the system, continued on to the lower Pawtucket Canal to the Lower Locks and out to the Concord River. At the Lower Locks, passengers could disembark onto a train back to the visitor center. The outlying loop did not include a train connection, but made a continuous ride on the upper Pawtucket (please refer to Map 3-1, Transportation Interpretation). The main goal was to provide water access to all the canals:

The Lowell canal system was one of the most impressive engineering achievements of 19th century America. Today, almost 125 years since its completion, the canal system is practically unchanged, a remarkably well preserved monument of our industrial heritage..." (5)

Trolley transit is mentioned only peripherally in captions to sketches. The vehicles are described as train engines and cars "...designed to resemble as closely as possible the appearance of equipment used on Lowell's first railroad." Since the route follows the existing tracks, it is in use today.

The Brown Book was an important guide to future implementation by crystallizing six key aspects of the transportation theme. While we did not incorporate all of them, they did provide the inspiration for our policies:

- \* the concept of park transportation being a combination of barge and rail vehicle forming continuous loops that used the canals and rails as organizing elements
- \* a rail connection between the Boott Mills and the Lowell Manufacturing Company (now called Market Mills) with a proposed extension to the Wannalancit Mill (Tremont Yard)
- \* the appearance of the rail vehicles: should resemble equipment that actually ran in Lowell
- \* the need for easement/rights for use of the railroad tracks
- \* the role of the vehicles as being interpretive devices
- \* the importance of transportation in the history of Lowell

### **3.1.2 The Legislative Mandate for the Lowell Park Trolley**

On June 5, 1978, Public Law 95-290 (see appendix 2) was passed "To provide for the establishment of the Lowell National Historical Park in the Commonwealth of Massachusetts." (6) It spells out Park boundaries, procedures, purposes, projects, and property that can be acquired, funding requirements, and the role of the National Park Service; it created the Lowell Historic Preservation Commission--an agency unlike any other in the federal system. The Brown Book was the basis for the law as seen in Section 1 (b):

It is the purpose of this Act to preserve and interpret the nationally significant historical and cultural sites, structures,

and districts in Lowell, Massachusetts, for the benefit and inspiration of present and future generations by implementing to the extent practicable the recommendations in the report of the Lowell Historic Canal District Commission. (7)

Under "Park Preservation Plan and Index," Section 302, (6 c), 6, the Commission was charged with the transportation responsibility. Specifically, it was to "provide for a transportation program by which the Commission shall provide, directly or by agreement with any person or any public or private entity, transportation services and facilities for park and preservation district visitors, including barge equipment, docking facilities, and local rail facilities" (8) Authors of the legislation gave the Commission this task because transportation programs are generally not within the scope of the National Park Service (refer to Chapter 1). In practice, the responsibilities worked out somewhat differently, but at the time the legislation was enacted, this clear-cut division reflected the cleanest way to achieve a visitor transit system.

The legislation sanctioned and, in fact, directed the Commission to begin developing a transportation system. What it should look like, what its specific goals were, how it should be implemented, and how the two agencies should cooperate were questions unanswered in the legislation. Wisely, it left these decisions to be formulated by the agency staffs. In 1980 and '81, the Commission staff hired an engineering consultant to prepare a feasibility study to determine exactly how to proceed; the Park staff investigated the possibility of a demonstration trolley project. Both staffs wrote major planning documents that described the policies and action plan to bring the street railway back to Lowell.

### 3.2.0 The Goals of the Lowell Park Trolley

The staffs of the Commission and the National Park Service, respectively, were required to write a Preservation Plan, completed in September 1980 and a General Management Plan, completed in August 1981, to comply with the legislation and to show how the provisions of the Act would be carried out. The primary responsibilities of the National Park Service "...will be historic preservation, historical interpretation, technical assistance for facade and structural rehabilitation, and the purchasing or leasing of certain historic structures for park uses." (9) The Commission's responsibilities emanate from the theme, "To tell the human story of the Industrial Revolution in a 19th century setting by encouraging cultural expression in Lowell."

Furthermore, it was to make preservation of historic structures possible by providing financial incentives, establishing a grants program for cultural activities, and carrying out specific physical projects identified in the Act. (10)

While the staffs of the National Park Service and the Commission were writing these compliance documents and detailing the specific projects we were undertaking, we were also implementing the first steps of the transportation program. ( Note: We were able to begin the implementation process under the auspices of a unusual 1979 legislative authorization; it is beyond the scope of the thesis to discuss it further.) The plans were actually a summary of what we had decided to do and were doing at that point in time. In other words, we were doing two things at once: the documents did have to be approved by the Secretary of the Interior before implementation began, but our strategy was to demonstrate that our proposals were valid because we could show that they

worked. The following sections describe how we got the transportation program underway and how the General Management Plan and Preservation Plan reflected our policies and actions.



### 3.2.1 Visitor Transportation, the Utilitarian side of the Lowell Park Trolley

These plans were more robust and credible because they described current actions that were successful--not just proposed actions and we believed that the successful action already taken strengthened our case for additional funds and demonstrated our ability to carry out the more complex long range plans. The eventual approval of the plans by the Secretary meant that the policies, goals, objectives of the transportation program were accepted as Department policies and we could proceed with the implementation. There was one catch: approval of the plans did not guarantee Congressional approval of yearly budget. All projects in the plans were subject to available funding, a fact that had considerable influence over the implementation process and will be discussed later in this chapter (please also refer back to Chapter 2).

In the section, "Transportation," in the Commission's Preservation Plan, we wrote that the agency's policy is one:

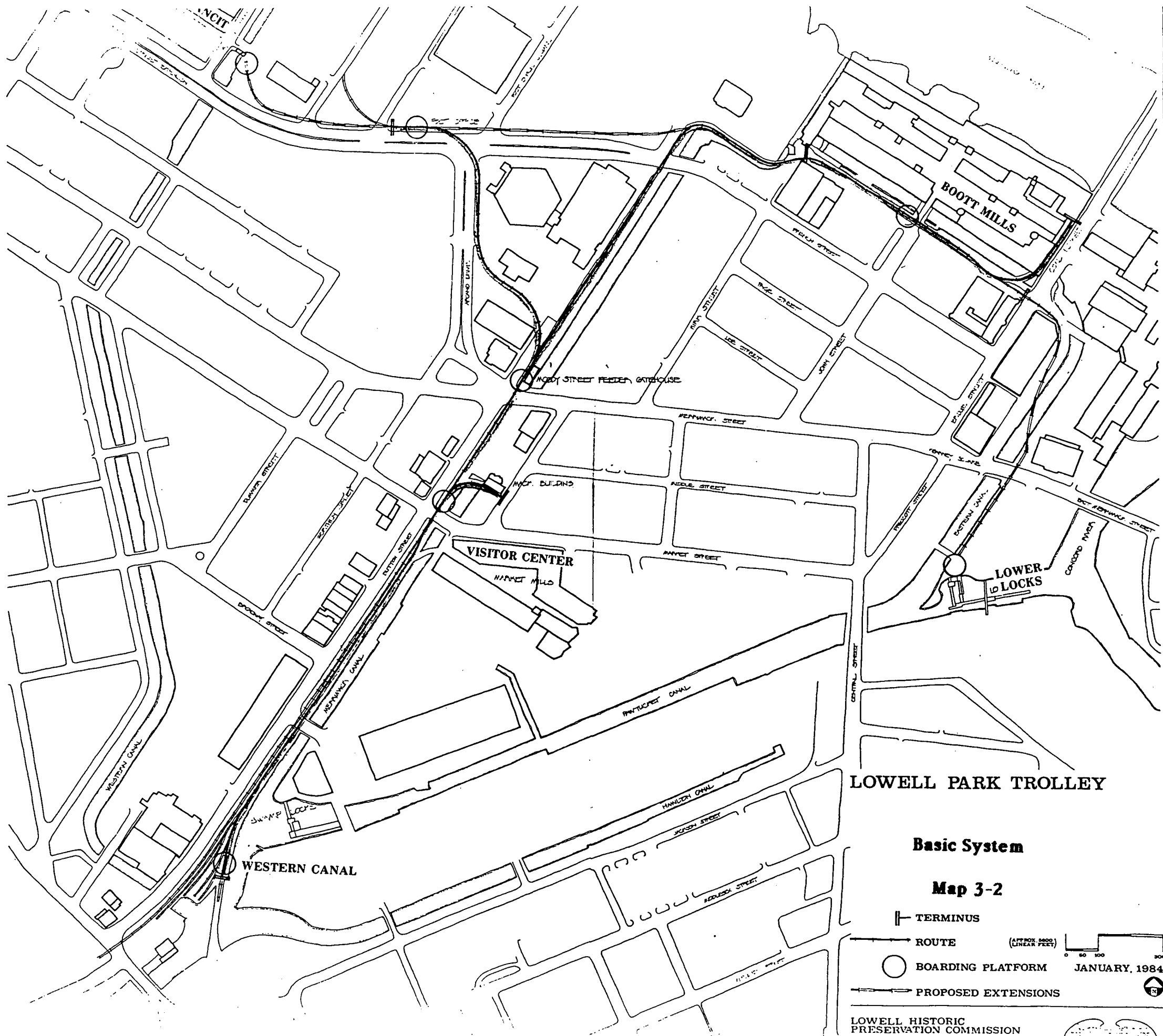
...that addresses the contemporary visitor needs and acknowledges that one of the essential characteristics of the 19th century environment of Lowell was its integration of industry, living and commerce into a lively and close knit urban fabric. An authentic transportation improvement effort must ensure that this fabric of streets, activities, and historic buildings is preserved and that the circulation needs of the park visitor mesh with the everyday needs of Lowell. For this reason, the Commission will focus on those transportation programs that stress making the Park "work" in its dense urban setting. (11)

To carry out this policy, we developed a three component-transportation

program: the legislatively mandated trolley and barge system, partial funding of parking garages and the pedestrian improvements needed to get people from the garages to various Commission and Park sites. We believed that unless the Commission was actively participated in parking garages, no other entity would build them because they are expensive compared to surface parking lots. As it turned out, parking and automobile access road improvements have been the two elements of the plan that the City of Lowell has been most active in providing, in order to support private development. To date, the Commission has provided design review but no funding for parking garages; the related pedestrian improvements have not been necessary.

The staff justified all these elements of the transportation program on the basis that they would help to mitigate the negative impact of heavy traffic and a parking shortage on the quality of the downtown experience. Put another way, the Commission wanted to protect its investment in the physical and cultural life of Lowell from the ravages of automobile congestion.

To make sure we were doing our part to reduce congestion from visitors to the Park, we had to woo visitors from their cars and into vehicles to take them on tours of the Park; this was the utilitarian side of the Lowell Park Trolley. The "authentic" transportation was, of course the trolley, or street railway and our objective was to use historic trolleys on the Boston and Maine railroad freight track, as described in the Brown Book, to link the mill interpretive sites in the Park. In addition to the basic system in use today, we described three proposed extensions which are being engineered as of this writing. When these extensions are complete, all the components of the Park, mills, canals,

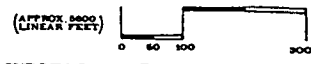


**LOWELL PARK TROLLEY**

**Basic System**

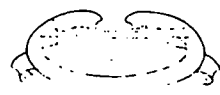
**Map 3-2**

- TERMINUS
- ROUTE (ARROW SHOWS DIRECTION OF TRAVEL)
- BOARDING PLATFORM
- PROPOSED EXTENSIONS



JANUARY, 1984

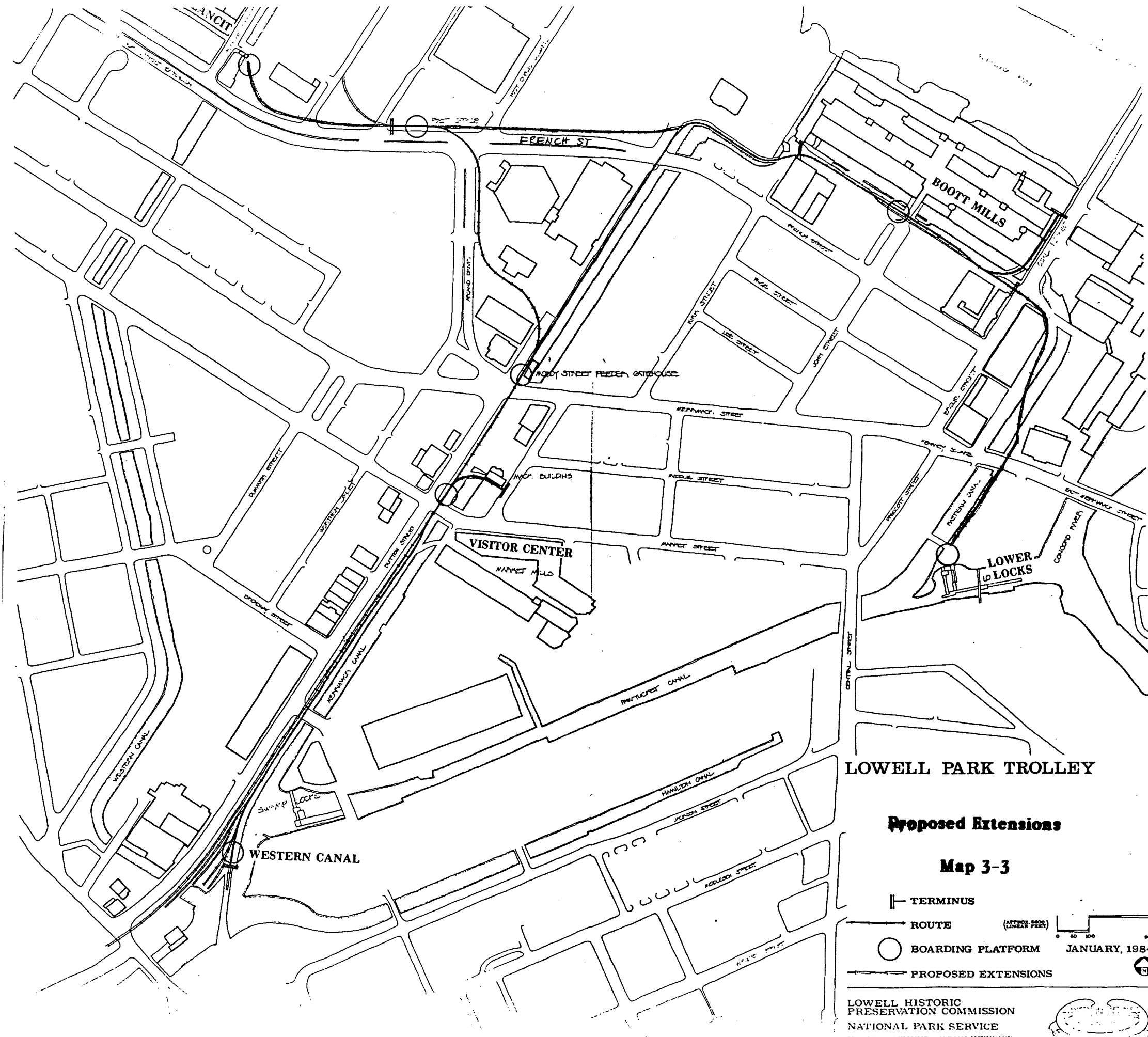
LOWELL HISTORIC  
PRESERVATION COMMISSION  
NATIONAL PARK SERVICE  
U.S. DEPARTMENT OF THE INTERIOR



lock structures, etc., will be accessible by either trolley or barge, and only the main downtown streets will require walking.

The General Management Plan, written by Lowell National Historical Park staff, factually describes how visitors can get to the park via public and private transportation, where they can park their cars, and how they can get around the park via barge and trolley. The approach is very matter-of-fact and utilitarian and reflects the reluctance of the staff to promote visitor transportation systems as ends in themselves. For example, the GMP states that "Other means [than the automobile] of circulating within the park--shuttle buses, trolleys, canal boats, bicycles, or on foot--will be encouraged by the Park Service...The use of shuttle buses and trolleys will be promoted by the Park Service." (12) The GMP also states that the Commission will provide development costs for implementation and the Park Service will operate the system.

