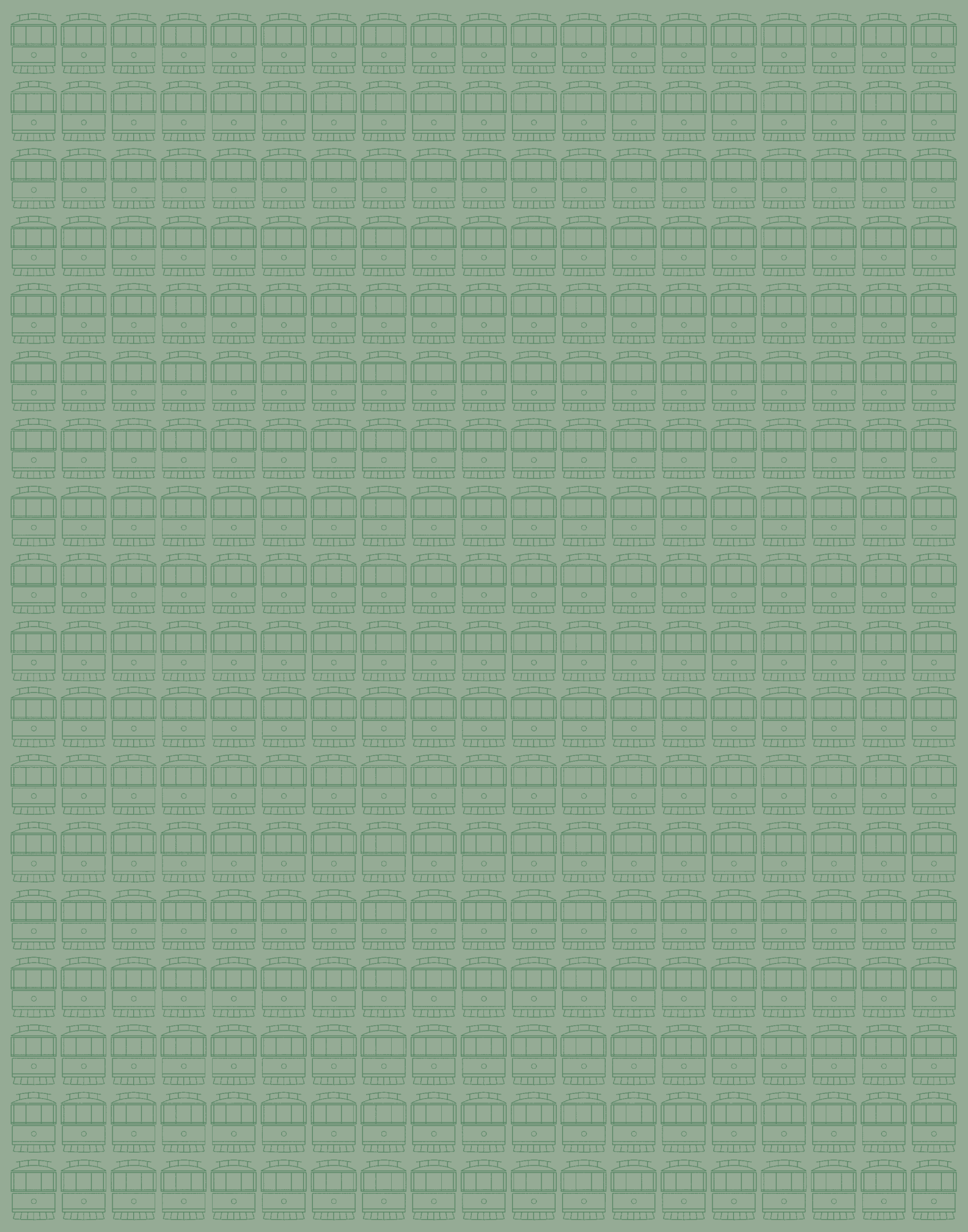
LOWELL TROLLEY STUDY

Executive Summary



INTRODUCTION

Lowell has come a long way in recent decades by capitalizing on the past to create an attractive 21st-century environment for education, commerce and urban living. But to maintain this momentum, it needs something more—a transportation system that weaves the whole city together in a way that's sustainable and economically viable. The existing National Park Service trolley system is a perfect base to build on. Taking it to the next level will take vision, perseverance, and a comprehensive framework for design, construction, operation and funding. This document provides that framework.

What's at stake is a broad array of social and economic benefits that can change the way people feel about and experience the entire city. At a practical level, the expanded Lowell Trolley will allow students at UMass Lowell to move quickly among its campus locations, the downtown Lowell business and entertainment district, and the Inn & Conference Center. It will enhance interregional connections and enable commuters to get downtown from the Gallagher Transportation Terminal in just a few minutes. It will give visitors an inexpensive, car-free way to enjoy all of the city's and the Lowell National Historical Park's (LNHP) historic sites and cultural attractions. And it will give families new options for reducing the everyday hassle of getting from A to B.

