I, David Wormald, hereby submit this original work as part of the requirements for the degree of:

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in Community Planning

It is entitled:

Evaluation of Cincinnati Union Terminal for InterCity Rail Passenger Service

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Committee Chair: Menelaos Triantafillou, MLA

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Evaluation of
Cincinnati Union Terminal
For Proposed Intercity Passenger Rail Service

A thesis submitted to the
Graduate School
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School of Planning
College of Design, Art, Architecture and Planning

By

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May 1992

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Abstract

The American Recovery and Reinvestment Act of 2009 (ARRA) allocated approximately $8 billion to the Federal Railroad Administration (FRA) for distribution to individual states on a competitive basis for the planning design and implementation of high-speed intercity passenger rail service. This represents the most significant expenditure by the federal government for the development of new passenger rail service in the post World War II period.

The FRA has designated several corridors to receive prioritization for funding towards implementation of high-speed passenger rail service. Two of these corridors terminate in Cincinnati. One corridor links Cincinnati to Chicago via Indianapolis, while the second links Cincinnati to Cleveland via Columbus (3-C Corridor). The exact route, service parameters, station locations, as well as capital and operational costs have not been finalized for either corridor.

In February 2010, the FRA awarded the Ohio Rail Development Commission (ORDC) $400 million for the implementation of “Quickstart” passenger service within the 3-C Corridor. The proposed “Quickstart” service would operate on a combination of existing freight railroads at a maximum speed of 79 mph starting in 2012. At the same time, planning and engineering would commence with the goal of establishing “high-speed” rail service which would operate at speeds up to 110 mph in the future. The ORDC application to the FRA designates a preferred location for the Cincinnati terminal station near Lunken Airport for “Quickstart” service and at the
Cincinnati Union Terminal (CUT) for future high-speed rail service. Regional political leadership, print and electronic media, as well as many in the public at large, have stated that the Lunken station location should be discarded and that all efforts should be directed at the utilization of the CUT as the City of Cincinnati’s rail terminal. To date, there have been few, if any, efforts evaluating the suitability of the CUT as a terminal station for both high-speed rail corridors as well as potential future upgrades to the existing Amtrak Cardinal linking Cincinnati to Washington, DC and New York City.

The parameters for evaluating potential sites for intercity rail passenger station facilities and related land use planning are complex. Prior to making a long term commitment to the future of intercity passenger rail service and investing significant sums of money for the development of a terminal station serving the region, significant study should be undertaken to verify that the CUT (although serving the region during the peak of rail travel in the mid 20th century) is a desirable facility for a terminal passenger rail station to serve Cincinnati during the 21st century.

This project seeks to answer the following questions:

- Is the use of the CUT as a rail passenger station serving both designated high-speed rail corridors feasible, given the physical constraints of the location, existing building configuration and adjacent railroad operations?

- If it is physically feasible to use the CUT, what is the likelihood that the CUT will spur economic development and provide a favorable location for a railroad terminal station serving Cincinnati?
Acknowledgements

I would like to thank my wife Lisa and may children Luke, Caroline and Noah (not the cat) for their support during my research, as well as the time and advice of my committee and other faculty of the School of Planning.
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<td>ADA</td>
<td>American With Disabilities Act of 1991</td>
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<tr>
<td>AREMA</td>
<td>American Railway Engineering &amp; Maintenance of Way Association</td>
</tr>
<tr>
<td>ARRA</td>
<td>American Recovery &amp; Reinvestment Act of 2009</td>
</tr>
<tr>
<td>B&amp;O</td>
<td>Baltimore &amp; Ohio Railroad</td>
</tr>
<tr>
<td>CAGIS</td>
<td>Cincinnati Area Geographic System</td>
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<tr>
<td>CBD</td>
<td>Central Business District</td>
</tr>
<tr>
<td>C&amp;I</td>
<td>Cincinnati &amp; Indianapolis Railroad</td>
</tr>
<tr>
<td>C&amp;O</td>
<td>Chesapeake &amp; Ohio Railroad</td>
</tr>
<tr>
<td>CAD</td>
<td>Computer Aided Design</td>
</tr>
<tr>
<td>CBD</td>
<td>Central Business District</td>
</tr>
<tr>
<td>CH&amp;D</td>
<td>Cincinnati Hamilton &amp; Dayton Railroad</td>
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<tr>
<td>CIND</td>
<td>Central Railroad of Indiana</td>
</tr>
<tr>
<td>CL&amp;N</td>
<td>Cincinnati Lebanon and Northern Railroad</td>
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<tr>
<td>CMC</td>
<td>Cincinnati Museum Center</td>
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<td>CUT</td>
<td>Cincinnati Union Terminal</td>
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<td>FRA</td>
<td>Federal Railroad Administration</td>
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<td>GIS</td>
<td>Geographic Information Systems</td>
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<tr>
<td>HSIPR</td>
<td>High-Speed Interstate Passenger Rail</td>
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<tr>
<td>I&amp;O</td>
<td>Indiana &amp; Ohio Railroad</td>
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<tr>
<td>ICC</td>
<td>Interstate Commerce Commission</td>
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<tr>
<td>L&amp;N</td>
<td>Louisville &amp; Nashville Railroad</td>
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<td>LMRR</td>
<td>Little Miami Railroad</td>
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<td>MWRSS</td>
<td>Midwest High-Speed Regional Rail System</td>
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<td>N&amp;W</td>
<td>Norfolk &amp; Western Railroad</td>
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<td>NEC</td>
<td>Northeast Corridor</td>
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<td>NYC</td>
<td>New York Central Railroad</td>
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<tr>
<td>O&amp;M</td>
<td>Ohio &amp; Mississippi Railroad</td>
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<td>ODOT</td>
<td>Ohio Department of Transportation</td>
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<tr>
<td>ORDC</td>
<td>Ohio Rail Development Commission</td>
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<td>PRIIA</td>
<td>Passenger Rail Investment &amp; Improvement Act of 2008</td>
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<tr>
<td>PTC</td>
<td>Positive Train Control</td>
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<td>SORTA</td>
<td>Southwest Ohio Regional Transit Authority</td>
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<td>TOD</td>
<td>Transit Oriented Development</td>
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<td>Ohio Transportation Review Advisory Council</td>
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1. Introduction

The American Recovery and Reinvestment Act of 2009 (ARRA) allocated approximately $8 billion to the Federal Railroad Administration (FRA) for distribution to individual states on a competitive basis for the planning design and implementation of high-speed intercity passenger rail service. This represents the most significant expenditure by the federal government for the development of new passenger rail service in the post World War II period.

The FRA has designated several corridors to receive prioritization for funding towards implementation of high-speed passenger rail service. Two of these corridors terminate in Cincinnati. One corridor links Cincinnati to Chicago via Indianapolis, while the second links Cincinnati to Cleveland via Columbus (3-C Corridor). The exact route, service parameters, station locations, as well as capital and operational costs have not been finalized for either corridor. Both corridors have been evaluated over the past decade by a series of planning studies.

In February 2010, the FRA awarded the Ohio Rail Development Commission (ORDC) $400 million for the implementation of “Quickstart” passenger service within the 3-C Corridor. The proposed “Quickstart” service would operate on a combination of existing freight railroads at a maximum speed of 79 mph starting in 2012. At the same time, planning and engineering would commence with the goal of establishing “high-speed” rail service which would operate at speeds up to 110 mph in the future. The ORDC application to the FRA designates a preferred location for the Cincinnati terminal station near Lunken Airport for “Quickstart” service and at the
Cincinnati Union Terminal (CUT) for future high-speed rail service. Regional political leadership, print and electronic media, as well as many in the public at large, have stated that the Lunken station location should be discarded and that all efforts should be directed at the utilization of the CUT as the City of Cincinnati’s rail terminal. To date, there have been few, if any, efforts evaluating the suitability of the CUT as a terminal station for both high-speed rail corridors as well as potential future upgrades to the existing Amtrak Cardinal linking Cincinnati to Washington, DC and New York City.

Rail stations have been envisioned by the planning community as a key to urban revitalization and economic development. The parameters for evaluating potential sites for intercity rail passenger station facilities and related land use planning are complex. Prior to making a long term commitment to the future of intercity passenger rail service and investing significant sums of money for the development of a terminal station serving the region, significant study should be undertaken to verify that the CUT (although serving the region during the peak of rail travel in the mid 20th century) is a desirable facility for a terminal passenger rail station to serve Cincinnati during the 21st century.

This project seeks to answer the following questions:

- Is the use of the CUT as a rail passenger station serving both designated high-speed rail corridors feasible, given the physical constraints of the location, existing building configuration and adjacent railroad operations?
• If it is physically feasible to use the CUT, what is the likelihood that the CUT will spur economic development and provide a favorable location for a railroad terminal station serving Cincinnati?
2. Methodology

2.1. Background

Planning for high-speed rail in the United States is a relatively recent development. The majority of published research has been conducted during the past decade. Most research devoted to high-speed rail has been focused on the development of corridor or national level networks. There is relatively little published data concerning best practices for station planning or the economic development trends of intercity rail station in the United States. Most rail station design parameters have been established by the American Railway Engineering and Maintenance of Way Association (AREMA) and Amtrak.

High-speed rail is a complex and wide ranging subject that will require a significant commitment of national resources to build the technical, manufacturing, management skills and knowledge in order to build a robust system which can match the investments in national rail networks made in Europe and Asia. Planning issues to be studied include: financing, the role of government, safety, security, level of service, travel time reliability, equipment and performance technology, and ridership characteristics, as well as the impact on other modes.

There are two federally designated high-speed rail corridors which terminate in Cincinnati. They link Cincinnati to Chicago and Cleveland. Planning efforts for these two corridors have been led by the Midwest Regional Rail System (MWRSS) and the
ORDC, respectively. Planning studies conducted thus far for the two respective corridors assume that a new station will be constructed in Cincinnati. The recent award of federal funding for implementation of rail service in the 3-C Corridor has raised interest in the station location in Cincinnati resulted. This has resulted in calls from political leaders and the public to use the CUT as the terminal for future high-speed rail.

This project does not address all of these broad issues directly. It is narrowly focused on evaluating the potential use of the CUT as a terminal station for the two federally designated high-speed rail corridors linking Cincinnati with Chicago and Cleveland, respectively. This evaluation is both quantitative and qualitative in nature and is at a “planning level” of detail. Time constraints and structure of a graduate research project do not permit a detailed technical analysis of the range of issues which should be studied prior to making significant decisions regarding use of the CUT as a future rail terminal.

Rail station planning is an iterative process whereby the operational assumptions for the rail service listed below help to define the size of platforms, waiting areas, parking, and track capacity, supporting infrastructure, staffing, equipment and operational costs of a station facility:

- Number of Trains per Day
- Rolling Stock (size and characteristics of train equipment)
- Size of Consist (number of train cars)
- Schedule & Frequency of Trains
- Terminal Location
- Maintenance Needs
• Ridership (peak hourly passengers)
• Ticketing and Fares

• Passenger Amenities
• Multimodal Connectivity

Assumptions for each of these variables have been published in planning studies conducted for the MWRSS and Ohio Hub 3-C Corridors (Transportation Economics and Management Systems, Inc. 2004 and 2007) and (Amtrak 2009). These assumptions, while generally in agreement, do vary somewhat from study to study. This project provides a summary table with a side-by-side comparison of the operational assumptions from the various studies (See Table 6-1). It does not independently develop operational assumptions for high-speed rail service.

Using the published operational assumptions from these studies, the following physical station design parameters can be established.

• Number of station tracks
• Number of platforms
• Length and size of platforms
• Parking requirements
• Capacity of layover yard
• Size of waiting areas and platform egress

• Ticketing requirements
• Dwell time occupy tracks
• Need for staffing and passenger services
• Track connections and signal requirements

When presented with a new site and unlimited constraints, these parameters can be addressed in a logical and efficient manner. The reuse of the CUT as a passenger station
does not provide unlimited freedom to implement new rail service without considering a host of physical, operational and economic constraints. Some of these constraints may in turn, limit the operational assumption for the station. As is the case with most planning issues, the use of the CUT is not a black and white decision. With enough engineering, political and financial resources, most anything can be accomplished, but does not necessarily equate to the effective or successful use of these resources.

This project identifies physical constraints, operational and economic planning issues which may or may not make the CUT a favorable rail terminal location as well as recommendations for further study.

The evaluation makes use of literature reviews in following subject areas:

- Operational Assumptions for MWRSS and 3-C Corridor
- Passenger Rail Station design parameters
- Existing conditions at the CUT and surrounding areas
- Rail Station planning case studies
- Economic Development

It also makes use of field observations, GIS analysis, CAD based analysis and design illustrations. The project compares existing conditions of the Amtrak station, track connections museum operations at the CUT and its surrounding land uses with established design criteria and comparable case studies for station area planning and design.
While valuable, interviews of key stakeholders (including staff of the Cincinnati Museum Center (CMC) and the affected railroads) and permission to use unpublished data have not been sought in the interest of time and to avoid potential professional conflicts of interest regarding ongoing discussions about the future funding and sustainability of the CMC.

2.2. Planning Context

Planning for intercity passenger rail service, and station locations in particular, has not been at the forefront of the planning profession and academia in the post World War II era. This period witnessed the creation of the national interstate highway system ushering in a new era of intercity vehicular travel. The competition from long distance trucking and growing automobile use contributed to the bankruptcy and consolidation of the railroad companies. Rapidly dwindling passenger volumes and revenues resulted in the development of few major intercity railroad stations. Congress created the National Rail Passenger Corporation (Amtrak) to assume the passenger service responsibilities of the remaining railroads in 1971. Amtrak continues to be the predominant operator of intercity passenger rail in the United States. Amtrak and AREMA are the primary sources of physical design guidance for station planning. These parameters generally apply to all rail passenger scenarios regardless of the operating speed of the rail service.

During the last three decades, transportation planners at the national and regional level have primarily focused their attention on the development of new or expanded rail transit service including light rail, commuter rail and more recently streetcars. Transit oriented
development (TOD) has been a key element of station planning for these systems. Project sponsors have taken efforts to maximize the TOD opportunities in locating stations in an effort to recover ancillary revenue streams to directly or indirectly fund the projects.

Many rail planners have promoted intercity passenger rail stations as means to spur TOD type development. Intercity passenger rail stations can provide a similar stimulus for economic development as TOD, but with some significant differences compared to transit or commuter rail (GEM Public Sector Services, 2007). This independent study of economic development assumptions from the Ohio Hub Study notes the surprising lack of academic literature on the subject.

The typical intercity passenger may require a rental vehicle or some alternative means to reach his or her final destination, assuming it is not within walking distance (one-quarter mile). Compared to transit or commuter rail, there are a higher percentage of passengers with carry-on or checked baggage. Intercity passenger rail equipment typically requires more significant space for layover and servicing. Operating scenarios for the Ohio Hub 3-C Corridor assume three daily trains where aggregate passenger loadings may be similar to a rail transit or commuter rail station, but limited to shorter windows of time (Amtrak 2009). The purported economic development benefits attributed to the stations for the MWRSS and 3-C Corridor are not likely to materialize from a station at the CUT.
2.3. Railroad Service in Cincinnati

The historic development of the railroad network in Cincinnati, and in particular the respective passenger stations, serve as an important basis for understanding the physical constraints on locating a rail station in the City of Cincinnati today and in the future. Therefore the project includes a summary of the historic development of passenger rail service in Cincinnati, with a particular focus on the CUT. The content for this summary is primarily based upon a more extensive historical record included in Cincinnati Union Terminal “The Design and Construction of an Art Deco Masterpiece” published by the Cincinnati Railroad Club, Inc as well as The Railroad and the City of Cincinnati “A Technological and Urbanistic History of the City of Cincinnati” by Carl Condit. More recent developments including the adaptive re-use of the CUT and its use as a home to the CMC and Amtrak station facility are be based on newspaper records and other public information provided by the Amtrak, the CMC, Hamilton County and the City of Cincinnati.

The project incorporates historic maps illustrating the respective railroad corridors and station locations (See Figure 5-1). Railroad ridership information during the 20th century in Cincinnati is presented illustrating the rise and gradual decline as well and recent Amtrak ridership on the Cardinal. This information is useful to put current forecasts for future high-speed rail ridership into perspective.
2.4. Cincinnati Union Terminal

A review of the historic planning, development and operations of the CUT is based upon a compilation of the subject (Cincinnati Railroad Club 1999), newspaper articles and more recent studies on the adaptive reuse of the facility. Current conditions are summarized in Section 7.3.

A somewhat unique facet in planning for the potential use of the CUT as a rail passenger station (the current Amtrak service aside given its night time operation and limited ridership) is that it must be compatible with its ongoing use as a major cultural institution as home for the CMC.

2.5. Operational Assumptions

The summary of the historic development of passenger rail service is followed by an overview of planning efforts for implementation of high-speed passenger rail service on a local, statewide and national level. Operational scenarios, equipment and forecasted ridership at the station have significant influence on the need for parking, platform space, layover yards, as well as the need for fare collection, restrooms and other passenger amenities.

Peak hour passenger volumes are a key element in dictating the required platform space and station tracks as well as identifying impacts to ongoing operations of the CMC. The yearly volume of the long-range forecasted ridership at the Cincinnati terminal station for the two corridors would at least equal the number of annual visitors to the CMC. While
remaining well below the peak use of the building in the 1940’s or even the early 1960’s, doubling the use of the building can have significant implications. The origin-destination data of the riders (Transportation Economics and Management Systems, Inc. 2007) and (GEM Public Sector Services 2007) guide planning decisions regarding the desirability of walk or transit access, as well as the need for other travel modes to reach destinations, which may not be in close proximity to the CUT.

Table 6-1 summarizes the assumptions that are relevant to the Cincinnati station. It should be noted that the assumptions are limited to long-term 110 mph service for the MWRRS and Ohio Hub 3-C Corridors and not the so-called “Quickstart” service for the 3-C Corridor which has received federal funding in 2010. The two corridors have not been studied to the same degree, with the planning for the 3-C Corridor at a more advance stage of development (Schwieterman 2007). This future service will have significantly higher ridership and levels of service and the corresponding station capacity will be larger. If the CUT is to be used as a terminal station for these corridors it should be planned to accommodate this future build out.

For purposes of this project, it is assumed that the operational parameters and rolling stock equipment will be the same for both corridors and are taken from the MWRRS and ORDC Studies for the two high-speed rail corridors. This summary is based on published planning documents for the respective corridors produced by Amtrak, the MWRRS, ORDC, City of Cincinnati and others (Schwieterman 2007).
The validity of these operational assumptions is generally taken at face value and is not systematically scrutinized as part of this project. Where differences in assumptions exist between publications or corridors they are be documented or explained to the extent feasible.

2.6. Passenger Rail Station design parameters

Given that intercity passenger rail service within the United States has been predominately provided by Amtrak since its inception in 1971, a review of Amtrak track and station standards (Amtrak 2003) and (Amtrak 2008) is the basis for evaluating the physical design of the assumed station. Additionally, track and station design standards in the United States promulgated by the AREMA are consulted, although the rail station standards are not specifically tailored for high-speed passenger rail.

