Passenger Rail and Development in Small Cities, Towns, and Rural Areas: 21st Century Transit in Holyoke, Massachusetts

Passenger Rail and Development in Small Towns, Cities, and Rural Areas:

21st Century Transit in Holyoke, Massachusetts

A Thesis Presented

by

W. Scott Laidlaw

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W. Scott Laidlaw

Approved as to style and content by:

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Kathleen Lugosch, Chair

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Steve Schreiber, Member

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William T.Oedel, Chair

Department of Art, Architecture, & Art History

DEDICATION

To my wonderful wife, Caroline V. Cuthbert, my daughter, Anna Cuthbert-Laidlaw, and my mother Donna K. Laidlaw, for their unfettered support and love.

To the faculty in the Architecture program for all of your hard work, care, and dedication to the students and the field.

To my fellow students, whose camaraderie, encouragement, and support were vital throughout.

And, to the memory of my father, William K. Laidlaw, Jr. whose love has sustained me even in his absence.

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ABSTRACT

PASSENGER RAIL AND DEVELOPMENT IN SMALL CITIES, TOWNS, AND RURAL AREAS: 21st CENTURY TRANSIT IN HOLYOKE, MASSACHUSETTS

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W. SCOTT LAIDLAW

BACHELOR OF ARTS, HAMILTON COLLEGE

MASTER OF SOCIAL WORK, UNIVERSITY OF PENNSYLVANIA

MASTER OF ARCHITECTURE, UNIVERSITY OF MASSACHUSETTS AMHERST

Directed by: Professor Kathleen Lugosch

The intent of this thesis is to explore the design challenges and opportunities presented by the reintroduction of passenger rail to a small economically challenged New England city. Central to my thesis is that the advent of more efficient transportation options is not, in itself, enough: the infrastructure built to support those options must provide users with a comfortable, safe, and welcoming experience. The architecture of the rail station is critical in influencing that behavior and moving our society toward greater energy efficiency.

Holyoke is a small mill city in western Massachusetts whose fortunes peaked in the early twentieth century and today struggles with decaying buildings and

infrastructure, high unemployment, and significant poverty. The city also has many strengths, including relatively inexpensive hydro-electric power, sturdy adaptable mill buildings, an excellent location, strong neighborhood and civic pride, and a rich history on which to build. The city's boosters feel that it is ripe for a renaissance already being driven by industry, the creative economy, telecommuters escaping the region's major cities, and tourism.

This research component of this thesis will explore:

- Current and historical demographic, industrial, and commercial context of the city and its passenger rail service, including usage projections, connections with various parts of the city, and Transit Oriented Design implications
- The needs of the adjacent Flats neighborhood for basic services and community space; strategies for attracting more consistent use of the station throughout its hours of operation by meeting the neighborhood residents' needs
- Potential requirements for a station's future capacity and adaptability – it will consider strategies for creating a flexible and adaptable building so as to meet the needs of the station and city as it changes over time
- Precedents that include rail stations and public buildings – it will investigate strategies used by effective public buildings

The design component of this thesis incorporates the above research in developing site and program plans with a specific focus on design strategies that address accessibility, wayfinding, relevant services, and creating a welcoming gateway into the residential, industrial, and commercial heart of the city.

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INTRODUCTION

I discovered the pastoral and historical charms of the Pioneer Valley of western Massachusetts in the fall of 1988 during a trip to visit a friend who had grown up in the area. I moved to the Pioneer Valley of western Massachusetts upon graduating college the next year, having fallen in love with the area on my first visit; it is the place in which I have chosen to settle and raise my daughter. This love extends to the communities up and down the Connecticut River valley, from the small agricultural towns scattered amongst the hills to the economically depressed mill towns with their decaying brick behemoths and commercial centers, once carefully placed on the thoroughfares running along the bottom of the valley. This mix of (post-) industrial and agricultural communities makes the Pioneer Valley particularly well-suited to return to being a self-sustaining region, considering issues such as food production, energy production, and economic viability in its exports and imports.

The Pioneer Valley remains closely connected to the larger world through commerce, tourism, and thousands of students who attend local colleges and university; indeed, these linkages are integral to our economy and way of life. Yet in pursuit of living and conducting business in a way that is more sustainable and better protects our most valuable natural resources, efforts to conserve energy resources and fossil fuels drives us to promote technologies and practices that meet those goals. The reestablishment of passenger rail service, with its potential for reaching long-distance and commuter destinations, along the western edge of the Connecticut River, the planned (and funded) “Knowledge Corridor,” is one significant example of that effort.

Passenger rail service would provide an armature upon which local transportation networks would be extended would provide the basis for increased economic development, but it would not guarantee it. People would need to actually use the service for it to realize its potential, and this would require to a certain degree a change in behavior for many people. Architecture has a role to play in supporting this seminal and critical change.

Since rail stations serve more than the immediate neighborhood, it is important to consider the larger region, from the station's front door to up to 10 miles away and to consider both current conditions (demographics, community concerns and desires, businesses, circulation, etc.) and anticipated growth conditions projected over at least 10 years. While this is typically the bailiwick of regional planners, the facilities and the immediate environment of the station will be critical in attracting ridership by providing space for the shopping, parking, and other services that create a safe and comfortable environment. Design has a significant role to play in the creation of places that are vibrant and welcoming, places that feel safe. They can also be places that celebrate energy conservation, turn a commute into a shared experience, and educate users about the sustainable and renewable resources available in the Pioneer Valley.

CHAPTER 1

HOLYOKE AND WESTERN MASSACHUSETTS

The Pioneer Valley is in a period of significant transition: Decaying mill towns seeking new purpose and vitality; an agricultural base that is shifting from tobacco, potatoes, and cucumbers into organic and locally grown markets; and a general shift from manufacturing and retail toward a service economy that is more dependent on broadband than on location. The loss of manufacturing has translated into less freight leaving the valley and into increased drive time for workers commuting longer distances to jobs. Increased broadband infrastructure for the area's educational institutions is translating into more workers telecommuting and traveling only once a week, or less, to offices based in Boston, New York, and beyond.

The connectivity trends of the Pioneer Valley shifted away from passenger rail many years ago, supplanted by the automobile, cheap gas, and a rising belief in individual independence. Connectivity in the valley remains based on the automobile, whether people live in town or in more distant rural areas. Bus service exists for many regions and towns, albeit limited in frequency and utility for most workers and residents. With the reintroduction of passenger rail along the west side of the Connecticut River arrives an opportunity to reorganize and expand the transportation networks to better serve the emerging needs of workers and residents, allowing people to maintain their high quality of life in their homes and communities while still traveling the distances the economy's shifts now require.

Architecture has a role to play in accommodating and making more comfortable this economic and lifestyle shift by contributing inspiring and inviting structures that, in conjunction with transit routes and modes, provide transportation experiences that reward travelers and commuters through comfortable facilities, services most convenient for users of public transit, and community building fostered by shared experience and by environmentally sustainable structures that emphasizes the energy and economic self-sufficiency of the valley.

Systems Approach to a connected Transportation System

Passenger rail is a powerful connector for people, although it cannot meet the needs of the Pioneer Valley's low-density communities without a well planned network that allows bus and automobile users to easily connect to rail stations. Route planning, service frequency, cost, and clean, comfortable equipment are all critical elements of a successful transit system; they are also beyond the scope of what architecture might provide. The part of the infrastructure of transit systems where architects will contribute are the transit nodes – access points such as bus stops and rail stations – and it is at these nodes that design helps determine the success of the overall system.

A design coherence that establishes clear connections between the most far flung bus stops and the major rail stations can create will encourage ridership and emphasize transit choices for a wider range of potential users. Such a system will provide new opportunities for individuals who live in service areas; it also provides new opportunities for communities to grow and diversify, an important consideration in the many towns in the valley that historically have been heavily dependent on a single segment of the economy; e.g. agriculture or manufacturing. This diversification is already happening, but with the result of many more car miles per person than is desirable or sustainable, particularly as oil prices approach historic highs and supply is put at risk by geopolitical forces.

Using a systems approach certainly has the potential to expand the scope of this project beyond what I am. Still, to understand the potential of this approach and design for it appropriately could distract from more central issues in which I am interested.

Passenger Rail History

The Knowledge Corridor is the name given to the stretch of track that will serve Amtrak's Vermonter train along the west side of the Connecticut River between Springfield and Northfield, MA. The three cities that are anticipated to become new stops on this rerouting are Holyoke, Northampton, and Greenfield.

The railroad first came to the lower Pioneer Valley in 1845, the year in which Northampton was connected to Springfield by the Connecticut River Railroad (CRRR). The next year the rails reached to Greenfield and by 1849 they had reached the Vermont border, connecting south of Brattleboro with the Vermont-Massachusetts Railroad. The railroad preceded Holyoke's transformation from an agricultural backwater to a planned industrial city by four years.

Passenger rail continued on the Connecticut River Railroad until the mid-1960s – intercity service stopped in 1966 and local service was terminated the following year.

Amtrak reintroduced intercity service in 1972with the reestablishment of two trains, the Montrealer (northbound) and the Washingtonian (southbound). This service was moved to the current route that meanders through Palmer and Amherst, MA, when Guilford Railways, the owner of the CRRR at the time, refused to improve their tracks. As a result even freight trains, the only trains that use the tracks on the west side of the river, are now allowed to travel at a slow ten miles an hour. [1]

Funding is already in place for rail improvements along the so-called "Knowledge Corridor," the stretch of rail from Springfield to Northfield, MA that follows the west side of the Connecticut River valley and represents the restoration of a passenger rail line that had once travelled this route. Simple self-service rail stations are being planned for Northampton and Greenfield, while Springfield's Union Station is the subject of an extensive renovation project (to begin soon, hopefully) and Holyoke went through a process of planning the renovation and reuse of and 1885 H. H. Richardson train station as the terminal for reestablished passenger service in that city.

A report prepared by HDR in 2009 and published by the Pioneer Valley Planning Commission, a regional planning organization, provides clear economic and demographic figures that help in the process of planning and advocating for expanded rail service. These figures are gathered in easy to read tables. Information about stations, the populations centered around those stations, and transportation networks related to those stations give a clear picture of the resources available and imply a brief for the planning

[1] Ronald D. **Karr** (1995), *The Rail Lines of Southern New England - A Handbook of Railroad History*, Branch Line Press

and design work necessary to create vital, vibrant, and useful transit points for passenger rail. [2]

Given that this is a project that has made it over immense political and funding hurdles to get to this point, it seems that it is a viable project, seldom a given in a political climate where public transit is challenged as wasted investment by many politicians and at a time when the pressure to cut public spending in all areas of the budget are immense and offer great political rewards. This project's fortunate viability raises the stakes for the success of this line; if it performs poorly and is underutilized, the slow pace of improved passenger rail systems in this country will slow even further. It is critical that the design and execution of passenger rail stations consider the broad array of programmatic goals such a station will require to maximize success for the people and communities of the Pioneer Valley.

Future of Passenger Rail in the Pioneer Valley

The expansion of passenger rail will be a boon to communities that invest in them, at some point in the future. Proponents of increasing Amtrak service, expanding existing commuter lines, and establishing light rail systems have an uphill battle in arguing for the enormous infrastructure and equipment investments these systems require because there is little immediate economic gratification. These strategies typically reflect a long range vision for a city's or region's transit evolution. While the economic returns

[2] **HDR Engineering, Inc.** (2009) *Knowledge Corridor Passenger Rail Feasibility Study*, Pioneer Valley Planning Commission

on investment are likely many years away, proponents rightly value the less tangible but potentially more valuable benefits associated with focusing on environmental, quality of life, and growth planning considerations.

As Amtrak service is restored after a more than 30-year absence to the west side of the Connecticut River in western Massachusetts, the entire Pioneer Valley region has the opportunity to rethink its transportation strategies and goals. This effort is being led by the Pioneer Valley Planning Commission and is broad enough to consider a wide variety of potential benefits, as well as threats and challenges.

Amongst the opportunities this new rail alignment presents is for three small cities (Holyoke, Northampton, and Greenfield) along the Connecticut River to reestablish their rail stations as significant city gateways and focal points of commerce and development. The city of Springfield, western Massachusetts largest city and the state's third largest, will also have an opportunity to capitalize on the realignment by being better connected to these smaller nearby cities, particularly if commuter service is expanded to the north. Expanded commuter rail service is already in the works between New Haven, CT and Springfield, meaning that traffic will increase significantly through Springfield's soon to be renovated Union Station; there is optimism that the commuter service will be extended on the newly replaced track so of the Knowledge Corridor to Northampton in the coming years.

In exploring the reestablishment of rail stations, I examined each of the four stations in western Massachusetts as potential sites for my thesis project. while I was learning toward Holyoke from the start, I recognized that each of the four presented its own challenges and differing circumstances concerning its (re)development. [3]

- **Springfield:** The Springfield Union Station is slated to be renovated with federal and state funds; this has been the case for decades; while the recent push looks more promising than past opportunities that never materialized, history tells us that this project is not a certain thing.

- **Northampton:** Northampton will need to build a new station as the existing one is leased to a restaurant; preliminary designs for Northampton's station have it as only an unstaffed linear shelter along the rails.

- **Greenfield:** Greenfield has a similar design to Northampton's, although the location in Greenfield is adjacent to a transit hub currently under construction near the original station's location.

- **Holyoke:** Holyoke was not included in the initial development plans for Amtrak service resumption, although it has generally been acknowledged that Holyoke will likely be included when passenger rail service is reinstated. Taking a proactive stance, in April, 2011the City of Holyoke identified the existing H.H. Richardson-designed station, currently boarded up and most recently used as an auto parts warehouse, as the site for the future Holyoke train station.

I selected Holyoke because of the unique challenges of the existing historic station's location, the unusual topography of the site, economic and social challenges the city faces, and my familiarity with the city from previous jobs. It turned out to be a rich vein to mine.

[3] **HDR Engineering, Inc.** (2009) *Knowledge Corridor Passenger Rail Feasibility Study*, Pioneer Valley Planning Commission

Sustainable Communities

Western Massachusetts, with its agricultural, manufacturing, and energy generation assets, has a strong foundation on which to base initiatives that will move the region closer to what is considered a sustainable community. The “buy local” and locally grown produce movements have increased the sustainability of the area. Building materials, a significant number of which can be sourced locally, are another category of goods that is worth considering in our region’s efforts to be self-sustaining. .

According to the Institute for Sustainable Community (an NGO based in Vermont), a sustainable community is one that is “economically, environmentally, and socially healthy and resilient.” This is achieved through solutions that are integrated and consistent with the overall goal of systems sustainability, as contrasted with solutions that allow local benefits but create harm elsewhere (e.g. fossil fuel extraction and use). It also “takes a long-term perspective—one that's focused on both the present and future, well beyond the next budget or election cycle.”

Accordingly, a sustainable community “manages its human, natural, and financial resources to meet current needs while ensuring that adequate resources are equitably available for future generations.” [4]

These principles apply to all areas of a local economy, including construction. It is commonly held that buildings us 40% of our country’s energy to maintain; clearly, making buildings as efficient as possible is a critical part of creating sustainable

[4] **Institute for Sustainable Communities** (2011), *What We Do,* www.iscvt.org/what_we_do/sustainable_community/

communities. This has become expected amongst people who value sustainability goals and even in the larger society.

The energy embedded in these buildings also needs to be considered, particularly as many building materials are often shipped from great distances and requiring a great deal of fossil fuel for that shipping. Exotic materials, such as Italian stone or colorful tropical hardwoods may be unique to other regions of the world, but even the basic elements of a building, such as 2 x 4's, are often sourced from far away even though they could be produced locally. By focusing on local sources and understanding the capabilities and limitations of those materials designers should be able to fashion solutions that allow for a high percentage of locally sourced building materials.

CHAPTER 2

THEORETICAL RESEARCH

We live in an era in which rail travel still bears the scars of decades of neglect and disinvestment. And despite a small recent revival in interest in passenger rail there remains a vocal, powerful, and stubborn opposition remains. The broad programmatic brief I have outlined for myself in undertaking the design of a passenger rail station in this political environment must examine a range of subjects that will serve to strengthen a station's usefulness, life span, ability to influence behavior, and role as a model of sustainable design. The research I have begun covers each of these areas. Below, some of that research is reviewed and discussed as it relates to rail station design.

Transit Oriented Development

Transit Oriented Development (TOD) provides a conceptual framework for urban and regional planning based around transit modes other than the automobile. A primary focus is the proximity of commuter rail stations to commercial, retail, and residential areas – all need to be no further than a 15 minute walk or five minute bus ride from the station to be considered "transit oriented". In this region, urban centers give way quite quickly to rural areas and populations are spread out. There are lessons to be learned and integrated from TOD, however, as planning will affect future development and the areas adjacent to transit stations will certainly change over time.

Each of the four communities that I investigated for thesis sites would be well served in considering TOD principles in their planning. Holyoke, Greenfield, and

Northampton all have commercial, retail, and residential neighborhoods close to their stations. Springfield is the only city of the four that does not; the urban planning demolition of the 1960s cleared a significant portion of the buildings in close proximity to the station and subsequent development has included only commercial and retail buildings, not residential. As was perhaps the original goal, the density that once existed in that area has never been recreated and it remains an underutilized zone.