The benefits at the macro level may be even greater. It is reasonable to expect that the system will lead to a significant increase in property values and millions of dollars in additional tax revenue. It also has the potential to enhance the marketability and visibility of both UMass Lowell and the LNHP. The trolley project is positioned to take maximum advantage of available federal funding for construction. Covering the costs of operation and maintenance is a separate challenge, but this document includes a solution to meet it.

Overall, we believe this document offers both the systemic perspective and the concrete detail to enable a rational judgment on the merits of the Lowell Trolley project.

Background

This document summarizes the findings of the trolley system feasibility study commissioned in 2009 by The Lowell Plan in conjunction with the National Park Service (NPS). Building upon the extensive groundwork that was laid by three earlier NPS studies, the Lowell Plan study proposes a defined route serving major downtown landmarks and the extensive UMass Lowell campus system. Equally important, it is the first to include a balanced plan for covering the system's operation and maintenance costs.

The project's goal was to transform the National Park Service's existing historic trolley service into a viable, modern system serving not only the LNHP, but all of central Lowell. To do this, it would extend the Lowell Trolley to 6.9 miles from its current length of 1.2 miles. This expanded trolley would then serve three distinct groups of riders—visitors, commuters, and the students, faculty and staff of UMass Lowell. The study team, comprised of federal, state, and local agencies and the private sector, believes these goals are fully achievable.

PROJECT AT A GLANCE

- Length of system: **Seven miles**
- Rider trips per year: **830,000**
- Maximum wait time for a trolley: **10 minutes**
- Construction cost: **$66 million**
- Annual operation & maintenance costs: **$3.3 million**
- Station Stops: **20**

(all figures approximate)

Lowell Trolley Transit System Proposed Routes

Clockwise from upper left: the existing NPS line, Gallagher, Father Morrissette, and South Campus

OPERATIONS AND RIDERS

Route Description

The proposed system includes four corridors: 1) the existing NPS line, 2) Gallagher, 3) Father Morrissette, and 4) South Campus. Starting at the Gallagher Terminal, the trolley will run through the Hamilton Canal District to downtown and the LNHP. It will then split into two branches: a short line serving Middlesex Community College and the UMass Lowell Inn & Conference Center, and a longer main line serving the Tsongas Arena at UMass Lowell, LeLacheur Park, and UMass Lowell's East and South Campuses.

Throughout this 7-mile span, the proposed route is designed to pass as close as possible to major destinations while requiring little or no land taking.

Service

The system is designed to ensure that riders will never have to wait more than 10 minutes for a train. This level of service is important to enable UMass Lowell faculty, staff and students to move efficiently among the university's campuses. The Lowell Trolley will operate year-round (see the sidebar for the weekly schedule). As many as 20 station stops will make it easy for riders to get on and off at convenient points. It will take about 25 minutes to travel the route from end to end. The trolley will move people as fast—or faster—than the transportation services currently offered by UMass Lowell and the Lowell Regional Transit Authority (LRTA). See the Comparison of Weekday Service chart on the next page for more detail.

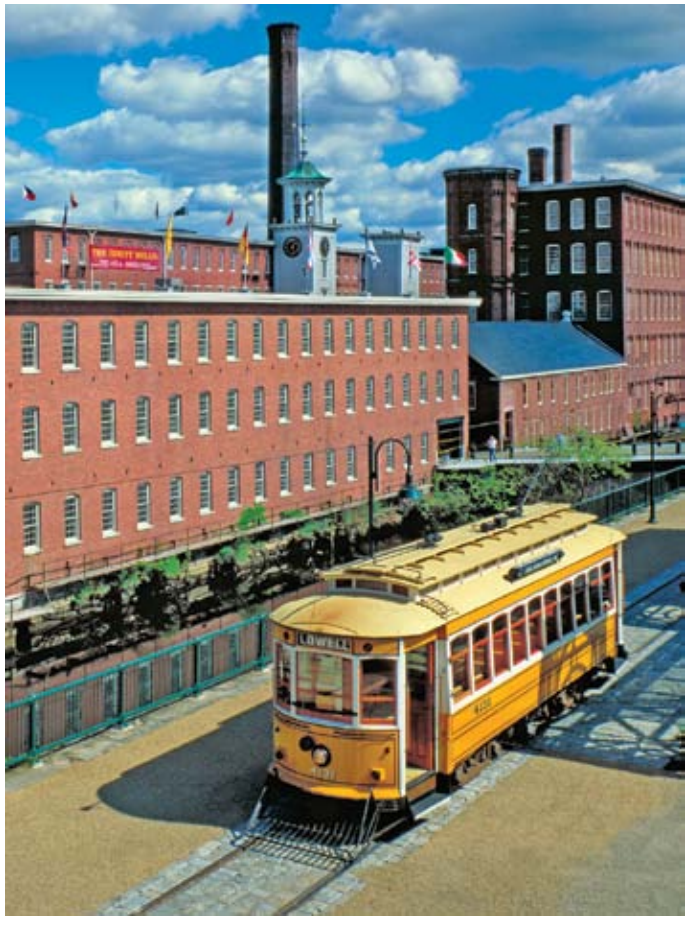
THE TROLLEY WILL OPERATE YEAR-ROUND DURING THE FOLLOWING TIMES:

- Monday through Thursday, 6 am – 10 pm
- Friday and Saturday, 6 am – Midnight
- Sunday, 10 am – 8 pm

Trolley Vehicles

The Lowell Trolley will operate using a total of nine heritage trolleys, six newly built modern vehicles designed to look historic. This figure includes the LNHP's three existing vehicles (one enclosed and two open cars), which will be upgraded and refurbished for supplemental use on the expanded system. The six new vehicles would serve the daily operational needs of the system with the LNHP vehicles deployed to meet peak demand for special events and to serve as back-up during vehicle maintenance and repair.