The FRA has also published planning best practice guidelines for corridor passenger rail service which summarizes the data needed to establish the programmatic design for rail passenger stations (Federal Railroad Administration 2005). The operational assumptions for the two corridors serve as inputs to these design standards which in turn provide a definition of the station size and capacity and related infrastructure needed to serve the forecasted future passenger volumes, rail equipment and level of service at the CUT.

2.7. Existing conditions at the CUT and surrounding areas

Planning for railroad facilities is in large part dictated by the location and capacity of the connecting tracks and the inherent limits of railroad technology (steel wheels on steel
rails). The vertical grades and horizontal curvature are significantly more restrictive when compared with roadways (AREMA 2009). Railroads must be relatively flat and straight. Depending upon the local conditions, these limits may have a significant influence on feasible track locations and stations. In a city with varied topography like Cincinnati, the railroads followed the relatively flat alluvial river and creek valleys. During the 19th Century and remaining today the regions largest concentration of railroads (including the CUT) and industrial development are located in the Mill Creek Valley which follows a relatively gentle grade rising from the Ohio River to the Great Miami Valley in Butler County and points north.

The rail connections for the two corridors approach Cincinnati station from different direction). At this time, there have been no formal proposals for extending the high-speed rail corridors south into Kentucky or to the east, therefore high-speed through service is not a consideration in station planning. At this time there is not a direct track connection between the Central Railroad of Indiana (CIND) (assumed for future high-speed rail service on the MWRRS Corridor) and the CUT.

Train speeds in the vicinity of the station are not likely to exceed existing freight service even if on dedicated passenger only tracks. Additionally, since the station will serve as an end of the line terminal station, space for layover of at least one train will likely be needed (Amtrak 2009). Amtrak and the ORDC have cited significant issues with existing freight rail congestion in the Mill Creek Valley, which at least for the more immediate “Quickstart” 3-C Corridor service proposed by the ORDC, precludes use of the CUT as a
station location (Amtrak 2009). Existing freight rail operations in the Mill Creek Valley will continue to be an impediment to the use of the CUT for passenger service in the future (Cambridge Systematics Inc. 2007).

It is necessary to evaluate the site-specific physical factors which may enable or inhibit such a use. This includes research on the existing conditions of the CUT building; Amtrak, platform and connecting trackwork as well as identifying what changes may be required.

To the extent feasible, the project includes a review of existing plans, condition assessment and capital improvement plans for the CMC and Amtrak facilities.

A field investigation has been conducted to observe and photograph existing conditions and produce illustrative figures documenting the existing conditions and contrasting them with historic photos where appropriate. These photos are taken from public property and “Tower A” of the CUT which provides an excellent vantage point of the surrounding area. No photos are taken from private property.

Digital orthophotography, track charts and valuation maps from the connecting railroads (Norfolk Southern and CSX) serve as a basis to document the existing railroad network and changes which may be required for accommodation of future passenger operations. Orthophotography combined with planometric and demographic data from the Cincinnati Area Geographic Information System (CAGIS), Ohio Kentucky Indiana Regional Council of Governments and Hamilton County Auditor are utilized to create thematic
mapping for the area surrounding the CUT. This mapping includes land ownership, land use, zoning, railroad track connections and transportation facilities.

Maps are included which illustrate the current track connections to the CUT that could be used for the two proposed high-speed rail corridors as well as current freight operations (See Figure 8-3). Autocad is used to make measurements of various distances, areas and geometric characteristics of the CUT and surrounding areas, as well as to produce schematic maps for the rail connections and platform space requirements. The results of this analysis identify impacts and needed improvements to use the CUT for both passengers rail corridors.


One of the major goals and justifications for the construction of a high-speed rail network is the induced economic development in the areas surrounding the stations. The MWRRS and the ORDC 3-C Corridor assume significant benefits accrued to host communities in the form of reduced transportation costs, increases in employment, household income and real estate values. The MWRRS plan assumes nearly $150 million in increased property values for the Cincinnati region (Transportation Economics and Management Systems, Inc. 2006, 11:25). If the Ohio Hub 3-C Corridor is combined with the MWRRS, the increase property values are estimated at $275 million. These forecasted increases are assumed to occur on a regional level and the station location is somewhat independent of this level of analysis.
Both the MWRRS and Ohio Hub 3-C Corridor studies assume that stations will provide downtown-to-downtown connectivity and will serve as multimodal transportation hubs (Transportation Economics and Management Systems, Inc. 2007, 68-71).

Utilizing a review of three of case studies for intercity passenger rail planning and design, best practices that are indicators of successful station planning can be compared with the proposed rail station at the CUT. Planning guidelines for transit-oriented development assume the majority of economic development impacts associated with a station location will occur within a quarter mile of the station since patrons are not likely to walk a greater distance. An analysis of existing conditions and surrounding landuses indicates that TOD type development is not likely to result from future rail service at the CUT.

The CUT is located less than two miles from the Central Business District (CBD) but complaints about its remoteness from the CBD have existed since its original construction. It is not a multimodal transportation hub and is not within walkable distance to any major trip generators.

The Ohio Department of Transportation is currently developing plans for the reconstruction of Interstate 75 which will alter access to the CUT. SORTA currently operates fixed route bus service (Route 1) linking the CBD and Eden Park to the CUT with a half hour headway. There are proposals to extend a streetcar loop to the site and taxi, shuttle or fixed route bus service could be implemented as needed. This project
reviews the latest plans for changes in access and discusses what impact this may have on future rail operations at the site.

This section attempts to identify physical, environmental, political and financial impediments to accommodating high-speed rail service at the CUT and makes an assessment if providing this accommodation is feasible and if this location adheres to case studies nationally.

Land use plans and zoning surrounding the CUT promote continued industrial development which is not compatible with conventional TOD development scenarios. Thematic GIS mapping of zoning and land uses surrounding are provided.

No independently derived forecasts of the economic impacts the station are provided, however, an overview of published estimates of the economic impacts of the CMC as well as likely increases due to rail passengers is presented.
3. Literature Review

As noted in the prior section, this evaluation makes use of literature reviews in following subject areas:

- Operational Assumptions for MWRSS and 3-C Corridor
- Passenger Rail Station design parameters
- Existing conditions at the CUT and surrounding areas
- Rail Station planning case studies
- Economic Development

As previously noted, planning for rail stations in recent decades has predominately been focused on rail transit and transit oriented development as opposed to Intercity Passenger Rail (Transportation Research Board 2008). The majority of scholarly research on station area planning for intercity passenger rail has been conducted under the auspices of the Transportation Research Board (TRB). This research is headed by the TRB Committee on Intercity Passenger Rail (AR010). The AR010 membership has been contacted for suggestions on relevant scholarly research and case studies to incorporate into the evaluation of the CUT for future intercity passenger service. A response from the Committee has not been provided thus far.

There is a small, but growing body of literature and public discourse concerning the feasibility, economic benefits and political and environmental benefits or pitfalls of intercity passenger rail. The vast majority of this literature is directed at the basic notion of high-speed rail and the role of the government in the United States to provide transportation services to its citizens. These
basic tenets of transportation policy are not the subject of this project and arguments, positive
or negative, regarding the development of high-speed intercity rail transportation as a national
policy are not included.

With the prospect of a long term commitment for sustained funding to develop a national high-
speed passenger rail network from the federal government, planning and research related to the
implementation of high-speed rail has recently begun in earnest.

3.1. Operational Assumptions for MWRRS and 3-C Corridor

As noted in Section 2.5, the operational assumptions for the two respective high-speed rail
corridors dictate the needed station facilities to a large degree. During the past decade, there
have been several technical planning documents published by state department of transportations
for both corridors under the auspices of the MWRRS and the ORDC. The most recent planning
documents for both corridors have been produced by rail planning consultant Transportation
Economics and Management Systems, Inc (TEMS). More recently, Amtrak has undertaken a
feasibility analysis of the 3-C Corridor for conventional speed “Quickstart” service. The ORDC
has begun environmental documentation and preliminary engineering for the corridor; however,
the results of this work will not be available to be incorporated into this project. The following
planning documents produced for the Ohio Hub and 3-C Corridor are reviewed:

- Cleveland-Columbus-Cincinnati High-Speed Rail Study, 2001
- Ohio & Lake Erie Regional Ohio Hub Study, 2004
- Ohio Hub Passenger Rail Economic Impact Study, 2007
- Ohio Hub Economic Impact Analysis, 2007
3.2. Passenger Rail Station design parameters

Refer to Section 2.6 for a detailed discussion of the references used to establish the station design parameters for the station. Publications by the AREMA and Amtrak are the major references utilized for this project. It should be noted that there are multiple layers of technical engineering and design guides and codes that are applicable for railroad station design and construction just as there is for any building or infrastructure. Detailed design criteria for the modification of the CUT are not provided, but incorporate the general parameters provided by these references to summarize physical constraints and design issues which must be examined in more detail.

3.3. Existing conditions at the CUT and surrounding areas

As noted in Section 2.7, this project relies on field observations and secondary information to access the existing conditions at the CUT and surrounding areas. The author relied extensively on newspaper articles documenting the ongoing efforts to redevelop the CUT in the wake of its closure in 1972 including the ongoing operations of the CMC and future plans for rehabilitation of the CUT.

Copies of some information regarding the CUT and CMC operations and finances including the existing Amtrak lease are not available for use in this project given both security concerns and the political sensitivity of the need for additional public funding to support both capital improvements and ongoing maintenance of the CMC.
Besides the physical requirements for accommodating intercity passenger rail, the CUT poses a significant and unique challenge in that it must function both as a major cultural institution and rail station. Studies conducted by the CMC have identified significant capital improvement needs to preserve the long-term integrity of the CUT. This project includes a review of available published data regarding the financial operations of the CMC, including benefits to the region and challenges to fund needed capital improvements and to reaching financial sustainability. This includes two studies by the University of Cincinnati Economic Center for Education and Research (Rexhausen September 2002 and 2009). These studies indicate that the CMC provides a net economic benefit to the Queensgate neighborhood and region as a whole. This benefit is based upon direct and indirect spending by the CMC, employees and visitors as well as employment and educational outreach.

Another important resource is an evaluation of the CMC Master Plan conducted by CR Architecture in April 2009 which served as an impendent peer review of a much larger comprehensive investigation and Masterplan for capital improvements to the CMC by Glaserworks and others in 2007. The author has not obtained a published copy of the 2007 study, but has relied upon the CR Architecture Report which provides a summary of the proposed renovation work, costs and phasing (CR Architecture 2009).

### 3.4. Rail Station Planning Case Studies

There are a limited number of recent case studies examining the common elements in the planning for intercity passenger rail stations which can result in favorable impacts to the respective communities. These studies include a study by Cornelius Nuworss and Elizabeth
Deeken presented at the 2009 TRB annual meeting. It derives best practices from case studies of a number of domestic and international high-speed rail stations, and makes recommendations for incorporating these practices into planning for California’s High-Speed Rail System (Nuworsoo 2009). GEM Public Sector Services conducted a review of passenger rail stations in a number of similar corridors to the Ohio Hub 3-C Corridor in Wisconsin, Pennsylvania and New England. The conclusion from this study is that intercity passenger stations can play a supportive role in neighborhood development, but are unlikely to be a driving force in neighborhood revitalization (GEM Public Sector Services 2007).

3.4.1 Developing Intermodal Train Stations in Rhode Island

The study was authored by Dr. Farhad Atash and Dr. Talis McCray of the University of Rhode Island. They examined case studies of two proposed train stations in Rhode Island (Warwick and Wikford Junction) for evaluation of a third station location (East Greenwich).

The case study locations are among seven rail station locations which are part of a multi-phase rail line development program for the state. This study was focused primarily at the potential utilization of public private partnerships. Each case study provided a summary level review of the project history, land use and zoning of the project area as well as transportation characteristics and funding structure.

**Warwick Station**

The Warwick station is located adjacent to TF Green Airport and includes the station itself as well as an automated people mover connecting the station to the airport and an adjacent parking
garage. The total cost of the project is estimated to be $130 million. It is a truly multimodal station with Amtrak, commuter rail, bus transit, rental car companies and public parking. The project is being built on a formerly contaminated brownfield site which was purchased and remediated by the Rhode Island Department of Transportation.

The City of Warrick established a station redevelopment district surrounding the station following the creation of a station area master plan and includes areas of dense commercial and residential development.

Project funding has utilized a variety of sources with the predominante funding sources being a low interest federal TIFIA loan and earmarks as well as a surcharge on rented vehicles at the airport.

**Wickford Station**

This station was historically used as a train station but closed in the 1980’s due to lack of use. The project was resurrected as part of a large mixed-use retail development including big box retail. It is primarily a commuter rail station with service to Providence and Boston. It is primarily funded by the private developer and the Federal Transit Administration.

The presence of an aquifer in the project area limits development to low density development which is not conducive to more dense traditional mixed use TOD development. There will be a mixed use privately owned parking structure adjacent to the station (which is limited to the station platform). There are no intermodal transit connections planned at this time. Operation
and maintenance of the station platform and rails will be the responsibility of the commuter rail operators.

The study concluded that close working relationships between public and private sectors were essential to the successful implementation of intermodal train station projects in Rhode Island. Other lessons learned are that the more stakeholders involved provides greater potential use of a variety of funding sources but at the same time make implementation and coordination more difficult. The use of private funding derived from commercial uses assisted in the funding of infrastructure improvements at both locations.

Land use and planning are key components in the planning process. Implementation of TOD is dependent on existing high-density development or at least the potential to implement such land use patterns.

### 3.4.2 Transforming High-Speed Rail Stations to Major Activity Hubs: Lessons for California

Cornelius Nuwarorsoo and Elisabeth Deaken conducted a case study review for a paper presented at the 2009 Annual Meeting of the Transportation Research Board. This paper reviewed three international and one domestic case study and their applications for rail station planning for the proposed California High-Speed Rail System. For each location the authors summarized the physical and economic improvements which can be attributed to the rail stations.

The case studies examined include the following locations:
**Hong Kong:** A new high-speed rail terminal was constructed on a new man-made peninsula dubbed Sky City adjacent to the Hong Kong Airport. The terminal provides multimodal connections for bus, rail, and ferry service, including an express rail connection to the terminal and Hong Kong mainland. The entire mixed-use master planned development is home to over 200,000 residents.

**Lyon and Lille France:** These stations are among the oldest on the French TGV rail network. The stations were the subject of a prior case study by the nonprofit Greenguage21. Both cities significantly reorganized land uses to foster development of major mixed-use commercial projects and provide easy access surrounding the stations. Both locations utilized previously underutilized land adjacent to the tracks but near emerging commercial centers to further stimulate growth.

**Elmhurst, Illinois:** This case study evaluated the changes in land use surrounding an existing Metra commuter rail station in this suburb of Chicago. The city undertook a multipronged effort to stimulate downtown revitalization surrounding the station area including allowing mixed uses, reducing parking requirements, etc.

Based on these case studies, the authors summarize four elements which characterize successful station planning and could be applied to station planning for California’s high-speed rail system. They are as follows:

- Intermodal connections – convenient access and ease of transferring between local and regional transport systems and modes, facilitated by the creation of multi-modal stations
• Physical improvements – increased and/or upgraded development of residential, retail, work and cultural land uses within walking distance of station areas

• Economic improvement – generation of economic activity and benefit as agglomeration economies take place

• Social improvement – creation of vibrant activity centers or hubs for social interaction and recreation.

Most notably, the authors recommend the implementation of relatively dense mixed use TOD like development with provisions for automobile circulation, rental services and parking. The density of development would have a gradation toward less density as one move away from the station along radial corridors of mixed-use development.

3.4.3 Ohio Hub Economic Impact Analysis

As previously noted, ORDC and the MWRSS retained TEMS to conduct studies on the economic feasibility and long-term economic benefits of the Ohio Hub high-speed passenger rail system. The ORDC retained Gem Public Sector Services (GEM) to provide a peer review of the forecasted economic development results from implementation of the Ohio Hub high-speed passenger rail system. As part of this review, GEM evaluated three case studies of similar corridors including: the “Downeaster”, linking Portland to Boston, the Keystone Corridor from Harrisburg to Philadelphia and the Hiawatha Line from Milwaukee to Chicago. For each of these corridors, GEM evaluated the influence of the existing Amtrak stations on housing, income, household spending and tax revenues from the areas surrounding the respective stations.
GEM reached the following conclusions based on their evaluation of the three case studies:

- The impacts of proximity to intercity passenger rail service on residential development are modest and mixed. Some stations experienced substantial increase in population and housing while others experienced declines or stagnant markets.

- Proximity to an intercity passenger rail station had little direct impact on projected household spending or increases in property values based on projected property tax revenue increases.

- Stations in existing built up urban neighborhoods, most notably Harrisburg and Lancaster, appeared to have stronger and more robust housing and residential trends.

- Stations with the highest ridership tended to be terminal stations (e.g., Milwaukee, Portland, and Harrisburg). These stations also tended to be located in industrial and commercial districts facilitating their use as intermodal hubs but limiting the station’s ability to stimulate new development.

- The data suggested that the existence of the rail station did not impact overall development trends. The conclusion is that investments in intercity passenger rail stations would support, rather than drive, existing real estate markets.

These case studies have implications for the likely future prospects for an intercity passenger station at the CUT. These implications are more fully evaluated in Section 8.4
4. National Passenger Rail Planning Efforts

It is important to establish the context in which decisions regarding intercity passenger railroad service are made on a national, state and local basis. As is the case with land use planning, transportation planning and their associated regulatory systems, there is no cohesive national policy in the United States. It is challenging even for policy experts and government agencies to provide a succinct and straightforward summary of Federal policies and regulatory authority for rail passenger service in the United States. More complex still are the various interrelationships for passenger rail policies planning and authority between the federal, state and local governments and the private railroad companies.

Since the inception of the railroad industry in the 1840’s, planning, construction operation and maintenance of the nation’s railroad system has been under the purview of private for profit railroad companies. This is not to say that favorable taxation, regulatory relief, public financing, donations of right of way and even public ownership did not assist in this effort. The vast majority of the nation’s railroad miles were constructed in the fifty-year period from 1870 to 1920. Each state and community took steps to ensure that its population centers and industry were well connected to the growing national network and markets. Cincinnati was no exception to this phenomenon as discussed in further detail in Section 5.1.

Railroads became the predominant mode of long distance travel during the later half of the nineteenth century. This led to the gradual decline of waterborne passenger travel, including canals and steamboats on the inland rivers. Cincinnati quickly rose to prominence and reached is
peak of growth in the 1850’s as a hub of the steamboat trade, but was subsequently eclipsed by Chicago which became the primary railroad hub in the nation’s interior and remains so today. The river trade and canals influenced the creation of Cincinnati’s railroad network and their impacts are still felt today (See Section 5.1).

As the railroads grew in dominance and effectively controlled long distance transportation of passengers and freight, national concern grew over the monopolistic and in some circles unscrupulous business practices. These concerns led to the passage of the *Interstate Commerce Act of 1887*. This law shifted the regulation of railroad and other interstate commerce to the federal government and created the Interstate Commerce Commission (ICC). The ICC would exercise regulatory control over the nation’s railroads until 1995. By the beginning of the 20th century, many of the early railroads which had originally constructed the nation’s rail network faced bankruptcy for a variety of reasons. They were consolidated and merged into major corporations which exercised control over multi-state networks. Cincinnati was served by seven railroads during the first half of the Twentieth Century.