Under a section on "Recreational Activities," the GMP comes closest to linking the trolley system to something more than just a means of circulating visitors: "Recreational activities will complement interpretation of the park. Visitors will be able to take advantage of...boating in portions of the canal system, and riding trolleys." (13) This rather dry description of the trolley system served a public function of demonstrating that the Park Service was not over-emphasizing the transportation component (note the discussion in Chapter 1 on this subject). It did not, however, represent the staff's intense interest in the historical interpretation potential of the car or the level of their involvement in the planning, policy-making and implementation of all aspects of the Lowell Park Trolley.



FRANCIS

FRENCH ST

BOOTT MILLS

WOOD STREET FEEDER GATEHOUSE

VISITOR CENTER

MARKET MILLS

LOWER 10 LOCKS

WESTERN CANAL

LOWELL PARK TROLLEY

Proposed Extensions

Map 3-3

TERMINUS

ROUTE

(APPROX 8000 LINEAR FEET)

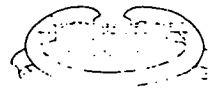
○

BOARDING PLATFORM

PROPOSED EXTENSIONS

JANUARY, 1984

LOWELL HISTORIC  
PRESERVATION COMMISSION  
NATIONAL PARK SERVICE  
U.S. DEPARTMENT OF THE INTERIOR



### **3.2.2 Historical Interpretation, the Glamorous Side of the Lowell Park Trolley**

The issue of what the trolley cars looked like was the most important policy decision of the Lowell Park Trolley for two reasons: one, there were so many choices, and two, the appearance of the cars sets the tone of the entire project. The cars are the system because they are the most visible element and the most evocative. In the Plan, we expressed our goal for the cars "to be reconstructions or selected from vehicles available through New England area trolley museums." (14) We also knew that the "system of historic trolley cars will be an important attraction on its own to visitors and residents alike and will draw people from private automobiles." (15) To bolster our case for full implementation of the Lowell Park Trolley, we described the successful demonstration project using an antique, self-powered rail car, The Whistler, on loan from the Strasburg Railway Museum in Pennsylvania.

Given that the appearance of the 1985 Lowell Park Trolley very closely resembles both the utilitarian and "glamor" goals set forth by both agencies, it would seem that there was a straight-forward progression from the above goals to that end product. However, this was not the case: not only did we not really appreciate the meaning of "attraction on its own," but it was serendipitous that we produced a car that was an "attraction on its own." The following sections will set forth the context

### **3.3.0 Policy and Development Process**

#### **3.3.1 Stages in the Process**

One approach to the development of the Lowell Park Trolley would have been to make all the policy decisions about the cars and the overhead line, obtained

all the permits and easements from the landowners in the right-of-way, obtained all the funding at once and proceed with two major phases for all components: design/engineering and construction. Instead the process of policy development and implementation were intermingled; the design and construction for each component proceeded on its own schedule. For example,

- \* The preparation of the technical specifications for the car construction were ready for bid about a year before the specifications for the overhead line were ready.
- \* We were determining the exact car model just as the car builder was preparing the shop drawings.
- \* Both cars were nearly complete as the overhead line was getting underway.
- \* We obtained permission for the pole placements as the overhead line contractor was proceeding, occasionally re-routing until we had the agreements.
- \* The demonstration project continued throughout until all the pieces came together.

### **3.3.2 Factors that Contributed to this Approach**

All planning and construction projects are guided by schedules and influenced by known and unknown tasks. In the Lowell Park Trolley project, we met our overall time deadline of being operational by the 1984 visitor season, but the time it took to accomplish the following tasks significantly affected individual schedules. Their impact was anticipated, but the amount of time they cost us was unpredictable. The following key variables will be discussed later in this thesis and I want to summarize them here:

- \* Obtaining yearly Congressional funding appropriations
- \* Preparation of technical specifications

- \* Approval for bidding and preparation of the bid documents
- \* Advertising the bid documents
- \* Awarding the contracts
- \* Obtaining required approvals from affected parties

Furthermore, the time required to accomplish any one of the above tasks was directly influenced by one or more of these important factors:

- A. The broad authority and stability of the core planning group
- B. Authority and interests of key agencies
- C. Input from technical consultants and contractors
- D. Federal funding cycles and lack of long range certainties

Since these four factors form the framework within which the Park and the Commission implemented the trolley project, each bears a closer look. Please refer back to Chapter 2, "Evolution of the Components of the Lowell Park Trolley," where they were also discussed.

### **A. The Core Planning Group**

The core planning group consisted of three people: John Debo, Assistant Superintendent of the Lowell National Historical Park; Sara Peskin, Planning Director of the Lowell Historic Preservation Commission; and myself, Projects Manager at the Commission. Both agencies were represented to make sure the program was fully coordinated between the funding agency (the Commission) and the operating agency (the National Park Service). We were not transportation planners, but all had formal training in planning. Each of us was committed to implementing the project. The three of us, with minor lapses, were involved with the project from the start of the Commission and



Park up until and through each phase of policy, plan and implementation. No other staff person was as influential as any one of us. All matters relating to transportation were either generated from us or funneled through us and our roles were confirmed by our superiors, the Superintendent of the Park and the Executive Director of the Commission. The group met regularly throughout the development period to review project status, solve problems, develop strategies, write contract documents, divide responsibilities and deal with what ever needed attention.

Our division of responsibilities reflected the directive in Public Law 95-290 whereby the Commission was to develop the transportation system and the Park was to operate it. Mr. Debo's primary job was to work out an operating arrangement with the Boston and Maine railroad; Ms. Peskin developed the short and long term budget requests, provided project oversight and obtained all approvals; I was responsible for the car and overhead line systems: getting them designed, engineered, and built. Our management approach was to bring any issue in need of discussion to the group so that major decisions were made by the group. In this case, I believe that task specialization streamlined the process because it would have been too time-consuming for one person to attend to all the issues.

When the issue was unusually complicated and the three of us could not keep equally informed, we delegated authority to one of the group. For example, in the case of the complex B&M agreement, Mr. Debo took the lead. This agreement took several years to work out and would have been virtually impossible to accomplish had all three tried to be equally involved.

### **B. Authority and interests of key agencies**

Our core planning group had several levels of federal government bureaucracy to whom we reported and from whom we received approvals as precursors to obtaining congressional approvals for funding. How we informed each level of our periodic funding requests was crucial to the project's continued success. Specifically, Mr. Debo reported to the Superintendent of the Park who in turn was responsible to the Director of the North Atlantic Regional Office. Ms. Peskin and I reported to our Executive Director who was responsible to a 15-member commission comprised of people from the private and public sector representing federal, state and local interests. It was by vote of this Commission that funds to build all components of the Lowell Park Trolley were approved. Both the Park and the Commission had to have both the support of former Senator Paul Tsongas and Congressman James Shannon in order to obtain congressional approval of funding requests as well as the support of the Secretary of the Department of the Interior. Successful funding--which we ultimately enjoyed--required support of each and every level and careful communication among them. This communication was orchestrated by the Executive Director of the Commission and the Superintendent of the Park, with input from the planning group.

While not crucial for funding, there were several entities from whom we had to obtain various types of approvals. The Boston and Maine railroad had veto over our plans by virtue of the fact that they owned and operated daily on the tracks upon which we wanted to operate the trolley system. Almost without exception, our requests to modify the tracks, install the overhead wires took three to six months for approvals. While we felt the B&M management supported the project, participation in the Lowell Park Trolley was an entirely

new venture and it often took their complex organizational structure many months to evaluate a request or proposal and to obtain a decision.

The City of Lowell had to grapple with the fact that we were planning to put up overhead lines just after a great deal of money had been spent to put the utilities underground. It also had to approve street crossings and the location of supporting poles on city property. Since no city funds were used, these approvals were quickly given and no objections voiced. I do, however, anticipate delays on two of the extensions where two city projects must commence first. The six other landowners along the railroad track right-of-way were asked to give us permission to locate poles on their land; all of them agreed and signed a pole placement plan drawn up with the advice of our Solicitor. The plans showed the location of the pole(s) in relation to property lines and buildings; these plans were not easements and did not have to be recorded at the Registry of Deeds.

Lastly, the loose association of trolley museum members who advised us from time to time on the accuracy of the hardware and historical facts constituted a group from whom we solicited informal approvals. They were a potential source of publicity, both favorable and unfavorable. Primarily because the core group's intentions were to be as historically accurate as possible, these people generally have a high regard for the Lowell Park Trolley.

### **C. The Technical Consultants and Contractors**

To date, the Commission has retained over \$200,000 worth of technical consultants' services ranging from the initial feasibility study that set the stage for the basic system to the construction documents for the track

extensions scheduled for construction in the fall of 1985. Most of the implementation decisions arose in the process of directing the engineers in their preparation of construction documents. For example, we had to determine exactly where we wanted metal support poles and how we wanted to make the cars handicap accessible when our engineers needed that information for the technical specification. It was in the process of answering the engineers' questions that we began to translate plans into practice.

The car and overhead line contractors were the ones who actually translated our policies into physical form. For example, we knew that we wanted to build the open trolley car identified as number 1597 because our museum contacts said it was typical of the cars that operated all over eastern Massachusetts, but at the time of the contract award, we only had one blurry photograph of it. Fortunately, a collector of trolley photos sent us several clear side views which could give the car builder definite information about the car detailing. It was only when the car builder started developing shop drawings for each element of the car, however, that we could determine that he was going to be able to translate our policy of historical accuracy into the actual car.

To make sure that the work progressed according to the technical specifications, we had two coordinated levels of review. First, the engineers, Louis T. Klauder and Associates, were responsible for reviewing the shop drawings, observing key points of the construction and reviewing all test results. They recommended that the Commission either approve, reject or request resubmission of the drawings and tests. The Commission also hired a 'railroad specialist' to represent it on the construction site to make sure that

the construction was proceeding in a satisfactory manner. This person had twenty years experience in the operation, maintenance and restoration of trolley cars. Both the engineers and the railroad specialist communicated frequently through myself as the project manager. I, in turn, reported results of each stage of the construction to the core planning group.

#### **D. Federal Funding**

The issue of how the Lowell Park Trolley was funded will be discussed throughout this thesis with two key points in mind: the impact of the yearly budget cycle and the fact that this was the only source of funds. Our technical consultants gave us estimates of the work for long range budget purposes and for each component that was put out for bid. With this information, we prepared a five-year budget at the beginning of the project, updated it periodically, but at no time did the Commission members have to vote to obligate funding for the entire package. They never had to vote on an expenditure larger than \$271,000 (the low bid for the construction of the overhead line) because they could only obligate funds that Congress had approved and because the construction schedules were staggered so that usually only one component at a time was advertized for bid.

The most serious impact of the yearly budget process was that we started the project by building one car, but we had no guarantee that we would receive funding for a second or third car, for the electric overhead system to propel it (them), or even for funds to repair the tracks. This being the only source of funds meant that we had to adapt our shedule to the yearly Congressional budget process and that the trolley budget had to be balanced with the other Commission requests. It meant a planning and construction schedule stretched-out over four years that might have been completed in two if private financing had been available.

There were two reasons why our funding requests were staggered over the four year project. One was the overall federal policy of asking Congress for what an agency can realistically spend within that fiscal year. Funds are

carried forward, but requests for development beyond one year were discouraged. It would have been impossible due to our limited staff resources for all the engineering and construction to be ready for a massive single year or even two year request. The second reason is that while a \$500,000 or \$1,000,000 single project is not unusual in the context of other government departments, it would have been out of scale with requests from parks in other parts of the country. Therefore, the Park and Commission's requests were purposely broken down into smaller amounts so as not to attract national attention and risk losing funding altogether.

#### **3.4.0 Decision-making methodology**

The previous sections of this chapter described the planning process we used for the Lowell Park Trolley as one where the larger vision was spelled out in several compliance documents as components of the trolley project were being developed. In this section, I want to illustrate how the theory of decision-making developed by David Braybrooke and Charles E. Lindblom in A Strategy of Decision--Policy Evaluation as a Social Process, "disjointed incrementalism," directly applies to the approvals we needed to implement the Lowell Park Trolley. I argue that our core planning group's approach to implementing the Lowell Park Trolley presents a text-book case study of disjointed incrementalism. The approvals were required by two of the actors discussed previously: the Lowell Historic Preservation Commission's 15-member board and the National Park Service hierarchy. The former voted periodically on funding requests for all components of the system; the latter had to approve the concept of the Lowell National Historical Park operating a visitor shuttle service within the park.

Disjointed incremental decisions are the opposite of synoptic planning where "...the synoptic approach encourage[s] the assumption that every detail of an innovation ought to be shown to be theoretically adequate before a move is made" (16) Braybrooke and Lindblom continue in their discussion of the synoptic approach by describing it as appearing "to correspond to good sense, fundamental notions of rationality, and scientific procedure." (17) It is the ideal situation where "all" alternatives and their consequences are evaluated and a decision made with seemingly total understanding. (18) The authors demonstrate why, for example, the "synoptic ideal is not adapted to inadequacy of information" (19) or "to man's limited problem-solving capacities." (20) I mention the synoptic approach only to show the antithesis of disjointed incrementalism which the authors describe in part two of their book as, "Observed Practice in Policy Evaluation and Decision-Making."

Braybrooke and Lindblom define disjointed incrementalism where there is a "permanent small alteration in policy or as one small step in an indefinite nonrepetitive sequence." (21) I prefer to call our approach "successful seduction." Each time Ms. Peskin and I presented a funding request to the Commission's Executive Director and he in turn presented it to the Commission membership for a vote, that represented an incremental decision. From 1979 until April 1985, there were approximately eighteen Commission votes to obligate funds, the largest was for \$271,000 (see "Federal Funding" section above), each being "small alterations." Furthermore, each vote cumulatively committed the Commission to the next request, until we spent well over \$1,000,000 on the capital development of the Lowell Park Trolley.

The Commission clearly took risks by voting incrementally on funding: no one



could predict if Congress would approve future budgets, no one knew if the low bid contractor could build the cars, etc. It also took these votes when we needed them to, i.e. when specifications were ready to go to bid, when the budgets had been approved, when a contractor submitted an unpredicted change order. The votes were tailored to specific short-term needs; Braybrooke and Lindblom describe this as a "restrictive examination of consequences" where "Omitting the consequences that are outside the planner's ability to analyze is often the only way a decision or set of decisions can be made manageable." (22)

Our core planning group certainly did not sit down in 1980 and decide to proceed with the disjointed incrementalism approach to decision-making. We did know, as did Braybrooke and Lindblom, that inherent in some federally funded projects was the requirement for a small-step approval process: "policy-making under the strategy proceeds through long chains of policy steps. This serial procedure is an important feature." (23)

In the discussion in the preceding chapter, I introduced the dilemmas posed by this federal funding process and discussed the influences of the self-powered rail car demonstration project, the choices of operating equipment, consultants' recommendations, and the Boston and Maine railroad on the physical form of the Lowell Park Trolley. My goal in this chapter was to demonstrate that it is these very dilemmas that are the links in these "long chains of policy steps."

## FOOTNOTES

## Chapter 3

1. Lowell Historic Canal District Commission, Report of the Lowell Historic Canal District Commission (Washington, D.C.: U.S. Government Printing Office, 1977), p. 20.
2. Ibid., p. 21.
3. Ibid., p. 5.
4. Ibid., p. 43.
5. Ibid., p. 42.
6. Public Law 95-290 (95th Congress, June 5, 1978).
7. Ibid.
8. Ibid.
9. National Park Service, United States Department of the Interior, General Management Plan, Lowell National Historical Park (Washington, D.C.: U.S. Government Printing Office, 1980).
10. Lowell Historic Preservation Commission, United States Department of the Interior, Preservation Plan (Lowell, MA: 1980), p.5.
11. Ibid., p. 54.
12. National Park Service, p.52.
13. Ibid., p. 16.
14. Lowell Historic Preservation Commission, p. 57.
15. Ibid., p. 56.
16. David Braybrooke and Charles E. Lindblom, A Strategy of Decision, Policy Evaluation as a Social Process (London: The Free Press of Glencoe, 1963), p. 108.