In general, western Massachusetts is simply not densely settled enough to warrant the investment or subsidies necessary to operate and maintain commuter rail at this time. However, reestablishing the rail line will open the possibility for different levels of passenger rail service when it becomes practical from a ridership perspective. The challenges that small cities might face considering ridership and transit station use because of this relatively low density need to be offset by offering architecture and services that attract visitors on their own merits; if the station becomes a destination for residents, then convincing them to use the train for commuting becomes that much simpler a task.[5]

Transit Stations

Encouraging ridership of mass transit requires a variety of incentives, not least of which is the transit station itself. Because commuters must still make their many weekly errands, providing some of the services in or adjacent to the station will allow commuters

[5] **Victoria Transit Policy Institute** (2011), *Transit Oriented Development*, TDM Encyclopedia, **www.vtpi.org/tdm/tdm45.htm**

a measure of convenience. Given that many people are used to the independence and flexibility of using their cars to commute and the fact that relatively few people will live within a walkable distance of the station, at least initially, these services should be considered as critical to building a sustainable ridership. These services might include, but not be limited to, a grocery or market, newsstand, cleaners, and bakery/café/coffee shop.

Of course, there are more basic services and considerations that a station must furnish as well. These features include both that banal and obvious (bathrooms, easy to interpret way finding information, and attractive landscaping) and the less obvious but equally vital (weather protection, security, and access to town streets/destinations). Without these services riders will be discouraged from using the transit system.

From a design perspective, transit stations need to be utilitarian and completely accessible. More than that, Americans need these stations to help in the shift from automobiles to rail transit, a cultural shift that will be challenging. While the services mentioned above are part of that, stations need to speak to reduced energy usage, mindful consumption, shared responsibility, and the excitement and benefits of the new.

My interest in this subject has to do with the challenges that small cities might face in establishing adequate ridership for new modes of passenger rail (not just Amtrak, but commuter rail as well) and in managing the growth that might accompany increased public transit access. It is desirable that the growth of small cities is managed more closely than the growth in more urban areas, especially with small cities that are attracting new residents and businesses. The planning and design of new transit stations can help to provide a focal point or model for future development.[6]

Environmental Architecture

Susannah Hagan's "Taking Shape: A New Contract Between Architecture and Nature" explores the evolution of scientific and academic theories that underpin the notion of sustainability as it applies to architecture. Hagan's thinking on the ability of architecture to express the importance of environmental sustainability provides a convincing argument for why public projects, such as a train station, should strive to not only meet their basic programmatic needs but also to educate the public about sustainability.

Hagan is a careful wielder of language, often taking pains to make sure her terms are narrowed to their sharpest points so as to best differentiate between various schools of thought, of practice, and of ethics. She quickly establishes a polemical tone, as in her first paragraph:

"Environmental architecture is split between an arcadian minority intent on returning building to a pre-industrial, ideally pre-urban state, and a rationalist

[6] **Victoria Transit Policy Institute** (2011), *Transit Station Improvements*, TDM Encyclopedia, **www.vtpi.org/tdm/tdm127.htm**

majority interested in developing the techniques and technologies of contemporary environmental design, some of which are pre-industrial, most of which are not." [7]

Later, after she has established this and other dichotomies, she begins to seek bridges to reconnect the distinctions she has drawn so that she can construct from the pieces a coherent unified approach on which she can erect her own guideposts.

She notes that what she terms "environmental" architecture (to replace the more currently used term "sustainable" and, before that, "green") has culturally "barely broken the surface of the collective consciousness." She builds an argument that this needs to change and the route to doing so is by creating formal architecture that does not merely incorporate new technology into old forms (which she terms "conservative") but that creates forms that reflect that technology. Simply put, architects, through the built environment, have an opportunity to promote sustainability in a way that few or no others do; and, we should enthusiastically grasp that challenge.

Hagan has created three criteria with which to identify, evaluate, and use to create environmental architecture. They are:

- Symbiosis: how nature and architecture work together as opposed to against one another.
- Differentiation: how buildings differ according to site, culture, climate, materials, etc. rather than applying environmental building principles without regard to those considerations.

[7] Susannah **Hagan** (2001), *Taking Shape: A New Contract Between Architecture and Nature*, Architectural Press, Oxford

- Visibility: how environmental buildings express themselves as examples of sustainable architecture.

Hagan's book is relevant to the issues inherent in designing environmentally sensitive passenger rail stations for the 21st century as it explores the challenges, possibilities, and limitations of using locally sourced materials in building. Hagan's argument that environmental buildings should show themselves in their form as well as their operation can be extended to include locally sourced materials. Indeed, locally sourced materials might present limits that would necessarily affect a building's forms, a challenge that could result in interesting design generation.

Hagan uses this book to call for a movement among architects to use their bully pulpit of building design to express their environmentalism. She writes that concerning the use of this influence:"It is better to contribute to democratic persuasion rather than hasten compulsion, while the choice is still there." Taking this argument a step further, "…architecture, as the product and the producer of culture, is in a position to persuade." Her position is that buildings have the power to influence the cultural adoption of new practices, technologies, and expectations; in service to the goal of promoting environmental buildings, architects should be using this power to persuade society of the value of environmental buildings. She takes this argument yet another step by forcefully arguing in chapter 1 that the artistry of architecture is a critical and powerful element in the ability of architecture to make a persuasive case and that architects should be using aesthetics in the service of these goals.

On their face, Hagan's arguments seem both obvious and overblown. Yes, architecture is often quite visible (depending on the project, location, use, etc.) and can use this attention to raise issues of environmental sustainability. No, design cannot in and of itself convince people of the merits of environmentally sustainability – that requires more of a dialogue than a building can provide. To be fair to Hagan, however, it would be necessary to test her arguments; this would require a review of many buildings that have tried to express their environmental values in their architectural designs and, more challenging, assess the responses viewers and users have to those buildings. The assessment would need to raise a variety of questions: Which environmental buildings have been successful? How valued are they and who is the audience that has determined their success – designers, the broader public, or both? How can we measure the impact of those buildings on the general public? Given that changing technology and broader efforts at educating the public on energy efficiency issues, what have been the effective timelines for those impacts?

This would be an interesting project to pursue, but it beyond the scope of this thesis.

Adaptable Buildings

Stewart Brand's "How Buildings Learn" is a meditation on how buildings adapt over time. He marvels that architects seem to not consider how a building's users' needs will change; he ungenerously surmises that they believe their buildings will persist in their original state. Still, his point is clearly valid – many buildings get demolished (the ultimate sign of unsustainability) because they are no longer able to be adapted to changing needs, and architects have a responsibility to plan for a wider variety of eventualities than what their clients' briefs state. This simple idea must be considered in my thesis, as it should for any building project, particularly in ones that serve a public role.

The notion of a "finished" piece of work is a tempting one for an architect – the opportunity for a concept to be realized whole, complete. There do exist many iconic buildings that have not been (or, in some instances, cannot be) altered and so largely remain in an unchanged state. These include the monuments from centuries past (although many of those had been changed before becoming museum pieces; think of Chartres or the US Capitol Building) and purpose specific structures that function in a limited and limiting way (e.g. Philly's 30th Street Station). A few even seem to have largely survived as their designers envisioned them (such as the Empire State Building many of Frank Lloyd Wright's Unitarian Church in Oak Grove). Those that survive tend to have been well designed, in high-demand areas, or in a depressed local real estate market; otherwise a buildings' lack of utility or marketability would have made them targets for significant overhaul or demolition. It may be that the responsible architects considered the major and relentless factor of time when designing, planning for different possible uses and for maximum adaptability, or maybe not.

One of the more compelling arguments Brand makes is that architects have an opportunity to become artists of time, not just of space. He does not make recommendations or suggest protocols for architects to follow in their design work, but he does provide an compelling reason for them to think about the projected lifespan of each building, what the forces might be that could impact that building during its lifespan, and how thoughtful design might extend the lifespan by offering greater flexibility or adaptability. In this still dawning era of sustainability, this is perhaps the emerging gold standard for building design.

In Susannah Hagan's "Taking Shape" (referenced above), the author makes an argument for architects to express the sustainable features of their work in the visible skin of what she refers to as "environmental buildings;" in other words, to use their art to create aesthetically beautiful buildings that will serve as evangelical testaments for sustainability. A bit incongruently, though, Hagan acknowledges that the approach of wearing a building's sustainability on its sleeve will only be necessary for a limited time (how long she does not say – maybe 20 years?), perhaps only until the concepts have gained broader or ubiquitous acceptance and moved into common practice.[8] What does this mean for those buildings designed to formally express their sustainability over time?

In reading Brand, this was perhaps the first critique that occurred to me. Hagan's argument is unusual in its advocacy for using design in a particular way, however meritorious it may be; such goals can quickly become pedantic and patronizing unless done particularly well. In light of Brand's arguments, Hagan's approach also risks limiting the building's flexibility to grow and adapt.

What happens to these proscriptive design elements over time? Will they become the stuff of nostalgia? Or revered hallmarks from an earlier era, kind of like beehive ovens and attached barns? It is easy to imagine these carefully designed element someday becoming simply another out of date fad, like the extravagant fins of Cadillacs

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[8] Susannah **Hagan** (2001), *Taking Shape: A New Contract Between Architecture and Nature*, Architectural Press, Oxford

of the early 1960s or streamlined everything of the 1930s – still attractive on occasion, more likely to be novel, and sometimes an embarrassment.

Consider Beddington Zero Energy Development, or BedZED, near London, UK. The project is one of the more well-known sustainable developments and proudly wears its sustainability on its sleeve – PV, green roofs, colorful ventilation tubes, gardens, and other "expressions" of "environmental architecture", as Hagan puts it. It seems certain that part of BedZED's celebrity is due its outward appearance. It makes a wonderful poster child for sustainable architecture. But fast forward 25 years – what will BedZED look like? What will the inevitable renovations, additions, quick fixes to sudden problems that accidentally become permanent, what will these do to the outward appearance of this groundbreaking development? It's impossible to say, but given the lessons from "How Buildings Learn," it's hard to imagine that the unexpected won't happen to even these buildings.

The challenge presented by the synthesis of Brand's and Hagan's arguments is to develop a design expression that communicates the sustainability inherent in the architecture but in such a way as to enable to removal of these elements once they lose their cultural value and, of course, making the entire building adaptable for future purposes.

But then there's the next flip side: What will be left of the architectural record if we design with the goal of making our designs so changeable? Perhaps it is merely the price architects must pay for building sustainably.

Environmental Aesthetic

Stephen Kieran's presentation of three Kiernan Timberlake projects in "Evolving an Environmental Aesthetic" serves to illustrate how designers can integrate the natural world into architecture.

Kieran approaches his integration argument obliquely with a quote about the practices of the industrial hog farming industry, specifically about the way successive layers of technology have been introduced, each new one designed to solve a problem created by an earlier innovation, until we reach the point at which the hog is as removed from the nature of being a hog as humans are from providing their personalized care. His point is that the aesthetics of nature require that architecture that aspires toward beauty need to introduce it in the original design. He notes that "nothing of beauty has ever been made by addition or by counting points." Instead, he wants to explore the "notion of an aesthetic derived from an integral, not additive, relationship with the natural world" and to discuss how this aesthetic might be applied in the real world. [9]

The evolution of shelter, Kieran argues, has moved from the crudest of forms beneath a tree to the hyper sealed envelopes of today's high efficiency homes. While these newer forms and technologies allow for reduced use of fossil fuels, they also become barriers between humans and the natural environment that these technologies are meant to protect. Kieran compares the impermeable envelope to the filter, a membrane that allows through what is desirable and keeps out what is not. He uses the metaphor of the filter as a way to argue for "the development of an aesthetic language that selectively

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[9] Stephen **Kieran**, "Evolving an Environmental Aesthetic", in Stephen R. Kellert, Judith Heerwagen, Martin Mador (2008), *Biophilic Design: The Theory, Science and Practice of Bringing Buildings to Life*, Wiley

integrates rather than systematically segregates." The building science that was developed to protect the natural world has paradoxically had the effect of further removing people from that world, argues Kieran quite compellingly. Well insulated houses are segregated: little noise penetrates thickly insulated walls or tight windows, openings are carefully controlled, even air flow has to be regulated with an added fan.

That last example, the ventilation fan in the super tight house, is a telling example of the additive nature of sustainable architecture and of the need for new technological solutions to fix the problems created by earlier technological solutions. Kieran argues that this additive process is contrary to the aesthetic he seeks; or perhaps 'elegance' is a better term to use here instead of aesthetics – after all, most ventilation fans will be hidden from view. But consider the sun louvers that block the overheating rays of the sun and views of the outside world; the trombe wall that is given primacy in the window space; the thermal mass that must be kept clear of carpets and furniture to work properly; or rooms whose utility has been compromised out of the desire to economize with by overlapping programmatic uses. All of these are examples of the shortcomings of sustainable design if applied carelessly or taken too far. Kieran asks how we can integrate the natural world into our architecture; and, can we simultaneously integrate our efforts at sustainability into our architecture as well?

Kieran's aesthetic argument about additive versus integrative is not a slam dunk. While the fixes to glaring problems often sacrifice some of the elegance of a particular architecture (look no further than the FAC drainage solutions or the lobby area that turned the campus gateway into a great barrier), Stewart Brand would argue that buildings change out of necessity and that there can be beauty found in those additions.

These changes may obscure the architect's dream, but the stories they tell can imbue a building with a new equally compelling aesthetic. Indeed, some of the most compelling examples are ones in which the additions were made in seeming disregard to the existing structure, as opposed to the high end additions given flashy institutions.

The Kieran Timberlake's projects that Kieran discusses provides some insight into his integration of the natural world concept: Sidwell Friends' relationship to classical quadrangles and permanent waste water treatment systems; Loblolly House's attempt to blend into the trees; Atwater Commons' green roof and emulation of natural features. He describes the generative design process of these three projects and how they involved the natural world in their aesthetics. His examples, however, leave me wondering why his design approach was more valid than any other.

Susannah Hagan's ideas about design that expresses its sustainability outwardly can inform how we read Kieran's descriptions of his design strategies. Kieran Timberlake's three buildings certainly express their environmental link and the title of Kieran's article underscores the intentionality of this evolving design approach. However, only the Sidwell Friends project, with its solar shades and prominent wetlands (initially meant to serve as a "living machine" to process the building occupants' waste but never put into use), is the only one of the three that Kieran mentions that fits neatly with Hagan's ideas. It is not that the other two buildings do not have sustainable features – they do – but that their outward appearances do not clearly express those features. Instead, Kieran Timberlake has striven to express the building's connection to their immediate environment through location, orientation, materials use, and artistic design elements, and in doing so express the firm's larger commitment to sustainability and to building what Hagan would clearly consider to be "environmental buildings".

Locally Sourced Materials

The reasons behind the "buy local" in many communities are varied, but all relate to quality products and quality of life. The primary reasons include:

- communities want to keep their dollars circulating in the local economy
- consumers want to minimize their carbon footprint by buying locally sourced items that do not need to be shipped long distances (groceries, crafts, building materials, etc.)
- the craftspeople and artisans who make these materials are local and therefore more likely to understand the performance demands of the products, and are therefore more likely to produce high quality products. Also, if there is a problem with those products those artisans are nearby to repair or replace them

There are different levels of local materials: locally sourced, which refers to materials extracted or originating in a given area; and locally produced, in which materials may originate elsewhere but are finished or manufactured into other products locally. The Western North Carolina Green Building Directory provided a chart, in conjunction with an article on locally sourced building materials, that gives excellent examples of materials that could be locally sourced in that area (perhaps a 100 mile diameter area). [10]

[10] Jake **Sadler** (2011) *Buying Locally*, Western North Carolina Green Building Directory, www.wncgreenbuilding.com/articles/full/buying_locally

PRODUCT	DESCRIPTION	LOCATION
Earthpaint	Specializes in manufacturing nontoxic, low- and no-VOC paints, stains and finishes	Asheville, N.C.
Safe Home Filters	Produces home air filters that reduce or eliminate chemical compounds, VOC's, formaldehyde and other odors and gasses	Asheville, N.C.
Columbia Forest Products	North America's largest manufacturer of hardwood plywood and hardwood veneer, a leader in sustainability, and innovator of formaldehyde-free PureBond technology	Old Fort, N.C.
Colbond	Leading producer of nonwoven fabrics and geosynthetic products for carpet backing, green roofs, subsurface drain-age, erosion control, radon control and more.	Asheville, N.C.
Green Fiber Cellulose	A great way for homeowners to insulate more efficiently using recycled materi-als; strong selection of products and accessories for your home	Charlotte, N.C.
Meld USA	Develops and produces innovative, award-winning concrete materials such as countertops and products for the modern lifestyle	Raleigh, N.C.
New River Concrete	Produces countertops made of sand and gravel from the New River, which is col-lected during regular, low-impact dredg-ing to maintain two dams in Grayson County	Independence, Va.
Crossville Tile and Stone	The largest domestic manufacturer of porcelain stone and recycled tile	Crossville, Tenn.
Silverline Plastic	Manufactures PVC Pipe for pressure and nonpressure water applications and for electrical conduit, as well as Polyethylene (PE) Pipe; recycled content	Asheville, N.C.
Cunningham Brick	Oldest family-owned-and-operated brick manufacturer in North Carolina; specialists in producing bricks from bioremediation and contaminated soil	Lexington, N.C.
Tamarin Tile	Produces custom and hand-crafted tiles for your home or business	Clyde, N.C.