Freight and passenger volumes and revenues continued to climb until the early 1920's. As the nation entered the 1920’s, trucking and automobiles began to erode the market share for long distance travel from the railroads from which they have never recovered fully. The nation’s economic depression also had a negative effect on the railroads due to accelerating declines in not only passenger travel but freight volume as well. The CUT was constructed from 1929 to 1933 and shortly after its opening many felt that it was too large and would never operate at full capacity in the era of declining railroad demand.
It should be noted that gradual improvements to the nation’s railroad system had been implemented since the widespread growth of the industry following the Civil War however the routes, stations and locomotive technology were essentially the same. The timetables for the fastest long distance trains provided an average travel speed in the 40 mph range. These speeds were generally faster, or at least on par with, trucking and automobiles of the time, but are not high-speed by any current measure.

World War II provided a marked if temporary spike in both passenger and freight volumes as the nation rationed most raw materials and manufacture of trucks, autos and related materials (See Figure 4-1). The War Years saw the highest utilization of the CUT as well. The 1950’s saw a return to the increasing decline of railroad passengers as automobile travel continued to proliferate and automobile ownership became widespread. Air travel also became a legitimate competitor for long distance travel and in 1960 airline passenger miles doubled the railroads’ and by 1970 were 20 times as much. The federal government launched the interstate highway system in 1956 which would for the first time provide national limited access highways which could provide city to city travel times less than rail service while providing greater flexibility and coverage. Rapid suburbanization and the decline of the historic urban centers which had been served by the railroads in the prior century had a combined effect of eliminating the nation’s streetcar systems and requiring the use of automobiles for local travel. Point to point travel by train now required the use of an auto at one or more links at either end of the origin destination pair.
The heavy regulation of the railroads by the ICC also was viewed as a hindrance to railroads seeking to respond to the changing marketplace by controlling pricing and requiring the railroads to provide passenger service which was not profitable. During the 1960’s two of the nation’s largest railroads, the Pennsylvania and New York Central (NYC) (which both had operations in Cincinnati) merged to form the Penn Central Railroad to stave off bankruptcy. It failed two years later.

The following figures show the rapid mode shift from railroads to air and auto travel in the Post War Period.

Figure 4-1: US Intercity Travel Trends by Modal Share, 1929-2004 (Source: FRA Strategic Plan 2009)
In an effort to prevent the financial collapse of other railroads, the federal government agreed to assume the responsibility of operating the nation's passenger rail system with the passage of the Rail Passenger Service Act of 1970, which created Amtrak.

Amtrak assumed operations of the nation’s intercity rail passenger service in 1971 and the following year ceased passenger operations at the CUT. The remaining passenger service in Cincinnati was transferred to a new smaller station located along River Road west of downtown (Cincinnati Railroad Club 1999). Rail service between Cincinnati, Columbus and Cleveland on the 3-C Corridor which had been run by the now bankrupt Penn Central was terminated. Refer to Section 5.2 for discussion of Amtrak service in Cincinnati.

During early 1970’s the Penn Central and several other eastern railroads suffered from ongoing financial difficulties and near collapse despite the assumption of passenger rail service by Amtrak. In 1973 the Federal Regional Rail Reorganization Act (3R) became law which created a consolidation plan for these railroads and led to the creation of a public/private railroad similar to Amtrak charged with freight operations in the eastern United States known as Conrail. Conrail assumed control of the former Penn Central lines in Cincinnati in 1976. Subsequent divestitures of track assets from Conrail continue play a key role passenger rail planning in Cincinnati today.

Amtrak was originally envisioned by some of its supporters in Congress to be capable of profitable operations after a few years of capitalization and improved services without the need for ongoing Federal subsidies (Congressional Budget Office 2003). Amtrak has continued to
receive annual appropriations since its inception and it is now recognized (not surprisingly given the history of passenger rail travel in the 20\textsuperscript{th} century) that it cannot operate a national rail network profitably.

During the 1970’s and 1980’s Federal efforts began to improve travel time to make rail more competitive with air and automobile travel. The primary focus during this time was to make improvements to the northeast corridor (NEC). The NEC is primarily owned and operated by Amtrak as well a several commuter railroads providing service between Washington, DC and Boston. It is a consolidation of several railroads which were reorganized in the events of the early 1970’s noted above. Efforts to explore high-speed rail elsewhere began with the passage of the Passenger Railroad Rebuilding Act of 1980. This legislation provided the states with funding
for state sponsored design and planning studies but no high-speed passenger rail systems were implemented (Schwieterman 2007).

The freight railroads continued to suffer from fiscal distress and in 1980 Congress passed the Stagers Act which significantly loosens the regulatory structure of the nation’s railroads administered by the ICC and let the railroad set rates on a competitive basis by corridor and allowed them to more easily abandon lines and customers which were not economically viable. The Stagers Act also set into motion the continued consolidation of the nation’s major freight carriers and an acceleration of abandonment of unprofitable lines. This played out in Cincinnati as well as the rest nation.

Amtrak began operations of the electrically powered high-speed Acela rail service ion the NEC in 2001. While this service can be considered slow by global standards, it is the only true high-speed rail service in the United States and demonstrated that high-speed rail service can be successful given the appropriate level of capital investment and market demand.

4.1. Federal High-speed Rail Corridors

Renewed initiative to provide a national high-speed rail network began with the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), which designated five high-speed rail corridors for development and funding eligibility for railroad grade separation projects. An additional five corridors were designated by the Transportation Equity Act for the 21st Century (TEA-21). The Department of Transportation has also designated several extensions of these original ten corridors.
Two corridors terminating in Cincinnati are extensions of the Chicago Hub Corridor originally designated in ISTEA. The Corridor from Chicago to Cincinnati via Indianapolis was designated in October 1999, while the 3-C Corridor from Cleveland to Cincinnati via Columbus was designated in August 2000 (Federal Railroad Administration 2009). See Figure 4-3 for a map of federally designated high-speed rail corridors.

Figure 4-3: National Passenger Railroad Corridors (FRA Strategic Rail Plan)

While the final alignment of these corridors has not been finalized, they have been proposed to operate on a mix of existing fright railroad lines and utilize diesel locomotives to achieve 110 mph travel speeds (Schwieterman 2007). Planning for implementation of rail service in these
The renewed emphasis on the development of a national high-speed rail network can be attributed to several factors including the following:

- Increased concerns about safety, security and financial stability of the nation's aviation system in the wake of the Terrorists attacks of 2001.

- Significant volatility in petroleum prices and consensus that long-term market forces will decrease availability due to increasing demand and costs will drive prices higher.

- Growing highway congestion in most major urban areas decreasing travel time reliability.

- Recognition of the effects of greenhouse gas emissions and their role in global warming and the need to reduce emissions through more efficient or alternative fueled vehicles.

- Continued implementation of successful high-speed rail services throughout Europe and Asia and the perceived lack of technological leadership by the United States.

- Public desire for alternative transportation choices and growing awareness of the potential for high-speed rail service in part based upon the success of the Amtrak Acela service in the NEC.

The last two years have witnessed the most significant change in federal policy and funding of intercity passenger rail service since the creation of Amtrak in 1970. The broad goal of this
legislation is the development of intercity passenger rail service which can be competitive with air and automobile travel. The significant legislation is summarized the following sections.

4.2. The Passenger Rail Investment and Improvement Act of 2008 (PRIIA)

Congress shifted the federal government’s emphasis from annual funding of Amtrak operations towards the implementation of high-speed rail on a national level with the passage of The Passenger Rail Investment and Improvement Act of 2008 (PRIIA).

This legislation established three competitive grant programs for funding high-speed and intercity passenger rail capital improvements.

4.2.1 Intercity Passenger Rail Service Corridor Capital Assistance Grants

This program allows states or groups of states to apply for Federal grants up to 80% of the costs of capital improvements which could benefit intercity passenger rail. The legislation required these improvements to be incorporated into a State Rail Plan. (This requirement was subsequently revised by the ARRA as described below).

4.2.2 High-speed Rail Corridor Development

This program allows states or group of states (including Amtrak) to apply for capital assistance grants but eligibility is restricted only to the federally designated high-speed rail corridors discussed in Section 4.1 and shown on Figure 4-3. It is intended for development of rail services which may reach speeds of at least 110 mph.
4.2.3 Congestion Relief Grants

This program allows for states or groups of states (including Amtrak) to apply for capital grants up to 80% for facilities, infrastructure or equipment to reduce congestion or facilitates ridership for intercity rail.

The legislation also requires the preparation of statewide rail plans and their incorporation into a national rail plan. Kentucky and Indiana have previously completed statewide rail plans. Ohio had not completed a statewide rail plan at the time the legislation was passed but have subsequently retained a consultant to complete it in 2010. See Section 6 for additional information.

Companion legislation, the Rail Safety Improvement Act of 2008 (RSIA) requires the implementation of Positive Train Control (PTC) on all mainlines where passenger rail service is provided as well as on lines where hazardous materials are shipped by the nation’s largest railroads. PTC is a computer based automated train control system designed to prevent collisions or unwarranted entry of trains onto tracks where switches are not correctly set or other trains or wayside workers may risk accidents. The legislation requires implementation of PTC by the end of 2015 (Federal Railroad Administration 2009). PTC will need to be implemented in the two designated high-speed rail corridors terminating in Cincinnati. The costs and responsibilities for implementation of PTC remain to be determined.

The American Recovery and Reinvestment Act of 2009 allocated approximately $8 billion to the states on a competitive basis for the planning design and implementation of high-speed intercity passenger rail service under the programs defined in the PRIIA. This represents the most significant single expenditure by the federal government for the development of new passenger rail service in the post World War II period. The ARRA often referred to the “Stimulus Bill” is intended to spur short-term employment opportunities through capital investments and construction. In order to expedite the application and funding process for these funds the legislation waives the requirements for a 20% state match and statewide rail plans.

The ARRA essentially will fund the programs defined by the PRIIA. The funding applications process and definition of the FRA High-Speed Intercity Passenger Rail Program (HSIPR) were published by the FRA in the Federal Register on June 23, 2009. Funding programs are divided into three tracks as follows.

- **Track 1 - Projects** – This track would provide grants to complete individual projects that are “ready to go” with preliminary engineering and environmental work completed and could be used for all three programs defined in the PRIIA. Projects must be completed within 2 years.

- **Track 2 Service Development Programs** – This would permit the FRA to enter into cooperative agreements with the states or project sponsors to develop entire phases or geographic sections of corridor programs that have completed corridor plans and
environmental documentation, and have a prioritized list of projects to meet the corridor objectives. Again, this would incorporate all three programs defined by the PRIIA. The ORDC was awarded for $400 million of a total $564 million funding application under this program for implementation of “Quickstart” service and planning for future high-speed service in the 3-C Corridor in February 2010.

- Track 3 Planning - Using non-ARRA funding, the FRA plans to also enter into cooperative agreements with the States or project sponsors for planning activities in order to create the corridor program and project pipeline needed to fully develop a high-speed rail network in the future. This program may be funded by an additional $2.5 billion designated for high-speed rail in the FY 2010 Omnibus Budget Bill.

- Track 4 FY 2009 Appropriations – This program allows states or project sponsors who can fund the majority of project costs the opportunity to apply for funding up to 50% of project costs. The deadline for completion of these projects is extended to five years.

4.4. Future Funding Programs

Following the passage of the ARRA in the spring of 2009, Congress allocated an additional $2.5 billion for the newly established HSIPR program as part of the FY 2010 Omnibus Budget Bill. At the time of this project, the House of Representatives has passed legislation for an additional round of stimulus funding in 2010, but the Senate has not taken any action. Current federal transportation funding authorization, the Safe, Accountable, Flexible and Efficient Transportation Equity Act A Legacy for Users (SAFETEA-LU) was passed in August of 2005
and expired in September 2009. It has been extended to December 2010 with a series of continuing resolutions. The successor legislation to this authorization should be passed in 2010 or 2011 and many anticipate that it could include a multi-billion multi-year commitment to funding high-speed intercity passenger rail if a means to bolster declining revenues to the Highway Trust Fund can be agreed upon.

While not a certainty at this time, prospects for significant funding from the federal government appear to be favorable for the near future. However, even with a federal commitment towards capital improvements the level of investment will not likely meet the demands from the states and project sponsors and this funding does not include commitments for ongoing operational subsidies.

The funding shortfall in ARRA funding provided to ORDC ($164 million) will require the agency to seek additional sources of capital funding or reduce the capital investment in infrastructure, equipment and or level of service. Due to the uncertainty of the Cincinnati station location some have suggested terminating the service at Sharonville in northern Hamilton County and saving the resulting funds needed to make track improvements to reach a temporary station location and plan for rail passenger operations at the CUT or alternative site.
5. **Existing Passenger Rail Service**

5.1. **Private Passenger Rail**

This section is not intended to be a detailed history of the development of railroads in the Cincinnati area. It does not include all railroads built in the region. It focuses on the railroads that constructed or operated passenger rail stations near the CBD. Additional railroads used these stations via trackage rights and agreements with other railroads. It is important to recognize that the railroad corridors that brought passengers to Downtown Cincinnati were essentially completed by the close of the 19th century. These corridors by and large still remain in tact even if the tracks, platforms and ancillary structures have been removed for some time. They could serve the City of Cincinnati once again as a terminus for passenger rail. The problem faced by the railroads a century ago and remaining to this day is to provide a single location which can be easily accessed by rail from all directions. The construction of the CUT was undertaken to solve this dilemma. The following is a brief summary of the former passenger railroads serving downtown and their stations. For a detailed history of the development of railroads in Cincinnati, refer to (Condit 1977).
Railroads do not have the ability to follow the lay of the land in the same respect that roads do. Even modern interstate highways can have geometric features which would impossible for trains to negotiate. Railroads must be much straighter, and more importantly, flatter than a road. In general, the maximum desirable slope for a railroad should be less than 2% (AREMA 2009).

The topography of the Cincinnati area is not favorable for the construction of railroads. In order to maintain an acceptable grade, the railroads follow the river valleys and creek beds surrounding the basin area of the original urbanized center of the region comprising Cincinnati, Covington and Newport. Railroads radiate from the downtown area in all directions towards the surrounding major cities of St. Louis, Dayton, Columbus, Lexington, Louisville, Portsmouth and Ashland. Not surprisingly, the railroads to the east and west generally follow the Ohio River.
while those to the north and south follow the Mill Creek, Little Miami, Licking and smaller creeks and waterways. All the mainline railroads linking Cincinnati the rest of the nation were constructed in the 19th century (See Figure 5-1).

As was the case throughout the nation, the early development of railroads was rapid, highly competitive and financially volatile. Most companies that originally constructed the lines collapsed under financial pressures or were consolidated by larger competitors as railroads grew to national prominence and controlled networks in multiple cities and states.

Cincinnati’s initial railroad was the Little Miami Railroad (LMRR) which was chartered in 1836 and began operations in 1846 with a $200,000 loan from the City of Cincinnati. This railroad followed the Ohio River from the eastern edge of the CBD east through the community of Pendleton to the Little Miami River and thence followed the Little Miami River to Wilmington and Springfield, Ohio with a connection to railroads to the north and east. The terminal station was to be located outside city limits due concerns over the noise and smoke and dangers associated with the new steam locomotives. The LMRR station constructed in 1853 replaced a smaller original station located at the foot of Eggleston Avenue in what is now Sawyer Point Park. This station stood for nearly 40 years before succumbing to fire and being replaced by a new station at the foot of the L&N Railroad (Purple People Bridge) in the 1880’s. The station accommodated three tracks, ten trains a day with a daily ridership of some 10,000 people (See Figure 5-2).
This railroad was later merged with Pittsburgh, Cincinnati and St. Louis and eventually the Pennsylvania Railroad before becoming part of Conrail in the 1970s. Conrail abandoned the portion of the railroad parallel to the Little Miami River in 1978 and it was developed into the well-known Little Miami Bike Trail. The portion of the railroad from the Little Miami River to Sawyer Point was sold to the Southwest Ohio Regional Transit Agency (SORTA) in 1993 with plans for future rail transit use. SORTA and the Indiana & Ohio Railroad (I&O) entered an agreement for the I&O to operate freight service on the line until passenger rail service would commence. This portion of the LMRR is now commonly referred as the “Oasis Line”. The Oasis line has been the subject of ongoing plans for a rail transit as part of the Eastern Corridor
Project and was initially identified by the ORDC as the preferred route for the Cincinnati Terminal Station for the 3-C Corridor “Quickstart” service.

Ironically, the 3-C “Quickstart” terminal station proposed to be located near the Cincinnati Boathouse not far from the original LMRR station was rejected by local residents and is now proposed to be located outside the urbanized area of the City of Cincinnati near Lunken Airport. To the lament of local rail advocates, local opinions have apparently have not changed significantly in 140 years.

The next railroad to serve Cincinnati the Cincinnati Hamilton & Dayton (CH&D) was chartered in 1846 and began operations in 1851. It followed the Mill Creek Valley to northern Hamilton County and the Great Miami River to Hamilton and Dayton and via trackage rights to Toledo and the Great Lakes. A terminal station was constructed at Fifth and Baymiller Streets west of downtown in 1853 and a station complex remained at this site for nearly a century although passenger operations were transferred to the CUT in 1933.

The CH&D acquired other branch lines and became the busiest railroad in the City of Cincinnati by the end of the 19th Century. The CH&D was acquired by the Baltimore &Ohio Railroad (B&O) in 1917. Today the railroad is owned and operated by CSX (the successor of the B&O)
north of the Proctor and Gamble Ivorydale complex. The track from the original station site at 5th street north to Ivorydale has been largely abandoned due to its relative isolation west of the Mill Creek. This portion of track is operated by CSX and is known as the Mill Creek Industrial Track. The remains of the station were demolished in 1963 as part of the reconstruction of Linn Street and the Queensgate Urban Renewal project. Some proponents have suggested the use of the former CH&D trackage south of Ivorydale as a bypass around the busy mainline and yard tracks in the lower Mill Creek Valley for passenger rail use however this trackage does not have a direct connection to the CUT.

Two lines were established in the mid 19th century linking Cincinnati to the west, the Ohio and Mississippi and the Cincinnati and Indianapolis. The former received $600,000 in financing from the City of Cincinnati and followed the Ohio River west from Mill Street (Mehring Way) to Aurora, Indiana and west through Southern Indiana to East St. Louis and the Mississippi River. It eventually became the Baltimore & Ohio Southwestern and remains in operation today by CSX.

The Cincinnati and Indianapolis (C&I RR) paralleled the Ohio and Mississippi (O&M RR) from North Bend to Downtown Cincinnati. With much foresight, its developers purchased the right of way of the former Whitewater Canal, which linked the Whitewater Valley in southeast Indiana with Downtown Cincinnati. This allowed the railroad to be constructed along a grade-separated alignment with few crossings. The railroad followed the route of the canal through the Mill Creek Valley in a broad S curve to the former turning basin for the canal located at Third and Central Avenue. A freight and passenger station would be constructed in first at Plum and Pearl
(Second Street) and later Third and Central. The railroads still follow alignment of the former canal today. The freight stations served a variety of produce warehouses and dealers which had been established in the canal days and lasted as an industry until the remaining businesses were relocated for the construction of Paul Brown Stadium in 1997. Cincinnati’s first Union Depot (serving six railroads) was constructed at Third and Central in 1883 and was the busiest station in the City of Cincinnati for 50 years until the opening of the CUT in 1933.