17. Ibid., p. 41.
18. Ibid., p. 40.
19. Ibid., p. 50.
20. Ibid., p. 48.
21. Ibid., p. 65.
22. Ibid., p. 91.
23. Ibid., p. 99.

## **Today and Tomorrow for the Lowell Park Trolley**

### **4.0.0 Introduction**

The Lowell Park Trolley has been an unequivocal success. It has attracted enthusiastic visitors to the Lowell National Historical Park, has been the focus of promotional campaigns for the city, has been the envy of cities around the country, and has operated nearly flawlessly. Between the inaugural run in May 1984 and June 1985, over 60,000 people have taken the regularly scheduled tours of the Park (note that the trolley only runs from Memorial Day to Columbus Day); this translates to 151,000 one-way rides if passengers are counted on each segment of the route. (1) But what about its future? The Park Services anticipates fewer operating dollars just at the time when costs are rising. Furthermore, the system will have a 50% increase in trackage and a third car by the 1986 visitor season. Chapter 4 will show how these seemingly conflicting situations are being resolved today so the Lowell Park Trolley will have a successful tomorrow.

Once again, current planning for the Lowell Park Trolley involves significant risk-taking and incremental decisions. As explained earlier in the thesis, the trolley system is the responsibility of two agencies, the Lowell Historic Preservation Commission for development and the National Park Service for operation. The situation as of July 1985 is that Congress has appropriated the requested Fiscal Year 1985-86 development funds, but has kept the operating funds at almost the same level as the previous year. We are taking another calculated risk by building more tracks, overhead line and a third, and

possibly a fourth car without a guarantee that the necessary operating funds will be appropriated. Why not take the alternate approach and keep the status quo?

It is paradoxical that operating funds are generally the most difficult to obtain from Congress, while development funds, on the other hand, are generally forthcoming, especially if they are used to complete a successful program that is already underway. It is our strategy to build the track extensions and a third, all-weather car while pursuing additional options for operating funds, and not allow the existence or non-existence of funds to delay them. Chapter 4 will explore the goals for the Lowell Park Trolley and the options we are looking at for its future operations.

Furthermore, the expansion of the system has always been planned by the Park and the Commission because it will allow visitors to comfortably take advantage of the full range of historic resources in Lowell without the negative impacts of increased automobile traffic. With the expanded trolley routes coupled with expanded barge routes, visitors will have a far more robust tour: they will be able to travel to the newly restored Lower Locks, the Suffolk and Massachusetts Mills and have the opportunity to make two complete loops through the city. Please refer to Map 4-1, "Expanded System." Ironically it is only by constructing the extensions that there will be opportunities for attracting operating funds from passenger revenues or from private business subsidies because the new tracks may be able to serve non-tour needs as well.

#### 4.1.0 Operating the Lowell Park Trolley

##### 4.1.1 Costs of Operation

The Lowell Park Trolley is unique, not only for its new 'old' cars, but because rides on 1601 and 1602 are free as are all attractions of the Lowell Historical National Park, the slide shows, visitor centers, exhibits, festivals, lectures, canal boats, and guided tours. The Park Service could charge user fees, but they would go into the General Treasury and therefore, any fees could not be used to recover program or operating costs incurred in the park. For example, fares collected in the visitor parking lot or for trolley rides could not be used to defray the costs to run these facilities. The Park Service does have several other options in addition to Congressional appropriations to obtain operating funds and I will discuss them in section 4.3.0.

The Lowell National Historical Park received \$2,275,000 and \$2,383,000 in 1984 and 1985 respectively in operating funds for the entire park; the cost to run the trolley system in 1984 was \$43,981 or roughly 2% of the Park's operating cost. (2) The 1984 costs are shown in Table 4-1:

#### Costs of Operating the Lowell Park Trolley

Table 4-1

	1984	1985
Motormen (wages)	\$13,800	\$15,800
Conductors (salaries)	7,000	10,000
Maintenance (wages)	6,000	10,000
Supplies	3,100	3,100
Electricity	6,600	6,200
B&M track leasing	4,381	4,735
Liability insurance (B&M)	3,100	3,100
TOTAL	\$43,981 (3)	\$53,335 (4)

#### 4.1.2 Anticipated increases in the cost to operate the basic system

The cost to run the basic system where one car operates between 9:00 am to 5:30 pm daily from May 30 to mid-October, will get more and more expensive each year:

- \* Salaries will gradually increase; the man-power allocated to the Lowell Park Trolley will also increase as the cars and overhead line require more maintenance.
- \* A driver and a conductor will be needed for each additional car that is in operation.
- \* The Boston and Maine lease has a built-in 8% yearly escalator clause in the track rent. In addition, should the Park Service switch to additional months of operation, the \$100 per month "dormant" rent will jump to almost \$871 per month "active" rent in 1986. Since the trolley is the only joint user of these tracks, there is no comparable rent.
- \* Massachusetts Electric charges a base rate of \$550 per month to have the electricity on stand-by service, whether or not it is used. The cost of the electricity actually used is added to the base rate, with a total yearly cost of \$6,600 over the next several years. (5)
- \* The Boston and Maine railroad requires that non-railroad persons performing work within its right-of-way purchase an insurance policy to protect the railroad against that person's negligence. The Park Service has already purchased a policy, but it does not cover anyone hired by the Park or the Commission. We may be required to purchase a policy for each contractor hired to maintain or repair the system; the policies cost approximately \$3,100.

The Park Service and the Commission's operating funds are appropriated yearly, and for the last two years, the amount has not increased enough to cover rising costs. Therefore, the issue of expanding the system or even operating two cars at once is problematical because of the possibility of an operating fund shortfall. Any increase in minimal trolley operations that requires additional funds must compete with salaries, utilities and other fixed costs in the Park's operating budget. For example, if during the 1984 visitor season, two cars were run simultaneously it would have increased costs by about \$30,000. (6) To operate two cars during the summer and one car during the off-season will bring the yearly costs to \$149,000, assuming no contingency funds. (7)

Thus, the real future 'tomorrow' of the Lowell Park Trolley lies with the ability of the Park staff to attract sufficient funds to run a continually vigorous program or to develop alternate strategies for funding the system. If additional operating funds are not found, the system will be forced to remain at a minimal level. A January 1985 Park Service memo on the status of the trolley system states succinctly, " While our 1985 budget will be able to provide these [transportation] services through the summer of 1985, we must begin examining alternatives beginning in 1986. (8)

#### **4.2.0 Expanding the Lowell Park Trolley**

##### **4.2.1 The Goals**

The goals for the Lowell Park Trolley are to have a trolley system that can transport visitors all year around and link key historic sites with the downtown and to provide a utilitarian shuttle service if there is no additional cost to the Park. The present system is limited to the existing Boston and Maine railroad tracks and they do not go far enough: visitors can only ride to



the Boott Mills, the Post Office and the Swamp Locks barge landing. The construction of the track extensions to the Suffolk and Wannalancit Mill complex, to the Lower Locks and along French Street will coincide with the full restoration of the structures at each location and a 1200 car parking garage on French Street.

A September 1984 briefing paper from the National Park Service Regional Director, North Atlantic Region in Boston to the Director in Washington D.C., "Historic Park Trolley Development and Operation: Background Information" stated that

The trolleys, together with barges on Lowell's canal system, offer an outstanding opportunity to interpret the park's major cultural resources in a manner consistent with "preserving the 19th century setting," a basic theme of the Preservation Plan. The three proposed extensions of the existing trolley line would powerfully reinforce the park's interpretive program by linking the four major interpretive "anchor points" in downtown Lowell: the Market Mills Visitor Center, Suffolk Mill Turbine Exhibit, Boott Mills/Boardinghouse Park, and the Lower Locks complex.

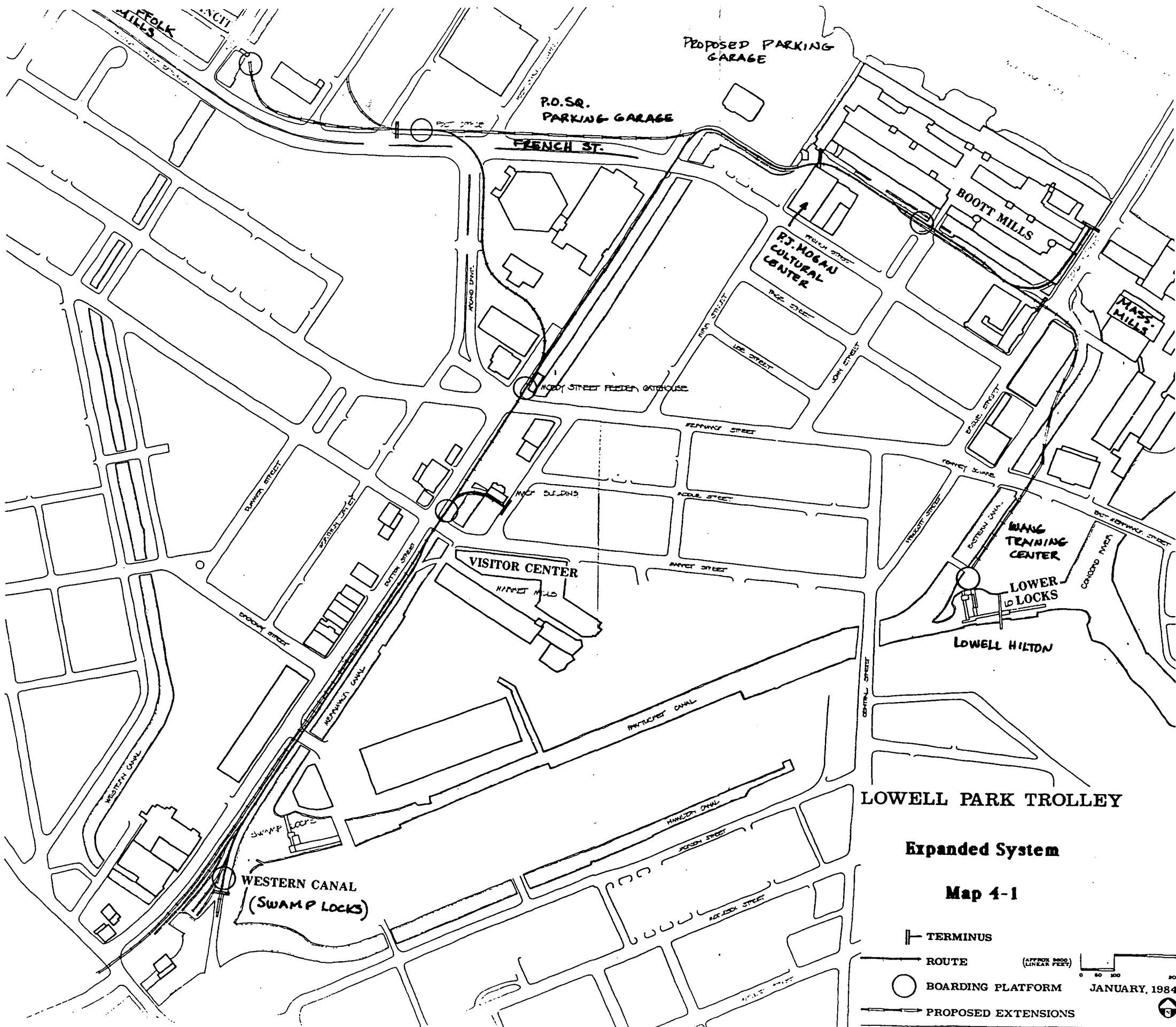
(9)

When the plans for implementing the extensions began in earnest in the Summer of 1984, downtown Lowell was experiencing an unprecedented development boom. In the public sector, agencies were implementing their own projects. The National Park Service was beginning the restoration of the Suffolk turbine exhibit and Boott Mill building number 6; The Lowell Historic Preservation Commission was reconstructing the Boott Mill boarding house, a.k.a. Patrick J. Mogan Cultural Center; the Park and the State Department of Environmental Management were jointly restoring the Lower Locks chambers and gate house. In the private sector, the Lowell Hilton opened in the Spring of 1985 and the Wang Training Center will open late Summer 1985 next to it; the Wannalancit Mills has been extensively renovated to house incubator

companies and a major developer was negotiating with the owners of the Massachusetts Mills to develop properties around the Eastern Canal. Within the next five years, it is anticipated that at least three parking garages will be built to serve the employees of these and other developments. It seemed obvious that the expanded Lowell Park Trolley might also benefit people who weren't necessarily park visitors to and from a destination--assuming the cost for the service could be covered.

The Commission and the Park have strongly encouraged the City and the private developers to design the garages to take advantage of the fact that the trolleys were a potential employee shuttle. We were concerned that the garages (1) not adversely impact the route during the construction or through increased automobile circulation, (2) be designed so people could exit them onto a trolley waiting platform and (3) that their design accommodate the overhead wire system. As a case in point, the City-owned garage along French Street will be under construction in the Summer of 1985 and the main entrance/exit is located so patrons can easily board the trolley cars, should a shuttle service be developed.

In addition to the purely utilitarian aspects of the track extensions, several developers are interested in the promotional potential of having the trolleys stop at their front doors. The Hilton Hotel developer wanted the trolley stop adjacent to his hotel because it is an attraction for guests; the developer of the W.annalancit Mills felt the trolley cars would enhance the appearance of his restored 19th century mill building as well as provide a shuttle service for people who work there.



**LOWELL PARK TROLLEY**

**Expanded System**

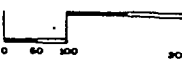
**Map 4-1**

—|— TERMINUS

— ROUTE (APPROX. SCALE)