Figure 1: Example of a locally sourced materials directory from North Carolina

In western Massachusetts, the materials that are well-known as able to be sourced locally include stone, wood, brick, and cellulose insulation. There are likely more building materials that either already exist or could be produced by existing businesses (such as ceramic tiles or custom pre-fab trusses). Ideally, my thesis project would include these types of materials.

CHAPTER 3

PRECEDENT STUDIES

The investigation of passenger rail stations whose stories are similar to those of the stations in the Pioneer Valley (i.e. stations that had once been central to the life of their communities, had seen their importance wane as automobiles supplanted trains, and became marginalized, falling into disrepair or being repurposed entirely) is challenging – there are not many stations that match that description. The two stations presented here illustrate related issues, however, and emphasize the relevance of Transit Oriented Design. Two other issues that I explored with precedent studies are the use of locally sourced materials and access in large public buildings.

Brunswick, Maine – Maine Street Station

Brunswick, Maine, is in a transition period. In 2009, Amtrak announced the resumption of rail service to this college town about 30 minutes north of Portland, the state's largest city. The return of this once critical transportation option creates the opportunity for Brunswick to pursue economic development possibilities in a part of town long since underutilized. How they are approaching this opportunity reveals a good deal about what is possible in a medium size

Figure 2: Maine Street Station (render), opened 2010, Amtrak service begins 2012

town that has suffered significant economic losses in the past decades.

The town's response and approach to the establishment of a new transportation hub can be found in their Master Plan of 2011. The Town has created tax incentives and zoning changes that support new development in the area immediately surrounding the once and future rail station create a clear incentive for developers and businesses to relocate and to begin to build the critical mass of services often considered necessary to the successful reestablishment of rail service. Regular rail service, via Amtrak's Northeaster line, will not return until sometime in 2012 but the planning is clearly in place for both promoting and supporting rail service and for sparking investment in the economic promise presented by renewed rail service. [11]

Figure 3: The Inn at Brunswick Station (rendering), opening spring, 2011

The location of the Maine Street Station is advantageous as it sits between the commercial center of town and the main entrance to the campus of Bowdoin College. The development plans call for capitalizing on this location by offering retail, restaurants, conference facilities, and lodging, all within a five minute walk of both the campus and downtown. The site still has to contend with a large parking lot and a large Hannaford's grocery store that diminishes the experience of walking from campus

[11] **Maine Street Station** (2011), http://www.brunswick-station.com/

to town, but the development plans attempt to screen the programmatic uses from direct views of this sprawling eyesore.

Mixed Use

The area around the rail line is now referred to as Maine Street Station and stretches along the south side of the rail corridor between two main thoroughfares, Maine Street and Union Street. There are six buildings planned, three of which were already complete as of early 2011. The Maine Street Station website proudly claims that 40,000 square feet in Buildings 3 and 4 are already 100% leased. The Inn at Brunswick Station, providing a tavern, conference facilities, and accommodations, is opened in the summer of 2011. Sixteen fully accessible one- and two-bedroom residential units are planned for construction sometime in the future – it appears that they have not yet secured either the funding for this project or enough tenant commitments to move forward with this phase.

Transit Hub

The Eastern Maine Railroad, a private tourist company that operates seasonally, relocated to the new Maine Street Station in 2010 and has begun running their services from that facility. The Concord Coach Lines has relocated their offices to the nearby Visitor Center, providing intercity bus connections through New Hampshire, Maine, and eastern Massachusetts. The Brunswick Explorer, a local hourly bus service serving “all of” Brunswick, also operates from the Visitor Center.

Building Key (Plan for Maine Street Station development)

1. Retail
2. Inn
3. Retail, Office, and Train Station
4. Retail and Office
5. Residential
6. Retail and Office

Figure 4: Maine Street Station master plan, City of Brunswick, ME

With the establishment of the Amtrak service, officials expect to have three trains a day stopping in Brunswick, creating a significant link for the rest of New England. There appear to be no plans for commuter rail at this time and it is unclear there would be the ridership necessary to make this option a viable consideration.

Programmatic considerations

The development has incorporated the primary programmatic considerations into its overall master plan. The station itself, therefore, is merely one piece of a larger development and cannot truly be considered the primary use, despite the name of the development being "Maine Street Station." Since the station's ticketing and waiting areas are included within the Town's Visitor Center it seems apparent that the Town's intention in promoting this project is to benefit Brunswick's tourist trade – creating a gateway for tourists from the south and a hub for local travelers.

Figure 5: Maine Street Station rendering, showing third and fourth phase structures, City of Brunswick, ME

In the absence of clear explanations in the planning documents, several conclusions may be drawn from how the new "station" project is assembled:

- By building prior to the reestablishment of rail service (which we have to assume is not a given until the trains begin pulling up, particularly as Amtrak is a political football), the planners had to consider multiple uses for the station building so that it's utility would not be tied to resumed train service.

- By planning around these other, non-transit oriented uses the planners acknowledged that transit uses are necessarily secondary in the programming hierarchy; another way to look at this would be to suggest that, even if there were an increase to ten trains a day, the building would be underutilized without other uses.

- By combining a visitors' center, restaurant, retail, and other uses with a transit hub, the planners believe that creating a vibrant commercial and office (and eventually small residential) complex will support the development and success of the passenger rail service.

While the first conclusion is merely a practical assumption, the last two conclusions are supported by Transit Oriented Design theorists, and one can assume that TOD principles were considered in the planning stages of this project. For my project, focusing on the Holyoke train station, this use of TOD principles in the Brunswick project reinforces my growing sense that it is appropriate to apply TOD principles in Holyoke, despite TOD's close association with urban and suburban planning. Neither Brunswick nor Holyoke can be considered suburban (Brunswick is a town unto itself) and Holyoke is a small city without the scale, economy, or services of an urban area.

Figure 6: Maine Street Station, mixed use building, City of Brunswick, ME

What is missing in this response is a sense of the iconic, of specialness, or uniqueness. A passenger rail station is a gateway and potentially central feature in a community and should be a visible, easily recognizable landmark, particularly in such a small town. The approach taken by Brunswick and/or the developers has created a complex that could have been built

Figure 7: Entrance to Maine Street Station, Google Street View (2011)

anywhere: the station does little to address the train tracks; the design is vaguely New Englandy, but is also bland and inexpressive, giving it no aesthetic weight despite it's potentially central or uniting location; the complex is given its own green, an attempt to focus attention inward on the development as opposed to connections with the nearby town; and the scale and siting reduce any impact the buildings might have in creating a vibrant space on Maine Street, the primary thoroughfare in Brunswick.

The aesthetic and spirit of the rail station are critical to encouraging the behavioral change that the reintroduction of passenger rail requires – people need to find added value in giving up their cars for alternative forms of transportation. The lesson for the Holyoke project is to use the project to inspire and engage the public so as to create a structure or area that draws the public and encourages participation.

Concord, MA Commuter Rail Station

Along the Fitchburg Commuter Rail Line, operated by the Massachusetts Bay Transit Authority between Boston's South Station and the small central Massachusetts city of Fitchburg, some local stations are being improved

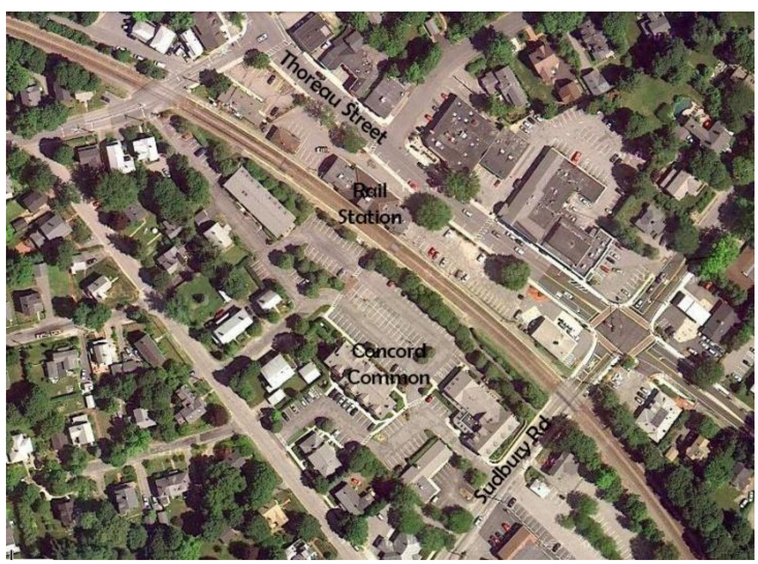

Figure 8: Concord, Massachusetts, Google Maps

or upgraded in anticipation of increased service that is expected to occur in the wake of track improvements funded by the federal stimulus dollars. Concord, MA, was ahead of the curve having instituted planning for the area surrounding the commuter rail station back in 1987, including Transit Oriented Development concepts such as higher densities of residential and commercial units, mixed uses, and reduced dependence on automobiles.

Figure 9: New residential units, Concord Common, www.mass.gov/envir/smart_growth_toolkit/pages/CS-tod-concord.html

The Concord Depot was built in the 1860s several hundred yards from the center of town where the railway made a slow curve past town. The station's immediate environs quickly became a new commercial district in town. The area around the station slowly lost businesses after the automobile displaced trains as the primary mode of transportation. Remaining businesses along Thoreau Street at that time included a Friendly's Restaurant, a supermarket, and a gas station. A 2.7 acre plot across from the station eventually became a lumberyard, which operated there until the early 1990s. That site was eventually redeveloped following the guidelines of the 1987 master

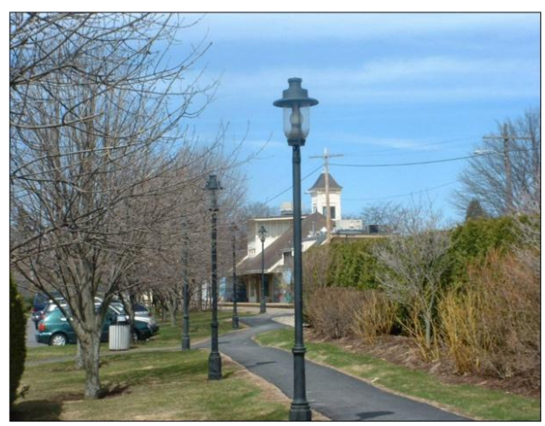

Figure 10: Walkway from Sudbury Road to rail platform, www.mass.gov/envir/smart_growth_toolkit/pages/CS-tod-concord.html

plan. [12]

The Concord Common development consists of three mixed use buildings that house retail space, office space, a 180-seat restaurant, and 20 rental apartments. In a deal struck with the developer, the affordable units the Town of Concord required the developer to create were built elsewhere in the town so that the units near the rail station could be market rate, a gamble that clearly shows the developer's confidence in the value of the TOD project. The Town of Concord and the developer also negotiated a reduction in the number of parking spaces required for the project, from 140 as required by Town zoning to 120. This resulted in less impervious surface area and allowed the Town to require the developer to create a landscaped walkway through the development connecting a nearby street to the train platform.

Figure 11: Rail station from inbound, www.mass.gov/envir/smart_growth_toolkit/pages/CS-tod-concord.htmlplatform

The station building itself has been "meticulously" preserved and is said to represent a "stunning example" of historic train stations from the mid-1800s, according to a state website, although there is no corroboration of this assertion to be found in my research. The station building no longer serves its original purpose, from what I can tell from limited sources, and all MBTA ticketing appears to be

[12] **Commonwealth of Massachusetts**, *Smart Growth/Smart Energy Toolkit: Transit Oriented Development (TOD) Suburban Case Study: Concord, MA*, www.mass.gov/envir/smart_growth_toolkit/pages/CS-tod-concord.html, accessed April 26, 2012

done through vending machines on the platforms or on the trains themselves. There is no longer an inside waiting area in the original station. The station does house, however, an "upscale general store on the ground floor and a sit down restaurant on the second floor". Other development in the area of the rail station now includes a rich variety of banks, markets, restaurants, coffee shops, retail, and office space. The nearby intersection of Sudbury Road and Thoreau Street has once again become a major intersection with each corner now hosting active businesses, all within a minute walk of the station.

This case study seems to show a success of planning and patient persistence on the part of the Town of Concord Planning Board in working with the developer to achieve these goals. The area surrounding the rail station has experienced a renaissance of sorts with a high influx of new businesses and increased residential and commercial density. This example demonstrates that towns with careful and able planners and Planning Boards can promote transit-oriented develop goals successfully. These are not necessarily reproducible in other communities without both of those resources, and possibly without the economic health that a wealthy suburb like Concord enjoys.

Holyoke' downtown has some similarities and many differences when compared with Concord's downtown. Both communities received rail links early, both have populations in the tens of thousands (not hundreds of thousands, like major cities), and both have been bypassed by major automobile arteries. The relative wealth and economic engines of each community, however, are enormously different: Concord has morphed from farming community to suburb, losing its agricultural economic base along the way, while Holyoke never realized its full, planned industrial potential and continues to suffer from the loss of industry over the past fifty years. Concord's interest in TOD derives from a desire to keep a walkable and attractive commercial district in the town's center specifically to serve the town's people; in Holyoke, meanwhile, the loss of downtown services, businesses, and restaurants was accelerated by the establishment of the Ingleside Mall just off the interstate, several miles from downtown. There is also a shocking lack of investment in Holyoke, given the long decline the city has suffered and the compounding national/global recession that has further eroded government programs and funding sources.

Concord's relative demographic homogeneity contrasts sharply with the racially diverse city of Holyoke, in which there is a very sizable Puerto Rican population, particularly in the neighborhood of the rail station; any planning in Holyoke would be lacking if it did not incorporate the input of various community and neighborhood groups. Community input is an area that has not been addressed virtually at all in the TOD documentation I have found, a deficiency that must be overcome. From past professional experience, I have learned that community input will be critical to the success of a project such as the one I propose. This is an area that will require greater research and thoughtful extrapolation from whatever examples I do find.

Heifer International Headquarters, Little Rock, AR, Locally Sourced Materials

While many buildings, and architects of these buildings, proudly proclaim that they use locally sourced materials, none appear to quantify their accomplishments by recording what percentage of their materials meet that criterion. Considering that LEED requires only 10% of a building's materials to be sourced locally (by which they mean within 500 miles, straining the notion of local by quite a bit), it is quite difficult to actually find a building constructed within the last 80 years using traditional methods and using more than 75% locally sourced materials. The exceptions are those buildings made with alternative construction materials such as straw bales, cobs, rammed earth, or adobe; these types of buildings are usually homes rather than public or commercial.

Figure 12: Heifer International Headquarters, Little Rock, AK, continuingeducation.construction.com/article.php?L=5&C=421&P=3

The Heifer International Headquarters, in Little Rock, Arkansas, was designed to be a sustainable building that emphasized energy conservation, the relatively flat organizational structure of the organization, and the reclamation of land considered to be a brownfield. The resulting 94,000 square feet building, completed in 2006 and costing $18.9 million has been lauded for its efforts in using locally sourced materials. The architects note that their goal was to use double the amount of locally sourced materials required by LEED, which would mean a goal of approximately 20%; I could not find numbers to confirm whether this goal was indeed met. [13]

13 Tristan Korthals Altes (2007), Circle of Life: A charity dedicated to nourishing families builds a new office as a model of harmony with nature, Green Source: The Magazine of Sustainable Design, web: http://greensource.construction.com/projects/0701_COL.asp

A review of the project noted that “A steel structure was chosen because the steel factory was three blocks from the site.” Additionally, the steel “included 97% recycled content,” which, while not necessarily local, made for a more attractive overall material. The report continues to say that the “heavy timber roof was also sourced locally” and that “an aluminum curtain wall and skin, making up more than 90% of the exterior, was fabricated at a major glass company located directly across the street.”

Figure 13: Heifer International Headquarters, Little Rock, AK, www.greendiary.com/entry/7-environmentally-friendly-buildings-united-states/

The architectural and construction teams clearly researched their options for locally sourced materials prior to beginning the design work. The unusually close proximity to sources for curtain wall systems and structural steel perhaps made these material choices obvious, yet understanding the limitations and possibilities of these materials must have been a critical piece of the success of the design.

Larch House, Ebbw Vale, Wales, UK, Locally Sourced Materials

The challenge was a publicly funded, energy efficient house in a somewhat harsh climate. The architect chosen for the project, Justin Bere, decided to take things a step further by designing a house to Passive House standards and sourcing at least 80% of the materials locally. Although he was not able to achieve Passive House certification and is having difficulty collecting reliable data on the house's performance, he was able to meet the materials goal. [14]

Figure 14: Larch House, Ebbw Vale, UK, www.passivhaus.org.uk/page.jsp?id=91

An article on the project notes briefly that, "The final buildings used Welsh timber (used in an innovative way to make up for its poor quality compared to, say, Scandinavian timber), Welsh-made Rockwool insulation, Welsh-made slates, local stone, and UK-made paint and sprinklers. Things that were harder to source included lime render (a Welsh company but a French lime), and woodfibre insulation, which was imported from Germany but could easily be made in Wales. The last challenge was the windows, which need to be of very high quality," and were subsequently imported from Germany. Despite the materials not sourced locally, the house still reached the 80% mark the architect had intended. The article notes that another house built later was able

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14 Rob **Hopkins** (2011) *The Local Passivhaus: an interview with Justin Bere*, Transition Culture, transitionculture.org/2011/04/11/the-local-passivhaus-an-interview-with-justin-bere/

to use locally sourced windows made by hand from a design that was approved for Passive House standards, bringing the total percentage of locally sourced materials for the second house to about 90%, illustrating that suppliers can be found in some markets if the designers and contractors are dedicated to finding and encouraging them.