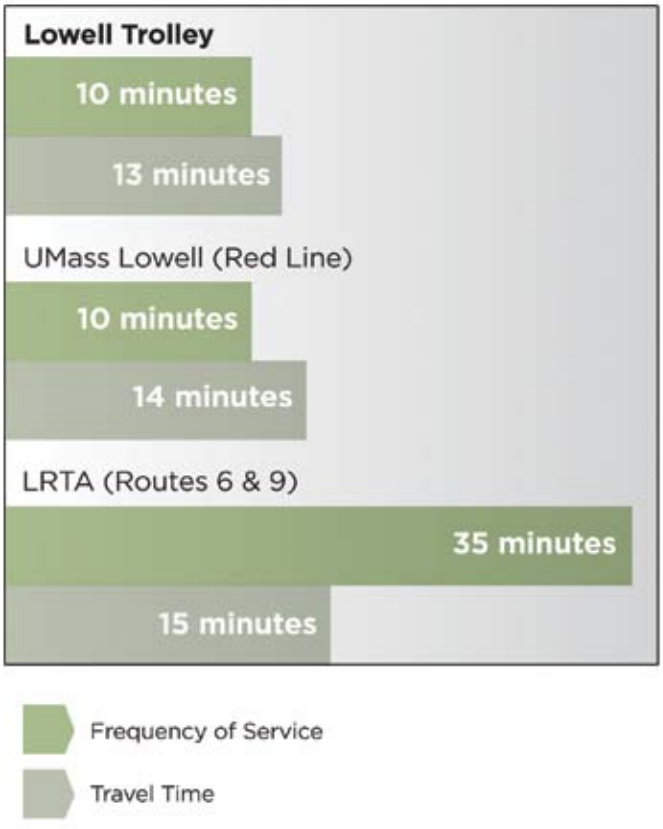
Heritage trolleys cost about $1 million each. They combine the modern conveniences of air conditioning, handicap accessibility and electronic fare payment options with the character and ambiance of historic trolleys. They are currently being used successfully in Tampa, Florida; Little Rock, Arkansas and Charlotte, North Carolina (see below). Conventional modern trolleys were also considered, but they were not recommended because each one would add approximately $2.5 million to the cost.



The Lowell Trolley Transit System would use heritage trolleys similar to the NPS enclosed trolley operating on the existing line.

OPERATIONS AND RIDERS

Comparison of Weekday Service:
UMass Lowell's South Campus to East Campus



Ridership

The trolley is designed to serve approximately 833,555 trips each year. This figure includes a baseline of 657,436 trips based on the current configuration of development in and around downtown Lowell, plus 176,119 additional trips projected to occur as a result of new development planned along the trolley tracks. The following is a detailed breakdown of the trolley's projected ridership.

Ridership Source	Projected Trips
National Park Service	52,589
Local Residents (within 1/4-mile of rail line)	44,730
Folk Festival	10,800
Entertainment Events	67,176
UMass Lowell	297,011
Lowell Regional Transit Authority	185,130
Total Existing Trips	**657,436**
New Residential	6,848
New Office	130,492
New Lowell Trial Court	38,780
Total Future Trips	**176,119**
TOTAL TRIPS	**833,555**

POTENTIAL SYSTEM OPERATOR

Given the expertise and specialized skills required to run a trolley system, the Lowell Trolley will likely be operated by a private company. However, this private operator could be managed by one of two entities: the LRTA or an independent not-for-profit organization. The LRTA currently manages a private contractor that runs the agency's seventeen bus routes, which serve the city of Lowell and its thirteen surrounding towns. With its experience overseeing this contractor and providing transportation services in the Merrimack Valley, the LRTA is a natural candidate to operate the trolley.

The Lowell Trolley could also be managed by a nonprofit organization. This model has been successful in Tampa and Dallas, where the streetcar system is administered by a non-profit organization that was created by an agreement between the city and the local transit operator. This nonprofit structure is attractive because it allows for mission-driven supporters to manage the system while leveraging the strength of inter-agency partnerships. While there is no standard for how to operate and manage a trolley system, both of these approaches could work for the Lowell Trolley.

LIVABILITY AND SUSTAINABILITY

Building a Livable Community

The charm of a heritage trolley system in a city whose character is deeply rooted in history and historic preservation will reinforce the unique sense of community and place that is Lowell. The system will strategically connect Lowell's modal points – transit centers, parking facilities, and pedestrian walkways into a truly intermodal, interconnected system.