The station was torn down in 1963 to make way for the construction of Fort Washington Way and Interstate 75, but a single-track approach remained until 2000. The former site of the Central Union Depot has been considered as a potential site for a new intercity rail station by the City of Cincinnati.

The C&I RR was merged with the New York Central by the close of the 19th century is now operated as the (CIND). An elevated viaduct was constructed as part of the track approach work for the CUT in 1929 which linked both of these railroads with the passenger platforms. This viaduct was removed in the 1970’s and there is currently not a direct connection to the remaining CSX mainline serving the current station platform. This is a key issue to resolve since the preferred alignment for the high-speed rail corridor linking Cincinnati and
Indianapolis assumes use of the CIND.

The earliest railroads serving Cincinnati were all located north of the Ohio River. The Ohio River was the impetus for the City of Cincinnati’s rapid growth in the first half of the 19th century, but presented a formidable challenge for railroad builders to span until the closing decades of the century. The first railroad to cross the river in 1872 was the Cincinnati Lexington and Louisville Railroad which would become the Louisville and Nashville Railroad a decade latter and eventually merge with CSX in the 1980’s. The Ohio River Bridge was strategically located to allow a rail line to be laid in Saratoga Street in Newport and to connect with the former LMRR Railroad station on the Cincinnati Riverfront (See Figure 5-2). The original Ohio River Bridge was reconstructed in 1896 and remained in service for rail traffic until 1984. The bridge has since been dubbed the Purple People Bridge and used for pedestrians only. Some rail transit advocates have proposed the bridge to be used for light rail or a streetcar connection between downtown and Newport. There is no longer a rail connection from the bridge to the CUT.

The next railroad to enter the City of Cincinnati was the Cincinnati Southern Railway which was fully financed and constructed by the City of Cincinnati at a total cost of $18 million in 1880. This railroad struck south from the Mill Creek Valley over a new bridge across the Ohio River through Ludlow, Kentucky up a long grade to
Erlanger, Kentucky (namesake of the first railroad president) and on south through Kentucky and Tennessee to Chattanooga. This railroad provided Cincinnati a rail route to the deep south and increased the through traffic bound from the industrial northern cities to the south and Gulf Coast via connections at Chattanooga, Tennessee. The line originally also used the Central Union Depot at Third Street and Central Avenue as its passenger terminal before relocating to the CUT in 1933 (See Figure 5-4). 

The City of Cincinnati has leased the Southern Railroad since its original construction and has received many fold return on its original investment and has continued to receive payments from the current lease to NS. The Southern Railroad merged with the Norfolk and Western Railroad in the 1970’s and formed NS. NS operates a major classification and intermodal yard adjacent to the CUT. The Southern Railroad’s Yard had been relocated for the construction of the CUT. Following the suspension of rail traffic due to the creation of Amtrak, the Southern purchased back this land and removed the CUT passenger concourse and station platforms. The NS tracks and yards in the vicinity operate at near capacity today. See Section 8.3.1 for additional information.

The last rail link to the south to be constructed is the Chesapeake and Ohio Railroad (C&O) in 1889. This line crossed the Ohio River on a combined rail and road bridge just west of Central Avenue. The track was above, but in close proximity to the Central Union Depot and traversed
through Covington, Newport and southeast along the Ohio River to Russell, Kentucky. Because the track was literally above the Central Union Depot, operations into and out of this station were difficult and in the 1890’s the C&O constructed a small station near Fourth and John Streets which was nearly the same elevation as bridge approach. The railroad bridge was replaced with a heavier structure in 1929 and the roadway bridge was replaced with the Clay Wade Bailey in 1972. Similar to the western lines, an elevated viaduct was constructed to link the C&O to the CUT and remains in operation today. The C&O is now operated by the CSX Railroad.

The last passenger railroad corridor to enter downtown was the Cincinnati & Northern railroad which operated between Cincinnati and Lebanon. This railroad unlike the others followed a rather steep grade from Norwood down the Deer Creek Valley into the northern portion of the basin. It was renamed the Cincinnati Lebanon and Northern (CL&N) and eventually was merged with the Pennsylvania Railroad. This railroad required the construction of the only railroad tunnels in the City of Cincinnati proper which are located under Oak and McMillan Streets in Walnut Hills. A passenger station was constructed at Court Street by the Norfolk and Western Railroad who had trackage rights on the line. This station was used until the CUT began operations in 1933 and is now the location of the Broadway Commons currently home to Cincinnati’s Greyhound bus station and slated to be the site of a major new urban casino complex.
The railroad remained active until the 1970’s when once again Conrail (successor to the bankrupt Penn Central stopped operations and sold much of the remaining rights of way to SORTA. The Indiana and Ohio Railway and SORTA entered into an agreement to operate the line from Mason to Norwood in 1983. South of the Norwood lateral the tracks have been removed. The former railroad corridor was planned to be used in part for a proposed light rail transit system in 2002 as part of SORTA’s Metromoves Plan.

Passenger volumes in Cincinnati continued to climb from the turn of the 20th Century reaching a peak in 1920 using the five stations described above. The growing volume of interchange freight traffic, postal express volumes and sleeping cars led to an exponential growth in railroad congestion well beyond the increases in passenger volumes. After reaching a peak in 1920 rail passenger volumes slow but steady decline which accelerated in the 1930s. Even so commercial air travel remained in its infancy and automobile use while growing remained less efficient for intercity travel.
At the direction of the United States Railroad Administration, the railroads in Cincinnati developed a plan for a consolidated freight and passenger terminals. Throughout the 1920’s, the railroads and planners settled on a location in the Mill Creek Valley west of downtown for a new Cincinnati Union Terminal which would replace the five stations describe above to facilitate not only passenger boarding, but exchanges between railroads, storage of coaches and dedicated facilities for handling mail and express freight. Construction of the CUT began in 1929 and was completed in 1933. Its design and physical features are more fully described in Section 7.

The number of scheduled trains operating at the CUT was 134 per day when it opened in 1933 which was down significantly from the pre-depression total operating from Cincinnati (224 per
day in 1928.) (Condit 1977, 258-261). The station was designed to accommodate 216 trains per day, but could handle significantly more. By the close of the 1930’s, local commuter trains to communities such as Hamilton, Lebanon, Maysville, Aurora, etc. had been largely eliminated from the railroads schedules.

World War II caused a significant increase in both freight and passenger volumes and the CUT reached its peak utilization in 1944. The number of passengers per train doubled between 1940 and 1944. In the peak year of 1944, there were 123 scheduled trains per day and it is estimated that up to 30,000 daily passengers used the CUT.

By 1950, passenger volumes had returned to their prewar levels which were about a third of the wartime peak at 12,000 daily passengers. In 1956, the Cincinnati Times Star ran a story questioning the future of the CUT (Cincinnati Times Star, 5-26-56).

In 1960, rail traffic had nearly fallen by half to 7,000 passengers and still further by 1970 as the interstate highway system opened locally and nationally. The remaining passenger operations in the CUT were taken over by Amtrak in 1971.

5.2. Amtrak Railroad Passenger Service

Amtrak continued to operate service between Cincinnati and Chicago (the James Whitcomb Riley, formerly run by Penn Central), and between Cincinnati and Washington, DC (George Washington, formerly run by the C&O). Soon after passenger railroad operations were taken over by Amtrak, plans were made to relocate to a new facility located along the former New York Central line along River Road west of the Mill Creek (Cincinnati Enquirer, 09/30/71). The
last train operated out of the CUT on October 28, 1972 and the new Amtrak station became operational the next day. Passenger rail service in the 3-C Corridor was discontinued. One reason for this move was that the connections to the New York Central line (today’s CIND) and the C&O would require a circuitous dead end route to reach the platforms at the CUT. The River Road location provided a direct linkage with both railroads. The concourse, platforms and approach tracks were demolished in 1973 (Cincinnati Railroad Club 1999).

Operations on these two routes would be combined and renamed the Cardinal in 1977. From 1976 until 1981, Amtrak also operated the Shenandoah, providing daily service from Cincinnati to Washington, DC. Amtrak temporarily suspended operations of both the Shenandoah and Cardinal in September, 1981. The Cardinal was reactivated in 1982 following a congressional mandate. CSX provided Amtrak $500,000 towards the costs of renovating the CUT facilities for

Figure 5-8: Former Amtrak Station on US-50 looking east (day before it was demolished). Photo by author
Amtrak’s waiting area and passenger platform in 1989 and Amtrak executed a 30-year lease agreement with the Union Terminal Association (Cincinnati Post, 4-10-90). Amtrak relocated its passenger station to the CUT in August 1991. The Amtrak station waiting room is housed in the former men’s lounge. It is connected to a single at grade platform immediately behind the west façade of the building adjacent to CSX Mainline No. 1. The current Cardinal timetable is 9 hours and 25 minutes to Chicago Union Station (average speed 34 mph) and 14 hours and 26 minutes to Washington, DC Union Station (average speed 42 mph). Since arrivals and departures are scheduled for these larger stations, arrivals and departures at the CUT take place between 1:00 and 4:00 A.M. (Amtrak October 26, 2009). One daily train operates from CUT in opposite directions so that service east or west is available every other day. The station hours are midnight to 6:30 AM. There are no accommodations for checked baggage.

The relatively slow speeds and predawn schedule are obvious deterrents to boosting ridership at Cincinnati. The yearly Amtrak boarding and alighting at Cincinnati over the past six years has averaged 14,700 or approximately 40 passengers per train (See Figure 8-4). It is assumed that there may be an upgrade to daily service with scheduled connecting service to Chicago or Washington, DC if the 3-C Corridor were to utilize the CUT. If the Chicago to Cincinnati MWRRS Corridor were to be implemented it is assumed that the current Amtrak Cardinal Service would be reconfigured and terminate at Cincinnati with daily connections to Chicago. For additional information on the current use and operations of the CUT see Sections 7.3 and Section 8.
6. Proposals for Intercity Passenger Rail in Cincinnati

The City of Cincinnati has conducted studies of other potential rail passenger terminal stations over the past decade. Alternative locations which have been evaluated include locations generally near the riverfront. These locations include the vicinity of Longworth Hall north of Pete Rose Way and west of Central Avenue, as well as the Transit Center located under Second Street established as part of the reconstruction of Fort Washington Way in 2001 and locations in the vicinity of the Cincinnati Boathouse in Sawyer Point Park. Each of these sites is located in relatively close proximity to the CBD and has its advantages and disadvantages. In some cases, it may not be feasible or desirable to locate a terminal station at these locations. Current plans for 3-C “Quickstart” service have evaluated sites located further from the CBD (See Figure 6-1). As of April 2010 the City of Cincinnati has stated that its preferred location for a “temporary” station is located along in the vicinity of the NS Berry Yard in the Bond Hill neighborhood. Hamilton County officials have promoted a site located in the vicinity of Red Bank Road near the Village of Fairfax.
6.1. Midwest High-speed Rail Initiative

The FRA designated a high-speed rail corridor linking Cincinnati with Chicago via Indianapolis in 1999. This corridor is one element of a larger hub and spoke network with Chicago at its center. The network which has been dubbed the MWRRS and has been developed cooperatively by a consortium of State Departments of Transportation including Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Nebraska, Ohio, and Wisconsin (See Figure 6-2).
Several studies have been performed since 1998 on various MWRRS Corridors. The most recent study for the Chicago to Cincinnati corridor was completed in 2004. This study was performed by Transportation Economics & Management Systems, Inc., the same firm that conducted studies for the Ohio Hub (3-C Corridor) in 2007. The 2007 Ohio Hub Study did update some of the forecast of ridership and economic impacts of this corridor.

Figure 6-2: MWRRS System Map (MWRRS)
The 2004 study evaluated the entire MWRRS network and did not isolate the Cincinnati to Chicago Corridor for independent analysis. Major elements of the study include the following (Transportation Economics and Management Systems, Inc. 2004):

- Ridership and Revenue forecasts
- Operating cost estimates
- Operating plan
- Feeder bus recommendations
- Capital cost estimates
- Freight rail capacity needs analysis
- Implementation plan phasing
- Financial plan
- Project coordination

The studies for the MWRRS and the Ohio Hub 3-C Corridor utilize the same methodologies. Routes are selected and the infrastructure capital improvements are identified along with an assumed technology for the rolling stock and operational parameters. Once these have been identified, capacity and travel time of the system can be estimated which then permits forecasts for ridership, revenue and operations and maintenance costs. The methodology is interactive since many of the assumptions affect the remaining elements of the plan.

See Table 6-1 for a comparison of the operational assumptions for the two high-speed corridors serving Cincinnati.

The express travel time between Cincinnati and Chicago Union Station (approximately 450 rail miles) proposed for this corridor is 4 hrs-8 minutes for an average speed of 108 mph which are
nearly 50% less than the current 9 hours and 15 minute schedule for the Amtrak Cardinal (Amtrak October 26, 2009). This travel time seems overly optimistic given the need for slower speeds in urban areas, during potential switching operations, recovery time for interfacing with freight traffic (assumed to be 5% in the study) and the need for some dwell time in the Indianapolis station.

The proposed alignment for the corridor through Indiana would use a combination of several freight railroads. Between Shelbyville, Indiana (southeast of Indianapolis) to Cincinnati, the designated route would utilize the CIND (formerly Conrail, New York Central and originally the Cincinnati and Indianapolis). This route is one of two remaining railroads between Cincinnati and Indianapolis and is the most direct. The current Amtrak Cardinal service utilizes the CSX (former C&O of Indiana) route which enters Ohio in Butler County from runs south from Hamilton to the CUT. The CIND enters Hamilton County near
Lawrenceburg, Indiana and enters Downtown Cincinnati from the west between the Ohio River and US-50. At present, there is not a direct connection between the CIND and the CSX mainline serving the passenger platform at the CUT (See Figure 8-9).

The MWRRS study assumes the use of a new Cincinnati terminal station on the western riverfront (Transportation Economics and Management Systems, Inc. 2004, 5-9). The study includes an allowance of $1.5 million for the Cincinnati terminal station.

The 2004 MWRRS report estimates that $606 million in capital improvements are necessary for the corridor between Chicago and Cincinnati (Transportation Economics and Management Systems, Inc. 2004). The study considered a range of “conservative, moderate and aggressive” infrastructure upgrades. The costs and final recommendations were for a “moderate” approach which is intended to support use of 110 mph running speeds. It should be noted that within Hamilton County, Ohio speeds would be appreciably less.

Intercity passenger rail typically requires provisions for layover of at least one train set so that it will be available for the initial departure on a daily basis. Not only does the report recommend provisions for a layover in Cincinnati, but also assumes the construction of maintenance and servicing yard for fueling and servicing rail equipment. A yard location is not designated in the report, but the capital cost estimates provide an allowance of $17.5 for the servicing and maintenance yard in Cincinnati. It may be feasible to provide accommodations for the passenger equipment servicing in the adjacent Gest Street Yard (NS) or Queen City Yard (CSX) but no formal discussions regarding such accommodations appear to have occurred.
Assumptions for the rail equipment to be used for the MWRRS have not been finalized. Currently there is one corridor (Chicago to St. Louis) envisioned to utilize high-speed electrically powered equipment. The Chicago to Cincinnati Corridor is assumed to use five diesel powered Talgo XXI train sets which could accommodate up to 300 passengers for six daily departures at the Cincinnati station. Travel forecast predict an average of 77 passengers per train between Cincinnati and Indianapolis (Transportation Economics and Management Systems, Inc. 2004, 7-6). The trains would operate in push-pull configuration which would allow them to be operated at a terminal station without having to turn the train.

The 2004 study predicts that the Chicago to Cincinnati corridor will have the highest operating ratio of any corridor. The revenues will exceed operating cost by 60 percent. Despite the studies promising assessment of the corridor, there have not been any significant steps taken towards further implementation of passenger rail service since 2004.
6.2. Ohio Hub 3-C Corridor

The Cincinnati, Columbus and Cleveland Corridor (3-C) is one element of the Ohio Hub system which is similar in concept to MWRRS. The Ohio Hub is a spoke and hub system with its primary hub in Cleveland. It is integrated with railroad corridors to the west planned as part of the Chicago hub system (See Figure 6-4).

Figure 6-4: Ohio Hub System Map (Source ORDC)
The Ohio Rail Development Commission has conducted a series of planning studies for the Ohio Hub over the past decade. The most recent analysis completed in 2007 updates the 2004 MWRRS study.

The ORDC received funding for a feasibility analysis to implement conventional “Quickstart” rail service in the 3-C Corridor in 2008. This feasibility analysis was completed by Amtrak in December 2009 and evaluated the feasibility of implementing passenger rail service on existing tracks with conventional diesel powered locomotives at a maximum speed of 79 mph. With the availability of funding for implementation of high-speed rail from the ARRA in 2009, the ORDC applied for funding to initiate the “Quickstart” service by 2012 while concurrently proceeding with planning and preliminary engineering for future implementation of high-speed rail service as described in Section 4.3. Work has begun on environmental documentation and preliminary engineering for the 3-C Corridor. President Obama announced that the FRA would contribute approximately $400 million towards implementation of the 3-C Corridor “Quickstart” rail service in March 2010.

The long-term high-speed service for the Ohio Hub is assumed to utilize diesel-powered equipment with 110 mph maximum running speeds compatible with the assumptions for the MWRRS. Unless otherwise noted, the following assumptions for of the 3-C Corridor are based on future 110 mph service and not the slower speed “Quickstart” service.
6.2.1 Proposed Routes

There are several alternative railroad connections between Cincinnati and Columbus, some of which do or do not serve Dayton. The routes are operated by a combination of several freight railroads (CSX, NS and the Indiana and Ohio Railway). The preferred route assumed in the ORDC “Quickstart” ARRA funding application is approximately 255 miles long with stops in Cincinnati, Sharonville, Dayton, and Columbus, Galleon, Cleveland Hopkins Airport and downtown and Cleveland (See Figure 6-5).

Figure 6-5: Proposed Route for 3-C “Quickstart” Service (Source: ORDC 3-C Service Development Plan)
Eight trains a day would originate or terminate in Cincinnati with a travel time between downtown Cleveland and Cincinnati of 3 hours-28 minutes for an average travel speed of 74 mph (Transportation Economics and Management Systems, Inc. 2007). The track follows the current NS (former CONRAIL) mainline south from Dayton to Cincinnati. This track connects to the CSX mainline track serving the CUT Amtrak station platform at “NA” Tower near the former Proctor and Gamble Ivory Dale Complex north of the CUT. This track is heavily used as a mainline freight route through Hamilton County by NS, CSX and Rail America. It should be noted that following the acquisition of Cincinnati area Conrail lines, the areas’ two major Class I railroads (CSX and NS) initiated a directional running operation in Cincinnati to maximize the capacity of the existing railroads in the Mill Creek Valley by sharing trackage rights. In general, northbound trains from both railroads operate over CSX tracks and southbound trains operate over NS tracks in the Mill Creek Valley north of the CUT. Use of this route would either preclude passenger service reaching the CUT or require passenger trains to run against the predominant flow of freight traffic on these two high-density lines. Amtrak and the ORDC do not view this route as optimal for passenger train service (Amtrak 2009, 10).