Seattle Public Library

Designed for a program that is both ages old and changing faster than can be accurately imagined, the Seattle Public Library is a good example of a public building that knows it needs to be prepared to evolve from its first day. According to its lead architect, Rem Koolhaas, "…When we came back and started looking at the program, (we divided) it into only two cavities – those elements and programmatic components that we assumed would remain stable over time, and those where we assumed they would start to mutate and change their character fairly quickly."

Figure 15: Seattle Public Library, places.designobserver.com/feature/seattle-central-library-civic-architecture-in-the-age-of-media/813/

Technology is changing library science, use, and planning at a faster pace than other fields, yet given that sustainable architecture needs to expect a long life span the idea of building for change is a critical challenge. Public buildings are expected by their clients, the long-lived and quite demanding taxpayer, to last a very long time, raising the bar for architects, builders, and maintenance departments everywhere. It has become reasonable to expect that a building will serve its original purpose effectively as well as purposes that cannot even be imagined at the time of design.

Programmatic Considerations

The Seattle Public Library was designed, in part, as a traditional lending library, with double the shelf space needed to hold the library's current 750,000 volumes. Because the nature on information sharing had changed so dramatically in the years during the design of the library and because the degree of change is not anticipated to diminish in the near future, open and flexible spaces were created within the library. Reading rooms, circulation centers, listening "domes", reference desks, and even virtual space via the internet and instant chat features were part of the library's design.

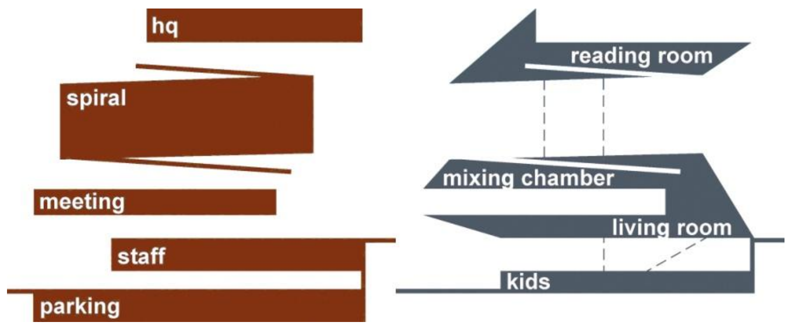

Figure 16: OMA diagram of library's uses, oma.eu

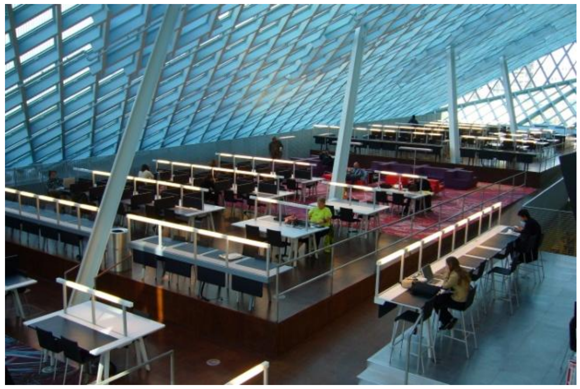

Figure 17: Reading room at the Seattle Public Library, Wikipedia.org

The portions of the program that were not expected to change over time included the book stacks, the staff or administrative offices, assembly spaces, electronics, a store, operations, and parking. The portions deemed subject to change include the reading room, an area that mediates the intersection of different programmatic functions and creates a separate public space called the "mixing chamber," the even more public "reading room," and the kids section. By separating these functions, the unchanging spaces were protected from infringement by new uses and, more importantly, kept from expanding into the more flexible areas. The more flexible areas were bounded but otherwise free to undergo any number of new iterations as need, technology, and desires dictated. In this way, the building is somewhat protected from becoming obsolete.

Aesthetic Considerations

From the outside, the building is somewhat standoffish. Its strange angles, looming shifting masses, and monolithic design send the message that this building is not meant to be easily breached; only from right outside the entrances does this building show its welcoming side. This is, of course, the opposite of the architects' intentions. It is not until one knows that each layer, offset within the angled skin, contains a discreet part of the library's program or services that one begins to understand the appearance of the exterior form. The architects took a risk in this respect – they are counting on people to use it even if it is initially unwelcoming, and once they are familiar they will appreciate its unusual form.

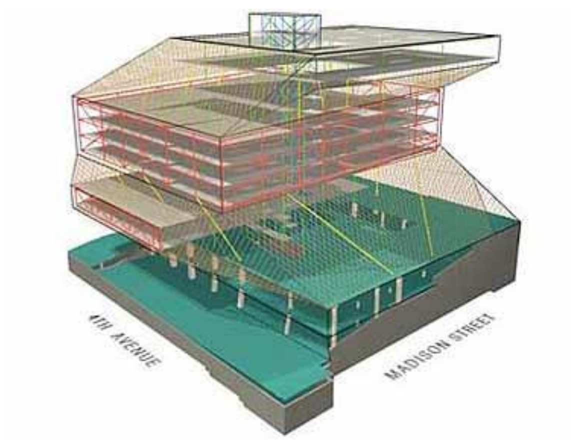

Figure 18: Transparent view of the Seattle Public Library, from OMA

Philosophically, OMA suggested that the library can be viewed as under threat from new technologies for communicating information, but OMA elected to approach the changing culture of information as an opportunity for the library to redefine its role and to "aggressively" organize the "coexistence of all available technologies."[15] This attitude informed their programmatic design work in dramatic, culturally unfamiliar, and sometimes counterintuitive ways.

Figure 19: Seattle Public Library, "book spiral," www.dayinthelifeofaskygurl.blogspot.com

The way the library serves the public is aggressive in and of itself. OMA's intention is to mold a user experience that encompasses all forms of information in one place, creating distinct spaces that spill into one another, turn in on themselves, or display their contents to the world. The user moves easily between the more open public spaces, vast volumes connected to a central tall core that reaches up through the building's layers. Yet at another point, users must commit themselves to the sudden constriction of the ramped spiraling pathway through the book stacks, a change of language that might be cozy but can also be considered a bit cold and impersonal; the "book spiral" is essentially a repurposed parking garage design with concrete floors and columns, albeit one with high ceilings, glass walls that open in several places to the larger library structure, and lit quite brightly. The use of materials and volumes that far exceed what is typically considered

[15] Amy **Murphy,** *Seattle Central Library: Civic Architecture in the Age of Media***,** October 12, 2011, **places.designobserver.com/feature/seattle-central-library-civic-architecture-in-the-age-of-media/813/**

"human scale" can be experienced as both alienating and as forcing users to make the spaces their own, a challenge that some will find to their liking and some will not.

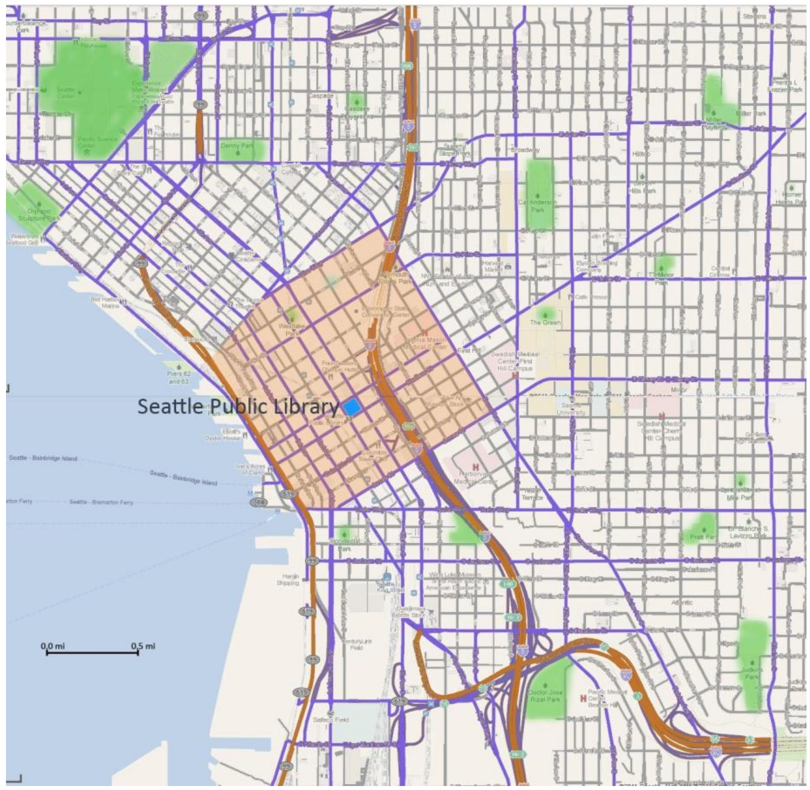

Figure 20: Seattle Public Library in the Central Business District, Google Maps

The library sits squarely in the Central Business District, the heart of downtown Seattle. Surrounded by skyscrapers, highways, and Puget Sound, it is in the most vibrant part of the city, at least during the daytime. Main thoroughfares surround it on four sides. Bus stops, minimarts, shops, and other services line the busy streets. As the only truly public space within a half mile (as contrasted with quasi-public space provided by commercial ventures such as malls) the library provides a respite and safe haven for residents and visitors from the business district.

Only the library's form – shifting, strange, unfamiliar – allows it to hold its ground in the face of so many large buildings. From above it is dwarfed by its neighbors. From the street it squats amongst the giants, more human scale except for that it lacks scale; its repeating patterns don't give anything away, and its size can't be read until alongside it. OMA had stated design goals of providing views from the upper floors of Mt. Rainier and Puget Sound, although it is hard to imagine anything other than glimpses and slivers of views. It seems the visitors' views will be most likely cast upon the building itself; fortunately, it provides enough interest to hold that gaze.

Figure 21: Seattle Public Library nestled amongst the tall buildings, Google Earth

CHAPTER 4

SITE ASSESSMENT

Although Amherst, MA, would be losing passenger rail service with the realignment initiated by the Knowledge Corridor project, three communities along the west side of the Connecticut River – Holyoke, Northampton, and Greenfield – will be gaining service. In addition, Springfield's Union Station would be renovated and virtually reborn after many years of neglect and disuse. I considered all of these as potential sites as I researched my thesis topic.

I eventually selected Holyoke as the location of my project, intending to work in accordance with the decisions made by the city that identified the existing H. H. Richardson-designed 1885 train station as the future station – again, a virtual rebirth after years of neglect. Amtrak, however, had different plans. I learned in January, 2012 that while Amtrak would indeed be including Holyoke as a stop along the Knowledge Corridor, the initial victory for historic preservationists was undermined by a subsequent decision. In November, 2011 Amtrak negotiated with the city to place the new passenger rail platform, a simple four-foot high concrete structure designed to just meet code, on a lot adjacent to the Richardson station. Their decision was reportedly predicated on the desire to not link the reestablishment of passenger rail with the renovation of the Richardson station, for which they do not yet have a developer or other funding.[16] My project similarly anticipates but does not encompass the renovation of the Richardson Station.

[16] Kathleen **Anderson**, *interview*, January 21, 2012

Depot Square and the new "Stone Station"

The Connecticut River Railroad was laid through Ireland Parish in 1845, for the future city of Holyoke a fortuitous last-minute change in course. Previously the tracks were to have travelled through South Hadley and crossed the Connecticut River near the present day border with Northampton, which would have left Holyoke with only a minor rail spur rather than the busy through-station it eventually became.[17]

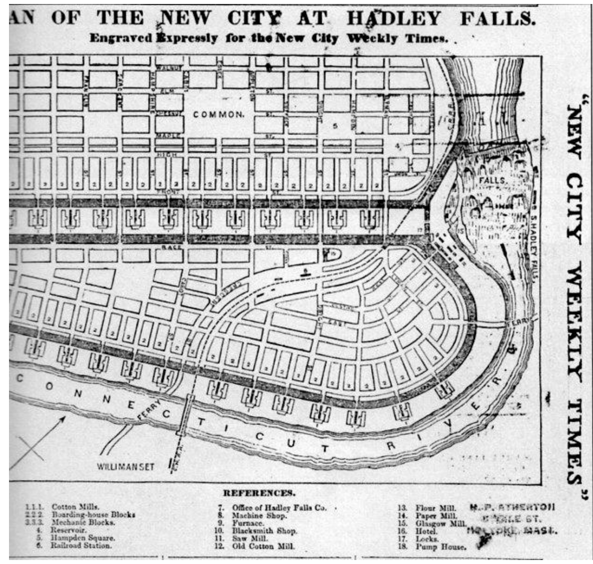

Figure 22: 1847 Plan by the Hadley Falls Company for Holyoke (Plan of the New City at Hadley Falls, 1847), imagemuseum.smugmug.com/History/Holyoke

Depot Square was already a vibrant and busy commercial district by 1850, when the canals were still being dug, the first mills were opening, and the city streets still being built.

Figure 23: Rendering of the Depot Square area of Holyoke, 1877, from the northeast (Bird's Eye View of Holyoke, Mass., 1877), www.old-maps.com/ma

The Hadley Falls Company's plans for Holyoke arrayed the first and second canals on a roughly north-south axis, with 100 yards between them to accommodate a mile long isthmus of mills situated to take advantage of the water power

17 Constance **Green** (1939), *Holyoke Massachusetts: A Case History of the Industrial Revolution in America*, Yale University Press

generated by the drop between the two canals. Main Street was laid out parallel to the canals and, at its intersection with Dwight Street, ran by the early depot. Main Street then followed the curving path of the rails as they climbed to their causeway along the west bank of the Connecticut River. Main Street joins with Canal Street to pass beneath the tracks at the intersection with Lyman Street near where the second canal curves to the east.

This stretch of Main Street, from Lyman down across Dwight to the next big street, Appleton, became the primary commercial district in Holyoke for the following 30 years. Its location was well suited, situated as it was between the mills and the tenements that filled the Flats, and alongside the rail yards and passenger station of the commercial lifeline 19th century, the railroad. Provisioners, hardware stores, butchers, banks, and saloons lined Main Street directly across from the rail yards from the time of the establishment of the town in 1850. That year saw the opening of the Holyoke House, a hotel on the opposite corner from the depot, billed almost immediately as rivaling the finest the hotels of Boston and New York. A church was constructed on Main Street a long block north of the depot, at the corner with Mosher Street, which became the 2nd Baptist Church of Holyoke. As the years passed some of the mills built offices and warehouses in attractive brick and stone

Figure 24: Trolley Car turning onto Dwight Street next to the Hamilton Hotel, on right, Property of the Archives of the Holyoke History Room of the Holyoke Public Library

buildings along Main Street and Race Street, the next street over that ran along the second canal. Later, a stately stone post office was constructed on Main Street, next to and replacing the one that had been located on the lower level of the Holyoke House (later the Hotel Hamilton) until the late 1800s.[18]

By the 1880s the tenements and other worker housing had taken over more and more of the city close to the mills and the wealthy climbed further up the hill to find bucolic setting for their homes and families. Grand Victorian houses were being erected to the west in the Highlands and along Cabot Street, a full mile from the mills. High Street, uphill from and parallel to the canals, hosted the new grand City Hall, completed in 1874, and soon after new commercial buildings sprouted up as well. By 1880 High Street competed with Main Street as the city's predominant commercial district, and by 1890 it had clearly prevailed. While the fancy shops and groceries were on High Street, the transient hotels, saloons, and

Figure 25: The Highlands of Holyoke as it was developing, c. 1885, Property of the Archives of the Holyoke History Room of the Holyoke Public Library

Figure 26: High Street in Holyoke, c. 1885, Property of the Archives of the Holyoke History Room of the Holyoke Public Library

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[18] **Digital Sanborn Map**,1884, sanborn.umi.com/ma/3751/dateid-000001.htm?CCSI=3842n

small scale manufactories took over Main Street. This district still served the workers and their families, but the wealthier citizens had taken their business up the hill.

Figure 27: Holyoke Train Station, circa 1885 (photographer unknown), Property of the Archives of the Holyoke History Room of the Holyoke Public Library

Figure 28: Holyoke House was built in 1850 (unknown photographer, taken in 1867), Property of the Archives of the Holyoke History Room of the Holyoke

In 1885 the new train station – commonly referred to as the "stone" station – was completed across the tracks from the north end of Main Street. Although travelers still used some of the hotels found on Main Street over the next two decades, Depot Square no longer accommodated the more affluent business people, or their business. Those people caught the electric trolleys or hotel-provided conveyances up the hill to High Street. Only the freight yards remained in Depot Square, and by the 1920s Main Street began its decline. Many of the most prized buildings in the district, including the Parsons Building, commonly referred to as the Flat Iron Building for its similarity in shape and prominence to the one in New York City, and Parsons Hall, an entertainment and social gathering spot, had either been demolished or severely damaged, not to be rebuilt to previous glory.