The streetcar will provide a seamless connection to the Gallagher Terminal extending the reach of the regional transit system into Lowell's neighborhoods, college and university campuses, and downtown commercial and cultural district. It will stimulate redevelopment of Lowell's undeveloped mill complexes and urban areas, support active educational and cultural uses, promote public-private investments, and create places where people want to live, work, and play.

The trolley system is part of a comprehensive effort to construct multi-modal infrastructure in Lowell to facilitate the next generation of downtown revitalization with a core focus on livability and walkability. It has been identified as a key element in the City's 'Downtown Evolution Plan' providing an important link in planned bicycle and pedestrian infrastructure improvements and plays a critical role in the University of Massachusetts, Lowell's transportation plan and goals to provide faculty and students with vehicle free transportation options to and within their dispersed campus system.

Reducing Our Carbon Footprint

The Lowell Streetcar Expansion project is part of a systematic and comprehensive effort to reduce the carbon footprint of the Lowell National Park and Preservation District. This project is an investment in Lowell's public transit infrastructure that will have lasting impacts on reducing greenhouse gas emissions and mitigating the impact of transit on climate change. The streetcar system will create a transportation network that will move people through the city ecologically, maximizing access to and within the city, and minimizing vehicle miles traveled, energy consumed, and pollutants emitted.

The trolley has the potential to reduce energy expended per passenger-mile by shifting travel to a more energy efficient travel mode. The Department of Energy (DOE) estimates that buses utilize 4,348 Btu (British thermal units, a measure of energy) per passenger-mile whereas rail transit on average utilizes 2,521Btu per passenger-mile, a 42% reduction in energy use per passenger-mile. The trolley is expected to largely replace the LRTA downtown circulator and the UMass Lowell shuttle services. Combined, these bus lines travel approximately 243,000 miles per year and emit an estimated 1.86 pounds of CO2 into the atmosphere. Full implementation of the project is expected to result in a significant 16.4 percent reduction in CO2 emissions levels.

Further, as a system completely powered by electricity, the Lowell Streetcar Expansion project has the potential to be 100% powered by renewable energy sources, as area utilities make available power generated by wind, water, geothermal, or solar energy. The current bus services do not have this potential.

COMMUNITY BENEFITS

LNHP

By enhancing inter-regional connections and by significantly improving the operational efficiency of the Park's transportation system, the expanded trolley system should lead to more visits and an enhanced visitor experience. The project will strengthen connectivity along the Park's multi-modal transportation system, expand park visitation reach, and further establish a "park once" approach to addressing visitor transportation needs in Lowell.

UMass Lowell

UMass Lowell will be a significant beneficiary of the trolley. The trolley system will enable the university to be less automobile dependent, possibly freeing up scarce land currently utilized as surface parking lots. Moreover, with trolleys shuttling students around as opposed to buses, academic life at UMass Lowell will be significantly enhanced. With a dedicated right of way, students and faculty will be able to move more reliably and comfortably among its three campuses. While also hard to quantify, the trolley should improve the University's standing among its peers, leading to more applications from a broader geographic area, resulting in higher test scores and class rankings from incoming students, and ultimately higher matriculation rates.

City

The expanded trolley system will increase the market potential of businesses by demonstrating to potential investors a strong commitment by government to permanent transportation consistent with the city's heritage. An extension of the trolley system will improve access to Lowell's vast historic mill space, simultaneously promoting growth and reducing the impact of added traffic following from such growth. A lively heritage transit system will enhance the character and attractiveness of the area, raising the quality of future development. All of this leads to a greatly enhanced quality of life in the city and region.

ECONOMIC DEVELOPMENT BENEFITS

The fundamental challenge with indentifying the many likely benefits of instituting a trolley system in Lowell is similar to estimating the benefits of any new public investment. Attributing and quantifying the benefit stream to a community is based upon conjecture and imperfect science, especially within the context of other private and public investment, background growth, and prevailing economic cycles. Nevertheless, however imperfect and imprecise, in every one of the other cities that have created or re-instituted urban trolley systems in the past ten years, the post- completion feedback from both the business and government sectors has been almost universally favorable. The next two sections describe some of these benefits.

increase in Value of existing Properties

An analysis of similar projects elsewhere in the country suggests that over a 10-year period the Lowell Trolley will boost the total value of existing residential, office, retail, hotel and medical office properties by at least $86 million or 5%. This increase promises to be a boon for property owners, especially those near station stops and along the right of way, who will see increased demand for their real estate in the form of higher rents and sales prices. However, revenue gains will be limited by the effects of Proposition 2½, a state statute that caps annual property tax increases at 2½%.

Supporting New Development

On the other hand, new projects currently planned close to the proposed trolley line total hundreds of thousands of square feet of commercial, retail, and residential space. These projects are projected to create over 5,000 new jobs. While some of this development will doubtless occur with or without the trolley, it's fair to assume that a successful trolley project will not only increase the volume of development, but also speed its pace.