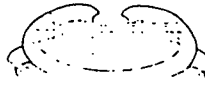
○ BOARDING PLATFORM

--- PROPOSED EXTENSIONS



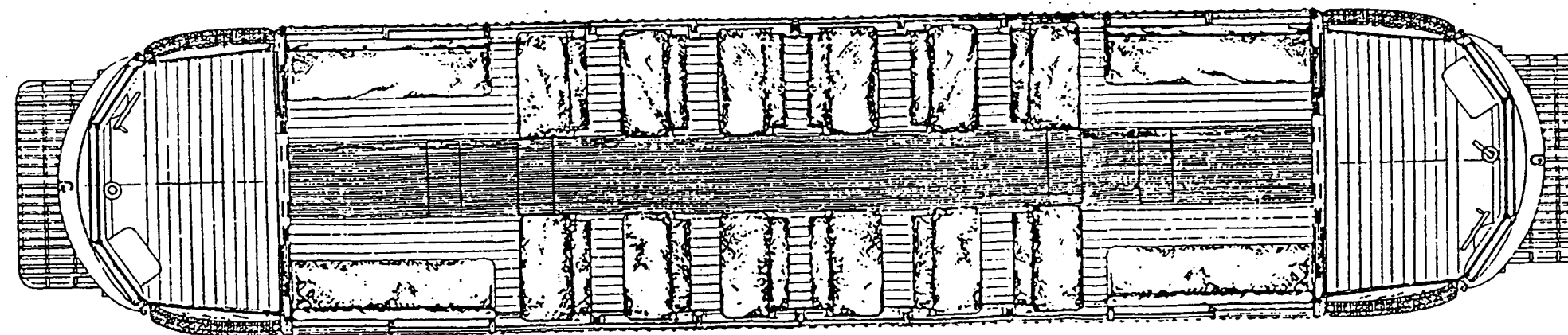
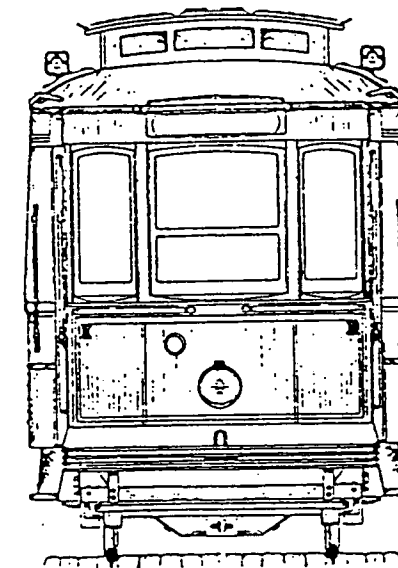
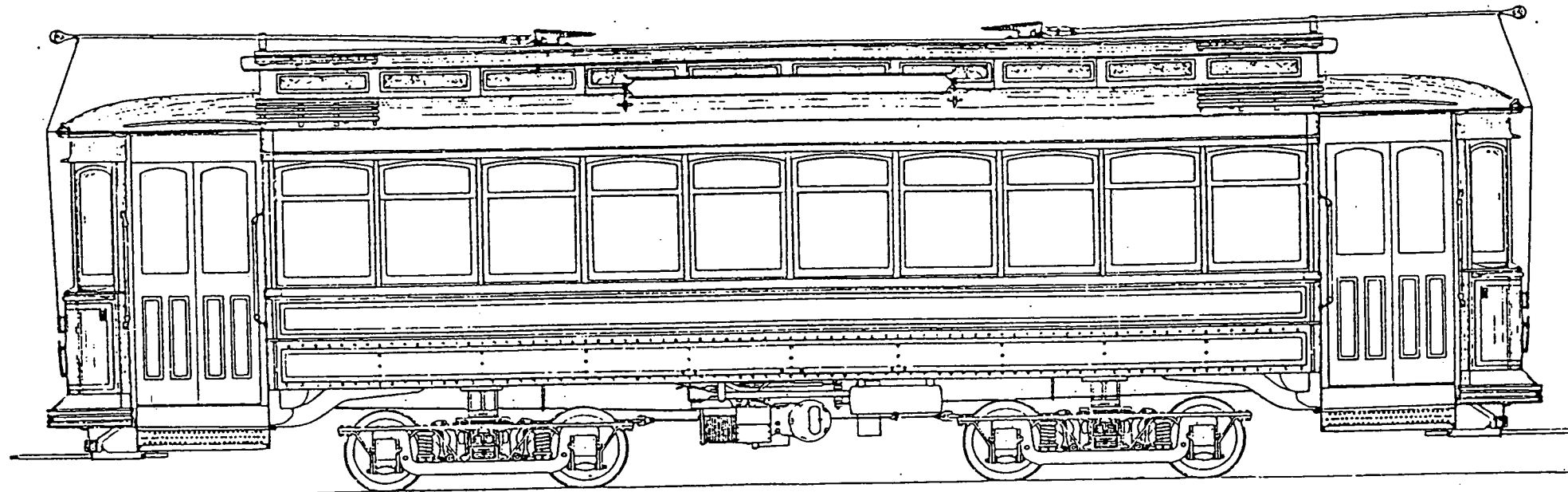
JANUARY, 1984

LOWELL HISTORIC  
PRESERVATION COMMISSION  
NATIONAL PARK SERVICE



In January 1985 we met with representatives of the Northern Middlesex Area Planning Commission to develop the scope of work for a study jointly funded by the National Park Service, Lowell Historic Preservation Commission and the Lowell Regional Transit Authority (LRTA) to see exactly how the trolley might be operated to accommodate both visitor and non-visitor needs on a year round basis. The study will include a needs assessment to determine who are the potential users, when they will need shuttle services and to which locations. Secondly, the study will determine if the employers feel that transportation services are a bonus they would like to offer employees and, if so, how much would they be willing to subsidize the service. Thirdly, the study will determine how these needs might best be met, either by trolley, LRTA shuttle bus or a combination of the two. Fourthly, it will address basic programmatic considerations: should fares be charged? which agency would actually provide the shuttle service? how often would the trolleys and/or shuttles run? would fares cover the cost of the service? if not, how would the cost be covered? is there an opportunity for the Park Service to offer trolley service and use revenues to offset the cost of the visitor tour program?

The answers from the study will guide us in deciding if the goal of providing non-visitor trolley service is feasible and how to go about providing it. The Commission will build the extensions regardless of the study's outcome in order to develop the Park's interpretive program. Furthermore, it is the opinion of the Commission and the Park Service that there is absolutely no chance of recovering operating costs even for visitors unless the system is expanded as planned.



LOWELL HISTORIC PRESERVATION COMMISSION

CONCEPTUAL VIEWS  
REPRODUCTION 4100 SERIES  
CLOSED CAR  
13 MARCH 1985

SCALE 1/4" = 1'-0"

NOTE: UNDERFLOOR EQUIPMENT  
REPRESENTATIVE ONLY



LTK Engineering Services

THE MODEL FOR THE THIRD CAR, LOWELL PARK TROLLEY



LACONIA CAR COMPANY

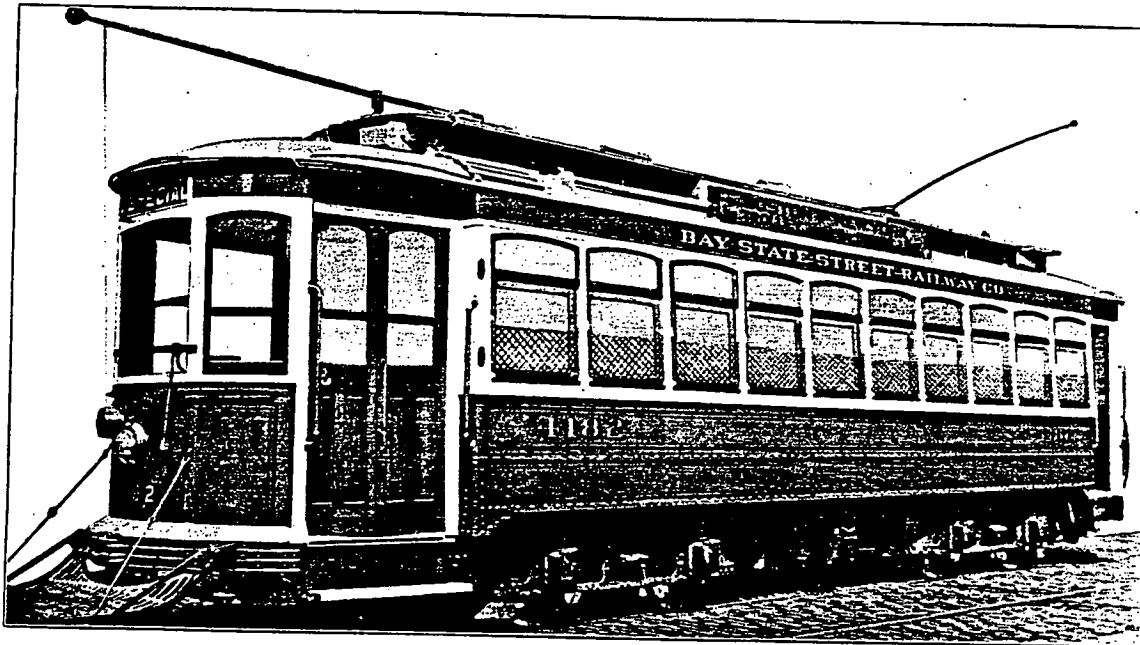


Fig. 58. Drop Platform Semi-Convertible Car  
Built for the Bay State Street Railway Company

Length over bumpers . . . . .	39' 6"
Width at sill . . . . .	8' 2"
Height from rail to top of trolley plank	11' 9"
Diameter of wheels . . . . .	34"
Truck centers . . . . .	17' 0"
Truck wheel base . . . . .	4' 10"
Weight car body . . . . .	15,475 lbs.
Seating capacity . . . . .	40

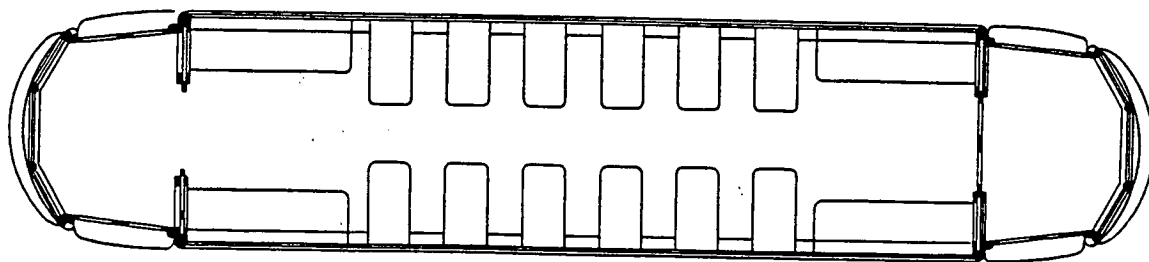


Fig. 59. Floor Plan

LACONIA, N. H.

### 4.2.2 The Equipment

Before the Lowell Park Trolley can provide year round service, it needs an expanded infrastructure, i.e. more tracks and overhead line and at least one closed-sided car. This section will discuss some of the problems encountered in developing them and how they were resolved.

#### A. The Cars

A closed-sided car is needed for October through March service precisely for the same reason that the street railway companies enclosed or scrapped the lovely open cars by the 1920's, they were impractical in New England's inclement weather.

We began the search for the third car in the Fall of 1984 by contacting trolley museums and people who owned pre-1920's closed cars in good condition that were indigenous to Lowell. The search ended in the same place it did when we were looking for the open or summer cars--no one wanted to sell their cars, especially the early vintage stock that we wanted. Seashore Trolley Museum, an important resource to the Lowell Park Trolley, would lease us an appropriate car, but not for winter use for fear that the snow and salt would quickly ruin it. We concluded that the most effective approach to obtaining a working, durable vehicle was to build a new reproduction car once again.

We selected the 4100 series 'semi-convertible' (the window shashes could be completely open for maximum ventilation) cars built in 1914 by the Laconia Car Company as the prototype car. They were a well-built, graceful car used extensively by the Bay State Street Railway and many were assigned to Lowell. As a bonus, the Seashore Trolley Museum owns an authentic car of this series and is in the process of completely restoring it. The builder who is awarded the contract to build the Lowell Park Trolley will be able to use it as

a reference for detailing, thus helping to ensure that we will get an accurate reproduction.

Our approach to constructing this car was different from the first two because, we are not starting from ground zero: our engineers modified the technical specification we used to construct the open cars and we knew it was technically feasible to build new cars. The 4100 car obviously has a number of components that are different from the open cars--the seats, heating system, windows and doors, siding, framing, etc., but the running equipment, general performance requirements, quality control, the handling of certain materials and so forth, are the same and hopefully, will prove to be as successful. Secondly, we decided to make an authentic reproduction of the 4100 series rather than a generic closed car and have an extensive collection of resource materials to guide the builder. The cost is expected to be in the range of \$250,000 and will be procured by competitive bids.

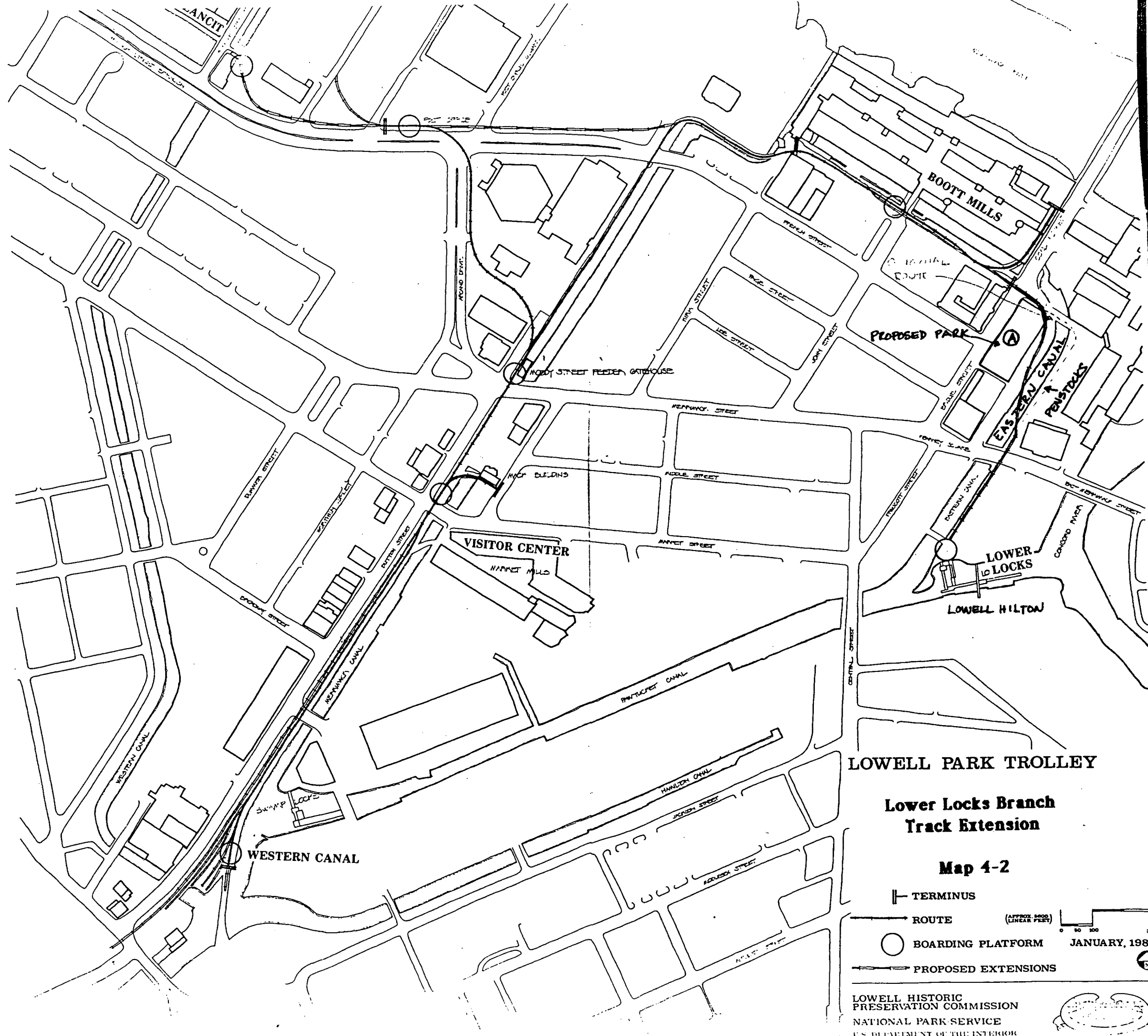


### **B. The Track and Overhead Line Extensions**

The extensions consist of a total of 2,650 linear feet of new tracks and overhead line in three branches, Wannalancit, French Street and Lower Locks/Hotel, that connect to the existing system and are shown on map 4-2. There are essentially five technical steps involved in implementing the extensions: preparation of the preliminary alignment plans, review and approval from all affected parties, land survey and acquisition of easements, preparations of the final design documents and construction. This section presents two brief examples of the dilemmas arising during this process.

The preliminary engineering was completed in January 1985 and consisted of topographic plans that showed the ideal location for each new branch. The Commission's job was to review these plans with all affected parties, i.e. land owners, the City, etc., obtain their comments, alter the alignments if necessary and direct the engineers to proceed with the final engineering. Meanwhile the Lands Office of the National Park Service would draw up the necessary documents to obtain easements from the land owners. If all had gone smoothly, the engineering plans and technical specifications would have gone out for bid by fall 1985 with construction starting by winter 1985. Things did not go smoothly and the schedule for the extensions was set back by months by two complex issues that surfaced during the preliminary engineering and its review that illustrate the essential experience of the Lowell Park Trolley--that it was the implementation itself that determined the final form of the system and that the institutional relationships are often as problematic and unpredictable as the physical issues.