Today, Main Street has few of the buildings it had 100 years ago, and those that are left have often been altered dramatically: The Parsons Hall has lost its third floor grand hall and the top third of its tower; the Holyoke House, expanded in the 1870s, has had its top floor and its grand Greek Revival entryway removed entirely. Across from the old depot, Main Street between Dwight and Appleton has few buildings at all, and of those only one is more than a single story. There may be remnants of some of the old buildings in the current structures, but it is hard to recognize them. Instead, the Depot Square area is most notable for the empty lots lining the streets, marking the spots where buildings and vitality has been lost.

Figure 29: Parsons Building, commonly known as the Flat Iron Building (unknown photographer), Property of the Archives of the Holyoke History Room of the Holyoke Public Library

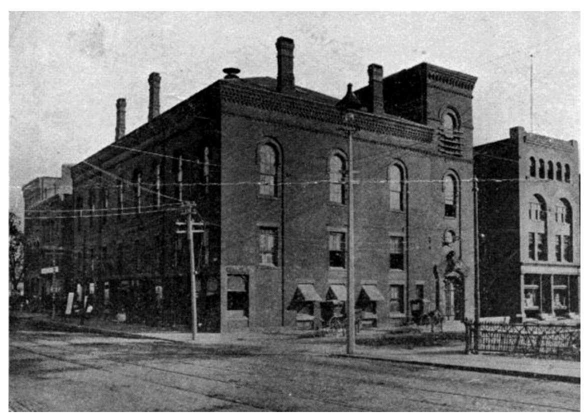

Figure 30: Parsons Block, housing shops, services, and a 3rd floor hall used for political events, opera, and other entertainments (unknown photographer), Property of the Archives of the Holyoke History Room of the Holyoke Public Library

The Canal Walk, an economic development and arts project that leads visitors through portions of Holyoke's arts district that is arrayed along the 1st and 2nd canals, is slated to be extended to the train station neighborhood. The first phase of the Canal Walk was completed in 2010.[19] Subsequent phases are planned but currently are awaiting funding for work to start. This improvement will create broad, well-marked sidewalks for pedestrians to walk safely and explore the local art scene. The city's Transit Oriented Development (TOD) District, centered around Holyoke's multimodal transit facility completed in 2010 and located about a half mile from the train station on the other side of High Street, has been extended as a "TOD path" along Dwight and Race Streets to reach the train station. This designation will reportedly facilitate the creation of a marked path from City Hall along the Canal Walk routes and on to the train station.[20]

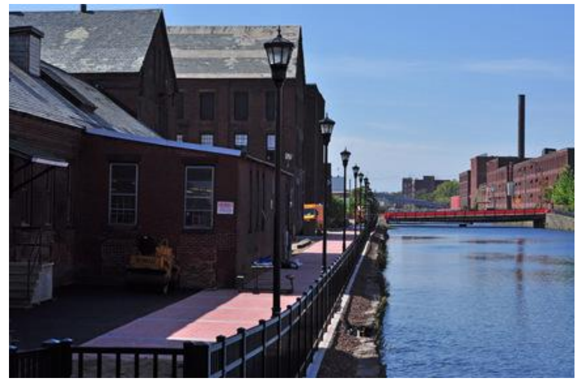

Figure 31: Holyoke's Canal Walk, Greg Saulmon, Springfield Republican, Oct. 2, 2009

Figure 32 : Holyoke's Canal Walk construction phases, friendsofthecanalwalk.weebly.com/index.html, 2011

[19] Sy **Becker**, *Blight to Beauty: Holyoke Canal Walk*, Oct. 10, 2010, http://www.wwlp.com/dpp/news/local/hampden/Blight-to-beauty;-Holyoke-canal-walk
[20] Kathleen **Anderson**, *interview*, October 21, 2011

Infrastructure and Connectivity

Holyoke, as a planned industrial city, was largely a challenge of building infrastructure – the dam, canals, access roads and railroad spurs. The layout, designed for 19th century industry and modes of transportation, exists today in much the same form, although now used by cars and buses rather than horses, carriages, and trolleys. While certainly updated, paved, and widened (where possible), the city's surface transportation infrastructure nevertheless presents a challenge to the establishment of a new transportation hub at the former train station.

Original infrastructure

As transportation hubs and city gateways, train stations were often located in close proximity to industrial and commercial districts and not too distant from civic and residential neighborhoods. The train line in Holyoke preceded the industrial planning of the late 1840s but nevertheless, by virtue of topography and good fortune (it had been planned for the east side of the river but was changed for purely practical, rather than political, reasons), ran through the area of canals, mills, and mill housing. Main Street, Holyoke's original commercial strip, grew up alongside a portion

Figure 33: Depot Square and Depot Hill, viewed from above the intersection of Dwight Street and Main Street, Property of the Archives of the Holyoke History Room of the Holyoke Public Library

of the rail line not far from the original train depot, located at the end of Dwight Street where it ran into a ridge that became known as Depot Hill.[21]

When it was constructed in 1883 several hundred yards from the original depot, the H. H. Richardson "stone station" was similarly bounded by a great deal of activity, including hotels, factories, mill workers' and supervisors' residences, and the commercial strip of Main Street. Beginning in 1884, a network of trolleys operated by the Holyoke Street Railway connected the station to the rest of the city.[22] The Railway grew quickly, replacing the horse-drawn trolleys with electric cars in 1891. By 1894, the Railway reached east to South Hadley Falls, south to Prew Street (off of Main Street) and on to West Springfield, southwest to Laurel Street in Elmwood, and northwest to Lincoln Street in the Highlands. One of the two main hubs for this network was close to the

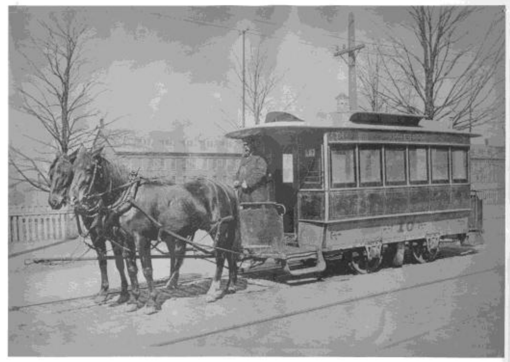

Figure 34: Holyoke Street Railway horse trolley, c. 1890, Property of the Archives of the Holyoke History Room of the Holyoke Public Library

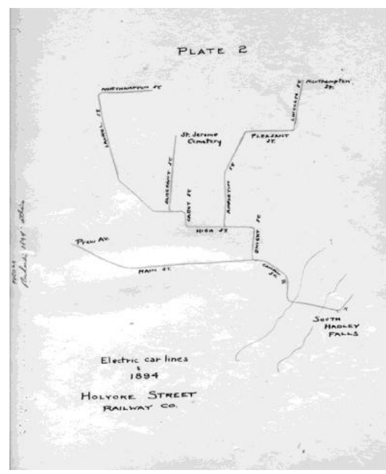

Figure 35: 1894 map of Holyoke Street Railway routes, Property of the Archives of the Holyoke History Room of the Holyoke Public Library

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[21] **Historical Commission Administration**, **City of Holyoke**, 2011, *Holyoke's History*, http://www.holyoke.org/index.php?option=com_content&task=view&id=40&Itemid=152&limitstart=2,October 2, 2011

[22] **Wisteriahurst Museum**, 2009, *Holyoke Street Railway: Chariots of Change Digital Exhibit*, September 30, 2011, http://wistariahurst.org/holyokestreetrailway/?page_id=66

train station, making it accessible from almost everywhere.[23]

With the decline in manufacturing in Holyoke, the commercial district along Main Street was slowly eclipsed by the commercial district along High Street. The Holyoke Street Railway was dismantled in 1937 and replaced with autobuses.

Projected Train Users and Destinations

The train station in Holyoke will necessarily serve a population that stretches beyond its many districts and neighborhoods. In researching the feasibility of returning passenger rail to Holyoke and other western Massachusetts cities, HDR considered the number of people within both two and five mile radii of the proposed stations and changes in ridership for different service scenarios in coming years, from the status quo of one train each way per day to 11 or more trips each way by intercity and

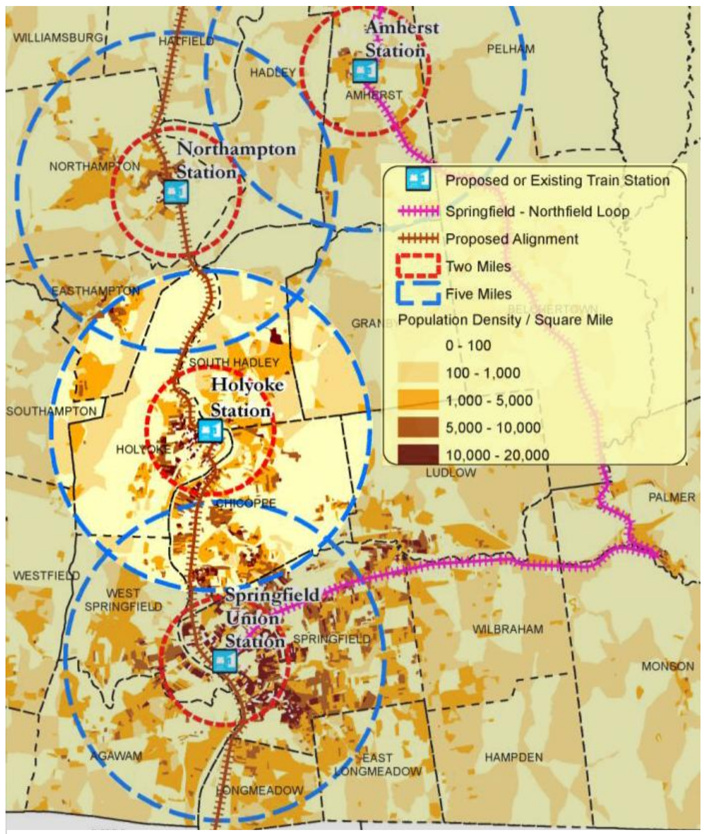

Figure 36: "Population Inside Two and Five Miles of Train Stations": HDR, 2009, *Knowledge Corridor Passenger Rail Feasibility Study*, **Pioneer Valley Planning Commission**

[23] **Wisteriahurst Museum**, 2009, *Holyoke Street Railway: Chariots of Change Digital Exhibit*, September 30, 2011, http://wistariahurst.org/holyokestreetrailway/?page_id=66

commuter service. Collectively, the results are positive for the Knowledge Corridor; for Holyoke, they represent a significant new portal for the city.

The riders will be drawn from all over, according to the research by HDR. Most riders using commuter service will be arriving for work in Holyoke, meaning that local residents using the commuter service will be outnumbered by those who are coming to work in the city.

Table 1: Daily Ridership Forecast Results, Near-Term (2012-2017) [24]

Brattleboro	16	21	41	39	41
Greenfield	0	12	23	41	179
Northampton	0	28	54	114	369
Amherst	19	0	0	0	0
Holyoke	0	13	25	46	123
Springfield	101	101	109	438	582
Total St. Albans to	415	513	826	1,37	2,01
% Increase Over		24%	99%	231	386

Source: HDR calculations

[24] **HDR Engineering, Inc.** (2009) *Knowledge Corridor Passenger Rail Feasibility Study*, Pioneer Valley Planning Commission

Table 2: Daily Ridership Forecast Results, Long-Term (2030)

			1 h		
Brattleboro	1	2	4	4	4
Greenfield	-	1	2	7	3
Northampton	-	2	5	1	5
Amherst	2	-	-	-	-
Holyoke	-	1	2	6	1
Springfield	1	1	1	5	8
Total St. Albans to	4	5	8	1,7	2,8
% Increase Over		2	8	304	549

Source: HDR calculations

The forecasts see only a modest ridership should the only passenger rail service include the existing Vermonter Amtrak line, which has one trip a day each way. If service were to increase, however, ridership quickly rises, although not to numbers that would make accessing the station,

The forecast numbers take into consideration some growth in the local economy related to the resumption of passenger rail service, but are necessarily conservative. Given the many assets in Holyoke relatively few of which are being taken full advantage (its relatively inexpensive hydropower, a great deal of affordable space in its many mill buildings, and beautiful architecture and industrial history), planning for a station to serve passenger rail should have the capacity to serve higher numbers in the future.

Access routes

The number of significant thoroughfares to and from the stone station is limited by the geography and infrastructure of the area. There are only three primary approaches:

- from the north along Canal Street (virtually all traffic from South Hadley and beyond)
- from the south along Main Street, to either Mosher Street or Lyman Street; traffic from the west that uses Dwight Street will have to use this approach
- from the west along Lyman Street, which runs adjacent to the station

The station can also be accessed from the east, although the roads there are such that traffic will likely be limited to only those who live or work in the immediate environs, and area called the Flats.

There are more than 500 households within a half mile radius from the station, with thousands more with a two mile radius. There appears to be significant potential for the development of more housing, should the demand warrant, in the immediate vicinity of the station, in particular at Open Square (the former Lyman Mills, located just across the second canal from the station) and at 109 Lyman Street, an affiliated development.

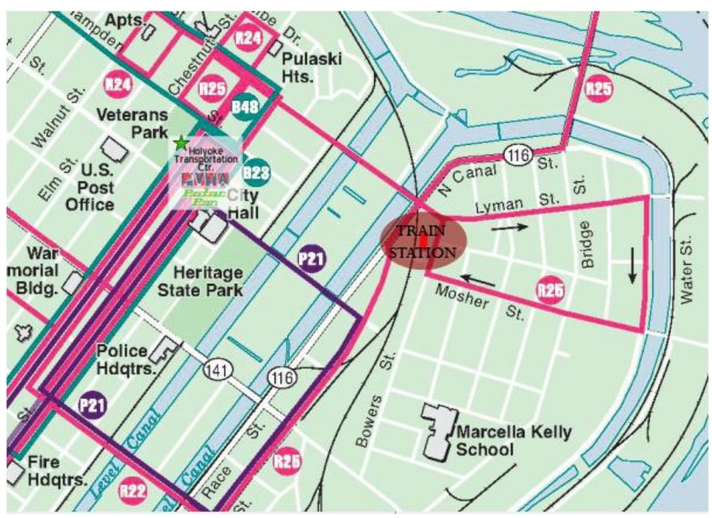

Figure 37: PVTA bus map for the downtown Holyoke, MA

Today, the Pioneer Valley Transit Authority runs two buses that run near the stone station.[25] Holyoke's relatively new Transportation Center, an intermodal hub, is located a half mile from the station and provides access to two additional bus routes.

Visibility

The location of the stone station is such that one needs to be quite close to it before it is visible. Even standing just in front of the building, it is modest in size and aspect, not the landmark that stations in larger cities often aspire to be. The station is not visible from any part of High Street, the current downtown commercial district, and only slightly visible from Main Street, the former downtown commercial district.

The station faces to the north, away from the city center; even when it was built, its aspect was away from Main Street and the commercial and industrial bustle of the city. This was likely because of the difference in grade between Main Street and the rails, which sit a full ten feet higher. Rather than create a situation in which passengers entered from Main Street and then ascended through the station to the platform level, the station was sited on the far side of the tracks and facing a largely residential area instead. Today, it faces a few multifamily houses and a large block of elderly housing.

[25] **Pioneer Valley Transportation Authority**, *Holyoke Inset Map,* September 30, 2011, http://www.pvta.com/HolyokeMap.php

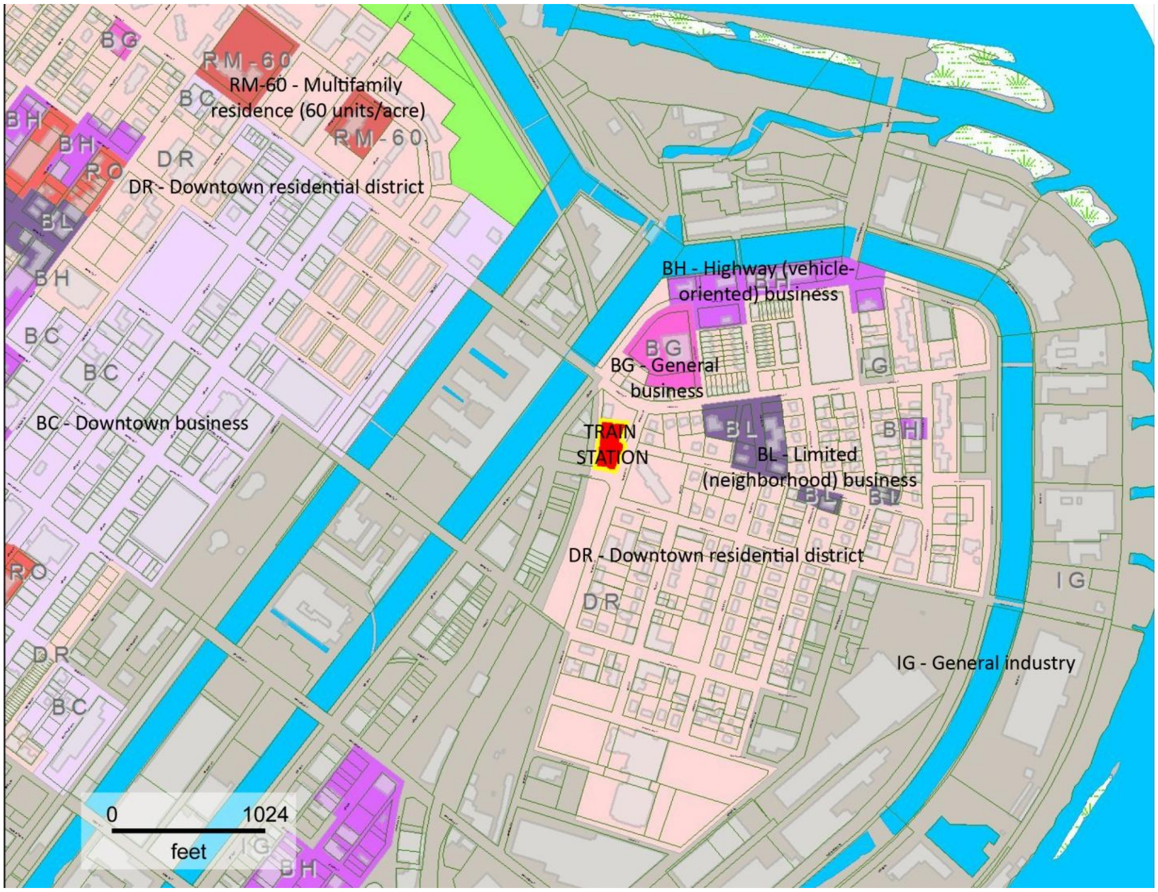

Figure 38: Zoning and aerial map showing the location of the H. H. Richardson train station and surroundings, City of Holyoke

Demographics

The Flats is home to a significant part of Holyoke's Puerto Rican population. It is also an economically disadvantaged part of the city. The 2010 Census reports that with between 501 and 750 housing units in the primary census tract in the Flats, fewer than fifty are owner occupied and between 40% and 60% of households are considered to have low incomes.[26]

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[26] **MassGIS,** *OLIVER: MassGIS's Online Mapping Tool*, Commonwealth of Massachusetts, October 2, 2011, http://maps.massgis.state.ma.us/map_ol/oliver.php

CHAPTER 5

CODE REVIEW, ZONING, AND REGULATORY CONSIDERATIONS

Zoning

The sites in the near vicinity of the H. H. Richardson Station consists of several parcels with a variety of owners and zoning assignations.