This new development will not be subject to Proposition 2½, so the $147 million in additional value and $2.6 million in annual taxes associated with it will all flow to the city. Equally important, the new residents and workers it will bring into Lowell represent a substantial infusion of new disposable income—roughly $81 million—which will surely help downtown retail stores as well as other businesses in the city.

The list of benefits outlined here is not exhaustive, but they are equally challenging to segregate and measure. The increased economic activity generated by new construction will be of significant benefit to and sorely needed by the Merrimack Valley building trades and suppliers. The new employment opportunities that will be created by the new businesses locating in the city, as well as new and existing retail businesses looking to meet the increased demand for services, should have a positive effect on local unemployment and underemployment. Finally, instituting a trolley system, even a serious planning effort to implement such a system, will get widespread media attention, and thus burnish the city's growing state and national reputation as being creative, green and authentic, a rare success story in post-industrial America.

CONSTRUCTION COSTS

Building the trolley system will cost an estimated $65.7 million. Projected construction costs break down as follows (all figures in millions):

Track	$37.4
Trolleys	$1.4
Trolleys	$7.4
Maintenance Facility	$4.4
Subtotal	$50.6
Plus Contingency (15%)	$7.6
Plus Design and Project Management	$7.5
Total	**$65.7**

CASE STUDY

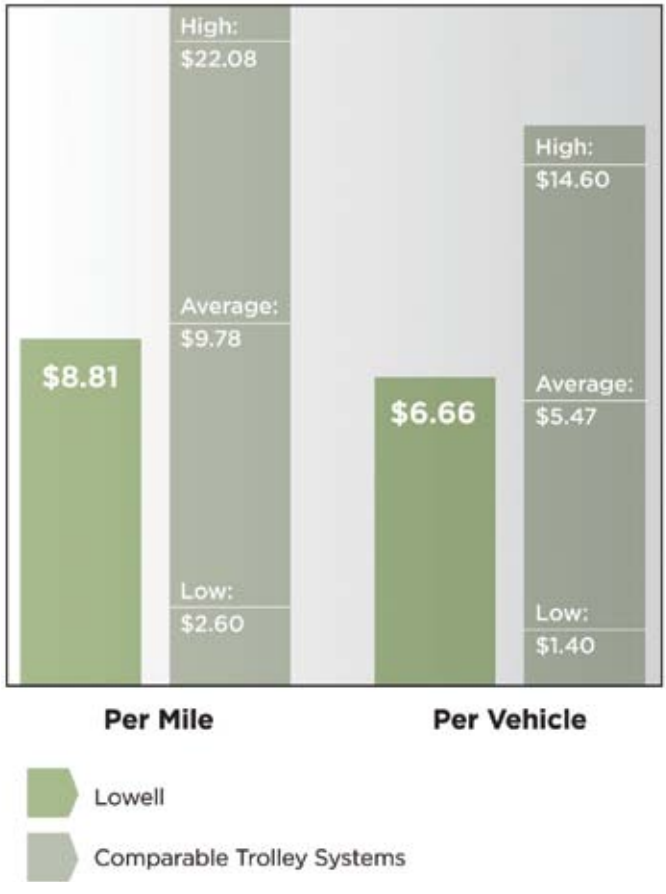
Little Rock, Arkansas

In 2004, Arkansas celebrated the opening of a 2.5-mile trolley system, River Rail Trolley, which connected its capital city of Little Rock with the city of North Little Rock. Building upon the success of the initial trolley line, Little Rock added almost a mile of track and began service to the William Jefferson Clinton Presidential Library in 2007. The River Rail Trolley cost $28.5 million to construct and operates using five heritage trolleys. Since its launch, the trolley has generated $260 million worth of economic development for the Little Rock region. Total ridership was 183,751 in 2009.

Little Rock's trolley system has been a powerful economic development tool.

Comparison of Construction Cost Estimate

To put the estimated $65.7-million construction cost in context, the following chart summarizes how much it actually cost to build trolley systems in other U.S. cities including Tampa, Little Rock, Memphis, Kenosha, Wisconsin and Portland, Oregon. For the clearest "apples to apples" comparison, costs are listed on a per- mile and per-vehicle basis. Because Lowell already has 1.2 miles of track in place, its estimated cost per mile is lower than the average for the comparable systems.



OPERATION AND MAINTENANCE COSTS

Running the trolley system will cost about $3.3 million per year. The cost estimate for operating and maintaining (O&M) Lowell's trolley each year was based upon the actual cost of operating Little Rock's trolley system, combined with estimates for projected annual miles and hours of operation in Lowell.