Total capital cost estimates for the 3-C Corridor to achieve 110 mph service are approximately $1.1 billion in 2002 dollars (Transportation Economics and Management Systems, Inc. 2007). The majority of capital costs are for grade crossing improvements, bridge and overpass reconstruction, construction of passenger sidings as well as station and yard facilities.

The Ohio Hub includes provisions for a layover of at least one train set so that it will be available for the initial departure on a daily basis. In contrast to the MWRSS, the Ohio Hub does not
assume the construction of maintenance and servicing yard for fueling and servicing rail equipment in Cincinnati. This would seem to be a significant discrepancy between the respective studies. If a service and maintenance yard can be eliminated from the Cincinnati terminal, there may be more flexibility in locating a station and could eliminate $20 million or more in capital expenditures.

The Cincinnati Station is forecasted to have an annual ridership of 895,000 or 2,900 daily for full implementation of the MWRRS system in 2020. This is 60% higher than forecasted for conventional 79 mph service. Amtrak estimates an annual ridership of approximately 65,000 for at Cincinnati for the 3-C “Quickstart” service. An eight-car train with six regular coaches with 36 seats per car, and two handicapped accessible coaches with 25 seats, would provide a capacity of 302-seats.

<table>
<thead>
<tr>
<th>Description</th>
<th>Amtrak Cardinal*</th>
<th>Amtrak “Quick Start”3-C</th>
<th>Ohio Hub (3-C)**</th>
<th>MWRRS***</th>
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* Chicago-Cincinnati only
** Daily passenger volumes are based on yearly ridership divided by 312 days (six day a week service)
*** Ridership for Ohio Hub and MWRRS are forecasted 2020 ridership volumes for max 110 mph service
1. Amtrak Cardinal Operates 6 trains per week, three eastbound and three westbound
2. Three round trips to Columbus with two of which extend to Cleveland
3. Based on 2009 ridership at Cincinnati Amtrak Station
6.2.2 Proposed Station Sites

The ORDC ARRA funding application for the 3-C “Quickstart” service identifies three station locations in Cincinnati, Sharonville, near Lunken Airport, and the CUT (for future 110 mph service). The 2009 Amtrak feasibility study for the 3-C Corridor notes that a station location at the CUT is problematic due to existing freight congestion problems in the Mill Creek Valley (Amtrak October 26, 2009). There have been some concerns raised about the lack of accessibility of the proposed Lunken Airport site. City of Cincinnati officials have proposed an additional station site adjacent to the NS track in Bond Hill for consideration. Some rail advocates propose ending the “Quickstart” service at Sharonville and obtaining funding to accommodate passenger operations at the CUT in the long term.

The Ohio Hub studies do not make reference to a specific station location, but defer to a study of station locations by the City of Cincinnati (Transportation Economics and Management Systems, Inc. 2007, 3-7). The Ohio Hub Study allocates $1.5 million for a new terminal station in Cincinnati. This is half the cost estimated by Amtrak in its 2009 study and is significantly less than the cost to accommodate passengers at the CUT estimated by the author.
7. Cincinnati Union Terminal

7.1. Overview

Cincinnati Union Terminal served as the primary transportation facility for the region for roughly 25 years from 1933 to the mid 1950’s. This period is far shorter than that held by the Public Landing from the 1780’s until the 1870’s or the former Central Union Depot or Pennsylvania Railroad Stations from the 1880’s until 1933. Since the mid 1950’s, the Greater Cincinnati Northern Kentucky International Airport has held that distinction even though in recent years its passenger volumes and air service have been in decline.

The magnificent art deco architecture and the nostalgic memories of a generation of Cincinnatians saved the CUT from total demolition in 1973 and have allowed it to be somewhat successfully be reincarnated as the home of the CMC in 1991. The CUT continues to serve as a vital cultural institution and source of regional pride. Its use as a transportation facility for Amtrak serving only 30 to 40 passengers in the predawn hours is virtually unnoticeable in terms of regional travel volumes. Its continued long-term vitality is dependent on a significant investment to repair, modernize and improve the original components of the building. (CR Architecture 2009) At this time, there are no funding resources identified to undertake such an investment. The CMC remains dependent on public subsidies to operate and minimally maintain the existing physical plant. If it is to serve a more robust role as the region’s terminal for high-speed rail service, the CUT will have to play dual roles which may or may not be mutually compatible or successful.
7.1.1 Planning

As mentioned in Section Error! Reference source not found., growing long distance travel and freight volumes put pressure on the capacity of the local railroad network in Cincinnati at the close of the 19th century. Due to topographic challenges, the railroads operated five separate railroad passenger stations near downtown (See Figure 5-7). Connections between stations on the east and west sides of downtown were limited to single tracks located in Eggleston Avenue and along the Riverfront. The need to interchange freight cars and passenger coaches between railroads often congested the local freight network at a time when through freight traffic had grown to such an extent that it exceeded the rail traffic with origins or destinations within the City of Cincinnati.

It became apparent in the early 20th Century that consolidation of the multiple passenger stations along with provisions for storage and transfer of passenger coaches was needed not only to improve operating efficiency of passenger railroad service but to improve the operation of freight trains to and through the Cincinnati area. In 1910 a proposal was made for a consolidated union station along Second and Third Streets at the Central Riverfront which would have required elevated approaches but would have linked railroads on the east and west side of downtown. The rise and fall of electrically powered interurban railroad, proposals for a mass transit loop, the flood of 1913, and nationalization of the railroads during World War I, put a stop to this plan. During the 1920’s, plans were made once again to determine a location for a consolidated passenger station.
The design principals set forth for locating the new terminal, recognizable to any planner of transit-oriented development, were as follows:

- Close proximity to the CBD for easy access to hotels, office buildings, and other places suitable for business transactions, shopping, and entertainment.

- Easy access to public transportation and the urban circulatory system.

- Sufficient area for the numerous parts of the terminal complex located to minimize interference with or disturbance to existing urban functions.

- Access to existing rail lines to minimize new construction (in the case of Cincinnati this also entail placing the terminal and approach tracks about the flood plain of the Ohio River.

A site with a large enough footprint (287 acres), an elevation above the flood plain and multiple track connections was not feasible immediately adjacent to the CBD. The chosen site was the former location of Chester Park in the West End neighborhood. The area was located adjacent to several existing railroads in the Mill Creek Valley surrounded by marginal land uses including a garbage dump (Cincinnati Railroad Club 1999). The eastern railroads (Pennsylvania and Norfolk & Western) would have to reach the terminal from the north via trackage rights. The western railroads (NYC and B&O southwestern) would require a new elevated viaduct to link them to the terminal as would the Kentucky Railroads (C&O and L&N). Besides the passenger terminal itself, the project would include the aforementioned track modifications, a coach yard, coaling station, round house and maintenance yard, power plant, substations, express mail yard, and a variety of supporting infrastructure. The Western Hills Viaduct linking Central Parkway and Spring Grove Avenue with State Street, Queen City and Harrison Avenues was also
constructed as part of the project. The Cincinnati Union Terminal Company (Company) was chartered in 1923 with capital of $20 million, but did not reach agreements with all seven-tenant railroads until the summer of 1927. Surveying and engineering work began the same year and the ICC approved the general station plan in March of 1928. The Company awarded the commission for the design of the CUT to the New York architectural firm of Alfred Fellheimer and Stewart Wagner in June 1928 (Cincinnati Railroad Club 1999).

7.1.2 Design & Construction

Railroad station design is a balance between optimizing the efficiency of railroad operations and providing access to passengers while at the same time minimizing the disruption to the surrounding urban fabric. The design of the CUT attempted to meet the four design principals presented in the previous section.

The station was designed to minimize conflicting movements of vehicles, trains, passengers, staff and support operations. Each user of the station was provided with dedicated facilities and circulation which would minimize conflict with others.

The station was designed to allow both the maximum accessibility of the traveling public with grade separated ramps for automobiles, busses and streetcars that could enter the station area on a one-way loop with separate loading areas for arriving and departing passengers. This expedited drop off and pick up of passengers in a sheltered environment in close proximity to station waiting areas without delays or conflicting vehicular or pedestrian movements.
Offices, baggage handling, railroad operations, utilities and railroad operations were segregated among six levels with all passenger services and train loading on entry level. Ticketing and ancillary services were provided in adjacent spaces arranged in radial fashion surrounding the grand rotunda.

The general north south orientation of the existing Mill Creek tracks dictated the orientation of the passenger platforms. To provide a connection to multiple tracks and align the station with the city street grid, the station lies on a general east west axis. To provide through movements of trains in either direction on all station tracks, the passenger-loading concourse was elevated over the platform level. This arrangement provided sufficient vertical clearances for trains to pass below and allowed direct access to each of the stations 15 platforms. The platforms themselves were 1,627 ft. long and 28 ft. wide and could accommodate a 17-car train which were much larger that the norm at other major train terminals (Cincinnati Railroad Club 1999). Each platform was accessed by stairs and long descending ramps and covered by an individual canopy (See Figure 7-1). The elevation of the tracks and the needed vertical clearance dictated the elevation of the passenger concourse and rotunda. This required the primary floor structure to be elevated above its surroundings by some 20 ft. This required the construction of bridges structures over Gest and Dalton Streets and the entry plaza. The heightened elevation of the station gives the station a commanding presence when viewed from the east. It also serves a barrier to egress with the surrounding land uses to the north and south.

A host of track improvements was needed in order to provide connections for all railroads. This required the construction of elevated viaducts on the south to connect the western railroads
(NYC and B&O Southwestern) and the southern railroads (C&O, L&N and Southern). To the north, the complex included a coach yard for storing passenger cars when not in use, a yard for processing mail and express packages, as well as a roundhouse, mechanical support, water and coaling operations. The CUT was designed to accommodate 216 trains per day.
The initial work undertaken for the project included removal of existing structures and placement of 10 to 12 ft. of fill over raise it the site to an average elevation of 513 ft.. The project required the demolition of a significant amount of substandard housing at the eastern portion of the site. The construction of the Laurel Homes public housing development in 1938 by the Cincinnati Metropolitan Housing authority partially mitigated the loss of housing due to the construction.

The C&O and L&N Railroad undertook a program to elevate and grade separates the approach tracks through Covington across the Ohio River on a new double track truss bridge and through the western riverfront to the CUT approach. This work which was completed in 1929 remains in service and is among the most heavily used segment of track in the region. Construction of the station tracks and yards were essentially completed in 1931 and the passenger concourse in 1932. The station’s monumental headhouse, interior spaces, mechanical electrical and signal systems were completed in 1933. The original cost for the entire terminal complex was $47 million or nearly $600 million in today’s dollars (Cincinnati Railroad Club 1999).
7.1.3 Operations

Union Terminal began operations in March 1933 and with 134 scheduled trains on the original timetable (Cincinnati Railroad Club 1999). It is estimated that on average throughout the 1930’s approximately 10,000 passengers per day utilized the station which was far below its design capacity. All rail operations into and out of the complex were directed from Tower “A” at the rear of the headhouse. When the station began operations it contained nearly all services needed by the traveling public including the following: newsreel theater, lunch counter, dining room, men’s and women’s lounges, toy store, book store, barbershop, ice-cream parlor, etc. The railroads shifted all passenger operations from their respective former stations which were to be
subsequently demolished. The station had an enormous physical impact on the west end neighborhood but due to its grade separated design and self sufficiency the passenger operations themselves had little direct impact on the surrounding neighborhood.

A new post office was constructed on Dalton Street just north of the CUT and various firms and trucking companies served the entire complex. As mentioned previously, the station did not reach its full potential until the onset of World War II which saw significant increase in both passenger and freight volumes. The passenger counts at the CUT peaked in 1944 when it was estimated that over 30,000 daily passengers used the facility on 160 trains (Condit 1977).

What would become the Northern Kentucky Greater Cincinnati International Airport opened in Boone County, Kentucky shifting passenger air service from Lunken Airport in 1947. During the 1950’s as rail travel began a continual and rapidly declining trend, some began to question the usefulness of maintaining the station and a May 1956 *Cincinnati Times Star* article declared it the City of Cincinnati’s next white elephant (Cincinnati Times Star, 05/26/56). During this same time, the last of the steam-powered trains were converted to diesels eliminating the need for much of the support structures specifically constructed for steam locomotive operations. The coal tipple and roundhouse were shuttered in 1957. The railroads offered the CUT as a site for a convention center or city hall during 1962. Some prophetic advocates suggested converting the station to a community museum complex the same year.

Interstate 75, the “Mill Creek Expressway, linking Cincinnati north to Dayton, Detroit and south to Lexington and beyond was completed in 1963. The interstate followed much of the route of
the former Miami Erie Canal along the eastern edge of the Mill Creek Valley and bypassed the CUT with and interchanges at Ezzard Charles Drive. Its construction displaced thousands in the City of Cincinnati’s west end neighborhood. The CUT having been criticized as too remotely located from the CBD seemed to be even remote due to the psychological divide created by the interstate. As the 1960’s progressed, the railroads faced increasing fiscal pressures and passenger volumes dwindled even more significantly and by 1970 it was evident that profitable passenger rail operations were no longer feasible. The last train operated out of CUT on October 28, 1972 (Cincinnati Railroad Club 1999).

7.2. Adaptive Reuse

It had become apparent by the late 1950’s that the CUT’s viability as a passenger rail station was questionable and railroads themselves offered the station to the City of Cincinnati for re-use in 1962. A subsequent study proposed that the CUT be reconfigured as a new city hall, a regional convention center, a science museum, site for a replacement of the Cincinnati Reds Crosley Field. None of these proposals made it beyond the study stage.

Following the relocation of Amtrak rail service to its new station on River Road in 1972 the CUT was generally vacant. The Southern Railroad acquired the western portion of the site for construction of a new intermodal terminal. To accommodate the yard trackage and to provide clearance for double stacked trains, it would be necessary to remove the passenger concourse. The passenger concourse was demolished in 1973 with the head-house including the rotunda, offices, control rooms, garage and plaza remaining (Cincinnati Time Star, 10/27/72)
During the next few years, several alternative uses were studied including: the operation and maintenance center for the newly created SORTA, a home for the Cincinnati Public Schools, School for Creative and Performing Arts, as well as a relocated Greyhound Bus Station and Amtrak Station (Cincinnati Enquirer, 09/24/75). After some study it became obvious that SORTA and the School for Creative and Performing Arts could not co-exist and plans for both uses were dropped. Amtrak did not wish to assume the expense of operating the terminal as a sole tenant. SORTA did utilize the former CUT mail and express building and yard site just to the north and subsequently constructed is operations center which remains in use today. By the end of 1976, the City of Cincinnati solicited proposals from prospective tenants and an offer to lease the property for a minimal fee in exchange for renovation and adaptive re-use of the CUT.

In 1977, a development group led by Joseph Skilken of Columbus, proposed renovation of the remaining buildings as a mixed-use urban retail center dubbed the “Land of Oz”. Through a mix of public and private financing the rotunda and surrounding areas were subdivided into retail and dining spaces. The complex opened to much fanfare and with 54 tenants in August of 1980. Following some initial success, the tenants and the City of Cincinnati lodged complaints of mismanagement. Sales and tenants gradually began to decline and the CUT’s life as an urban mall was over by 1984.

During the mid-1980’s the Cincinnati Museum of Natural History and the Cincinnati Historical Society developed plans for a joint museum project to be housed in the CUT. The idea adaptive reuse of a museum had been proposed at various times since the 1960’s. In May 1986, Hamilton County voters approved a $33 million 20-year bond issue for the restoration of the terminal to
house the two museums and an Omnimax Theater. These bond payments were completed in 2009. The State of Ohio and the City of Cincinnati also contributed to the capital funding towards the restoration. Hamilton County established a memorandum of agreement with the Union Terminal Association (UTA) in 1989 defining the respective roles of Hamilton County and UTA. The UTA executed a 99-year lease for one dollar per year (Cincinnati Railroad Club 1999).

7.3. Current Conditions

7.3.1 Cultural Uses

In November 1990, the CUT reopened as the CMC, an educational and cultural complex including the Cincinnati Museum of Natural History, the Cincinnati Historical Society Museum and Library and the Robert D. Lindner Family OMNIMAX Theater. The museums are housed in the former auto and bus ramps at either side of the rotunda as well as the lower level parking garages and ancillary support spaces. The rotunda is surrounded by gift shops, and supportive services (food service, bathrooms etc.). Spaces such as the original dining room are rented to host meetings, receptions or special events. The Cincinnati Railroad Club renovated the former Train Control Room “Tower A” and opens it to the public on weekends as a railroad museum and observation area for the adjacent railroad operations.

The Omnimax Theater is located at the rear of the rotunda where the concourse was removed in 1973. The Historical Center Library is housed on the lower level below the Omnimax Theater. The Omnimax Theater projector and waiting areas are immediately adjacent to the Amtrak waiting room. See Figure 7-3 for the general arrangement of the museums.
The Cincinnati History Museum, Cincinnati Historical Society Library, the Museum of Natural History & Science and the Robert D. Lindner Family Omnimax Theater merged operations in January 1995 as the CMC. The Children's Museum of Cincinnati joined the CMC in July 1997. The CMC also hosts temporary visiting exhibits in its lower level gallery space which are its
most lucrative sources of revenues. Since its opening in 1990, the CMC has attracted more than one million visitors each year and has gained stature as one of the premier cultural institutions in the region and is among one of the most visited museum facilities in the nation.

The CMC has sponsored a series of studies to provide information on its economic benefits to the region. Two studies were completed by the University of Cincinnati’s Economic Center for Education and Research in 2002 and 2009. The 2002 study found that the CMC’s annual economic impact was approximately $76 million and supported approximately 1,100 full and part-time jobs. Over 200,000 youth also toured or experienced educational exhibits or programs by the member museums and Omnimax Theater based on 2001 data. (Rexhausen September 2002).

7.3.2 Maintenance & Operational Issues

Annual operating and maintenance for the CUT is approximately $3.5 million at this time. Since the operating endowment was smaller than anticipated and operating assistance limited to approximately $150,000 per year from the City of Cincinnati and State of Ohio, the CMC has historically been unable to be profitable and has had to offset operating loses by tapping its endowment. (Rexhausen September 2002)

In 2002, Hamilton County voters approved a five-year levee to provide funding assistance for maintenance and operations of the CUT. As the five year levee approached is expiration in 2009 the CMC conducted an in depth condition evaluation of the CUT and identified long-term capital repairs and renovations. The study revealed significant damage to the building envelope and
structural frame as well as much needed electrical and mechanical upgrades of aging systems which dated from the original construction. The total estimated costs for these repairs and improvements are approximately $139 million (Rexhuasen February 2009). The CMC does not have the financial resources to undertake this work. It is likely that significant public funding will be necessary to make any significant repairs. At this time, specific sources of funding have not been identified nor has the project garnered political support for another County tax levee (Hamilton County Tax Levee Review Committee 2009). This long-term financial outlook has implications for any future use of the CUT as a rail passenger station.