- The Richardson station and the properties on Main Street and Canal Street just opposite the tracks from the station are all owned by Holyoke Gas & Electric. The station, the outbuilding (former baggage building), and the adjacent parking area are all zoned as Downtown Residential. The Parking lot at Main and Canal Streets and the buildings it serves are all zoned as General Industry.

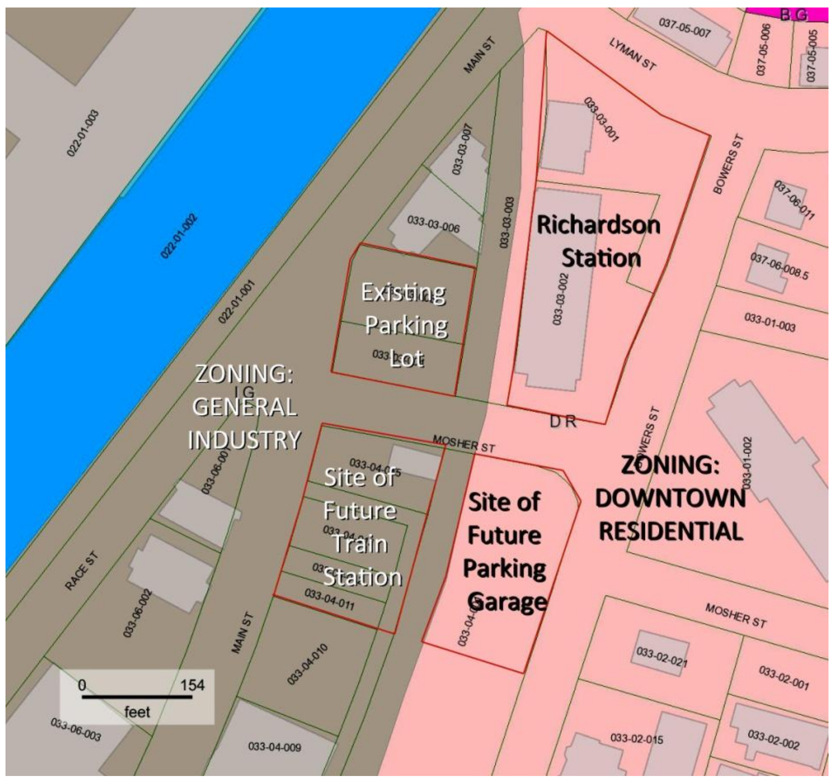


Figure 39: Parcel Map, City of Holyoke, host.appgeo.com/holyokeMA/Map.aspx

- The parcel on the southwest corner of Mosher Street and Bowers Street is owned by the Boston & Maine Railroad Company and is the site that Amtrak has identified as the future site of the passenger rail platform for the Knowledge Corridor; it is quite narrow and currently undeveloped. This parcel is zoned as Downtown Residential.

- The four vacant Main Street lots across the tracks from the Boston & Main Railroad property are owned by four separate owners. All four properties are zoned as General Industry.

My thesis proposal includes using the four empty lots on Main Street into a train station. The zoning may need to be changed from General Industry to another category, perhaps Downtown Business (this is the zoning category of the Intermodal Center on Maple Street). The parcel on the southwest corner of Mosher and Bower Streets would be used for a three level parking garage embedded in the slope in addition to the train platform the city has already allowed; any structure would likely need to be designed with respect for the residential neighborhood the lot borders. The Richardson train station would similarly need to be rezoned for commercial use, should it be developed (while desirable, this is not within the scope of my thesis).

Code

Transit stations are subject to strict MAAB standards that govern accessibility of platforms dimensions and surfaces, gaps between trains and platforms, and features transit stations must provide. This chapter's appendix, the relevant portion of 521 CMR 18, details these requirements.

Some details from this code:

- An *accessible route* shall connect all terminal *buildings* or station houses, platforms, parking areas and street *entrances*
- At least 50% of the *entrances* to a transportation terminal shall be *accessible*
- The distance between platform and vehicle at boarding platforms shall not exceed three inches in the horizontal plane and ½ an inch in the vertical plane

- Platform edges at newly *constructed*, *reconstructed*, *altered*, or *remodeled* stations shall have a yellow (Federal Yellow 33538) band of *detectable warning* at least 24 inches

- At newly *constructed* stations serving *commuter rail* coaches, access shall be provided to all passengers and to all coaches of the train by means of a full length raised platform

- Such platforms shall be at least 60 inches (60"=1524mm) in *clear* width

- Such platforms shall provide overhead shelter from rain and snow along a total of at least150 feet (150' = 46m) of their length and at all access *ramps*

- At least one entry and one exit gate shall be *accessible* and shall have a *clear* opening of not less than 32 inches (32" = 813mm) wide

- Visual systems for providing announcement to deaf and hard of hearing customers shall be provided wherever there are auditory systems for providing announcements

  The Massachusetts State Building Code is International Building Code, 2009.

Holyoke has adopted the Stretch Code.

CHAPTER 6

PROGRAM

The program for the Holyoke Train Station Portal outlined below is a broad sketch of the various programmatic elements, design elements, and features that would ideally be included in the project.

1. Passenger Rail Station
    - 1.1. Double platform with shelters on each
    - 1.2. Connecting passageway(s) between platforms running under/over tracks
    - 1.3. Waiting areas
    - 1.4. Restrooms
    - 1.5. Connector bridge to parking garage
2. Retail services
    - 2.1. News and books
    - 2.2. Quick food and beverage service
    - 2.3. Restaurant
    - 2.4. Bakery/bodega
3. Parking
    - 3.1. 100 car parking spots
        - 3.1.1. Connection to station
    - 3.2. 100 bike parking spots
        - 3.2.1. Covered and protected
        - 3.2.2. Connection to station

4. Safety

    4.1. Clear sightlines

    4.2. Good lighting, no dark passages

    4.3. Call boxes

5. Wayfinding

    5.1. Landmark

        5.1.1. Unique design feature expressed on the exterior to identify the building as a transit station

    5.2. Gateway

        5.2.1. Arrival and departing experiences that mark the gateway to and from Holyoke

    5.3. Obvious cues to proper pathways for travelers

        5.3.1. Entrances, exits, and passageways to other parts of the station, to platforms, and to transportation connections

    5.4. Information boards

    5.5. Information kiosks

6. Sustainability:

    6.1. Daylighting

        6.1.1. Glazing

        6.1.2. High reflectance interior surfaces

        6.1.3. Automatic light sensors

    6.2. Energy harvesting

        6.2.1. Ground source

6.2.2. Solar hot water

6.2.3. Photovoltaics

6.2.4. Canal water for cooling

6.3. Ventilation

6.3.1. Operable windows

6.3.2. Solar chimney

7. Future adaptability

7.1. Adaptable layout for alternate programming

7.2. Adaptable structure for alternate layouts

7.3. Adaptable skin and structure for additional or alternate energy harvesting technologies

8. Local materials

8.1. Expressed in exterior and interior elevations

8.2. Wood, brick, and stone for primary materials

CHAPTER 7

A NEW TRAIN STATION FOR HOLYOKE

After ten months of research and writing, it was finally time to begin design of the project, a new train station in Holyoke, in earnest. The following highlights the design process and decisions.

Site and Immediate Vicinity

Outside the station, the area surrounding the site has been changed to encourage pedestrian traffic and create one way flows of auto traffic, most importantly on Mosher Street. This allows for the creation of the aforementioned passenger drop-off lane just north of the station building and also for a second broad sidewalk that passes beneath the train track bridge. This second sidewalk better serves the residents of the Flats who currently cut diagonally across the empty site, including an unprotected crossing of the tracks, to get to Main Street; while not as direct, this sidewalk will be safer, better lit,

Figure 40: Site planning diagram, by the author

and better placed for residents heading south on Main Street or to the station itself. This sidewalk also provides a safe connection from the station to the parking garage.

The station will be more easily accessible to the center of Holyoke than the existing H. H. Richardson station by virtue of being sited on the near side of the railroad tracks. The tracks are a physical barrier to movement, requiring residents of the Flats to use either the Mosher Street or Lyman Street underpasses. While these pinch points remain, the new Mosher Street sidewalk and the north bound platform, which bridges Mosher Street, create a better connected site. The Richardson station is more accessible, making it more attractive for developers and creating the opportunity for a larger commercial and/or community complex.

Design Concept

Train stations are gateways for cities that open up in the midst of the urban fabric. This is an unusual and unfamiliar phenomenon for most people – few cities have major train stations anymore; most gateways are located at airports, often dozens of miles from urban cores, or where interstates cross city lines, typically with no fanfare whatsoever. In a city that has been without a train station for decades, the idea of a new gateway provides

Figure 41: Design concept illustration, part I, by the author

impetus for new thinking about the urban fabric, development, and connectivity with the rest of the world.

The context in which the station will soon reappear is a varied one. It is adjacent to the Flats, once the most densely populated neighborhood in Holyoke and now a stable, modest neighborhood. It is in close proximity to dozens of old mill complexes where hundreds of people still work, and where developers hope many hundreds more will work and live in the future. It is about a ten-minute walk from High Street, the primary commercial district in the city and home to city hall. And it is at the terminus of the planned Canal Walk which will connect the station area to High Street and become the destination or way station for visitors and gallery-hoppers.

The allure of rail travel attracts many to stations around the world, not necessarily for travel but for the services found in stations and for the proximity to the rails and trains using those services provides. The train station design will reflect the intersection of the city and the rails through integration and interweaving of the lines these two elements carve through the site.

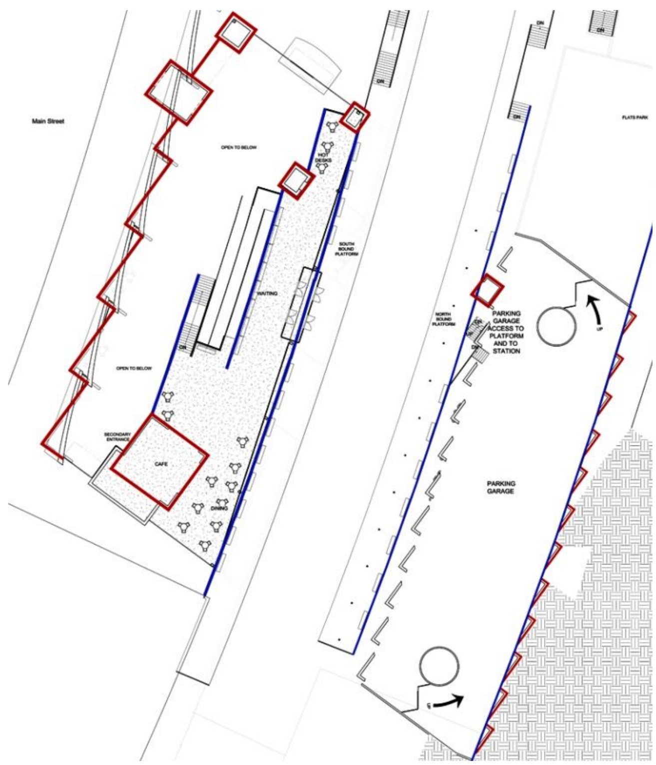


Figure 42: Design concept illustration, part II, by the author

The blockish orthogonality of the city grid dissolves into the graceful smooth curve of the rail, creating a dialectic of immovable blocks and sweeping pathways. As visitors pass deeper into the station and rise to the platform level, 14' above the street entrances,

Design Execution

The city grid is most strongly in evidence along the Main Street façade. Upon entering the building, the brick and stone blockish volumes which hold services such as a market, a cleaners, concierge services, etc., become covered by or encased within the platform level floorplate, an arcing post & beam supported wooden deck that steps back

Figure 43: Main Street façade showing the intersection of the city and rail grids, from the south, by the author

in plan and connects directly with the south bound platform.

Across the tracks and set just behind the north bound platform, the parking garage structure echoes the intersecting curves and blocks on a scale that better fits with the residential neighborhood with which it connects.

The station is designed as essentially one large room under which the various elements are arranged. The goal in this strategy is to:

- Create a spacious “grand hall” entry area in which visitors are greeted with long views, high ceilings, exposed structure, and a clear sense of the station’s layout and of wayfinding

- create excellent sight lines and freedom of movement for a strong sense of safety

- create a building envelope that can easily be adapted over time to meet changing programmatic needs, including dividing the space into uniform sections or building out enclosed spaces behind façade elements to create storefronts

- create space for community events, such as farmers’ markets or concerts/entertainment that can happen concurrently with other programmatic elements of the station

Figure 44: Interior view of the multipurpose ground floor waiting are, with farmers’ market and musical entertainment as examples of use, by the author

The roof is supported by a series of glulam trusses that span the entire depth of the station and form six 32’ wide bays. Separate curved roof planes span between each of the trusses, sloping to the north to create a monitor window that allows in natural lighting. Curtain walls enclose the trusses, which are visible from the outside as well as from the inside. Glulam was selected with the intention of using locally sourced wood in their manufacture; as local wood is typically less strong than Douglass fir or Southern Pine, the trusses are sized slightly larger than is typical for the loads they carry.

The main foyer is the key to wayfinding for visitors to the station, and information boards and kiosks are found close to the main entrances. Restrooms are tucked beneath the curving overhang of the platform level deck opposite the main entrance and adjacent to a well-lit gallery space. Other services are similarly placed beneath the platform level deck above at the accessible points along the length of the station, particularly close to the south secondary entrance. The entrances to the elevator, ramp, and stairs are arrayed along the curve of the deck above, enunciating the sweep of its lines and highlighting the movement inherent in the form, particularly when contrasted with the solid blocks that represent the city's orthogonal grid and house services such as a market, newsstand, bakery/coffee stand, and concierge services within their walls. Waiting areas are spread throughout the station, creating pockets of benches or of tables and chairs that can serve individuals or groups equally well. These seats can be moved or used for special events.

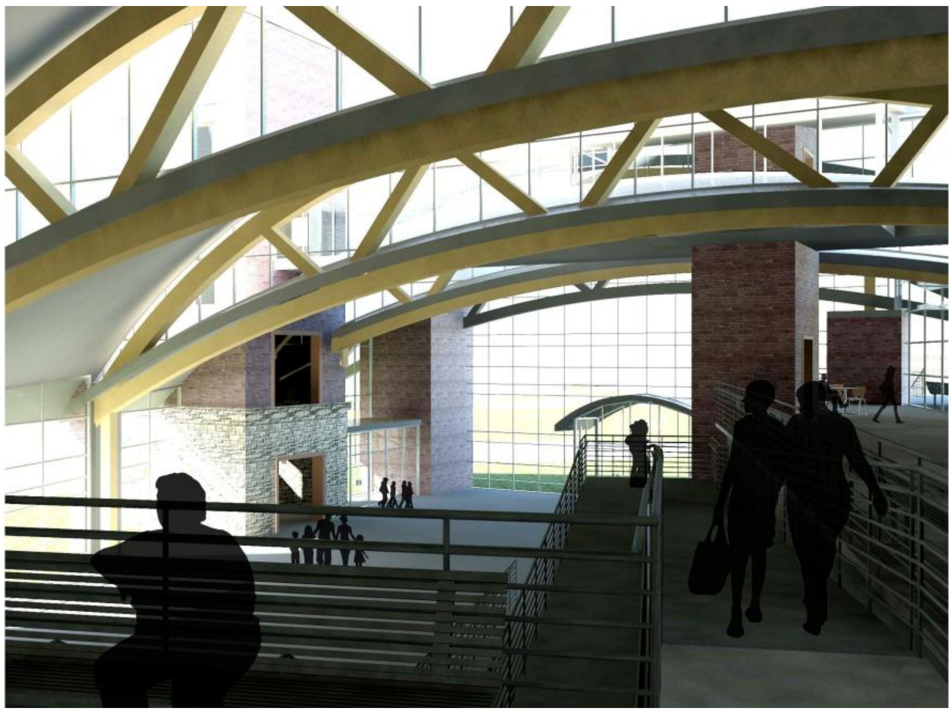


Figure 45: Interior view from the top of the gently curving ramp, with glulam truss and north-facing monitors visible, by the author

The platform level has fewer orthogonal blocks than the ground level; those that are present project through the floor, creating strong vertical lines that accentuate the design concept. The blocks on the platform level include the elevator shaft, information kiosk, and restaurant/café space. Long sight lines and a relatively open plan allow for a strong sense of safety and help with wayfinding. Kiosks with departure and arrival information are also found on this level.