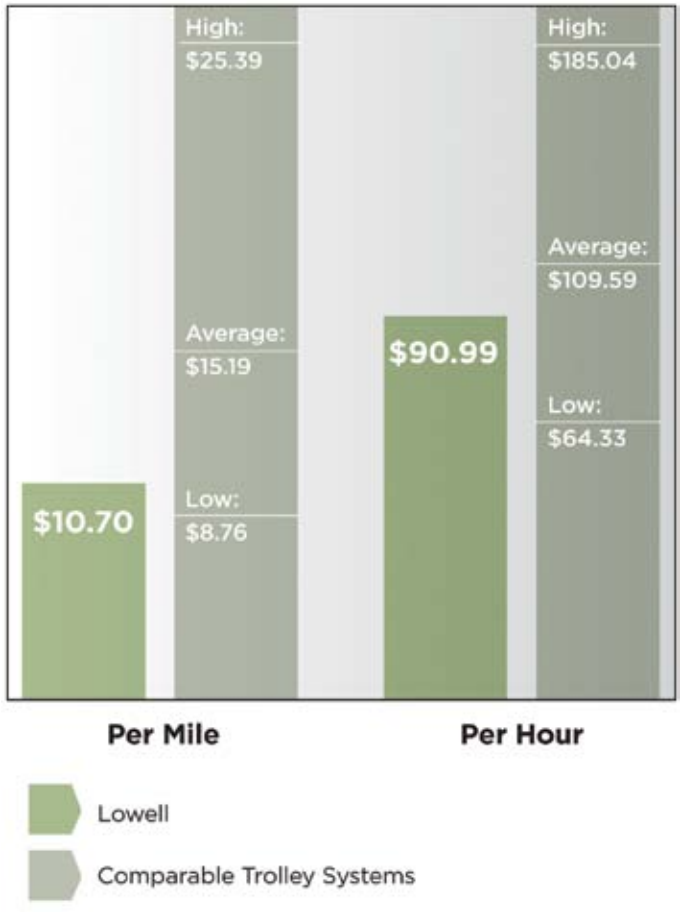
We used Little Rock as a basis because, like the system envisioned for Lowell, Little Rock's trolley system charges fares. The Little Rock system also has a maintenance facility, which will be necessary in Lowell. All of the O&M cost figures for Lowell have been adjusted upwards to account for the higher cost of living and more extreme winters in Lowell as compared to Little Rock.

Vehicle Operations	$1,749,408
Vehicle Maintenance	$676,496
Track Maintenance	$107,648
General Administration	$444,754
Sub-Total	$2,978,305
10% Cost Reserve	$297,831
Total	**$3,276,136**

Note: Numbers do not sum properly due to rounding.

Comparison of O&M Cost Estimate

As with the construction cost estimate, the following chart summarizes how much it costs to operate and maintain trolley systems in other U.S. cities including Tampa, Little Rock, Memphis, Kenosha, Wisconsin and Portland, Oregon. Lowell's estimated per-mile and per-hour operating costs are lower than the average of the other systems because the Lowell plan provides for a trolley every ten minutes, much more frequently than comparable systems.



CONSTRUCTION FUNDING SOURCES

Construction

Given that the construction of the trolley is still a few years away, the Lowell Plan study examined but did not recommend specific sources for construction financing. The following is a list of programs that could be utilized to build the Lowell Trolley.

Name of Program	Description	Funding Available Per Project
Small Starts	Funding program for smaller-scale transit projects	Up to $75 million
Urban Circulator	Funding for transit projects that move people within a Down-town area	Up to $25 million
Congestion Mitigation Air Quality	Funding for transit projects in areas that do not meet certain air quality standards	Varies
Transit in Parks Program [1]	Funding for transporta-tion projects in federal parks, including national parks	Up to $6 million
Earmarks	Funding set aside by congressional representatives for projects in their district	Varies
Public Works Economic Development Program	Infrastructure funding for stim-ulating economic development	Up to $1-2 million

1. This is an estimate based upon 2009 funding levels for this program.

O&M FUNDING SOURCES

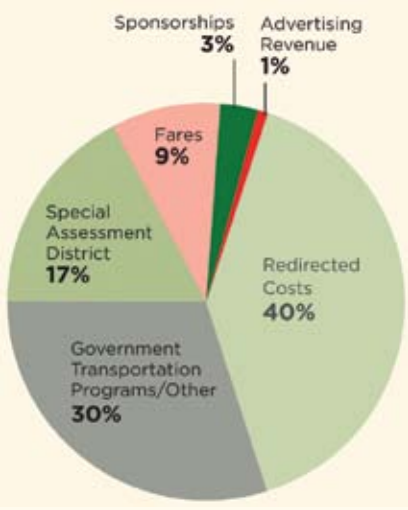
Operation & Maintenance

One of the biggest challenges of the Lowell Trolley is developing a sustainable way of paying for its operation and maintenance costs. Fortunately, Lowell already has much of what is needed to operate and sustain a trolley system in place. There are currently three independently operated transit services operating within the City of Lowell. The combined outlay for transportation services now provided by the LRTA, the NPS and UMass Lowell accounts for nearly 45% of the non-fare revenue required to run the proposed system. These existing services will become largely redundant once the trolley is built. Consolidation of these transit services under one system will create significant financial efficiencies. Especially in view of the other benefits mentioned above, this is a unique and extremely compelling opportunity to leverage existing resources.

The following table illustrates the funding sources the Trolley's operator could use to cover the day-to-day costs of running the system (all figures are approximate and listed on a yearly basis). Each of these funding sources is described in greater detail below and in the screened area at bottom of page.