If a rail passenger station were to be located at the CUT its operation would be dependent on, and share in the cost of, the use of the overall facility for parking, utilities, communications, lighting, security, restrooms, etc. If the cost to sustain the long-term viability of the facility becomes burdensome financially the rail passenger operations may suffer as well since its operational subsidy is intended to be minimal as possible and is not intended provide for significant expenditures to partially support the capital improvements identified by the CMC. The additional revenue attributable to use for passenger rail operations will not be sufficient to address the current operating losses or long term capital improvement needs.
8. Evaluation of CUT for Rail Passenger Service

8.1. Physical Constraints

The following discussion of physical constraints is based on the author’s personal observations and available information. Survey data or architectural drawings of the existing CMC facilities including the Amtrak Station have not been made available. Definitive conclusions regarding physical constraints will require further study. General conclusions can be drawn from these observations and available information.

8.1.1 Site and Building Characteristics

The CUT property is owned by the City of Cincinnati and comprises approximately 15 acres in the City of Cincinnati’s West End neighborhood. This represents less than 10 percent of the original CUT property. It is bounded on the west by the CSX Railroad and on the east by Interstate 75. The CUT complex spans over Dalton Street via a tunnel like bridge. The primary access to the facility is from the east along Ezzard Charles Drive forming an east-west axis connecting the CUT to Central Parkway near 13th Street at the rear of Music Hall. An interchange with Interstate 75 is located in proximity to the CUT via collector/distributor ramps on Western and Winchell Avenues. The site is bounded on the north and south by Kenner and Hoskins Streets (See Figure 8-3.)
The design of the CUT was predicated on elevating the passenger platforms and connecting trackage above the Ohio River floodplain. The passenger concourse was then elevated above the platforms to provide a vertical clearance of 17 ft. to allow for through train movements. The floor elevation of the passenger concourse was maintained throughout including the entry rotunda. The need to elevate the building above the surrounding land provides a commanding presence for the CUT when viewed from the east. However for all intensive purposes, the CUT functions as a walled fortress from the north and south. The entry plaza and concourse are elevated more than 20 ft. above the adjacent streets and land uses. The public parking areas are fenced off with barbed wire and the former stairway portals on Dalton Street are shuttered and forlorn (See Figure 8-1 and Figure 8-2).

Figure 8-1: CUT from Dalton Ave looking North (Photo by Author)
Loading dock areas and support parking are located on the north and south sides of the building west of Dalton. The former underground parking areas have been largely converted to exhibit spaces. Visitors to the CMC museums as well as Amtrak utilize two large surface parking areas stretching along either side of the entry drive from the Rotunda to Western Avenue. The parking lots are paved over former passive landscaped grounds that were originally known as Lincoln Park.

At the CUT entrance drive, the original ornamental cascading fountain remains as do some of the original light pedestals and flagpoles. The fountain is located above the subsurface garage and Dalton Street. It has experienced ongoing maintenance problems in recent years.

The interior spaces and layout of the CMC within the CUT are described in Section 7.3.
Immediately to the west of the CUT, lie the CSX mainline tracks (which serve the current Amtrak Station) and will presumably serve the Ohio Hub 3-C Corridor and MWRRS Cincinnati-Chicago Corridor as well. West of the CSX mainline tracks is the NS Gest Street Intermodal Yard constructed during 1973 and 1974. The Gest Street Yard occupies the location of the former CUT passenger platforms. Railroad property is not publicly accessible and is unlikely to offer any opportunity for changes in use for the foreseeable future.

Figure 8-3: Current CUT Site Conditions (Map by Author)

8.2. Station programmatic and design requirements

The design for a railroad passenger station is dependent on many variables and there is not a definitive model which applies in all situations. The relative lack of modern railroad station construction or new rail equipment in the United States has allowed most of the programmatic
and design parameters established in the late 19th and early 20th century to remain as contemporary standards. The primary sources of information for passenger station design requirements are taken from the *Manual for Railway Engineering* published by the AREMA and various design guidelines published by Amtrak.

Fundamentally, a train station provides a location for passengers (and potentially baggage & freight) to board or exit from a stopped train on an adjacent track. Typically the waiting area or “platform” is long enough to provide direct access each of the cars in a given train. The number and configuration of cars on an individual train is commonly referred to as a “consist” and the individual locomotives and cars are referred to as “rolling stock”. The platform must be long enough to provide convenient loading onto the maximum expected number of passenger cars while being wide enough to efficiently accommodate the number of anticipated passengers at any given time and provide sufficient clearance for the trains to pass without obstruction. Platforms typically provide some shelter from precipitation and provide egress to ancillary facilities or other transportation modes. Many times a platform can serve two tracks (one located on either side). For this center platform configuration passengers must cross one or more tracks either at grade or overhead. The latter design was employed at the CUT where the concourse was elevated above multiple station tracks and passenger platforms.

Stations can be comprised of the platforms alone but often include ancillary facilities to store and service the trains while not in operation as well as for passengers to purchase tickets, obtain information, and transfer to other transportation modes, etc. The need for these supportive facilities varies by location, numbers of passengers, frequency of trains, and level of service.
As noted in Sections 5 and 6.2, the operational variables which inform station design have not been finalized for the Ohio Hub or MWRRS high-speed rail corridors. Based upon the forecasted ridership and assumed rolling stock configurations from the conceptual planning done to date, some assumptions regarding the station design parameters can be made. These parameters dictate a different configuration than the current Amtrak station.

Typically when a new rail service is being evaluated, detailed design criteria will be established for one or more stations. The design criteria cover station design issues in great detail and are beyond the scope of this project which is done at conceptual level. A memorandum of understanding will need to be executed between the CMC, Hamilton County, the City of Cincinnati, the railroads and operator of the future high-speed rail service that will define the respective roles for design, funding, maintenance, revenue and management of nearly all aspects of the station. The legal agreement defining the roles and responsibilities for the existing Amtrak Station was requested, but not provided to the author.

8.2.1 Travel Demand Forecasts

Ridership forecasts are among the most important tasks when planning for new or expanded rail passenger service. The numbers of passengers expected to use the service, including the boarding at a particular station, determine the needed numbers of seats. The number of seats can be provided either by having more cars per train or more frequent trains. Both variables increase the costs of the service in terms of the size and numbers of passenger cars, as well as the nature of operations. For station planning, the peak number of passengers waiting to board or alight
from a train plays a major role in determining the size of the platform, support areas, parking and other facilities.

Several forecasts of ridership for the Cincinnati Station have been developed by the MWRRS and ORDC during the past decade. Until the most recent forecast for the 3-C “Quickstart” service these forecasts have been developed by a proprietary software (COMPASS™) created by Transportation and Economics and Management Systems. Forecasts for the Amtrak 3-C “Quickstart” service Study have been developed by AECOM, Inc. The “National Corridor Model” developed by AECOM for Amtrak and various states for corridor passenger rail forecasting throughout the US, including corridors in the Midwest was used for the 3-C Corridor and is similar to that developed by Transportation and Economics and Management Systems.

The independent review of the methodology utilized for these forecasts is beyond the scope of this study. The forecasts are highly dependent on the rail service characteristics including train frequency, travel time, train and station amenities, and fares, as well as the population and employment at either trip end. The basic mythology uses a gravity model based on using origin and destinations between travel analysis zones using travel preference survey conducted in 2002. The model zones include both the Ohio Hub as a stand-alone and combined the MWRRS travel market areas. It includes both internal and external zones with major trip generators such as Chicago, Washington, DC and New York City. The zone system is intended to represent the market area where travel would occur between origins and destinations. The majority of the travel analysis zones represent county-level socio economic data, where it is important to identify more refined trip origins and destinations, some counties are split into two or more
zones. The AECOM model makes use of zonal data from the Ohio Department of Transportation Statewide Travel Demand Model supplemented by national databases.

As is often repeated throughout this document, the operating parameters for future rail passenger service remain to be finalized. Network effects generate higher levels of ridership due to the increase options of travelers reach multiple destinations with more flexible schedules. This is the primary reason to plan for a unified station location which can serve all potential future passengers rail corridors.

Based upon the recent planning studies for the MWRRI and Ohio Hub 3-C Corridor, the maximum load per train will be approximately 300 passengers with two to four trains per day in each corridor. It is reasonable to assume that the maximum future daily passenger loads would be two to three thousand with an hourly peak load of 400 to 600 passengers, assuming two trains board nearly simultaneously. The maximum future forecasted passenger loads are less than half that using the CUT when Amtrak assumed service.
The respective ridership forecasts for the Cincinnati Station are provided in Table 6-1.

### 8.2.2 Parking

Parking is the most land intensive requirement for the development of a new railroad station (AREMA 2009). A combination of drop off, short term and long-term parking is required. The current Amtrak passenger station does not present a significant conflict with CMC operations due to its predawn hours and limited ridership. If the CUT were to serve as a future high-speed rail terminal, provisions for additional short and long-term parking must be made. Presumably the existing surface parking lots flanking the entry drive will provide shared parking for rail passengers and museum patrons alike. Museum patrons are currently charged $6.00 per day with discounts for evening usage. A portion of the parking revenues fund the operations of the CMC.
Current Amtrak passengers are permitted to utilize the parking lot at the same rates as museum patrons. There are no designated or reserved spaces for Amtrak passengers.

The long-term number of daily passengers boarding at the Cincinnati terminal station is forecasted to be up to nearly three thousand in 2035 assuming build out of the Ohio hub and Midwest Regional Rail System (See Table 6-1.) Approximately 60 percent of the forecasted daily passenger volumes should be provided long-term parking (AREMA 2009) for a total of approximately 1800 spaces. There are approximately 1,000 public parking spaces (20 for disabled persons) provided at this time. Clearly, the forecasted long-term parking demands to accommodate rail passengers would be overly burdensome to the CMC without additional capacity.

An equitable allocation or reservation of the parking space and associated revenue for rail passengers and museum passengers must be coordinated among the respective parties. The existing parking lots are located at some distance (approximately 650 ft. minimum) from the current passenger waiting area (See Figure 8-11). It should be noted that the *CMC 2007 Capital Improvement Plan* proposed a new parking structure to be erected adjacent to the CUT. If a new parking structure were to be constructed, it may provide closer access to the rail station platforms than the existing surface lots while providing improved security. There are currently no provisions for onsite rental car facilities but consideration should be given to providing rental facilities on site or in close proximity.
The existing drive (although not originally intended to be used for passenger drop-off does provide sufficient curbside space and close proximity to the entrance to the CUT for passenger and/or museum patrons. During peak museum visits by school groups there are several school busses which use the drive for temporary loading which may lead to congestion and conflicts with rail passengers. Unrestricted access to the front entrance for vehicular drop off and loading also raises potential security concerns similar to those experienced by the nation’s airport terminals in the wake of the terrorist attacks of 2001. Planners will need to evaluate circulation for all users of the facility including vehicular circulation.

8.2.3 Platforms

The passenger platform serving the existing Amtrak Station is a remnant of platform No 1 from the original CUT construction. It is located adjacent to a tangent segment of the CSX mainline tracks (See Figure 8-3). It abuts the western façade of the CUT. It can be reached via steps and ramp (on the north side) as well as an elevator which was installed when Amtrak reoccupied the building.
Architectural drawings of the Amtrak Station are unavailable, but based on digital orthophotography the platform at is narrowest is approximately 12 ft. wide and 920 ft. long. The platform is lighted but there is no canopy or shelter. The elevation of the platform is approximately level with the top of rail and there are no permanent provisions to allow for level boarding of trains for disabled passengers nor is there a tactile warning strip at the edge of the platform closest to the track. There are no separate facilities for handling of baggage or packages. Amtrak is responsible for maintenance of the platform itself.

The rolling stock assumed for the two future high-speed rail corridors assumes a maximum train capacity of 302 passengers with eight passenger cars. The passenger car (Talgo VII) length is approximately 44 ft.
The required platform length to serve the passenger cars and locomotives is approximately 600 ft. or two-thirds the current platform length. The width is somewhat substandard. The preferable platform width is 20 to 24 ft. (AREMA 2009).

The current platform does not meet the provisions of the Americans with Disability Act of 1990 (ADA). In 2005 the United Stated Department of Transportation (USDOT) provided guidance that new or reconstructed rail passenger station platforms must provide “level” boarding (48 inches above the top of rail). To archive this standard nearly all station platforms outside the northeast corridor (including Cincinnati) would have to be reconstructed. Amtrak has appealed this guidance and has proposed use of a variety of strategies to meet boarding including ramps and wheel chair lifts. In 2009 Amtrak was awarded funding from the ARRA to undertake a program to bring its rail stations into substantial compliance with provisions of the ADA as part
of its “Mobility First” program. Amtrak has estimated that $1.15 million will be needed to upgrade its Cincinnati station to meet these more flexible ADA standards. This includes updated ticketing, signage, communications and audio-visual provisions (Amtrak 2009).

ADA issues aside, the existing platform provides adequate space for the existing Amtrak Cardinal as well as a single planned future high-speed rail consist. Since two to three corridors may be ultimately be served by the CUT and it would be advantageous to allow for simultaneous boarding and alighting of more than one train if possible. To permit this operation it is desirable for a center platform to serve at least two tracks simultaneously. It is not possible for this arrangement without track modifications which would require relocation of the CSX mainline tracks or alternatively providing an overhead concourse to provide access to a separate platform located within the NS Gest Street intermodal yard on a similar arrangement as the original station but at a significantly smaller scale. A center platform also provides secondary capacity if a train is disabled or must layover in a station track (See Figure 8-7).
The figure above is based on a center platform 750 ft. long by 20 ft. wide with a new overhead connection from the existing Amtrak station waiting area. Two station tracks are shown in red with the relocated CSX mainline shown in blue. Equally as challenging as the platform design is design of the approach tracks and layover yards. See Section 8.3 for additional information.

8.2.4 Other Station Elements

The waiting areas, ticketing and concourse likely need to be expanded to meet the forecasted ridership. The existing Amtrak waiting room provides seating for 78 passengers. As noted above, the ancillary services (utilities, communications, security, restrooms, food service, etc.) needed to support the station are assumed be provided as part of the overall operations of the CUT by the
CMC. Revisions to the existing Amtrak lease for the facility for railroad operations will be necessary to mutually address a range of joint use issues which have implications that go beyond the current Amtrak operations. The author does not have access to the 1989 lease agreement between the City of Cincinnati, the CMC and Amtrak so it is not possible to definitively state what provisions may change. It is also unknown what entity would ultimately be responsible for operation of high-speed rail service and what its relationship would be with Amtrak and the CMC. The entrance to the current waiting area is located in close proximity to the Omnimax Theater and would like result in conflicting circulation of patrons if trains and showtimes are scheduled in close proximity and the current spatial layout of the station facilities remains in place. It should be noted that the 2007 Capital Improvement Plans for the CUT envisions the relocation of the Amtrak waiting area (CR Architecture 2009).

The Ohio Hub and MWRRS assume some station revenues could be obtained through advertising on premises. It is unlikely that any advertising within the CUT itself would be acceptable to the CMC and whatever revenues could be created would be limited to the platform area etc. It is likely that the existing food service operated by the CMC would experience an increase in sales and revenue as a result of a portion of rail passengers using the facility in addition to museum guests. The potential generation of additional revenues on site cannot be addressed without a review of existing and future lease agreements between the CMC, Hamilton County and rail operators.
8.3. Rail Road Operations

The site of the CUT was selected to provide connectivity to all railroads serving the Cincinnati area in the early 20th century. At the time of its construction, the five passenger and freight stations circling the CBD, while remote to each other, were linked by tracks located within Eggleston Avenue along the central Riverfront and even through Newport and Covington, Kentucky via the L&N Bridge. The majority of these track connections remained until the 1980’s. The last remaining remnants of the “Riverfront Running Track” linking the City’s east and west rail networks was removed for the construction of Paul Brown Stadium. Today it is no longer feasible to connect the tracks on the east and west sides of the CBD south of Norwood. All north or southbound rail traffic operating through Cincinnati must utilize the tracks in the Mill Creek Valley.

Through the consolidation of the railroads during the 20th century, only two major railroads (CSX and NS) own and operate the tracks in the Mill Creek Valley today). A third railroad company, Rail America operates on CSX and NS via trackage rights agreements linking its (I&O Railway) on the east with the (CIND) on the west. Coordination and acceptance of the project by the freight railroads will be critical for the use of the CUT as a high-speed rail passenger station. In the interest of time, the freight railroads were not directly contacted as part of this research.

The Mill Creek, the historic industrial heart of the region, has been the primarily location of the regions’ rail infrastructure and has been home to several rail yards. In the wake of the closure of the CUT, both CSX and NS constructed major intermodal and classification yards in the vacated
space left from the passenger platforms, coach yard and express mail yard during the 1970’s. The NS Gest Street and CSX Queensgate Yards are major facilities which process hundreds of railcars per day. Up to 100 trains per day operate along the CSX/NS tracks from St. Bernard near the Proctor and Gamble south to Hopple Street at the northern end of the CSX Queensgate Yard. The limited space and heavy volume of traffic in the corridor led CSX and NS to institute a directional running arrangement where the railroad operate on each other tracks in a one-way configuration from the Hopple Street north to Hamilton. This arrangement optimizes limited capacity similar to a one-way pair of urban streets. Despite these efforts, congestion remains which delays freight train as they wait to access the yards (See Section 6.2.1 for additional information).

The Ohio Freight Rail Choke Point Study identified several potential improvements to address capacity issues including construction of an additional main track in this area, improvements to switches at the north end of Gest Street Yard and a potential relocation of operations from Gest Street to Sharron Yard in Sharonville, Ohio or a new suburban location (Cambridge Systematics Inc. 2007). These congestion issues have been sited by Amtrak, NS and CSX as well as the ORDC as reasons forgo use of the CUT in the near term as a passenger rail station for the 3-C Corridor. All Aboard Ohio (the advocacy group of the Ohio Rail Passenger Association) acknowledged these problems and estimated the costs for providing additional capacity in the Mill Creek at $87 million in a letter to the FRA regarding the ORDC funding application for ARRA funds for the 3-C Corridor. This figure does not include provisions for dedicated station tracks, connections for the MWRRS Corridor nor a layover/maintenance yard.
8.3.1 NS Gest Street Yard

Immediately west of the CUT, lies the NS Gest Street classification and intermodal yard. This facility comprises two separate yard areas located on approximately 360 acres. The intermodal yard occupies the former passenger track area of the CUT and was purchased from the Union Terminal Company for $10 million in 1973. It includes seven tracks for temporary storage of intermodal trains and two tracks for loading/unloading trailers or shipping containers on flat cars via mobile rubber tired gantry cranes as well as paved lay down area for storage of containers, trailers and miscellaneous equipment. Hamilton County Auditor information indicates that the property is currently owned by a NS real estate holding company. The CUT overpass structures on Gest Street continue to be utilized to support the southern approach tracks. If the CSX mainline tracks are to be relocated westward to provide a space for dedicated station tracks
serving the CUT, a portion of the NS intermodal yard would be removed. Unless NS develops new intermodal capability within the Cincinnati area, it is unlikely that NS would agree to a reduction in capacity when intermodal traffic is the railroad industry’s largest growing volume and source of revenues.