Outside the station, the area surrounding the site has been changed to encourage pedestrian traffic and create one way flows of auto traffic, most importantly on Mosher Street. This allows for the creation of the aforementioned passenger drop-off lane just north of the station building and also for a second broad sidewalk that passes beneath the train track bridge. This second sidewalk better serves the residents of the Flats who currently cut diagonally across the empty site, including an unprotected crossing of the tracks, to get to Main Street; while not as direct, this sidewalk will be safer, better lit, and better placed for residents heading south on Main Street or to the station itself. This sidewalk also provides a safe connection from the station to the parking garage.

Visitors arriving at the station by foot from point south and west will be able to enter through the Main Street entrance, well marked and identifiable at a distance as the main entrance by the tall brick and stone towers that flank the entranceway. From the south, pedestrians can enter the station more quickly by using the secondary entrance on the south end of the station, just a few steps from Main Street's sidewalk. Bikers from all directions will be provided with safe, well-lit, covered bike parking adjacent to this south entrance.

Travelers arriving in cars can drop off passengers on the Mosher Street drop-off area, a dedicated lane that can accommodate several cars at once. Drivers can then proceed beneath the train track bridge on Mosher to the entrance of the parking garage, only 100 feet from the station's entrance. The parking garage is a one-way three level structure that leads drivers up ramps at either end of each floor. The garage exits onto Bowers Street from the third level, which is at the same elevation as Bowers Street due to

Figure 46: Exterior view of the new station complex, with Richardson station on left and Mosher Street and drop-off area in the right foreground, by the author

the hill upon which it sits. Drivers can access the station and south bound platform either by exiting the garage onto Mosher Street and using the sidewalk already mentioned, or by ascending to the roof of the garage and using the elevated walkway that bridges the train tracks and connects to the elevator tower inside the station.

The station houses some energy features specific to the building. In addition to ground source heat pumps, solar hot water, and photovoltaic panels, the station will take advantage of cold water from the nearby canal to assist in cooling and in dehumidifying. Remotely operable vents allow for natural ventilation of the building, assisted by a solar chimneys integrated with two of the brick and stone towers.

APPENDIX A

MASSACHUSETTS ARCHITECTURAL ACCESS BOARD REGULATIONS

Massachusetts Architectural Access Board regulations governing passenger rail stations (relevant excerpts).

521 CMR 18.00: **TRANSPORTATION TERMINALS**

18.1 GENERAL

Transportation terminals shall comply with 521 CMR, except as specified or modified in

521 CMR 18.00. Transportation terminals shall include but not be limited to airports, bus and train stations, marine terminals, subway stops, *commuter rail*, *light rail*, and *rapid rail* transit stations.

18.2 ACCESSIBLE ROUTE

At all newly *constructed*, *reconstructed*, *altered* or *remodeled* stations, an *accessible route* shall connect all terminal *buildings* or station houses, platforms, parking areas and street *entrances*.

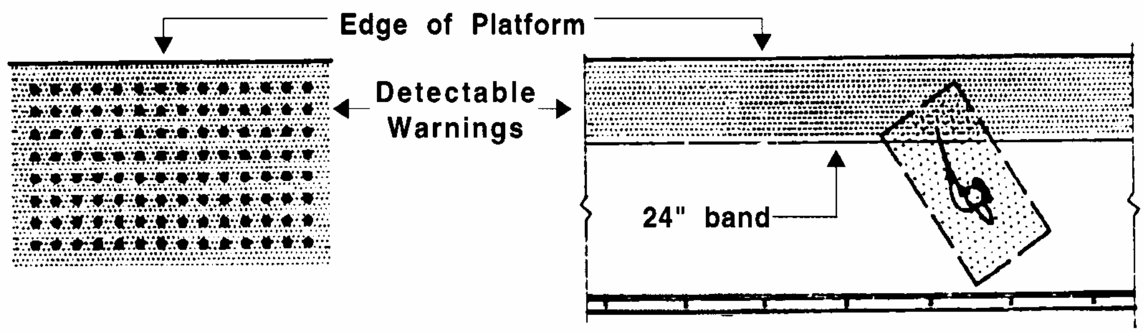
18.3 ENTRANCES

At least 50% of the *entrances* to a transportation terminal shall be *accessible*.

18.4 PLATFORM ACCESS

To facilitate access to subway cars, airplanes, buses, trains, and other means of public transportation, platforms shall comply with the following:

18.4.1 Platform to Vehicle Gaps: At newly *constructed*, *reconstructed*, *altered*, or *remodeled* stations, the distance between platform and vehicle at boarding platforms shall not exceed three inches (3" = 76mm) in the horizontal plane and ½ an inch (½" = 13mm) in the vertical plane. Where *construction* constraints result in platform to vehicle gaps that exceed these requirements, a bridge plate designed to eliminate such gaps shall be made available at every door of the vehicle where passengers are boarding or disembarking. Where construction constraints in *light rail* stations result in platform to vehicle gaps that exceed the requirements a device used to bridge the gap must be a minimum of 36 inches wide or the width of the opening, whichever is greater and the slope shall not exceed 1:12. Exception: a slope between 1:10 (10%) and 1:12 (8.3%) is allowed for a single rise of a maximum of three inches (3" = 76mm).



Detectable Warnings
Figure 18a

18.4.2 Platform Warnings: Platform edges at newly *constructed*, *reconstructed*, *altered*, or *remodeled* stations shall have a yellow (Federal Yellow 33538) band of *detectable warning* at least 24 inches (24" = 610mm) in width except where there is no defined platform edge, the warnings shall be placed far enough from the tracks to allow for the dynamic envelope of vehicles using tracks at those terminals. **See Fig 18a**.

a. *Detectable warnings* shall consist of raised truncated domes with a base diameter of nominal 0.9 inches (0.9" = 23mm), a height of nominal 0.2 inches (0.2" = 5mm) and a center-to-center spacing between domes which are farthest apart in a configuration, of nominal 2.35 inches (2.35" = 60mm) and shall contrast visually with adjoining surfaces, by a minimum of 40%.

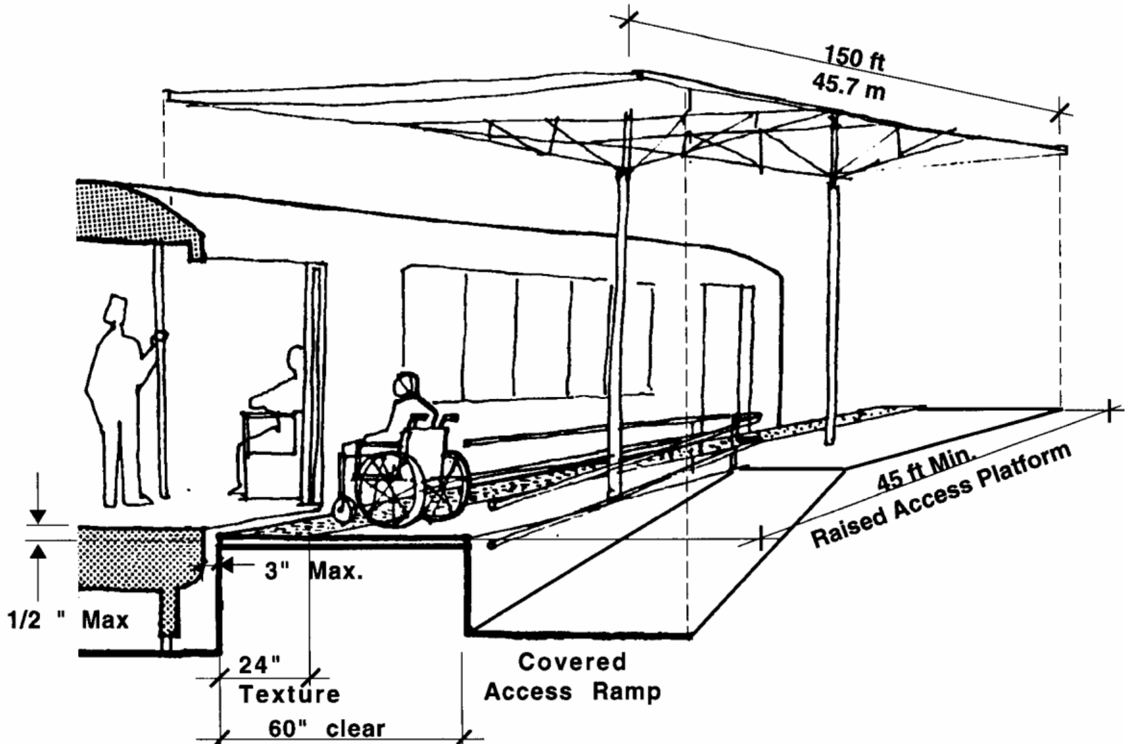
b. The material used to provide contrast shall be an integral part of the walking surface.

c. *Detectable warnings* used on interior surfaces shall differ from adjoining walking surfaces in resiliency or sound-on-cane contact.

18.5 COMMUTER, LIGHT RAIL AND RAPID RAIL TRANSIT TERMINALS

To facilitate access to *commuter, light rail,* and *rapid rail* transit vehicles, the following shall be provided:

18.5.1 Platforms at new stations: At newly *constructed* stations serving *commuter rail* coaches, access shall be provided to all passengers and to all coaches of the train by means of a full length raised platform. For purposes of 521 CMR 18, a newly *constructed*



Access Platform
Figure 18b

station is defined as any station stop where passenger services has not heretofore been provided or where no regularly scheduled passenger service has been provided for five or more years. **See Fig. 18b**.

a. Such platforms shall be at least 60 inches (60"=1524mm) in *clear* width

b. Such platforms shall provide overhead shelter from rain and snow along a total of at least 150 feet (150' = 46m) of their length and at all access *ramps*.

18.5.2 Said platform shall comply with the following:

a. Such platforms shall be at least 60 inches (60" = 1524mm) in *clear* width.

b. Such platforms shall be at least 45 feet (45' = 14m) in length and shall, along their full length and at all access *ramps*, provide overhead shelter from rain and snow.

18.5.3 *Light Rail* Transit Terminals: To facilitate access to *light rail* transit vehicles, the following shall be provided:

18.5.3.1 Platforms at newly *constructed* stations serving *light rail* transit vehicles shall provide access to all passengers and to all coaches of the train by means of a full length raised platform. Such platforms shall be at least 60 inches (60" = 1524mm) to *clear* width at the stopping zone for *accessible* doors. A minimum of 36 inches (36" = 914mm) in *clear* width must be provided to each stopping zone for *accessible* doors.

18.5.3.2 Platforms at *reconstructed, remodeled or altered* stations serving *light rail* transit vehicles shall afford *access* to at least one car by means of a raised platform. Said platform shall comply with the following:

a. Such platforms shall be at least 60 inches (60" = 1524mm) in clear width at the stopping zone for *accessible* doors. A minimum 36 inch (36" = 914mm) clear width must be provided to each stopping zone for *accessible* doors.

b. Such platforms shall be at least eight feet (8' = 2438mm) in length.

18.6 FARE TRANSACTION

At least one fare transaction area of each type, at each accessible entrance shall be *accessible* and shall have a minimum 36 inch (36" = 914mm) wide path of travel. Where transaction counters are provided, they shall comply with the requirements set forth in 521 CMR 7.2.1a., b., c., and d. Where provided, coin or card slots shall comply with **521 CMR 6.5 Forward Reach** or **521 CMR 6.6 Side Reach**.

18.7 ENTRY/EXIT GATE

At least one entry and one exit gate shall be *accessible* and shall have a *clear* opening of not less than 32 inches (32" = 813mm) wide. If one gate serves as both entry/exit, it shall have a *clear* opening of not less than 32 inches (32" = 813mm) wide.

18.8 HAZARDOUS VEHICULAR AREAS

Detectable warnings shall be provided where a *walk* crosses or adjoins a *vehicular way* and the pedestrian and vehicular areas are not separated by curbs, railings, or other *elements*. The boundary between the areas shall be defined by a continuous *detectable warning* which is 24 inches (24" = 610mm) wide, complying with **521 CMR 18.4.2(a), (b)**, and **(c)**.

Within the terminal there shall be seating at intervals not to exceed 200 feet (200' = 61m).

18.10 AT GRADE CROSSINGS

Where public *sidewalks* cross rail systems at grade, the surface of the continuous passage shall be level and flush with the rail top at the outer edge and between the rails. The horizontal gap on the inner edge of each rail shall be the minimum necessary to allow passage of wheel flanges and shall not exceed 2½ inches (2½" = 64mm). Where tracks cross a *sidewalk*, 24 inch (24" =

610mm) wide *detectable warnings* complying with **521 CMR 18.4.2a** shall be placed on both sides of the tracks across the entire width of the *sidewalk*, at a sufficient distance from the tracks to allow clearance for the widest vehicle using those tracks. Where multiple tracks are part of the same level crossing, *detectable warnings* should be placed alongside the outermost track, and not within the sets of tracks.

18.11 ANNOUNCEMENTS IN SEATING AND PLATFORM AREAS

Visual systems for providing announcement to deaf and hard of hearing customers shall be provided wherever there are auditory systems for providing announcements.

APPENDIX B

PRESENTATION BOARDS

The images below are low resolution reproductions of 30” x 40” presentation boards. PDFs of the original boards are attached separately.

Holyoke Train Station

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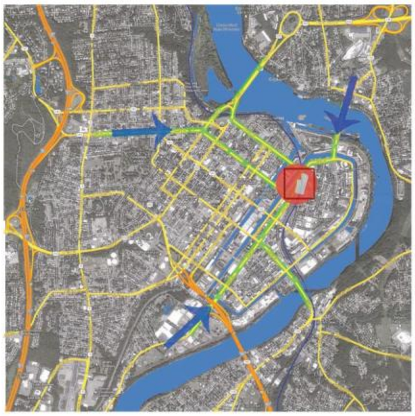
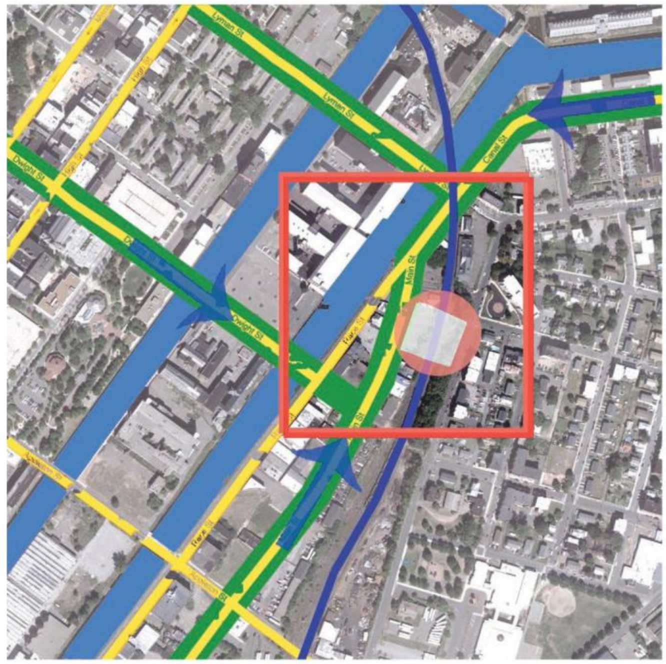
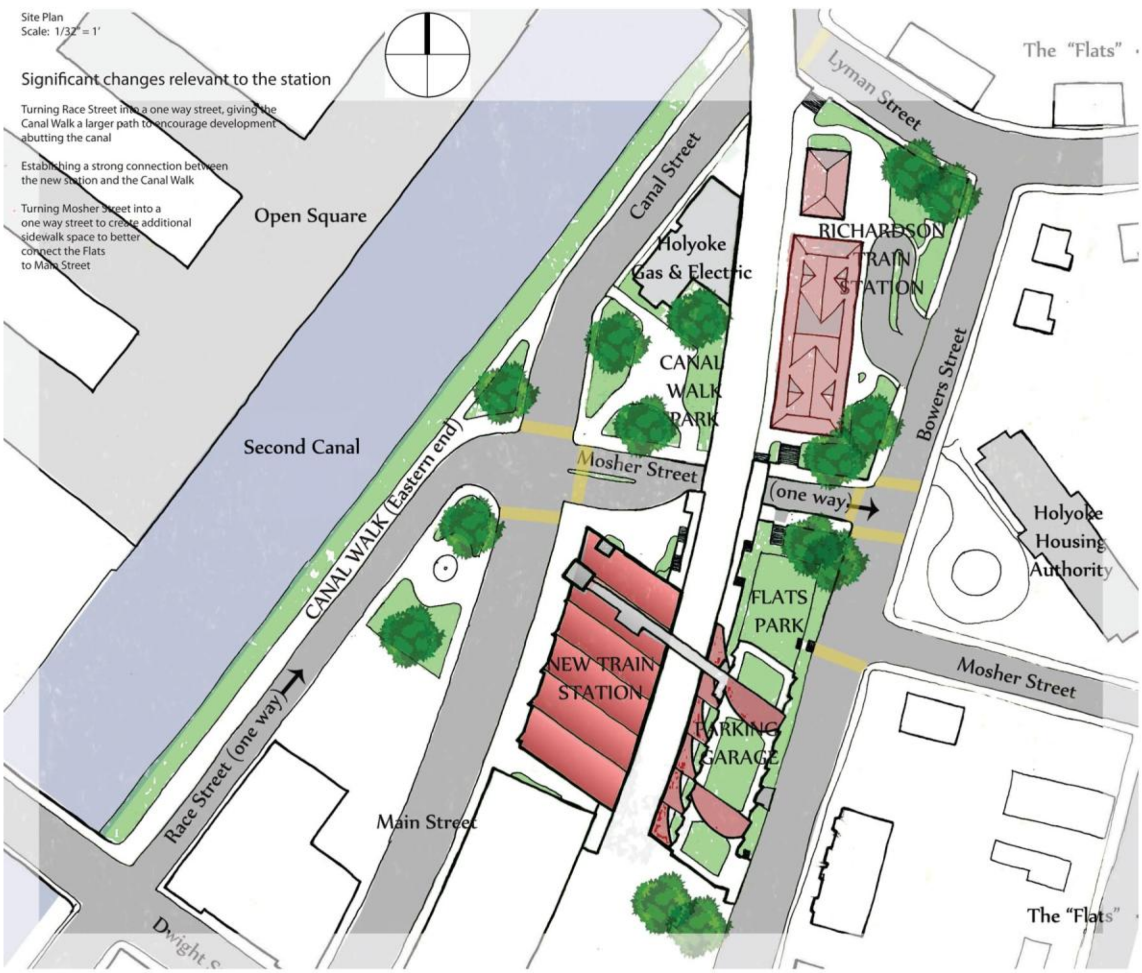
SITE PLANNING