Fares	$307,826
Sponsorships	$105,000
Advertising Revenue	$50,000
Redirected Costs	$1,337,450
Government Transportation Programs/Other	$1,000,000
Special Assessment District	$576,489
Total	**$3,376,775**

O&M Revenue Breakdown



2. The figures listed here are projected for the first year of service.

Fares: Money that riders will spend to travel on the Lowell Trolley. The Lowell Plan study assumes that fares will start at $1.00 in the first few years of service and increase to $1.50 in the fifth year of service.

Sponsorships: Cash that organizations will pay to sponsor a trolley vehicle, a sta- tion or the entire system. This operation and maintenance budget assumes that companies will pay $10,000 every year to sponsor six of the Lowell Trolley's trolleys and $4,500 to sponsor ten of the system's station stops.

Advertising Revenue: Money that will be generated from placing ads inside and outside of the trolleys and at station stops. For comparison's sake, the LRTA currently receives approximately $100,000 in advertising revenue each year.

Redirected Costs: Funds that could be shifted from transportation services that will become redundant once the Lowell Trolley is completed. These include services currently run by UMass Lowell, Lowell Regional Transit Authority and the National Park Service.

Government Transportation Programs/Other: Funds from federal transportation programs as well as private foundation support.

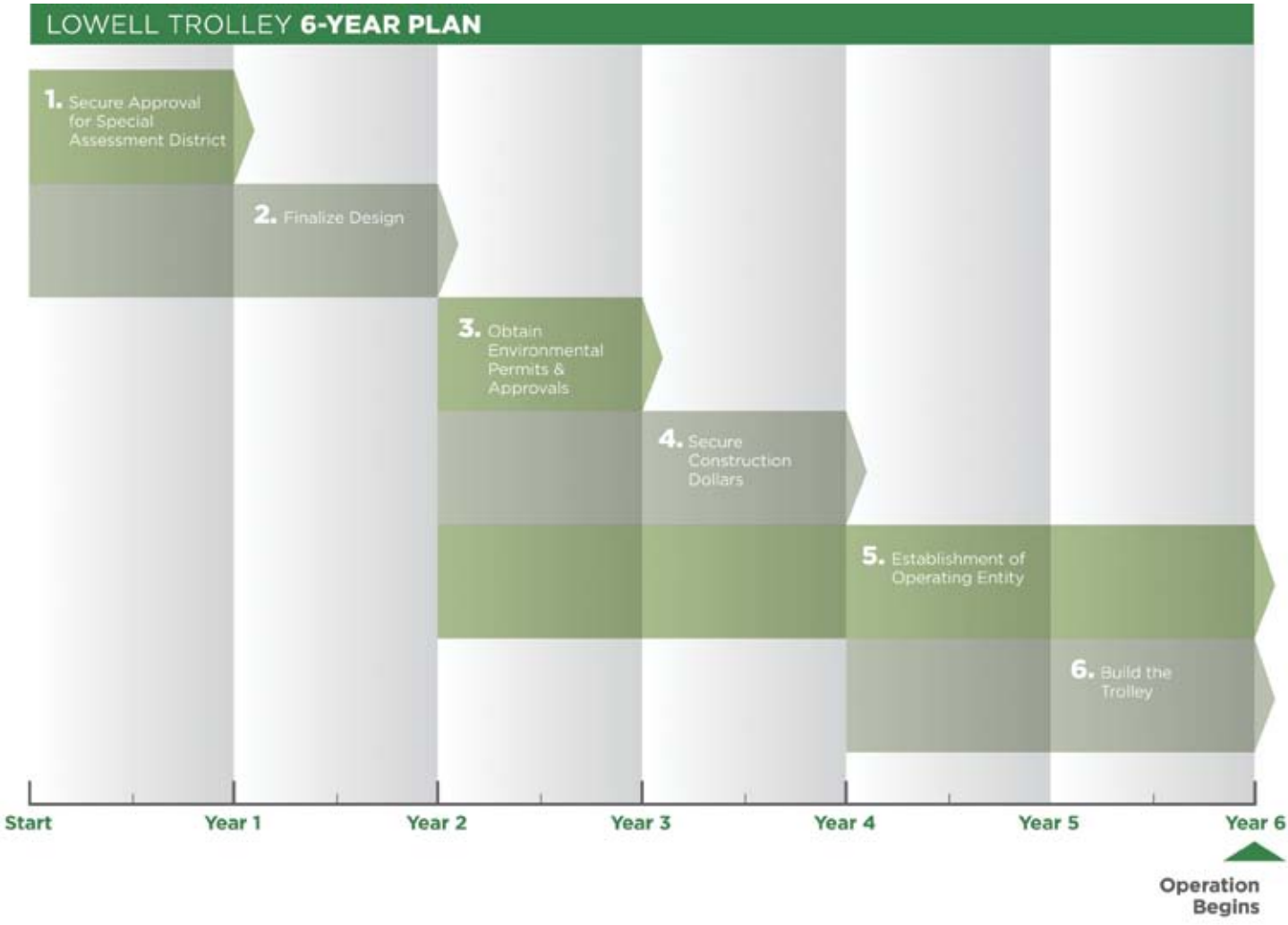
Special Assessment District: Annual fees that owners of buildings located near the trolley line will pay to support the Lowell Trolley.