8.3.2 CSX Intermodal Yard and Mainline Tracks

Located between the NS intermodal yard and the CUT are the two mainline tracks operate by the CSX railroad. CSX is the successor to the B&O, C&O and L&N railroads which were consolidated in the early 1980’s and historically has been the most prominent railroads in Cincinnati. The CSX trackage in this area is known as the Cincinnati Terminal Division and links Cincinnati by rail to Dayton, Indianapolis, Ashland, Lexington and Louisville. The mainline tracks are located adjacent to the existing Amtrak platform. When the Amtrak Cardinal is stopped at the CUT, it occupies the eastern mainline track effectively stopping through movement. Unless a dedicated station siding were created this same operation would apply to any future use of the existing Amtrak platform. Given that over 30 freight trains daily typically use this track, the combined six to twelve trains planned for the Ohio Hub and MWRRS Corridors may present unacceptable constraints while dwelling at the station platform.

In addition to the mainline tracks, CSX also operates what originally was an express bypass track for the CUT which passes under the building east of the passenger platform. This track currently serves as a connecting track to the CSX intermodal yard located approximately a mile north of the CUT where the former coaling tower, power plant and other service buildings were located.
In order to provide double stacked clearance under the CUT this track is lower in elevation that the mainline tracks.

North of the CUT, the single track connects to several lead tracks into the CSX intermodal yard (See Figure 8-3). The space occupied by this track could potentially be used as a dedicated station track but would require modifications to the yard access. There is currently no access from the concourse level to the CSX intermodal track under the concourse at the CUT. Similar to the NS Gest Street Yard, it is doubtful that CSX would alter use of this track without preservation or relocation of its existing intermodal capacity in the area.

8.3.3 Layover Yard

Both the MWRRS and Ohio Hub studies assume that a layover yard to accommodate at least one train set will be located in Cincinnati. Neither of these rail corridor studies or station studies conducted by the City of Cincinnati has designated a preferred location for a layover yard. The layover yard should provide a minimum of two tracks to store one train each along with potential for future expansion. Tracks used for layover services will require electrical power and potable water for trains to operate in standby mode. Electrical power needed for lighting, heating, cooling, or other auxiliary electrical services on the train is supplied by an external power source, rather than by the locomotive which is typically shut down to conserve fuel. It is assumed that train fueling will not be done in Cincinnati.

If the CUT is used as a terminal station it is desirable for the layover yard to have convenient track connections in close proximity to the station tracks while providing sufficient space to store
one or more train sets and service them if necessary. There is a potential that any of the existing yards within the immediate area (Gest Street, or Queensgate) could be used for such a function. More remote, but less constrained locations, such as the I&O McCullough Yard in Norwood, Ohio, several CSX sidings in Covington, Kentucky, NS sidings in Ludlow, Kentucky, or sidings along the CIND west of the Mill Creek could be used although may be less desirable.

8.3.4 MWRRS Connection

A new grade separated viaduct connecting the CUT passenger approach tracks to the B&O Southwestern (CSX) and New York Central Railroads (CIND) connecting Cincinnati with St. Louis and Indianapolis was built as part of the original CUT project in 1933 (See Section 6.1). The superstructure for the viaduct was subsequently removed in the 1970’s. The substructure of the viaduct remains in place (See Figure 6-3). The CIND has been assumed as the preferred route into Cincinnati for the MWRRS Corridor. With the removal of the viaduct there is not a direct connection between the CIND and the CUT.
It will be necessary to at least construct new bridge superstructure, track connections, switches and signals at both the CIND and the CSX approach tracks south of the CUT. The CIND and CSX tracks are currently being relocated as part of the City of Cincinnati’s reconstruction of the Waldvogel Viaduct at the western terminus of the former railroad viaduct. Restoration of the former CUT connection will require construction of a single-track bridge structure approximately 4,000 ft. in length over the Mill Creek, US-50, Gest Street and the CSX Wood
Street industrial track. Most of the right of way is owned by the City of Cincinnati or the CSX railroad, however, some parcels have been sold to private industry. It may be possible to utilize at least some of the remaining substructure units as they appear to be in fair condition but would require further engineering analysis. Such a structure would likely exceed $24 million based on MWRRS Capital Cost assumptions in 2002 dollars (Transportation Economics and Management Systems, Inc. 2004).

8.4. Economic Development

Economic development induced by rail stations has been touted in the MWRRS and Ohio Hub Studies as well as other rail planning efforts nationally and internationally. Intercity rail stations have served as an important foundation of economic development since the rise of the railroads in the mid 19th Century. In recent decades, most railroad stations in the United States have not been developed in city centers and have by and large had a marginal affect on surrounding land uses. There are a few notable station economic development successes in the United States, namely Union Stations in Chicago, Illinois and Washington, DC, which have been redeveloped as multitenant retail and commercial centers, as well as robust transportation hubs in relatively close proximity to the downtown cores of their respective cities.

8.4.1 Transit Oriented Development

Economic development surrounding rail stations of all types is often included under the guise of “Transit Oriented Development” (TOD). This term is a rather loosely defined concept which typically refers to compact mixed-use development located in proximity to a transit station or stop. Generally the urban design parameters of TOD give preference to pedestrian and bicycle
access but does not totally exclude automobile uses. Because of the focus on human scaled pedestrian access, the extent of TOD developments are generally assumed to be limited to a distance ¼ to ½ mile from the transit stop or station.

A large literature review of TOD was conducted by Robert Cervero, Christopher Ferrell, and Steven Murphy, from the Institute of Urban and Regional Development, University of California, Berkeley as part of the Transportation Research Board’s Transit Cooperative Research Program (TCRP) in 2002. This literature review focused on four areas: Institutional Issues, Evaluation of Impacts and Benefits, Implementation, and Urban Design. It found that while TOD is a nearly universally accepted and desired model for land use, empirical data which allows for evaluation of successful implementation of TOD or its transferability among locations is lacking. The effect on induced ridership and overall mode shifts is not well understood with gaps remaining on the understanding and quantification of public and private benefits associated with TOD (Cervero 2002).

The vast majority of TOD literature focuses on commuter rail, bus rapid transit and light rail transit station locations. There are similarities but also significant differences between mass transit or commuter rail and intercity passenger rail. For daily commuters, the location of a residence or business plays a more significant role than does an intercity passenger rail patron which perhaps may not ride more than a few times per year. Additionally, daily commuters typically do not have baggage needs or the use of rental vehicles or transit to reach destinations beyond the TOD.
Cincinnati does not currently have specific zoning or land use policies regarding TOD although there is growing interest in this topic both regionally and nationally. This issue is discussed in more detail in the following sections.

8.4.2 Inter City Passenger Rail Case Studies

In order to access what may be considered best practices in intercity passenger rail station planning and related economic development it is necessary to look beyond the large amount of TOD literatures to focus specifically on intercity passenger rail and more specifically high-speed passenger rail.

A review of recent case studies examining the potential benefits and best practices for rail station planning and transit oriented developments were conducted. This includes a review of the impacts of intercity passenger rail in three separate corridors by GEM Public Reality as part of a follow up study to evaluate the conclusions of the Ohio Hub Study and independent case studies of the development of intercity passenger stations in Rhode Island, as well as best practices for development of intercity rail stations developed as part of the proposed California High-speed Rail System. None of these case studies reveal consistent evidence that existing or planned intercity passenger rail stations are the catalyst for economic development or redevelopment of the surrounding areas. They did conclude that the primary determinant for the inducement of development or redevelopment surrounding the station areas is ease of accessibility and multimodal connectivity (See Section 3.4)
8.4.3 Surrounding Land Uses

The CUT is located in the Queensgate neighborhood and bordered on the east by the West End neighborhood of Cincinnati. Land use in the West End has historically been a mix of industrial, commercial warehousing and working class housing. It is home to a large minority population and demographically is one of Cincinnati’s poorest neighborhoods. During the later half of the 20th century former high-density housing and industrial developments were cleared for the construction of the CUT, public housing, Interstate 75 and subsequent urban renewal projects. The City of Cincinnati designated the area west of Interstate 75 as “Queensgate” during the 1960’s and began an effort to stimulate low density industrial and commercial redevelopment in consolidated superblocks. There are essentially no residential units within Queensgate.

In 1997, the West End and Queensgate neighborhood were included in the Cincinnati Area Empowerment Zone. More recently, the area has been identified in the Go Cincinnati Plan as a target area for a “green industrial” park development in a drivable suburban configuration (KMK Consulting Inc. and the Brookings Institution 2008).

As noted above, the existing land uses surrounding the CUT are primarily light industrial, wholesale distribution and warehousing. The majority of the existing structures were constructed in the urban renewal era of the in the later half of the 20th century. One notable exception is the former motherhouse for the Sisters of Mercy religious order located on the corner of Ezzard Charles Drive and Western Avenue which is partially vacant and used as an employment-training center.
The area is effectively bisected by the railroads to the west and Interstate 75 to the east with the CUT providing a physical barrier along its axis with the exception of Dalton Avenue. There is a limited number of property owners in close proximity of the CUT itself as shown on Figure 8-10.

To the east of Interstate 75 lies the City West public housing development which was constructed over the past five years replacing the former Laurel and Lincoln Court public housing complexes. City West consists of a mix of approximately 1,000 residential units comprised of market rate rental units, public housing units and owner occupied homes when fully built out. The West End Comprehensive Plan completed in 2002 envisions this area for medium density residential use combined with a potential arts district adjacent to the Ezzard

Figure 8-10  Major Property Owners (By Author)
Charles Interstate 75 Interchange. Areas west and north of the CUT are targeted for continued industrial development.

### 8.4.4 Accessibility

The CUT is primarily served by Ezzard Charles Drive providing a boulevard like connection from the primary entrance to the CUT east across Interstate 75 to Central Parkway. The surrounding area to the north and south is served by a series of low volume local and minor arterials. As noted in Section 7.3, the CUT is grade separate from the surrounding neighborhood street grid.

Interstate 75 runs north south approximately 2,000 ft. east of the CUT and provides direct access to the CUT via Ezzard Charles Drive. The interstate is planned to be reconstructed during the next five to ten years to provide additional capacity and improve safety. The design for the interstate and interchanges remains to be finalized. It is anticipated that interstate access to the CUT including the Ezzard Charles overpass structures will be retained. The new access may be provided via a parallel collector distributor system. Direct interstate access is an important asset for the CUT for its continued viability as the CMC or a railroad station.

The grade separated design of the station essentially cuts off the local street grid with the exception of Dalton Street which runs below the station. There are no sidewalk connections to the north and south and the existing portals to the adjacent streets have been abandoned (See Figure 8-2). Pedestrian access is limited to the east. The farthest limits of the existing CMC parking lots are located over a quarter mile from the platforms (See Figure 8-11). The lack of
pedestrian connections and limited vehicular access is a constraint on potential TOD even if zoning an urban design standards are implemented to support such development. The existing railroad yards located to the west do not allow any access.

SORTA currently operates fixed route bus service (Route 1) linking the CBD and Eden Park to the CUT with a half hour headway. Bus service is limited to daytime operations and does not operate during current predawn Amtrak Cardinal arrivals or departures.
There are proposals to extend a future streetcar loop to the site and taxi, shuttle or fixed route bus service could be implemented as needed. The City of Cincinnati is currently in the planning stages for development of a streetcar linking the CBD with the Uptown area surrounding the University of Cincinnati. At this time funding for construction and operation of the proposed streetcar has not been identified.

Figure 8-12 Proposed Cincinnati Streetcar (Source: HDR Inc., Cincinnati Streetcar Feasibility Study)
A rail connection to the Cincinnati-Northern Kentucky International Airport (CVG) in Hebron, Kentucky (the Cincinnati area’s primary commercial airport) does not currently exist. The airport is located approximately 13 miles south of the CUT. A proposed light rail transit corridor linking the CBD to the airport was proposed as part of the SORTA MetroMoves project in 2002 but funding and planning for this connection have not been advanced follow the defeat of a Hamilton County voter referendum which would have raised the County sales tax rate to partially fund the system.

The FRA’s Vision for High Speed Rail in America recommends that high-speed rail corridors be developed in urbanized areas less than 600 miles between origin destination pairs in order to compete with door-to-door times with current air transportation. While the site of the CUT does not preclude such a connection in the future, a connection between CVG and other regional airports via intercity passenger rail or through secondary public transportation systems should be considered. Several of the case studies repeatedly emphasis the importance of multimodal connectivity and include connections to adjacent airport facilities. This topic is beyond the scope of this project but should receive consideration as plans for intercity rail are advanced in the region.

8.4.5 Zoning

The CUT and the surrounding area in Queensgate west of Interstate 75 is zoned entirely as general manufacturing (MG) this designation does reflect the current land uses. The description of this zoning classification taken from the Cincinnati Zoning Code is as follows:
MG Manufacturing General

“To create, preserve and enhance areas that are appropriate for a wide variety of supporting and related commercial and manufacturing establishments that may have the potential to generate off-site impacts. Future development will accommodate heavy industrial and manufacturing uses, transportation facilities, warehousing and distribution and similar and related supporting uses. These uses typically require sites with good transportation access. Uses that may inhibit industrial development are prohibited.”

This zoning classification has been in place for some time even though the City of Cincinnati’s Zoning Code was last updated in 2004 (See Figure 8-13). The City has undertaken the development of an updated Comprehensive Plan as part of this process the City is investigating the potential to revise its existing use base zoning in favor of form based performance zoning which would allow additional flexibility in landuses in many zones. It is unknown if any changes will be made to the code provisions for manufacturing zones.
The CUT may not be characterized as a nonconforming use, but its use as a cultural institution does not meld with the description above. Due to its physical separation from the surrounding areas to the north and south and the isolation imposed by the rail yards on the west and Interstate 75 on the east, most public patrons of the CMC do not circulate within or are even aware of the adjacent land uses.

Based on historic and planned future use of the area, it is unlikely that a change in zoning will be necessary or desirable in the near future. More importantly, the current zoning would seem to prohibit any mixed used development typically associated with TOD or other rail station sites since they may conflict with industrial uses.
8.5. Station Costs

Significant capital costs will be incurred to implement new passenger rail service at the CUT. Ongoing costs for the operation, maintenance and staffing of the station will also need to be funded. It is assumed that the station will serve both the 3-C Corridor as well as the MWRRI Cincinnati to Chicago Corridor with two station tracks and up to 6 to 8 trains per day. The Amtrak Cardinal or a successor service would also operate from the station. Presumably, the timetables and frequency of service for the Amtrak Cardinal would be adjusted in the future to allow for daytime operations and transferability to the 3-C Corridor and MWRRI Corridor. Amtrak announced in April 2010 that is reviewing operations on some of its long distance routes including the Cardinal to determine if changes to current timetables or frequency of service may result in more favorable operating ratios and increased ridership.

My literature review and other research indicate that there are no recent capital or operational cost estimates for a CUT station serving all potential passengers rail corridors. The following cost estimate for the station and MWRRI connection combined with published estimates to provide additional capacity in the Mill Creek Valley could range up to $150 million making a proposed station at the CUT a significant regional investment.

8.5.1 Operational Costs

Operational costs are based upon the levels of staffing as well as the size of the facility and resulting maintenance and utility requirements. Since the final levels of service and passenger demand are not definitively known at this time it is difficult to estimate the ongoing operational costs for the station. Given the expected level of activity, it would appear reasonable to assume
that two full time staff would be present during operating hours. This does not include support cleaning and maintenance staff who would be employed on behalf of the Museum Center itself, nor would it include employees responsible for rolling stock servicing, maintenance, loading/baggage handling and security.

The current Amtrak facility is staffed during overnight hours when the Cardinal is scheduled to stop at the CUT. The Amtrak makes lease payments to the CMC for the space. Details of the current lease regarding allocation of utility payments, and maintenance costs have not been reviewed. It is presumed that these costs are wrapped into the overall lease payments for the space. Furthermore, it is assumed that any future rail station facility would execute a lease for space from the CMC or other successor entity. The joint use of the CUT with the CMC creates a level of complexity not found at other proposed station location throughout Ohio.

The 3-C Corridor “Quickstart” planning documents assume that the annual operational expenses for all stations on the corridor would be approximately $1.9 million in 2009 dollars (Amtrak 2009). This figure represents approximately 10% of the overall operational expenses for the service which total $29.2 million. It should be noted that this analysis did not specifically include use of the CUT for the Cincinnati terminal station. As noted in Sections 6.1 and 6.2, prior planning for high-speed passenger rail service has not considered the CUT as a preferred station location and therefore an evaluation of operational expenses associated with a CUT station has not been performed other than current Amtrak service.
Due to the highly variable nature of future passenger rail operations and lack of available data on the operational expenses of the current station, the development of an independent estimate of station operating expenses beyond the scope of this project. It should be a goal of any future feasibility study for the CUT to ascertain the likely operational expenses to accommodate passenger rail service the 3-C Corridor, MWRRI Corridor and Amtrak Cardinal. Most importantly, it will be necessary to determine isolate the portion of these expenses which would be generally fixed regardless of location and which are dependent on the use of the CUT that have both favorable and unfavorable impacts to the operating expenses.

8.5.2 Capital Costs

Capital improvements include not only the station itself but the work necessary to provide the track connections to the CIND as noted in Section 8.3.4, to relocate the NS Guest Street Intermodal Yard and to address congestion issues to and from the north noted in Section 8.3. The capital cost estimate developed for this report is conceptual in nature and should not be construed to be a precise measure of construction costs. The author does not possess detailed architectural and engineering drawings for the existing CUT or the existing railroad infrastructure in the area. The quantities for used in the estimate are based on available mapping, observations and assumptions. The capital cost estimate provides an order of magnitude that can be assumed for planning purposes and development of a scope of work for further study and investigations.

Capital construction costs for new passenger rail station faculties at the CUT can be divided in the following major elements.
• Demolition and removal of existing platforms, tracks and supporting infrastructure.

• Platform Construction

• Track Improvements (station tracks)

• Track Improvements (approaches, intermodal yard and mainline tracks)

• Signal Systems

• Lighting, communications and security

• Platform Canopies or weather protection

• Waiting room improvements (including overhead egress) to platform area

• Right of Way acquisition

• Mechanical, Electrical and Drainage Systems

• Parking and pedestrian improvements.

• Acquisition of Privately owned Right of Way

The programmatic requirements for the proposed station are discussed in Section 8.2. The following is a brief description of each of the major cost elements noted above. See Table 8-1 for a summary of estimated capital costs for the station and approach tracks. Unit costs assumed for the capital cost estimate are based upon recent planning studies for the 3-C “Quickstart” Environmental Assessment or other recent passenger rail studies. It should be noted that although the corridors served by the CUT are considered “high-speed” the design parameters, materials and methods of construction are virtually identical to conventional freight railroad
infrastructure. All new station construction would be in accordance with current design codes and specifications including applicable provisions of the Americans with Disability Act.