Specifically, the first issue involved the discovery of a serious structural



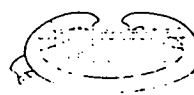
**LOWELL PARK TROLLEY**

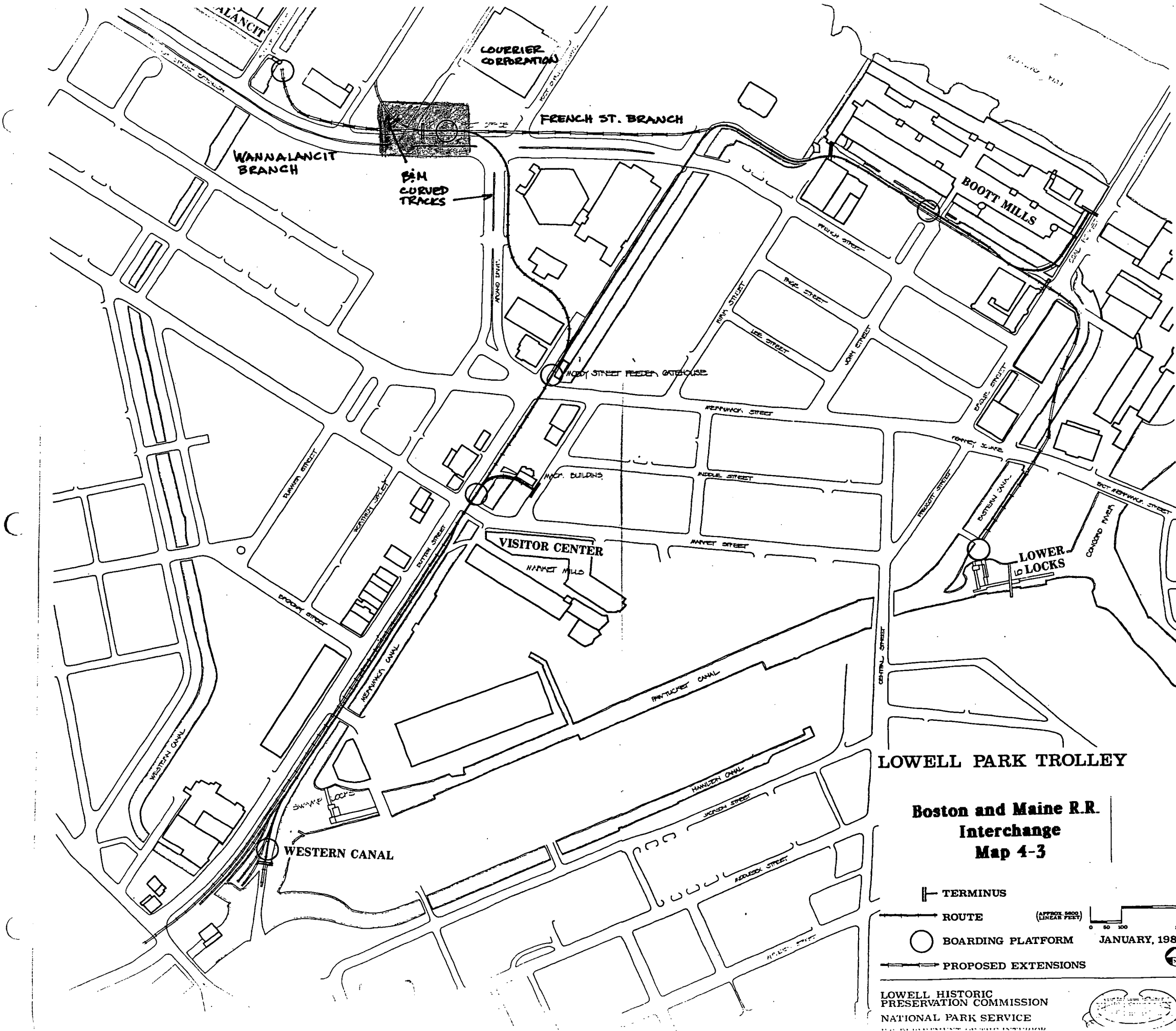
**Lower Locks Branch  
Track Extension**

**Map 4-2**

- |— TERMINUS
- ROUTE (APPROX. 1:1000)
- BOARDING PLATFORM
- - - - - PROPOSED EXTENSIONS

LOWELL HISTORIC  
PRESERVATION COMMISSION  
NATIONAL PARK SERVICE  
U.S. DEPARTMENT OF THE INTERIOR





**LOWELL PARK TROLLEY**

**Boston and Maine R.R.  
Interchange  
Map 4-3**

- TERMINUS
- ROUTE (APPROX. 5000 LINEAR FEET)
- BOARDING PLATFORM
- PROPOSED EXTENSIONS

LOWELL HISTORIC PRESERVATION COMMISSION  
NATIONAL PARK SERVICE  
JANUARY, 1984



problem along the long-proposed route of the Lower Locks/Hotel branch that required a major shift in the track location. The new location, while technically preferable, crosses a site targeted for a new City park and is likely to be embroiled in eminent domain proceedings for the foreseeable future. The second issue involved a conflict between the Commission and the Boston and Maine railroad over the design of the interchange between the railroad-owned tracks and the Wannalancit and French Street extensions. The railroad preferred a design that was far beyond the Commission's budget and, in an unexpected twist, decided to construct it at their expense. During the discovery and resolution of these two issues, there was a continuous struggle between the system's planners and the physical and institutional realities. I will highlight both of them to illustrate how the dilemmas that surfaced during the development of the Lowell Park Trolley often influenced its final form.

In the process of preparing the preliminary alignment for the Lower Locks/Hotel branch, our engineers discovered a series of penstocks (tunnels for carrying water from the canal to turbines inside adjacent mill buildings) on the east bank of the Eastern Canal. A cantilevered supporting platform would have to be built over the penstocks because they are so close to the surface--virtually precluding building tracks on that side, as had been the assumption from the beginning of the project. Instead, they recommended staying on the west bank and cutting over to the east side via a 100 foot new bridge to by-pass the penstocks. Aside from the expense of building a \$100,000 to 200,000 new bridge that we had not anticipated, there were additional complications. The owners of the canal, The Proprietors of the Locks and Canals, wanted a clear-span bridge (no center pier) and one that is not supported by the canal walls; both of these requirements will increase the cost

of design and construction. Secondly, the federal contracting procedures will add considerably to the time involved in obtaining the engineering and construction services for the bridge.

Coincidentally, to the realization that the shift in location was needed in order to bring the Lower Locks/Hotel branch to its desired terminus, the City developed plans for a park (location "A" on the map) to make the area more attractive to potential developers of the Massachusetts Mills properties. Its goals are to acquire the warehouse on the site by eminent domain, demolish it, and construct a canal-side park. A key attraction to the park would be the trolley running through it, and the City is very anxious for the Commission to proceed with the 'new bridge' route. But, as the Commission considers its goal of completing the extensions, there are a number of decisions to make that bear directly on the outcome. Who pays for the bridge? We have to wait for the City to complete eminent domain proceedings on the building before we can start the construction of the tracks and the bridge; but what if the the proceedings fall through because the City cannot raise the funds for a fair and equitable price? It is highly unlikely that the present owner will voluntarily allow the trolley tracks to be built on his property if the City's efforts to purchase his property fail. Does the Commission go back to the original alignment and develop an engineering solution to bringing the tracks over the penstocks?

There are no easy answers to these dilemmas. We are taking certain risks based on several assumptions. We are assuming that the building will be taken down and the park will be constructed, even though the total cost to the City is not known and it is not committed to the project at any cost. However, we are proceeding with the final engineering for an alignment that will

severely limit owner access to his warehouse; if the building is not taken by the City a completely new alignment must be selected. We are assuming that a bridge can be built that meets the canal owners criteria. We are assuming that the Commission's development budget will be sufficient to build this bridge and the extensions; cost estimates will be prepared as the project proceeds. And finally, we are assuming that the reaching Lower Locks/Hotel destination is worth the effort to get there, even with the construction of a new bridge. In conclusion, once again we are proceeding into unknown territory. The Lowell Park Trolley process was and is still the process of putting all the pieces in place.

The second situation involves the design of the interchange shown on Map 4-3, "Boston and Maine Interchange" where the French Street and Wannalancit extensions connect with the existing B&M tracks that serve the Courier Corporation. The railroad makes one delivery daily to the company. In order to accomplish our goals of having these two branches meet the B&M tracks in a straight line, our engineers proposed that the curves in the B&M tracks be tightened slightly. During the review process on the preliminary alignment, the Commission's engineering consultants and Commission and Park staff met with the B&M engineers to obtain their permission to change the curvature. The B&M official said that they had some problems with our proposed alignment, namely that they could not accept even the minor change in the curvature of their tracks recommended by our engineers. Furthermore, the official said that the railroad would exercise their right as owners of the tracks to design and build the interchange themselves, but would charge the Commission for the work since the changes are needed for our program.

The entire argument revolves around two technical issues. One is that the

railroad claims that their big freight cars can barely negotiate the curves as they are now, much less curves that are tighter. The other is that the curves were built tighter than current railroad specifications allow and our proposed alignment tightens them even further, albeit by a small amount. The bottom line was that the engineering on the two branches was stalemated for six months: either the B&M allowed their curves to be tightened or we elected to proceed with a less than satisfactory alignment for the trolley tracks.

The resolution finally came about when the Commission engineers developed a track alignment for the interchange that shifted the B&M tracks, but did not alter the curvature, and that provided straight tracks on the two new branches. While this alignment gave both sides what they wanted, it was at least twice as expensive--and completely beyond the Commission's budget--as our original proposal to the railroad. Our purpose in developing it was to demonstrate to the B&M that the trolley track extensions were in jeopardy unless they relaxed their curve requirements. In a surprise decision, the Chief of Engineering selected this as the preferred alternative and stated that the railroad would pay for the additional cost to construct the interchange the way they wanted it. The rationale being that this alignment would assure continued, safe service to the Courier Corporation and would not endanger the Lowell Park Trolley extensions. This completely unexpected decision again proves the point that it is during actual implementation phase that the influential issues surface.

Even though this issues appears to be resolved, the strategy we are took to resolve it bears a closer look. Essentially we built a rational case that demonstrated factually to the Chief of Engineering that: 1) the B&M cars can negotiate tighter curves at the low speeds used on that section of track, 2) the

trolley extensions must have straight tracks, not complicated reverse curves, and 3) to accommodate both the B&M's ideal curvature and the Commission's ideal straight tracks will involve extensive rebuilding of the entire tracks serving Courier Corporation at a cost far exceeding the Commission's budget and would very likely jeopardize the whole project. Because the B&M staff seemed to be avoiding the issue for so long, we realized that the railroad simply was not going to waive their curvature requirements to accommodate the Lowell Park Trolley. Therefore, because we had presented them with all the alternatives and the consequences of each, they were able to see that unless they rebuilt the interchange, the B&M would be responsible for stopping the extension program and crippling the entire trolley system.

The frustrating part of this issue was that we thought we had the ear of the decision makers and we thought that B&M officials would expeditiously review and approve our preliminary alignment. As stated above, it took us six months to resolve the dilemma. The long-term solution that surfaced once again was for the government to purchase the tracks from the railroad. The pros and cons to this solution will be discussed in the following section, Strategies for Future Lowell Park Trolley Operations.

#### **4.3.0 Strategies for Future Lowell Park Trolley Operations**

The future of the Lowell Park Trolley can be organized into two main components, one is the service the Park will provide to its tour visitors (as of June 1985, visitation increased 22% over the same period in 1984) and the other is the possibility for providing transit service to non-tour users in the city. (10) This section discusses the alternatives the Park and the Northern Middlesex Area Commission, a regional planning agency responsible for



coordinating transportation services, are exploring to substitute for the present situation where the Park funds and staffs the operation and maintenance of the Lowell Park Trolley. The following four strategies summarize and simplify several of the strategies the Park Service will have to consider for the 1986 visitor season if there are reduced operating funds for the trolley system.

The first priority to the National Park Service is its May through October visitor tour program, where the trolleys and barges run on a seven-day-a-week schedule; the schedule is intermittent during the rest of the year and the vehicles are not put into service. The Park staff is planning to expand the official tour season to an all-year program once the closed car and track extensions are built, but the prospect of obtaining sufficient operating funds for this service from Congress do not look promising. Therefore, the Park is considering an arrangement with a private operator or concessionaire to provide the service.

The second component in the future of the Lowell Park Trolley is the use of the trolley cars to provide morning and afternoon commuter shuttle as well as lunch time service for people who work in Lowell and to provide transportation downtown for guests at the Lowell Hilton. Since this service would not be provided by the Park unless the cost is borne by the users, the NMAC undertook a feasibility study (please refer to section 4.2.0) to determine how and at what cost such a service might be provided. The study, "Feasibility and Operations Analysis, Lowell Electrified Trolley System--Extended Trackage, Year Round Service," was complete in July 1985 and these strategies, 'operation by a third party' and 'subsidies by private businesses' provide the 2nd and 3rd alternatives and are briefly summarized

below.

A fourth scenario that has been previously mentioned is also discussed, namely the purchase of the Boston and Maine railroad tracks by the federal government. A B&M buy-out does not alleviate the need for alternate sources of operating funds, but it is a means of protecting the Commission's investment in the Lowell Park Trolley and of simplifying the relationship with the B&M railroad.

#### **4.3.1 Operation by a Concessionaire**

A concession operation is one where the National Park Service contracts with a private individual to operate a facility that provides certain visitor services, such as a lodge, campground, gift shop, cafeteria, raft trips or horseback rides. The operator charges a fee for the service to cover his costs and to allow him to turn a profit. In the cases where a profit from revenues is not possible, but the service is needed, the National Park Service may subsidize the concessionaire's operation so that he can realize a profit. If a large profit is likely, an agreement may be structured whereby the concessionaire returns a certain percentage of his earnings to the park. In exchange for being allowed to provide the service in the park, he must agree to perform certain services and is subject to cancellation if they are not provided properly.

The staff of the Lowell National Historical Park is currently studying the possibility of allowing a concessionaire run the trolley and the canal barge system. Ideally the fees collected by the concessionaire would cover the expense of the operation, provide him with a profit and return a percentage of his profit to the Park. If ridership does not produce a high enough level of revenue, then the subsidy arrangement will have to be considered.

The issues being considered now by the Park staff are: at what point in the development of the trolley system does it make sense to bring in a concessionaire? how are fees charged and collected and how will this affect visitation levels? what visitation level is needed and what fares should be charged to attract a concessionaire? will the trolleys continue to be maintained by the Park staff and how will their maintenance be coordinated with the concessionaire? All of these questions will have to be evaluated before the status quo is changed from a trolley system that is government-owned and operated by Park staff to one that is operated by a private entity.

#### **4.3.2 Operation by a Third Party**

In its feasibility study, the Northern Middlesex Area Commission determined that the Lowell Regional Transit Authority would be the most likely 'third party' to operate the Lowell Park Trolley on a year round basis because of its experience in providing comprehensive transit service and because it can "directly receive funds and revenues from outside sources that can be directly applied to the trolley service." (11) This is important if private subsidies are desired to offset the cost of delivering non-visitor service, section 4.3.3 below.

The study concluded that it was slightly more cost-effective for the National Park Service to continue to operate the system than it was for the LRTA to do so. Specifically, if the system were to be operated year round by the LRTA, it would cost about \$176,000; the same service would cost about \$170,000 if operated by the National Park Service. At full operation, the NMAC estimated the potential annual ridership to be 338,000 one-way trips and the cost of the service per passenger would be \$.51. (12)

### 4.3.3 Subsidies by Private Businesses

The NMAC recommended a system whereby visitors and commuters to and from the renovated Wannalancit Technology Center could be accommodated for an annual cost of \$48,000 to \$54,000 and Hilton Hotel guests could be accommodated for \$17,000 to \$19,000. The cost for the tour program for Park visitors would be borne by the Park at an annual cost of \$105,000 to \$120,000. (13) Again, the main stumbling block to the the Park Service providing the non-visitor service will be its ability to accept the assessments from private sources and apply them to the trolley service.

An exclusive shuttle service would be provided between the Wannalancit Technology Center and the Post Office Square garage, where over 700 spaces will be assigned to the employees of the Center, between 7:00 A.M. and 9:00 A.M. and between 4:00 P.M. and 6:00 P.M. Riders would have to wait a maximum of seven minutes for a car. (14)

While the developers of the Wannalancit Mills and the Hilton Hotel are extremely interested in the trolleys providing visitor and employee service to their buildings it remains to be seen to what extent each is willing to subsidize that service. Their participation will not necessarily offset the Park's cost of providing visitor services, but it will add an important dimension to the Lowell Park Trolley by removing its 'novelty' transportation image.