CONCLUSION AND NEXT STEPS

With both Massachusetts and New Hampshire recovering from the recession faster than most of the United States, Lowell is poised for a new wave of revitalization. Over the next several years, more than 1,000 units of housing are slated for development along the trolley line. The addition of over one million square feet of commercial space in the city center will bring hundreds of jobs to Lowell and expand its economic base. By strengthening the city's existing urban fabric, supporting reinvestment and opening up new areas for redevelopment, the Lowell Trolley can play a lead role in Lowell's continuing resurgence. We estimate it will take six years to realize the vision presented in this document.

The following timeline indicates the major phases to come:

- **Secure approval for special assessment district (1 year)**
- **Finalize design (2 years)**
- **Obtain environmental permits and approvals (1 year)**
- **Secure construction dollars (2 years)**
- **Establishment of operating entity (4 years)**
- **Build the trolley (2 years)**



WORKING GROUP MEMBERS

This study was the culmination of a year-long effort by the trolley working group, which included the following members:

City of Lowell
James Milinazzo, *Mayor*
Bernard Lynch, *City Manager*
Adam Baacke, *Assistant City Manager*
James Errickson, *Urban Renewal Project Manager*

Lowell Plan
Jim Cook, *President*

National Park Service
Michael Creasey, *Superintendent*
Peter Aucella, *Assistant Superintendent*
Chris Briggs, *Community Planner*

North Middlesex Council of Governments
Beverly Woods, *Executive Director*
Sarah Bradbury, *Transportation Program Manager*

Seashore Trolley Museum
Jim Schantz, *Advisor/Consultant*

Stone Consulting
Harvey Stone, *President*
Randy Gufstafson, *Vice President of Operations/ Transportation Analyst*

Trinity Financial
Jim Keefe, *President*
Abby Goldenfarb, *Project Manager*
Hank Keating, *Associate, Design & Construction*
Dan Drazen, *Assistant Project Manager*

UMass lowell
Marty Meehan, *Chancellor*
Joanne Yestramski, *Vice Chancellor of Finance and Operations*
Beth Rubenstein, *Director of Campus Planning*
Gretchen VonGrossmann, *Assistant Director of Campus Planning*
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Volpe Center
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Middlesex Community College


PAWTUCKETVILLE
CENTRALVILLE
THE ACRE
LOWER HIGHLANDS
DOWNTOWN
HAMILTON CANAL DISTRICT
BACK CENTRAL
UMass Lowell - North Campus
UMass Lowell - East Campus
UMass Lowell - University Crossing
UMass Lowell - South Campus
Planned University Ave Bridge
LeLACHEUR PARK
Merrimack River
Northern Canal
Pawtucket Canal
Hamilton Canal
Western Canal
Concord River
UNIVERSITY AV
SEVENTH AV
FOURTH AV
MAMMOTH RD
RIVERSIDE ST
WANNALANCIT PARK
RIVER GREENWAY
VANDERBURG ESPLANADE
PAWTUCKET ST
PAWTUCKET BLVD
VARNUM AV
SHEEHY PARK
FRANCIS GATE PARK
WALKER ST
AIKEN ST
CABOT ST
VFW HWY
BRIDGE ST
FIRST ST
HUNTS FALL BRIDGE
FR MORRISSETTE BLVD
MERRIMACK ST
MOODY ST
SALEM ST
MARKET ST
FLETCHER ST
DUTTON ST
KEARNEY SQ
NORTH COMMON
SCHOOL ST
BROADWAY ST
CHURCH ST
ANDOVER ST
APPLETON ST
CENTRAL ST
LAWRENCE ST
GORHAM ST
ROGERS ST
LORD OVERPASS
SOUTH COMMON
BRANCH ST
C'HELMSFORD ST
Suffolk Mill Turbine Exhibit
Tsongas Center at UMass Lowell
Boott Cotton Mills
Mogan Cultural Center
Saints Medical Center
Lowell High School
Lowell Memorial Auditorium
JFK Plaza
Pollard Library
City Hall
Middlesex Community College
Murkland Elementary School
Visitor Center
UMass Lowell Inn & Conference Center
Market Basket Supermarket
Bartlett Community Partnership School
Lowell Senior Center
Lowell General Hospital
Stoklosa Middle School
Proposed Streetcar Maintenance Facility
American Textile History Museum
New Lowell Trial Court
Gallagher Transit Terminal
Lowell YMCA
MBTA Commuter Rail to Boston
Parcel
Park /Open Space
Water Body
Railroad
Road
Transit Terminal
Existing Trolley Line
Proposed Trolley Line
Proposed Trolley Stop
Facilities and Amenities
Hospital
Education
Government/Public
Culture/Recreation
Lowell National Historic Park Sites (LNHP)
Commercial and Retail
0
400 ft
800 ft
1600 ft
N