To capitalize on the opportunity this new gateway presents, the station's design should consider the proposed site's connections with the rest of the city, the barrier of the railroad and the canals, the different groups who would be the station's primary users, the current needs of the neighborhoods, and the impact on future planning efforts.







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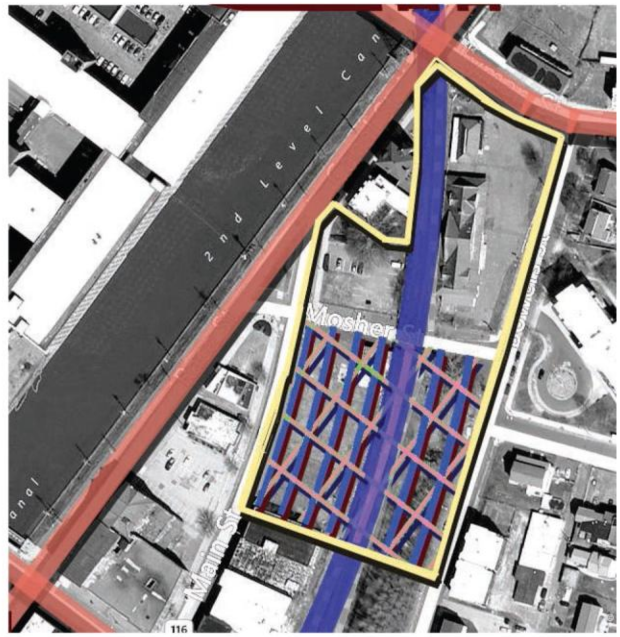
TWO GRIDS

Gateways necessarily mean transitions. The transition from the orthogonal grid of city blocks to the subtle radial grid created by the gentle curve of the rails as they pass through this section of Holyoke stands in for the transition from one mode of transit to another.

As visitors move through the station, the language of the building changes with them, from the orthogonal to the radial; from the blocky and slow to the curvilinear and fast.



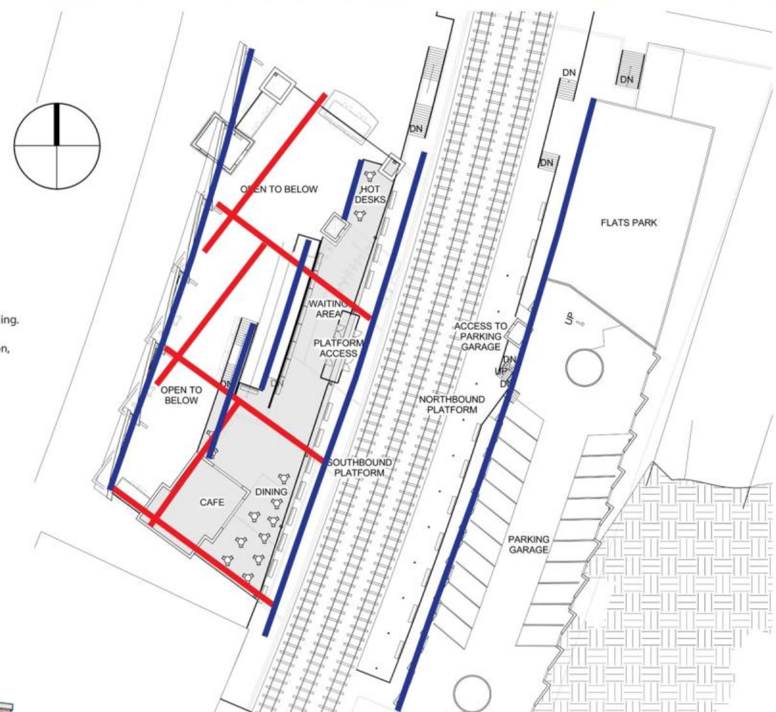
The grid as expressed in the station's layout

Scale: 1/16" = 1'

Orthogonal brick structures continue the orthogonal city grid into the building.

The wooden second floor of the station, located at the level of the platform, 14 feet above the street level, follows the gentle arc of the rails.

Stairs and ramps invite movement into the building along paths parallel to the rails.



Both grids are apparent in the stepped facade continuos curved line of the roof on Main Street

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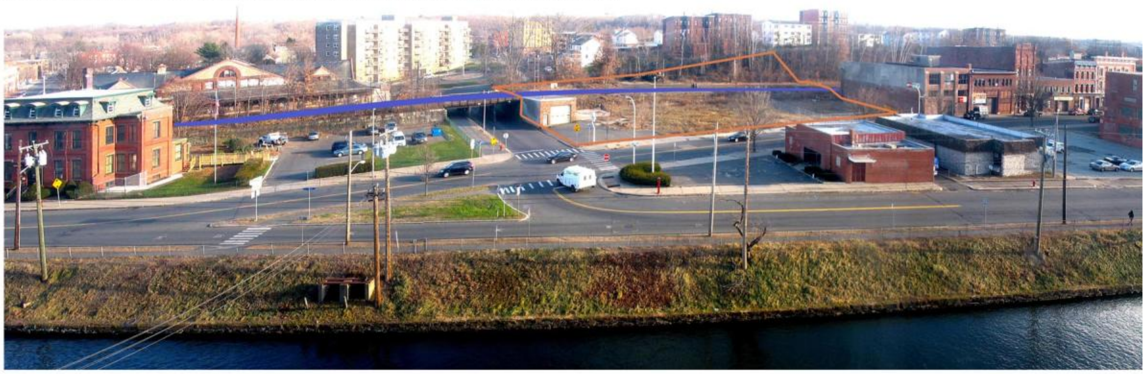
EXISTING CONDITIONS

This district was home to the city's original commercial center. Many of the remaining buildings survive from before 1910, with some as old as 1850. Many buildings have been lost, unfortunately, and the streetscapes have many gaps now filled with parking lots or weeds. Some buildings have been renovated while others appear barely maintained.

Grade change: The Second Canal is about 10 feet below the level of Main Street. The hill rising to the southeast of the site rises to 39 feet above Main Street.

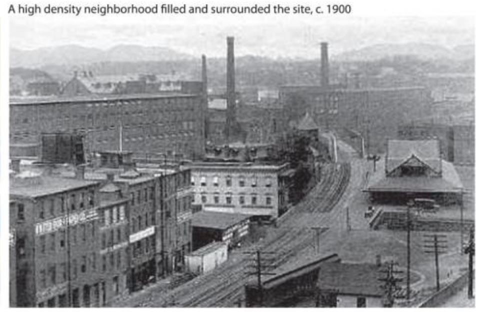
The image below shows existing conditions .

A view from the fourth floor of Open Square, formerly the Lyman Mills and dating from c.1850, just to the west of the site.



Foot paths through site

A high density neighborhood filled and surrounded the site, c. 1900



H. H. Richardson's 1885 Train Station, c. 1890

... and today

Holyoke Hotel, c. 1867 (established 1850)

... and today

Some of the area's many assets: *(left to right)* Open Square, the Canal Gallery and Artists' Studios, and the Parsons Hall Project

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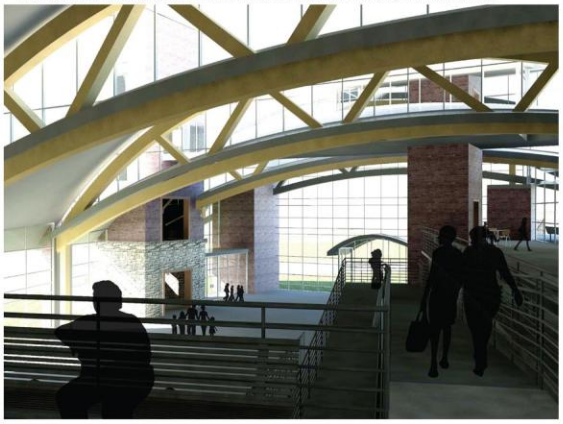
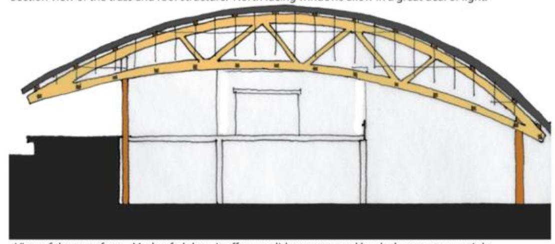
STRUCTURAL DETAIL

The interior is spanned by a glulam truss, allowing for an open plan and programmatic flexibility



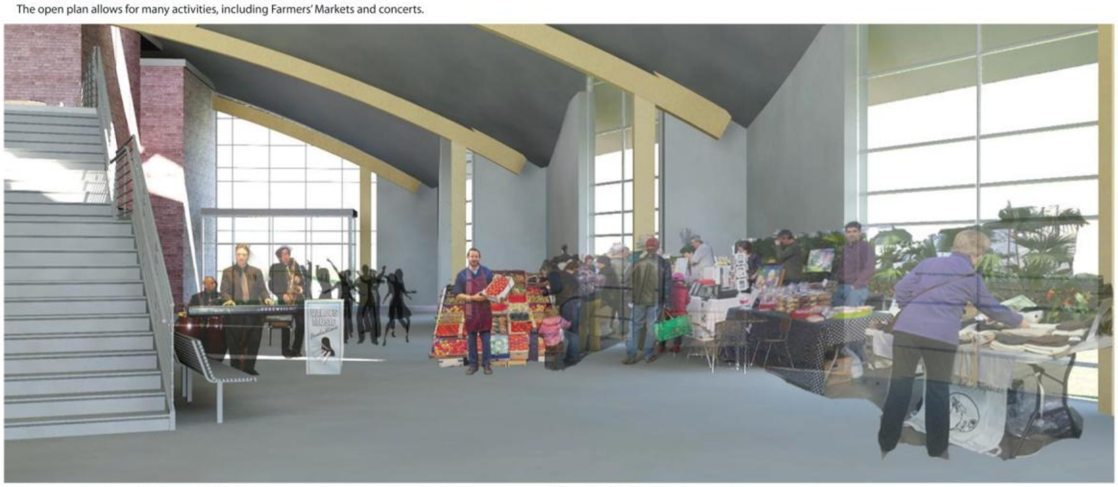
Section view of the truss and roof structure. North facing windows allow in a great deal of light.



View of the truss form. Made of glulam, it offers a solid presence and lends the structure weight.

PROGRAMMATIC EXAMPLES

The open plan allows for many activities, including Farmers' Markets and concerts.



Gallery space at the far end of the entry hall invites commuters, shoppers, and Canal Walk visitors to engage with another local industry, the growing arts community.

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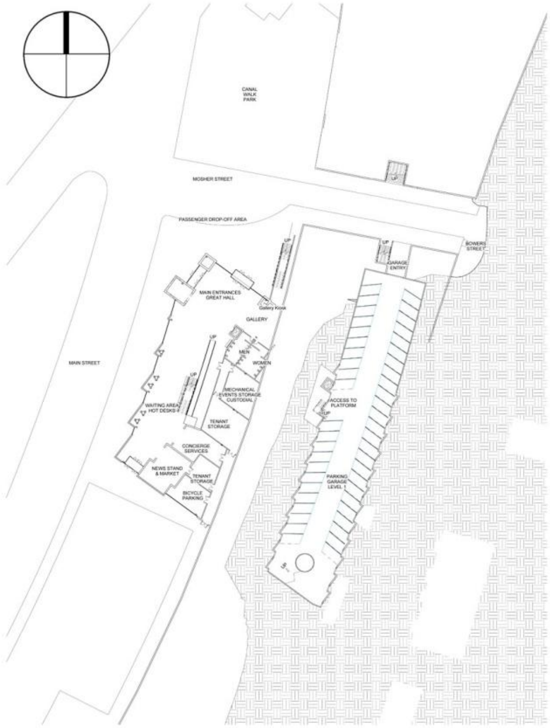
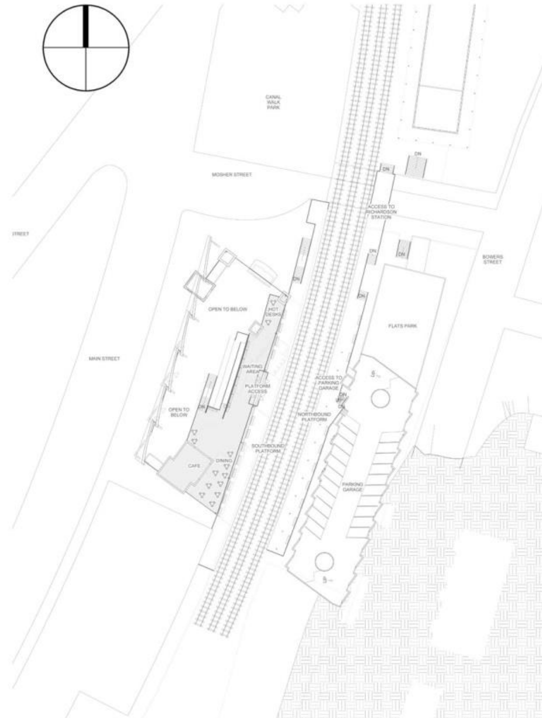
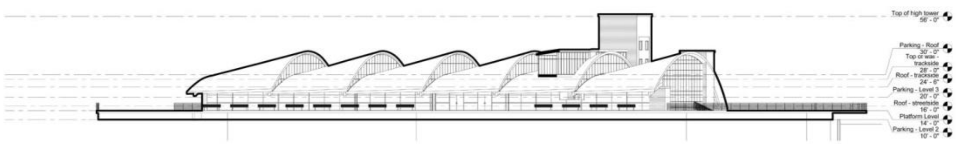
PLANS & ELEVATIONS



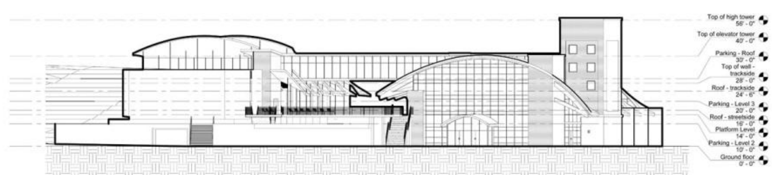
Ground Floor - Floor Plan 1/32" = 1'



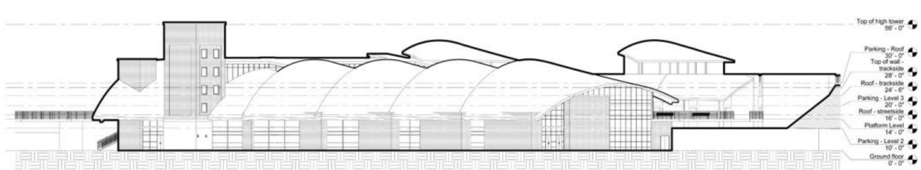
Platform Level - Floor Plan 1/32" = 1'



East Elevation (trackside) - 1/32" = 1'



North Elevation - 1/32" = 1'



West Elevation - 1/32" = 1'

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