#### **4.3.4 Purchase of the Boston and Maine Tracks and Right-of-Way**

The concept of the federal government purchasing the tracks originated when the staffs of the Lowell Historic Preservation Commission and the Lowell National Historical Park were first negotiating the operating agreement with the Trustees of the railroad. The Trustees declined the offer to sell the Lowell spur tracks until a new owner took over the corporation. The issue surfaced again during the spring of 1985 when the Park was preparing to perform a variety of maintenance tasks on the tracks and realized that each one required a separate approval from the railroad. Obviously government ownership would simplify the job of day-to-day operation of the Lowell Park Trolley--or would it? This section discusses some of the pros and cons and concludes that, for the time being, federal ownership is not desirable.

The main rationale supporting federal purchase, either by the Commission or the Park, was that it was in the Commission's best interest to obtain permanent rights to the right-of-way. That way we could protect our financial investment in the overhead line equipment and trolley cars as well as guarantee the continued service to Park visitors. With any lease, there is the possibility that it could be revoked or not renewed and we would lose our rights to operate the system. A lease of less than twenty-five years would not give us the maximum use from the equipment and any substantial upgrading of the tracks and right-of-way, e.g. tie and ballast replacement, could not be justified. Obviously, if we owned the system, we would be assured the use of our equipment for its useful life.

There are at least four other benefits to federal ownership:

- \* simplified procedures for maintenance (no B&M approvals);

- \* no requirement to purchase a \$3100 insurance premium for every private contractor hired to work within the right-of-way;

- \* justification of significant upgradings of the tracks should funds become available;

- \* no rental payment; if the system operated on 12 months during 1986, the rental would be \$10,459. (15). At the 8% escalation rate, the total rental payments will surpass the estimated \$200,000 purchase price long before the lease expires in the year 2008.

There are significant disadvantages to federal ownership, however. The most crucial is that with the ownership comes the responsibility of operating both a freight and a trolley system. As long as the B&M continues to serve customers in Lowell, the freight operation must continue; we have every indication to believe that it is a permanent situation. Ownership would require negotiating the purchase price and an operating agreement with the railroad--the reciprocal of the agreement now in effect. Due to the inability of the National Park to collect revenues for use in Lowell, it is not likely that the Park could charge rents from the B&M. An arrangement might be set up whereby the rents go to a concessionaire or third party as discussed above. The government, specifically the Park, would now be the party responsible for track and schedule management and for approving any work the B&M did on the tracks or within the right-of-way. It is possible that the B&M could even require us to bring the tracks up to standards greater than they themselves require. While the Park and Commission are well-versed in risk-taking in the implementation of the Lowell Park Trolley, the purchase of the B&M tracks and right-of-way is a responsibility that the Park is not prepared to undertake at this time.

## Footnotes

1. Michael Wilbur, "Ridership--one-way passenger trips," memorandum prepared upon request, Lowell National Historical Park, May 9, 1985.
2. "Summary of Lowell National Historical Park and Lowell Historic Preservation Commission Funding and Projects," February 11, 1985.
3. "Estimated Cost of Trolley Operations," memorandum to Nancy Woods from the Deputy Superintendent, Lowell National Historical Park, June 19, 1984.
4. Peter Promutico, Administrative Officer, Lowell National Historical Park, figures provided upon request.
5. Northern Middlesex Area Commission, Feasibility and Operations Analysis, Lowell Electrified Trolley System--Extended Trackage, Year Round Service (Lowell, Massachusetts, July 1985), p. 77.
6. "Transportation Systems, Lowell National Historical Park," memorandum prepared by the Park staff, January 1985.
7. Northern Middlesex Area Commission, p. 80.
8. "Transportation Systems."
9. "Historic Park Trolley Development and Operation Background Information," to Director, National Park Service from Regional Director, North Atlantic Region, July 20, 1984.
10. Michael Wilbur.
11. Northern Middlesex Area Commission, p. 82.
12. Ibid., p. 6.
13. Ibid., p.7.
14. Ibid., p.6.
15. Ibid., p. 75.

## Conclusions, Contributions and Recommendations

### 5.0.0 Introduction

The planning and implementation of the first phase of the Lowell Park Trolley were analyzed in the previous chapters in an effort to illustrate the complicated, circuitous effort it took to build the system. It cost approximately \$1.3 million to construct two reproduction 1902 open trolley car, to install a 550 VDC electric propulsion system, to upgrade the freight trackage and to retain the requisite engineering services, but the real story of this thesis is how the system evolved from the planning stage to the implementation stage.

As of this writing in July 1985, the National Park Service had successfully completed one and a half visitor seasons operating the electric Lowell Park Trolley. The seasons were successful because visitor attendance increased about 20% over 1984, the cars made over 108,000 one-way passenger trips (one-way is a segment of the route between adjacent stops), the system has become an attraction in its own right and is integral to the interpretive programs given by the Park rangers. The Lowell Historic Preservation Commission staff are in the process of implementing the next phase: a closed-sided 1914 vintage trolley car (two cars if funding is available), three track extensions with a total of two thousand feet of new track and overhead line, and one new bridge that is required to complete one of the extension branches. The closed car should be under construction by fall of 1985 and two branches of the track extensions should be under construction by winter 1986. This expanded system will have the potential for integrating the Lowell Park



Trolley into the downtown transportation system with a potential ridership of 338,000 one-way trips, over three times the ridership of the present system.

This chapter will put the Lowell Park Trolley in a larger context by discussing the trolley car renaissance occurring in cities across the country that are looking to the wood and brass trolleys of the 1900's--or facsimilies thereof--to add to the attractiveness of their downtowns. Lowell is certainly not unique in this respect, the Park's system is usually featured in the City's promotional materials. However, it is very important to realize that downtown revitalization was not the primary purpose of bringing the trolleys back to Lowell; in the following sections I will discuss what these cities can and cannot expect their trolley systems to do for them. It is ironic that the 1902 'new' Lowell cars were not the first choice but were arrived at after all other options had been eliminated, yet they were definitely the right choice: the cars stand up well to the rigors of daily use and complement the historic downtown--they evoke the nostalgia of 'trolley mania' that swept the country during the early 1900's.

The Lowell Park Trolley is unique in a number of respects. I have summarized below its distinguishing physical features and contributions it has made in the field of 'vintage' transit. By demonstrating that new cars can replicate museum pieces, we have expanded communities' options for specialized, 'theme' light rail vehicles. This summary is primarily in response to the many inquiries we have received regarding all aspects of the system, including the cars. One of my goals it to present this information so that agencies planning similar projects can learn from the Lowell Park Trolley experience. This discussion will culminate in a series of recommendations for implementing a vintage trolley line based on the Lowell strategies.

### 5.1.0. The Trolley Renaissance

Several studies have cited the resurgence of the light rail vehicles in urban centers as an effective way to provide a people mover that is faster and of better quality than a bus or street railway. I suggest that the Lowell Park Trolley is, in fact, a hybrid form of transportation, part tourist line, part light rail transit. The latter will be demonstrated when the system is expanded and is used as a commuter shuttle. "Although it is essentially turn-of-the-century streetcar technology, light rail transit today is being touted as a low-cost way to carry commuters along urban corridors where heavy rail investments can't be justified and where roadway capacity can no longer be expanded." (1)

Today's light rail transit vehicles do not travel in the street but "onto a private or semi-private right-of-way." (2) Transportation planners may not agree that the Lowell Park Trolley fully qualifies for light rail vehicle status, the latter article defines it as a "short 'tourist' line", it certainly resembles it physically: the route is separate from street traffic, cars are designed for slow speeds (12 miles per hour compared to 50 miles per hour for rapid transit) and the trackbed is well below the standard necessary for high speed passenger rail travel. (3) Until the Lowell Park Trolley joins the ranks of official light rail transit systems, it will continue in its role as providing interpretive transit for visitors to the Lowell National Historical Park and complement the City's own historical renaissance.

Other cities, such as Duluth, Minnesota, are also considering vintage trolley cars for their downtowns. Duluth is typical because it has heavy tourist traffic (over 500,000 visitors during the summer) and needs a transit system to meet the utilitarian needs of these visitors. It also wants "to add to the tourism potential" of "major historic and recreational destinations such as Canal Park."

and "there is an increasing interest in preserving various aspects of our past.

(4) The Duluth Historic Trolley would do this by creating the actual environment of the early transportation system, complete with rails, vintage cars and overhead wires." (5)

I think the reasons for the trolley car renaissance are woven into people's romance with antique vehicles and with nostalgia for the "better life" in the old days. Planners who propose antique or replica trolley systems want to capitalize on this perception and look to them to help define a place, especially an historical district, as special and capable of offering people a chance "to experience the type of journey their parents and grandparents made." (6)

Louis T. Klauder and Associates, the engineering consultants on the Lowell Park Trolley are actively capitalizing on the trolley car renaissance in their marketing brochure, "An Historic Trolley Line, A Modern Concept for the Revitalized Community":

Times have changed and the problems of air pollution, traffic congestion and escalating costs, and the increasing demand for fast, quiet public transit have brought about the rebirth of the trolley systems in a new and modern form. As the Light Rail Vehicle, the old-time trolley car has made a dramatic return to the transit scene....As part of this new approach, the great contribution of the old-time trolley has been recognized and a recreation of an historic trolley car operation is once again becoming an integral part of the community fabric both as a viable mass transit mode for specialized applications and as an extremely popular tourist attraction. (7)

Enhancing this mystique of the electric street car are the thousands of trolley

enthusiasts or 'fans.' There are trolley museums of virtually all sizes that are thriving in the United States and Europe whose annual events and on-going projects keep the lore of the electric trolley alive and well even though most transit companies scrapped their street railway systems in the 1930's. We discovered during our search for antique cars for the Lowell system that it is not unusual for a person who owns a trolley car to will it in perpetuity to a museum so the car can have permanent home. Occasionally, funds will accompany the car for its restoration. Seashore Trolley Museum, in operation for well over 40 years, is restoring the original of the closed-sided car we are building for the Lowell Park Trolley.

For some places trying to achieve two goals at once, the old-fashioned charm of trolleys and public transit, the solution is often a trolley bus. Based on observations of the use of trolley busses operated by the Lowell Regional Transit Authority and by other authorities, busses, no matter what their appearances, still bear a psychological stigma. Busses have utilitarian associations at best: school busses, back-of-the bus, bussing for school desegregation, bus station. These low-brow images are not the stuff of tourist attractions. Thus, to expect a trolley bus to enhance an historic district for the long term is unrealistic, not only because it is phony, but it is still a bus. Only the London double deckers seem to escape this stigma and have a special appeal for their unique ride experience.

Busses can also be pulled out of service and disappear from the city streets without leaving a trace of having been there. This gives them a disposable, undependable image; people rarely seem to remember bus lines fondly. Mention trolley lines to someone whose parents or grandparents rode them

and a different story will emerge. It may be a story of feeling the far-off vibrations of an approaching street car, it may even be of saving a foot or two of the tracks when they were finally removed for downtown 'improvements.' In any event, the tracks and delicate overhead lines of electric trolleys become organizing elements in the streetscape that suggest permanence and the expectation of the next ride.

In conclusion, the selection of replicas of historic vehicles for the Lowell Park Trolley to operate on the existing tracks was the right decision for two reasons: one is that they enliven the Lowell National Historical Park's interpretive program which gives people who come to the Park an experience that compliments the tours of the mill buildings and canals. While the Park staff would like to think that the historical tours are the reasons people come to the Park, my unscientific surveys indicate that most people come first for the trolley and barge rides ("Disneyworld North" as one visitor told me) and interpretation of the Industrial Revolution second. The other reason is that public relations for the City and local businesses spotlight the trolley cars by photographing them against meticulously restored 19th century gatehouses and mill buildings to create a distinctive image for the City and Park, proving that Lowell is an enthusiastic participant in the trolley renaissance.

### 5.2.0 Distinguishing features of the Lowell Park Trolley

This section summarizes the salient points of the Lowell Park Trolley so that it may be compared to other vintage transit systems and to illustrate what it is and is not:

1. Funding: 100% of the capital funds are federal and obtained through Congressional appropriations to the Lowell Historic Preservation Commission and the National Park Service, both agencies of the Department of the Interior; no funds Urban Mass Transportation Administration were used in the development of the project. 100% of the operating funds are also federal from same source as the capital funds. The cars and the electric system are entirely owned and operated by the National Park Service.

2. Fares: No user fees or fares are charged by the Park Service. This may change because the NPS fee structure is in flux; it may also change if the system is operated by a private concessionaire or other entity.

3. Relationship to regional transit system: None, but a study recently completed by the Northern Middlesex Area Commission concluded that under some circumstances there were advantages for the Lowell Regional Transit Authority to operate the system. The cost for LRTA operation would be slightly more than for the National Park Service, but the LRTA could accept subsidies from other sources to pay for transit service while it is not clear whether or the NPS can do so. To date, the National Park Service and the LRTA have not jointly participated in combining public bus service with visitor trolley transit.

## LOWELL PARK TROLLEY SYSTEM

Two new, double truck open trolley cars will be operated by the National Park Service in Lowell starting in May, 1984. The trolley cars are authentic reproductions of the 1597 - 1600 series manufactured in 1901 by the J.G. Brill Co. for the Eastern Massachusetts Street Railway, and are numbered 1601 and 1602. The cars, powered by an electric overhead line, will run on one mile of existing Boston and Maine railroad track which links the historic downtown mill complexes with Lowell National Historical Park's canal barge transportation system. All rides will be free.

CARS: 1601 - yellow with green stripes, 1602 - dark green with silver stripes.

CAR BUILDER: The GOMACO Corporation, Ida Grove, Iowa

ENGINEER: Louis T. Klauder and Associates, Philadelphia, Pennsylvania

FUNDING AGENCY: Lowell Historic Preservation Commission, U.S. Department of the Interior, 204 Middle Street, Lowell, MA 01852

OPERATING AGENCY: National Park Service, Lowell National Historical Park

SOURCE OF RUNNING EQUIPMENT: Melbourne and Metropolitan Tramways Board, Australia

- MV 101 motors from England, 40 hp, 600 volts
- air brakes
- General Electric K35 controller and CP27 air compressor
- trucks are similar to U.S. M.C.B.

HEIGHT: 11'10"

WIDTH: 10'1" with running boards lowered

LENGTH: 43'6"

WEIGHT: 34,000 pounds, approximately

SPEED: 0-14 mph, maximum

BENCHES: 15, seats 90 people

UNDERFRAME: new steel construction developed by GOMACO

FITTINGS: new brass castings

CURTAINS: striped canvas

WOODS:

- double grab bars and foot rests--ash
- seat backs--ash and cherry in varigated pattern
- seat bottoms--ash
- seat end posts--ash
- inside ceiling--birch veneer
- floor--plywood subfloor with grooved maple boards on wearing surface, douglas fir under seats

CLERESTORY GLASS: clear red at ends; white glue glass on sides

RUNNING BOARDS: double, lower one folds

HANDICAPPED ACCESS: one wheel chair tie-town on each end; Park will have hydraulic lifts at most stops

WHISTLES: Ohio Brass 3 tone air chime with WABCO valves

LIGHTS: 11 interior; 2 headlights reproduced by GOMACO

PAINT AND VARNISH SYSTEM: Pittsburgh paint

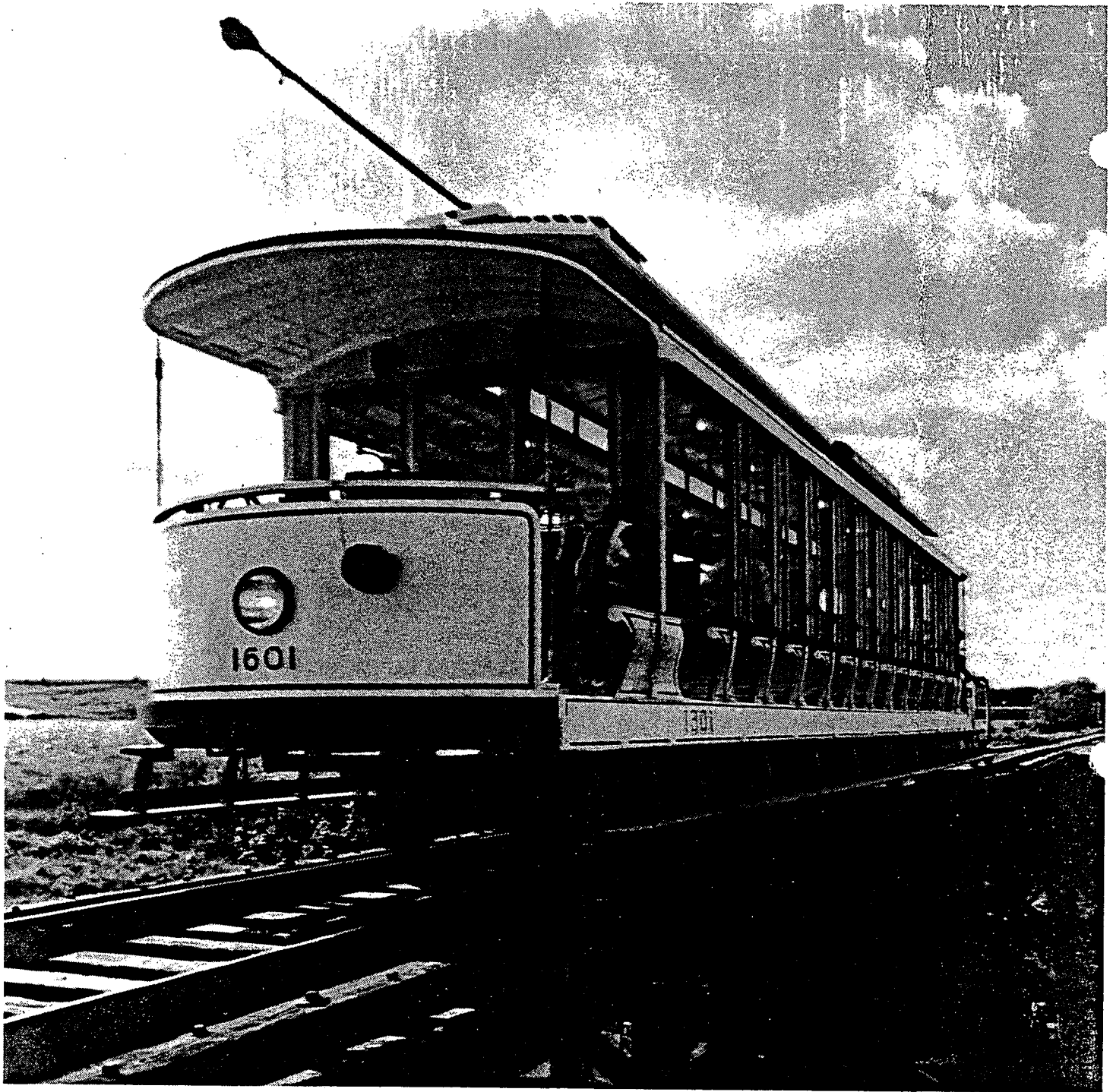
TRACKS: owned by Boston & Maine Railroad and leased by the National Park Service

OVERHEAD LINE SYSTEM: Lord Electric/Mass.

Electric Construction Co. according to specifications developed by Louis T. Klauder

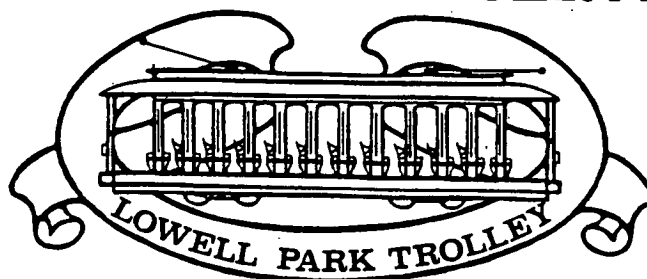
SUBSTATION AND RECTIFIER: Ohio Brass

FOR MORE INFORMATION: Maude Salinger, Lowell National Historical Park, 169 Merrimack St., Lowell, MA 01852 (617) 459-1015.



**LOWELL HISTORIC PRESERVATION  
COMMISSION**

**NATIONAL PARK SERVICE**



**U. S. DEPARTMENT OF THE INTERIOR**



4. Route: There is a total of one mile of existing freight tracks owned and jointly used by the Boston and Maine railroad. The tracks link at two points to two mile barge route on the upper Pawtucket and Northern Canals; together, the trolley and barge routes connect major historical points in the City. The Park offers tours seven-days-a-week on a reservation basis from May through October. Commercial centers are not linked, but a proposed extended route will connect the 240 room Hilton Hotel, high technology training center, two adaptively reused mill complexes and two parking garages. With 3,000 people working within a short walk of the proposed termini, there will be opportunity for the Lowell Park Trolley to provide morning, lunch-time and evening shuttle service, assuming that subsidies from private sources can be arranged to cover the additional operating and maintenance costs.

5. Equipment: The Lowell Park Trolley constructed and operates two replicas of open cars built in 1902 by the J.G. Brill Co.; the cars have newly constructed bodies and underframes and utilized salvaged 1920 vintage running gear purchased from Melbourne, Australia; the cars are propelled by a 550 VDC electric system with the power supplied by a 300 kw rectifier substation; the overhead electric line was designed to replicate early 1900's style equipment with sectional metal poles salvaged from MBTA used in vicinity of Park visitor center. The attached fact sheet, the "Lowell Park Trolley system" gives greater detail about the technical components.

6. Relationship to revitalization and land use development: There has been no direct link but the establishment of the Lowell National Historical Park was one of the catalyzing forces in the economic and historical rebirth of

Lowell; the trolley and barge transportation system was an integral component of park plans for the interpretation of the Industrial Revolution.

7. Riders: In 1984, there were over 42,000 visitors to the Lowell National Historical Park who had reservations on the 20 daily tours during the visitor season; total ridership in 1984 was 108,538 one-way passenger trips, approximately 26,300 of these were non-tour riders. The figures for 1985 are approximately 20% higher. Anyone may ride the trolley cars if space is available, but non-tour riding has not been promoted (space is generally not available on the barges); all park visitors are directed to a parking lot for free parking during their stay and then to the Visitor Center to meet their tour group. Visitors constitute a 'captured' group of trolley riders.

8. Institutional relationships: The National Park Service rents the tracks from the Boston and Maine railroad under a complicated lease agreement that includes an 8% yearly cost escalation; the NPS pays for track improvements that are necessary for the safe operation of the trolley line; freight cars are not allowed on the tracks when the trolley is in service and vice versa. In places where the right-of-way is owned privately, the NPS has obtained pole placement agreements from the owners. The City plays no role in the Lowell Park Trolley except to grant licenses for the overhead lines to cross city streets and to allow supporting poles to be placed on City property.

9. Environmental compliance: Both the National Park Service and the Lowell Historic Preservation Commission had to comply with the National Environmental Policy Act (NEPA) and prepare the appropriate compliance documents.

### 5.3.0. Contributions made by the Lowell Park Trolley

The new open cars are the Lowell Park Trolley's clearest tangible contribution; it is the one most often highlighted in the press and in feasibility studies for other trolley lines. Building the cars required that salvaged 1920's running equipment from Melbourne, Australia be mated with a body that looked authentic, but had a steel underframe, roof supports and other modern non-visible materials. Our cars were the first open cars built since the 1930's and the first time ever that a new transit vehicle was built using 60-year old running equipment. With these achievements, the Lowell Park Trolley opened up an entirely new source of non-fragile (in contrast with museum pieces), reliable cars and demonstrated that close replicas of the indigenous vehicles could be built cost-effectively.

Until the Lowell cars were built, cities had few choices: decorated busses, a very limited number of authentic historical cars and cars of various descriptions purchased from foreign countries. From these alternatives, it was almost impossible to find durable cars that were authentic to a particular area. In fact, if we had been successful in our first attempt to locate trolley cars that I described earlier in this thesis, several European trolleys would be operating today in Lowell today, looking quite out of place and having no relation to the City and its history. While the builder for our cars, GOMACO Corporation has not had any offers since our cars to build additional electric open cars, there has been considerable interest from other cities in the company building diesel-powered rail cars and rubber-tired open car replicas, with the emphasis on careful historical accuracy.

The Lowell Park Trolley has made a second major contribution by demonstrating that two federal agencies can cooperately develop a unique transportation system and incorporate it successfully into a National Historical Park. Specifically, the Lowell Park Trolley and the canal barges constitute a hybrid transportation system, part Light Rail Vehicle, part "theme" transit that currently serves the park visitor on reserved tours and will serve commuters when the tracks are extended. While nothing is unique about specialty rides for visitors, as every visitor to Disneyworld knows, the Lowell Park Trolley provides visitors with both the transportation needed to get to the historical points of interest and the opportunity to experience first hand how residents in the early 1900's travelled around the City. When the trolley system is expanded and connected to dense employment nodes, it will perform as a true LRV system. The Lowell Park Trolley will demonstrate that it is possible to incorporate function, history and visitor-attraction into a portion of its transportation.

While the testing of this dual operation is yet to occur, it will require that the National Park Service shift from primarily visitor services to services that include the general public. Obviously these non-visitors should not be subsidized by the government, but it will be a new situation for a staff that does not necessarily feel an obligation to the public at large. It will also take a shift in attitude by the Lowell Regional Transit Authority, regardless of the role they play, to regard the electric trolley system as an a system that could benefit them rather than as one that is a threat to their service. Finally, the expanded system--even one that simply runs two trolleys for tour and casual riders--will require more management, operational and maintenance personnel than the present staff of the Park is able to provide.

#### **5.4.0 Recommendations for cities considering interpretive transit**

The Lowell Park Trolley was built for a specific purpose: to move people to historic locations and to give them the "feel" of history at the same time. As tax incentives are used more and more to rehabilitate historic buildings, many downtowns are shedding their 1960's and 70's "modernizations" and returning to early 1900's street scapes. The trolley--in one form or another--can be a complementary amenity. Just how complementary depends on the city's commitment, whether it is minor with one relatively inexpensive specialty tours bus, or major with track and overhead infrastructure and historically appropriate vehicles.

By far the most perplexing problem is funding. The Lowell system was highly unusual and not likely to be duplicated elsewhere--the U.S. Department of the Interior funded the entire development for a facility in a national park-- and I am not recommending that this approach even be considered. In fact, the funds spent on the Lowell Park Trolley were a small fraction of the millions of dollars in federal funding that came to the City via the Lowell National Historical Park and the Lowell Historic Preservation Commission for a comprehensive historic restoration and development effort.

However, several recommendations emerge from the Lowell experience that are directly applicable to cities contemplating comparable systems. The previous sections of this chapter describe the salient points of the Lowell Park Trolley that enable anyone involved in planning a similar system to determine the relevance of our experience. This section presents recommendations for procedures, implementation and the physical layout.

1. Once the lead agency is determined and a decision is made to proceed with the feasibility studies, a demonstration project should be established. It will provide a physical presence of the future project that everyone can see, i.e. it acts as its own advertisement, and makes it harder to cancel the project when people have gotten accustomed to "phase one." And, if necessary, it can be structured to work out operational and institutional problems that may be obstacles for the fully developed project. The important point is that the project must be carefully designed to provide experience that is relevant to the final product. Often projects can be scrapped on the basis of the demonstration project because the project was poorly set up. For example, it would have been useless for us to run a rubber-tire bus as a demonstration project to help work out an arrangement with the railroad. It would be just as useless to run a self-powered car on tracks remote from the population center and scrap the project because no one rode the car.

2. Incremental funding approvals for project components and their implementation are important for demonstrating that the project is underway. While long range planning and budgets were continually updated, actual funding approvals were made incrementally and for each component of the project as it was ready to build. Yearly budget requests to Congress included only the next year's anticipated expenditures; so the funds for the entire project were never guaranteed. Federal funding is done by yearly budget and sufficient funds are generally authorized to cover only one fiscal year and may not be sufficient to cover large capital projects. However, by starting the implementation process with small funding approvals, we could demonstrate the need for future funding to complete the project.

3. The ridership should include a captive audience in order to have a guaranteed source of passengers. Spontaneous ridership for the sake of riding represented only about one-third of the riders on the Lowell Park Trolley. This portion might be much lower if fares were charged. Intercept parking and clear routing of visitors were in place before the trolley was built. If the operation of the transportation system is to be turned over to a for-profit entity, an even greater recruitment of riders will be necessary.

4. Historic trolleys alone are not enough to revitalize a downtown and cannot be promoted with this goal. People can and will go to many rail museums for rides before they will go to a depressed city center for a trolley ride. It will enhance an over-all revitalization effort by giving an attractive focal point for local advertising and promotion.

5. The quality of the cars cannot be overemphasized. The more detailed and close to authentic reproductions, the greater their long term appeal. There is a liability involved in reproducing historic cars that building preservationists have known for years--you cannot win with everyone. One of our goals was to produce a system, and most notably the cars, that was reasonably accurate historically. For the perfectionist members of the street railway fan clubs, we tried admirably and fell slightly short. In fact, several such critics pointed out that our cars were modeled after cars that ran on the South Shore--similar to cars that ran north of Boston, but not identical; we used a 1920's handbrake system--too modern for the 1902 cars; the curve on the wooden seat is not sharp enough--it does not fit the bench ends quite right; and the floor boards are not individual strips of wood--they are grooved panels. Details, yes, but criticisms nevertheless. Each of these

compromises was made with the full knowledge that it was a compromise, but fortunately we received more kudos than knocks. Our advice: if historic replication is a goal, research, enlist the fan clubs for input, then make independent decisions and keep compromises on the visible details to a minimum in order to maximize the vehicle's appeal.

6. Take advantage of existing tracks as an asset in starting the system.

Even if the route does not have an ideal relationship with existing commercial centers, the possibility of using these tracks to link parking with planned new activity centers should be carefully considered.



7. If one of the goals is to utilize existing tracks and the they are owned by a railroad, a relationship should be established at the highest level and it is important for this person to 'buy into' the trolley project from the beginning. From then, it is important to understand how the railroad departments are structured, who makes what decisions and how to get them made; this may take a great deal of time and patience. We found that presenting the railroad management with specific proposals or requests was the most effective way to approach them; they were extremely busy and beset with problems throughout their territory and could not respond to general concepts. It was also effective for us to assign one person to be the railroad liaison and to work out the terms of the operating agreement. Railroads treat their responsibilities very seriously and the use of their tracks by another entity should be approached firmly and just as seriously.

8. Establish a 'hands-on' interagency committee that has the dual responsibility of planning and implementation. We found this to be an effective way to minimize beaureaucratic layers, confusion and delays. The Lowell Park Trolley was developed by a core planning group of three people, two from the Commission and one from the Park, whose terms of authority were broad and clear to their constituents. Within the group, tasks were divided with little overlap and the implementation was integrated horizontally: planning, procurement, contract administration, construction management and operations were all directly carried out or supervised by the three members.

### Footnotes

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Appendix 2

This AGREEMENT made in duplicate this 24<sup>th</sup> day of May, 1983 by and between Robert W. Meserve and Benjamin H. Lacy, as Trustees of the Property of Boston and Maine Corporation, Debtor, and not individually (see in the Matter of Boston and Maine Corporation, Debtor, United States District Court for the District of Massachusetts, Docket No. 70.250-M), with offices at 150 Causeway Street, Boston, Massachusetts, hereinafter called the "TRUSTEES" and the United States of America, acting by and through the Lowell National Historical Park with offices at 169 Merrimack Street, Lowell, Massachusetts 01852, hereinafter called the "LESSEE."

WITNESSETH:

Whereas, the LESSEE is authorized under 16 U.S.C. 410 cc-25(2)(d) to provide transportation services and facilities for the Lowell National Historical Park and Preservation District including local rail facilities, and

Whereas, the TRUSTEES own or operate railroad right-of-way including industrial spur or railroad trackage within the Lowell National Historical Park and on which it is proposed that the National Park Trolley operate.

Now, therefore, the TRUSTEES so far as they lawfully may, for valuable consideration received hereby lease to the LESSEE for the purposes of operating and maintaining a passenger trolley system for public use; including but not limited to installing overhead electric lines and related structures and fixtures to power the system, the premises shown outlined in red, upon a plan attached hereto, made a part hereof, and entitled:

"BOSTON & MAINE CORP.  
VALSEC 131      MAPS 25 & 26  
" " 15      " 1

LOWELL, MASS.

OFFICE OF THE VICE PRESIDENT - ENG.  
SCALE: 1"=200'      DATE: 3-18-80  
3-15-83"

upon the following terms and conditions:

1. The LESSEE shall pay to the TRUSTEES rent at the base rate of Eighty-three Hundred and no/100 (8,300.00) Dollars for the first year adjusted proportionately at the rate of Six Hundred Ninety-two (692.00) Dollars for each calendar month during 1983 in which the LESSEE or its operator conducts passenger trolley operations for ten (10) or more days and proportionately at the rate of One Hundred and no/100 (100.00) Dollars for each and every calendar month that said trolley operations are conducted for less than ten (10) days; said base rate and proportionate rates are subject to escalation as set forth in Section 9 hereof; said rent being payable in arrears in monthly payments; any holding over by the LESSEE after the termination hereof shall be upon the same terms and conditions (except as to term) as herein set forth.
2. With the exception of the TRUSTEES obligations as to routine maintenance, so-called, and snow and ice removal, and such capital improvements contracts as the parties hereto may from time to time enter into and which may obligate the TRUSTEES to perform certain work, at the expense of the LESSEE, it is understood, covenanted and agreed that the TRUSTEES shall be under no obligation to make any repairs upon the exterior or interior of said premises during the continuance of this lease, but that if at any time upon the request of the LESSEE the TRUSTEES shall make repairs upon said premises, the making of said repairs shall be at the expense of the LESSEE and shall not be considered an admission by the TRUSTEES of a duty to make repairs, and shall in no way obligate the TRUSTEES to make further repairs.

3. It is understood, covenanted and agreed by and between the parties hereto that surface drainage in adjoining land and location of the railroad operated by the TRUSTEES is to be protected at the expense of the LESSEE against any adverse effect caused in the sole and reasonable judgment of the Principal Engineering Officer of the railroad operated by the TRUSTEES by use by the LESSEE of the premises herein leased.

4. It is understood, covenanted and agreed by and between the parties hereto that the TRUSTEES shall perform routine maintenance and snow and ice removal to and from the track structure and crossings located within the red-outlined premises; provided, however, that the TRUSTEES shall in no event be obligated hereunder to maintain any crossing or to remove snow and ice from any crossing wherein it is currently the responsibility or obligation of the City of Lowell or public authority either to provide maintenance or snow and ice removal or to assume the cost thereof. It being the intent of this paragraph that the TRUSTEES' obligation to perform routine maintenance consisting of maintenance of tracks within the red-outlined premises in safe and serviceable condition for use by TRUSTEES, shall in no event involve, extend to or include, either the LESSEE's proposed catenary system and its appurtenances, or such capital improvements as shall from time to time be determined to be necessary in the opinion of the TRUSTEES or desirable in the opinion of the LESSEE; such capital improvements shall in any event be performed or implemented by the Engineering Department of the TRUSTEES by written contract made by and between the parties hereto. The cost of the aforesaid routine maintenance shall in no event exceed Twenty-five Hundred (\$2500.00) Dollars per year.

5. The LESSEE covenants and agrees that if, for any reason whatsoever, any bill rendered hereunder is not paid within forty-five (45) days, it shall become subject to a finance charge computed in accordance with the rate as provided by the Federal Prompt Payment Act at such rate as prescribed therein. If for any reason said act expires or becomes null and/or void, then the rate shall be one and one-half percent (1.5%) per month applicable to the previous balance after deducting any current payment.

6. Nothing contained herein shall be construed as binding the LESSEE to expend in any one fiscal year any sum in excess of appropriations made by Congress or to involve the LESSEE in any contract or other obligation for the future expenditure of money in excess of such appropriations.

7. The LESSEE covenants and agrees that if, for any reason whatsoever, any bill rendered hereunder is not paid and the TRUSTEES, their successor and assigns, seek and obtain a court judgment favorable to the TRUSTEES, their successors and/or assigns, in the matter of payment, the LESSEE covenants and agrees for itself, its successors and assigns, to also pay to the TRUSTEES, their successors and assigns, forthwith, reasonable legal fees and costs for related legal action.

8. Every notice hereunder to be given or made by the TRUSTEES to the LESSEE shall be in writing and shall be enclosed in a sealed envelope, addressed to Lowell National Historical Park, 169 Merrimack Street, Lowell, Massachusetts 01852, and any notice required or permitted by the terms of this agreement to be given or made by the LESSEE to the TRUSTEES or their successors or assigns, shall be enclosed in a sealed envelope addressed to Robert W. Meserve and Benjamin H. Lacy, Trustees of Boston & Maine Corporation-Debtor, 150 Causeway Street, Boston, Massachusetts 02114. All notices given or made in accordance with this provision shall be sent by Certified Mail and for all purposes hereof, shall be determined to have been given as of the date of certification thereof. Either of the parties hereto may, by written notice sent to the other by Certified Mail, change the address to which notices hereunder shall be addressed.

9. The base rate and proportionate rates of the rent specified in Section 1 of this Agreement and to be paid by the LESSEE to the TRUSTEES shall on May 1, 1984, and on May 1 of each and every year thereafter be increased for the next twelve (12) months then ensuing by adding to the rent prevailing hereunder on the day before each such anniversary, an amount of money determined by multiplying by eight percent (8%), the rent for the preceding twelve- (12-) month period.

10. The TRUSTEES shall obtain and keep in force insurance coverage to protect the TRUSTEES from any liability for personal injuries or property damage resulting from the exercise by the LESSEE of the leasehold rights granted herein and the TRUSTEES' maintenance obligations as provided herein or elsewhere. Such policy or policies shall provide for:

General liability protection with the TRUSTEES named insured with limits of One Million Dollars (\$1,000,000) for all damage arising out of bodily injuries to or death of any person and subject to the same limit for each person with a total of Three Million Dollars (\$3,000,000) in the aggregate for all damages arising out of bodily injuries to or death of two or more persons in each occurrence, and in the amount of not less than Five Hundred Thousand Dollars (\$500,000) for all damages arising out of injury to or destruction of property in each occurrence. The name insured under said policy or policies shall be Robert W. Meserve and Benjamin H. Lacy, as Trustees of the property of Boston and Maine Corporation, Debtor, or their successors and assigns as the case may be, and the LESSEE shall reimburse the TRUSTEES for the cost thereof, forthwith upon receipt of bills therefor. Forthwith upon exercise of each option in the LESSEE to extend the term of this agreement for the further term of five (5) years, the LESSEE and the TRUSTEES or their successors and assigns as the case may be shall diligently pursue negotiations relative to increasing the aforesaid amounts of bodily injury and property damage coverage to adequately protect the TRUSTEES as intended under the terms of this Section 10.

11. This agreement shall take effect as of the 1st day of May, 1983, and shall continue in full force and effect for the term of five (5) years. The LESSEE shall have six (6) options to extend the term of this agreement for additional terms of five (5) years each commencing May 1, 1988, May 1, 1993, May 1, 1998, May 1, 2003, May 1, 2008, and May 1, 2013 upon the same terms and conditions as herein provided; except as to rental which shall be in accordance with the escalations resulting from the exercise of Section 9 hereof. However, it is understood and agreed that, as a condition precedent to exercising any of its options to extend the term of this agreement for an additional term of five (5) years, the LESSEE must, at least 90 days prior to May 1 of the appropriate year and in the case of each option, notify the TRUSTEES in writing of its desire to extend the term of this agreement for the further term of five (5) years.

12. After the expiration of any of the aforesaid five-year terms, and in the event of nonexercise of any of the aforesaid options, or after April 30, 2013, in the event said five-year options are exercised, this agreement shall continue in full force and effect until terminated on any day by thirty (30) days written notice given by either party to the other of intention to terminate. Such notice on the part of the TRUSTEES may, at their option, be given by posting in a conspicuous place upon the premises herein leased, and this agreement, in such case, shall terminate in thirty (30) days after such posting.

13. The LESSEE covenants and agrees to pay any and all taxes or assessments of any nature or description levied or assessed upon the premises as shown outlined in red on said attached plan during the term of this lease or any extensions thereof.



14. In the event the leased premises or any part thereof shall be taken by public authority for public use, or shall receive any direct or consequential damage by reason of anything done in compliance with any public authority, any land damage which may be recoverable by reason of such taking, or as a result of such action pursuant to any public authority, shall be due solely to the TRUSTEES.

15. The TRUSTEES reserve air rights over the premises herein leased in excess of thirty (30) feet above existing top of rail at any given point on said premises.

16. The TRUSTEES and the LESSEE shall agree to a defined set of operating procedures, to be set forth in a separate document executed simultaneously herewith. Such procedures shall identify, at a minimum, the following:

- a detailed trolley operating schedule
- clearance procedures with the so-called, "Lowell Tower" of the TRUSTEES
- names and telephone numbers of operations managers and other key personnel for the LESSEE and the TRUSTEES and/or any operator of the LESSEE
- emergency procedures

17. The LESSEE covenants and agrees to make a daily track safety inspection; including track, switches, appurtenances, and other right-of-way structures in the leased premises, prior to commencing passenger service. It is the obligation of the LESSEE to cease trolley operations immediately if hazardous track conditions are noted at any time during periods of passenger operations.

18. The TRUSTEES shall provide the LESSEE with emergency assistance in the event of derailments or other extraordinary circumstances. The LESSEE shall reimburse the TRUSTEES for the actual cost of such assistance, portal to portal, according to the current AAR schedule.

19. The TRUSTEES reserve in the premises herein leased the right to provide freight service to properties known as or owned by the Courier Corporation - Hall Street Plant - and the Curran Morton Warehouse on Bridge Street and future freight transportation customers both at present and reasonable foreseeable levels of traffic volume and activity and in the general manner in which it is now conducted or may hereafter be conducted; such service shall be during morning hours prior to 9:00 a.m. while this lease is in effect. Should special circumstances arise, freight service shall be alternatively scheduled after 6:30 p.m. In the event that emergency freight service is required during the period from 9:00 a.m. to 6:30 p.m., the TRUSTEES shall, upon notifying the LESSEE endeavor to hold to a minimum the amount of time the trolley or passenger operations will be required to be out of service. The day-to-day operations of freight service under the right herein reserved may be outlined in greater detail in the aforesaid separate document described in Section 16 of this agreement.

20. No member or delegate to the Congress or official of the Department of the Interior shall be admitted to any share or part of this Agreement or to any benefit that may arise therefrom.

21. Neither party to this Agreement shall discriminate against any person because of his/her color, race, religion, sex, age, or national origin by refusing to employ, contract with or otherwise utilize the services of such persons.

22. The LESSEE agrees to use said premises and to occupy the same in a careful, safe and orderly manner so as not to interfere in any way with the maintenance or operation of the TRUSTEES' railroad, or any of its appurtenances, and not to make any alterations in or addition to said premises, nor install or alter heating, lighting or power equipment therein without written consent of the TRUSTEES and not to commit or suffer waste or nuisance upon said premises, but to keep and deliver up the same upon the termination hereof in as good condition as they are now in or may be put in by the TRUSTEES, common and ordinary wear and tear and damage by the elements without concurring fault on the part of the LESSEE excepted, and not assign this lease nor underlet the whole or any part of the demised premises without written permission from the TRUSTEES which permission or consent shall not be unreasonably withheld, and to permit the TRUSTEES, their agents or applicants, for purchase or lease to inspect the premises at all reasonable times.

23. Buildings, structures and fixtures of any kind or nature upon the said premises and belonging to the LESSEE shall remain the property of and may be removed by said LESSEE at any time before the termination of this agreement or within a reasonable period of time not to exceed thirty (30) days thereafter, and any and all such buildings, structures and fixtures upon said premises thereafter, shall become and be absolutely the property of the TRUSTEES.

24. Should the LESSEE fail to comply with any covenant or condition whatever of this agreement, the TRUSTEES may terminate the agreement provided LESSEE receives written notice of noncompliance and is allowed thirty (30) days to cure.

25. Upon termination of this agreement, the TRUSTEES may enter upon the premises and repossess the same and LESSEE further agrees that it will remove any or all of said buildings, structures or fixtures belonging to the LESSEE from the said premises within a reasonable period of time not to exceed thirty (30) days after the termination of this agreement, the LESSEE agrees that the TRUSTEES, if they so elect, may at any time thereafter remove the said buildings, structures or fixtures and repair the said premises at the expense of the LESSEE and without being answerable for the disposition of any of the materials therein.

26. This Agreement is given subject to the terms of an Indenture dated December 1, 1919, made by and between Boston and Maine Railroad, predecessor to Boston and Maine Corporation, its successors or assigns and the Old Colony Trust Company and S. Parkman Shaw, Jr., Trustees, as provided in Article 14, Section 10 of said Indenture dated as of July 1, 1940, made by and between Boston and Maine Railroad, predecessor to Boston and Maine Corporation, its successors or assigns and the State Street Trust Company and Dana M. Dutch, Trustees, as provided in ARTICLE 14, Section 10 of said Indenture and in any supplemental Indenture amendatory thereof.

27. The LESSEE covenants and agrees that prior to construction or installation of the aforesaid overhead electric lines and related structures and fixtures to power said passenger trolley system, to obtain in writing from the office of the Principal Engineering Officer of the railroad operated by the TRUSTEES approval of detail design plans, specifications and proposed vertical and horizontal clearances resulting therefrom, or to be created thereby.

28. It is understood, covenanted and agreed by and between the parties hereto that the LESSEE may with the written consent of the TRUSTEES retain the services of a competent and responsible operator of said passenger trolley system. The TRUSTEES' decision as to the adequacy or inadequacy of such proposed operator's competency and responsibility shall prevail.

29. The covenants and agreements herein contained shall inure to the benefit of and be binding upon the heirs, executors, administrators, successors or assigns of the parties hereto respectively and the word "TRUSTEES" shall be considered as meaning, "Robert W. Meserve and Benjamin H. Lacy, as Trustees of the Property of Boston and Maine Corporation, Debtor, and not individually (see In the Matter of Boston and Maine Corporation, Debtor, United States District Court for the District of Massachusetts, Docket No. 70-250-M) with offices at 150 Causeway Street, Boston, Massachusetts, their successors or assigns" and the word "LESSEE" shall be considered as meaning the "LESSEE", its heirs, executors, administrators, successors or assigns," wherever the context does not render such construction impossible.

IN WITNESS WHEREOF, the LESSEE has hereunto set its hand and seal and the TRUSTEES have executed these presents in duplicate on the day and year first above written.

Form Approved

ROBERT W. MESERVE AND BENJAMIN H. LACY,  
TRUSTEES OF THE PROPERTY OF BOSTON AND  
MAINE CORPORATION-DEBTOR

*[Signature]*  
.....  
Execution Approved

.....  
*[Signature: Robert W. Meserve]*  
.....  
(As Trustees and Not Individually)

.....  
*[Signature: Benjamin H. Lacy]*  
.....  
(As Trustees and Not Individually)

United States of America, acting by and  
through the Lowell National Historical Park

By: *[Signature: Alan J. Burdick]*  
Supt. Lowell Hist. B.P.  
.....  
BY: *[Signature: Peter A. ...]*  
Title  
Administrator

COMMONWEALTH OF MASSACHUSETTS

ss.

May 20, 1983

Then personally appeared the above named John J. Burch, II

and

acknowledged the foregoing instrument to be the free act and deed of said

Before me,

  
Notary Public

My Commission expires: June 24, 1988

COMMONWEALTH OF MASSACHUSETTS

ss.

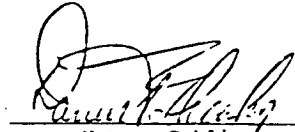
May 20, 1983

Then personally appeared the above named Peter A. Promuticu

and

acknowledged the foregoing instrument to be the free act and deed of said

Before me,

  
Notary Public

My Commission expires: June 24, 1988