**Demolition and Removal of Existing Platforms, Tracks and Supporting Infrastructure.**

The existing platform, fending, lighting and adjacent CSX mainline and portions of the NS intermodal yard are assumed to be removed. This also includes subsurface utilities and any conflicting foundations, etc. The existing ramp and steps (remnants of the original CUT passenger concourse) would be removed. Phasing will be required to maintain operation of at least one CSX mainline track during this process. A minimum of two NS intermodal yard tracks will be removed to facilitate shifting the CSX mainline to the west to accommodate the proposed station tracks and platform as shown in Figure 8-7.

**Track Improvements (Station Tracks)**

It is assumed that a minimum of two station tracks will be necessary to serve both corridors as well as the Amtrak Cardinal. These tracks will be located on either side of a center platform as shown in Figure 8-7 and are approximately 2,100 ft. long. These tracks must be nearly level and set at a fixed elevation relative to the platform to allow for level boarding. This elevation difference is dictated by the specific passenger coaches utilized for the respective corridors. The station tracks must be tangent (straight) where adjacent to the platforms and somewhat beyond so that the gap between the passenger coaches and the edge of the platform is minimal and nearly uniform. It is estimated that approx 4,200 ft. of ballasted at-grade station tracks will be necessary.
Track Improvements (approaches, intermodal yard and mainline tracks)

The two existing CSX mainline tracks will be relocated west of their present location. To accommodate this relocation, a minimum of two NS intermodal yards tracks along with there connections must be removed. The relocated mainline tracks and the turnouts (switches) to allow for this alignment will be a significant expense. It is estimate those 7,200 ft. of relocated or replaced tracks will be required. The existing topography of the adjacent NS Yard is somewhat higher than the adjacent CSX mainline so some excavation and grading will be necessary to facilitate the relocation of the CSX mainline along with some retaining walls between the remainder of the NS Yard and the relocated mainline. The new tracks for the proposed connection for the MWRSS Corridor shown in Figure 8-9 are broken out separately. Track improvements to address existing constraints on capacity north of the CUT area will likely be required as well and are not included in the capital cost estimate for the station. See Section 8.3.2 for additional information.

Signal Systems

The configuration of the existing railroad signals must be modified or replaced to reflect the new track and platform configuration. The signals are controlled by electrical circuits made by the rails and a train occupying a particular segment of track. These circuits also control remote automatic switching of tracks to prevent collisions also known as interlocking. The author does not have detailed information on the configuration of the existing railroad signals in the vicinity of the CUT. An allowance for signal modifications based on the numbers of turnouts and station
tracks. There are no at-grade crossings in the vicinity which require preemption of traffic signals etc. (See Figure 8-3). Modifications of the existing railroad’s dispatching and train control software and hardware will likely be required as well but is not explicitly included in this cost estimate.

**Platform Construction**

A new center platform will be constructed. The platform is essentially a level concrete surface located between the station tracks where passengers wait and board trains. The platform is raised above the track elevation to permit ease of boarding. The proposed platform would be approximately 700 ft. by 20 ft. The height and dimensions of the platform are dictated by the rolling stock and the expected numbers of passengers who will be waiting. The platform construction would also incorporate some of the following elements such as lighting, security, canopies or other weather protection. If the platform is raised above the track to provide for level boarding it would only function for passenger traffic as larger horizontal clearances are required for freight operations.

**Lighting, Communications and Security**

Modern train stations include lighting, communications, video monitoring and other access control and monitoring. Detailed design criteria for these elements have not been developed but an allowance is used to cover these elements. It is assumed that power and communications will be provided as part of the overall building systems CUT and could potentially be integrated with plans for overall capital improvements to the CUT developed by the CMC.
Platform Canopies, Seating and Weather Protection

The passenger platform will not be located within a building structure and therefore will be exposed to the elements. It is assumed that the passenger platform would provide a partially sheltered area protected from precipitation and potentially wind. It is also assumed that at some seating will be provided as well. This project does not propose any specific architectural design parameters for these elements which can range from the very basic to elaborate and highly visible signature elements for a station. Given the passenger platform’s location away from the public view and essentially below grade with respect to the passenger waiting areas, it is unlikely that the platform will be a signature design element for the surrounding areas. An allowance for platform canopies and seating has been provided.

Waiting Room and Support Area Improvements (including overhead egress to platform)

The CMC has identified a host of major capital improvements needed to repair, preserve and expand the CUT to meet the long-term needs of its member museums. As part of this strategy the existing Amtrak waiting area may be relocated (CR Architecture 2009). It is assumed that the waiting area will remain in essentially the same location. Since the proposed passenger platform will be located further west than the current facilities it will be necessary to construct an overhead connection to the platform which will span one of the station tracks and provide elevator and stair access. Although the MWRRI and Ohio Hub included the potential for express package shipping the proposed design does not include any dedicated facilities for the loading or
processing of express package, mail or freight shipments distinct from passenger carryon baggage.

**Mechanical, Electrical and Drainage Systems**

Mechanical, electrical and drainage systems will be replaced or improved for the waiting area pedestrian connections and platform areas as part of the overall CUT capital improvement program. Power will be provided for lighting, communications, signaling, switching and for train set auxiliary power units. The mechanical electrical and drainage improvements for the tracked and approaches, signals and switching are incorporated into the costs of those items and would be in accordance with the operating railroads design parameters.

**Parking and Pedestrian Improvements.**

As noted above a new overhead pedestrian connection will need to be constructed from the waiting area to the passenger platform. This includes stairs and elevator access to the platform. The pedestrian circulation needs to be segregated from the public areas of the CMC operations to the extent feasible. It is likely that additional dedicated supply of on site parking will be needed either in a surface lot or a parking structure to meet the long-term forecasted ridership. It is assumed that provisions for a three-hundred space surface parking lot must be constructed near the CUT. For additional discussion of this issue please see Section 8.2.2.
Acquisition of Privately Owned Right of Way

The CUT building and surrounding parking is owed by the City of Cincinnati as is some of the adjacent land to the north. The land immediately to the west where the passenger platform and approach tracks would be located is owned by a variety of corporate partnerships, holding companies or predecessor companies to the CSX and NS railroads. The future ownership structure for the platform and approach tracks remains to be determined. These facilities could potentially be owned by one or more of the railroads and leased back to the City or state Ohio or the state could attempt to acquired this property and own it outright. It should be noted that while NS and CSX depend on mutual cooperation to facilitate railroad operations in the Mill Creek Valley they are also competitors in many markets and any relocation of facilities and exchanges of land must be considered to be equitable for both railroad and will be key driver of costs and complexity in developing a station at the CUT. The valuation of railroad property is very complex and relevant valuations are not publically available by the Hamilton County Auditors office since railroad right of way is exempt from taxation under the Ohio Revised Code. An allowance is provided for the lease or purchase of railroad property.

Railroad Improvements

Besides the station and its approach tracks it will likely be necessary to undertake several improvements to increase capacity of the NS and CSX tracks in the Mill Creek Valley north of the CUT. This includes potential improvements north to the vicinity of the NS Sharon Yard in Sharonville. These improvements may include the construction of an additional mainline track
from a point near Hopple Street northward two and a half miles to what is known as NA junction near the former Proctor and Gamble Ivorydale complex where the CSX and NS mainlines diverge from single corridor as they proceed north to Butler County. Other capacity improvements include improved access into the NS Gest Street Yard from the north and improved connections in the vicinity of the NS Sharon Yard. The costs for these improvements will likely exceed those associated with the station improvements themselves. The Ohio Department of Transportation has tentatively awarded funding to the Cincinnati Port Authority to being a feasibility study of possible railroad capacity improvement in the Mill Creek Valley which may facilitate operation of the CUT for future passenger rail service. This study will build upon work done by the Ohio Freight Rail Choke Point Study and others. Conceptual cost estimates for these improvements are $75 to $100 million. See Section 8.3 for a more detailed description of the railroad operations in this area.

Table 8-1 provides a summary of the Capital Costs for the proposed CUT station. Note that these costs are for 2009 dollars and do not include future inflation. The total costs are estimated to be approximately $13 million. This is significantly higher than the $2.6 million estimate for the Cincinnati Station included in the ORDC 3-C “Quickstart” planning documents (Amtrak 2009 Appendix 1, Rail Station Costs, RL Banks Associates) which assumed a new at grade single platform located along the Oasis line near Lunken Airport (See Figure 6-1 Error! Reference source not found.). Despite the differential in station costs they are likely to represent 10 to 15% of the overall capital improvement cost necessary to allow passenger rail service from all planned corridors to operate from the CUT.
## Table 8-1: Estimated Station Costs

<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity</th>
<th>Unit</th>
<th>Unit Price</th>
<th>Costs</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demolition and removal of Platform</td>
<td>9,750</td>
<td>SF</td>
<td>$20</td>
<td>$195,000</td>
<td>Removal of platform, steps and ramp</td>
</tr>
<tr>
<td>Earthwork</td>
<td>22,000</td>
<td>CY</td>
<td>$20</td>
<td>$440,000</td>
<td>Grading to lower NS intermodal tracks (assume ave 6' depth)</td>
</tr>
<tr>
<td>retaining walls</td>
<td>9,000</td>
<td>SF</td>
<td>$35</td>
<td>$315,000</td>
<td>Wall between station tracks and NS yard and CSX intermodal lead tracks</td>
</tr>
<tr>
<td>Mainline Track</td>
<td>7,200</td>
<td>TF</td>
<td>$200</td>
<td>$1,440,000</td>
<td>Assumes replacement of existing CSX mainline</td>
</tr>
<tr>
<td>Turnouts</td>
<td>10</td>
<td>EACH</td>
<td>$160,000</td>
<td>$1,600,000</td>
<td>Turnout angle to be determined</td>
</tr>
<tr>
<td>Relocate Track</td>
<td>1,000</td>
<td>TF</td>
<td>$150</td>
<td>$150,000</td>
<td>Relocation of existing NS/CSX track connections north and south</td>
</tr>
<tr>
<td>Remove Track</td>
<td>11,000</td>
<td>TF</td>
<td>$25</td>
<td>$275,000</td>
<td>Removal of Ex. CSX mainline and NS intermodal tracks</td>
</tr>
<tr>
<td>Railroad Signals</td>
<td>12</td>
<td>EACH</td>
<td>$100,000</td>
<td>$1,200,000</td>
<td>Assumes 8 switch signals and 4 station track signals</td>
</tr>
<tr>
<td>Elevated Pedestrian Connection</td>
<td>1</td>
<td>LUMP SUM</td>
<td>$1</td>
<td>$300,000</td>
<td>Elevated enclosed pedestrian connection approx 800 SF</td>
</tr>
<tr>
<td>Waiting Room Renovations</td>
<td>1</td>
<td>LUMP SUM</td>
<td>$1</td>
<td>$450,000</td>
<td>General interior renovation and expansion of waiting area with furnishings</td>
</tr>
<tr>
<td>Mechanical/Electrical/Plumbing</td>
<td>1</td>
<td>LUMP SUM</td>
<td>$1</td>
<td>$400,000</td>
<td>Includes both interior and exterior MEP</td>
</tr>
<tr>
<td>Platform Construction</td>
<td>15,400</td>
<td>SF</td>
<td>$35</td>
<td>$539,000</td>
<td>Center elevated platform 48&quot; high 700' long, 20' wide</td>
</tr>
<tr>
<td>Lighting</td>
<td>1</td>
<td>LUMP SUM</td>
<td>$60,000</td>
<td>$60,000</td>
<td>Exterior lighting for platform and approach tracks</td>
</tr>
<tr>
<td>Security and Communications</td>
<td>1</td>
<td>LUMP SUM</td>
<td>$50,000</td>
<td>$50,000</td>
<td></td>
</tr>
<tr>
<td>Weather Shelters/Platform Seating</td>
<td>1</td>
<td>LUMP SUM</td>
<td>$250,000</td>
<td>$250,000</td>
<td>Partial Coverage of station with weather protection</td>
</tr>
<tr>
<td>Surface Parking</td>
<td>300</td>
<td>SPACES</td>
<td>$4,000</td>
<td>$1,200,000</td>
<td>Assumes construction of new surface lot adjacent to station</td>
</tr>
<tr>
<td>Subtotal Construction Costs</td>
<td></td>
<td></td>
<td></td>
<td>$8,669,000</td>
<td></td>
</tr>
<tr>
<td>Construction Contingency (20%)</td>
<td></td>
<td></td>
<td></td>
<td>$1,733,800</td>
<td>Construction contingency should not be lower than 20% but may be higher</td>
</tr>
<tr>
<td>Total Construction Costs</td>
<td></td>
<td></td>
<td></td>
<td>$10,400,000</td>
<td>This cost is in current year dollars and does not account for inflation</td>
</tr>
<tr>
<td>Engineering and Design</td>
<td>Percentage 0.09</td>
<td>$936,000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction Management</td>
<td>Percentage 0.03</td>
<td>$312,000</td>
<td></td>
<td>Station Only (no track connection or capacity improvements)</td>
<td></td>
</tr>
<tr>
<td>Project Management</td>
<td>Percentage 0.05</td>
<td>$520,000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Soft Cost</td>
<td></td>
<td></td>
<td></td>
<td>$1,770,000</td>
<td></td>
</tr>
<tr>
<td>Right of Way</td>
<td>5</td>
<td>ACRE</td>
<td>$100,000</td>
<td>$500,000</td>
<td>Total acquisition of railroad right of way TBD. 5 acres is placeholder. The valuation of railroad property is a place holder.</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td>$12,670,000</td>
<td></td>
</tr>
</tbody>
</table>

TF (track feet) includes two rails, connection plates, ties, ballast and subballast
This estimate does not include SW connection for MWRRI Cincinnati-Chicago Connection or separate layover and maintenance yard
This estimate does not include modifications to railroad dispatching or traincontrol software and hardware
9. Conclusions

Based upon research conducted for this project the following conclusions can be made.

9.1. Physical Constraints and Railroad Operations

The rolling topography of Cincinnati restricts the locations where railroad construction is economically viable. These corridors generally follow existing watercourses where the grades of the alluvial floodplains are generally flat enough to permit railroad construction without significant cuts, fills, bridges and tunnels.

The historic development of railroads in Cincinnati led to the establishment of five separate facilities remotely located from each other surrounding the CBD by the end of the 19th century. The individual railroad stations were consolidated to the CUT in 1933. During subsequent years the connections between the original station locations and the railroads on the east and western sides of the City of Cincinnati have been removed. The CUT remains well located for connections to the intercity rail corridors into Cincinnati with the exception of the railroads to the west along US-50 including the CIND which has been identified for future passenger rail use for the MWRSS Corridor to Chicago and the railroads from the east including the SORTA owned and I&O operated “Oasis Line”.

During the post World War II period, the supporting passenger yards and infrastructure for the CUT were gradually abandoned and removed ultimately including the passenger concourse and approach tracks in 1973. The freight railroads (NS and CSX) subsequently reoccupied much of
this area with new intermodal yards and track connections. The growing freight operations and constrained space have led to significant congestion on the remaining network as trains wait to access NS Gest Street and CSX Queensgate Yards. Without addressing these existing capacity constraints, delays to passenger trains to and from the north will likely result unacceptable delays and degrade on-time performance.

The current Amtrak station is served by a single existing CSX mainline track. Any passenger service will occupy this track while stopped at the station unless dedicated station tracks are constructed. This track currently serves more than thirty through trains daily and the railroads have indicated that they cannot accommodate passenger rail operations without capacity improvements in the Mill Creek Valley.

The existing passenger platform used for Amtrak service is long enough to service the anticipated rolling stock for future intercity passenger rail. It does not meet ADA accessibility requirements and does not provide shelter from inclement weather or provisions for baggage handling and as previously noted, is served by a single Amtrak mainline track. It would be beneficial for a platform to be served by two dedicated passenger tracks and provide ADA compliant boarding while linked to adjoining waiting areas and supporting services.

A relocated or expanded passenger platform will require relocation of the CSX mainline tracks, adjacent NS intermodal yard and/or leed tracks to the CSX intermodal yard. The freight railroads will likely require mitigation of these impacts with new or expanded yard capacity elsewhere.
Accommodations for layover/maintenance facilities could potentially be provided within the existing freight yards in the vicinity if the freight railroads can allocate space. More remote locations could also be feasible if needed. There is no vacant track space in close proximity to the CUT.

There is currently no physical connection between the CUT and CIND railroad designated as the preferred route for the MWRRS rail corridor linking Cincinnati to Chicago. A new elevated track connection will be required as shown on Figure 8-9. This connection will likely cost more than $24 million or twice the estimated cost of the station itself. There are no direct connections between the CIND and alternative station sites with the exception of Longworth Hall on the riverfront (See Figure 6-1).

9.2. Operational Issues

The CUT has been successfully reused as a home for the CMC. While the CMC is a cultural success, it has struggled to remain profitable and has required public funding for continued operations and maintenance. Significant funding will be required to fund repairs and capital improvements to sustain the viability of the building for the long term (CR Architecture 2009). Current operations of the CMC and Amtrak station do not post a significant conflict with each other. The same may not be true if future intercity passenger rail services are implemented.

Legal agreements will need to be established defining the respective and equitable allocation of funding, roles and responsibilities among the CMC, City, County, passenger railroad operator and others as needed. It is unlikely that revenues from station advertising, parking and other
concession could directly fund railroad operations since this revenue is dedicated to operation of the CMC and since operational and maintenance costs from the CUT building exceed revenues.

If forecasts for future ridership are accurate, expansion of the existing surface parking will likely be required to accommodate both museum patrons and rail passengers. If the current Amtrak waiting room is utilized there may be circulation conflicts between rail passengers and museum patrons (in particular Omnimax Theater guests).

Based upon the existing configuration of the CUT and surrounding land uses and zoning and similar case studies, it is unlikely that that implementation of future intercity passenger rail will spur growth of mixed-use development within close proximity of the station. While the CMC has a net positive economic impact on the region and could be characterized as a stabilizing factor in real-estate values for Queensgate and the west end, the CUT is physically isolated from the surrounding neighborhood to large degree. Current zoning and land use plans envision continued industrial use of the area but recent planning initiatives have envisioned the entire I-75 corridor with the potential for increased densities and mixed uses. Based on the existing landuses, lack of intermodal connectivity, levels of ridership and review of case studies, the author believes increases in economic activity resulting for intercity passenger rail operations at the CUT will likely be modest. The majority of direct employment growth will be attributable to staffing the train station and increase sales of food, parking revues and rental cars/transit.

The CUT may remain the best location in the region to connect with the three future rail passenger corridors linking Cincinnati with Chicago and Cleveland as well as improved Cardinal
service to the east. Alternative locations do not have the direct connectivity to all three corridors but could function through circuitous connections.
10. Proposed Next Steps

10.1. Union Terminal Station Feasibility Study

The Cincinnati City Council passed a resolution on March 3, 2010 stating that the City of Cincinnati wishes to utilize the CUT as its passenger railroad station if possible. Furthermore, it requests that the ORDC initiate studies necessary to identify the improvements, cost and timeline to accommodate if the CUT is feasible. If the ORDC determines that use of the CUT is not feasible within five to seven years a “temporary station” location will be determined. This project evaluates the use of the CUT as terminal station intercity passenger rail operations. The evaluation is conceptual in nature and is subject to inherent limitations resulting from lack of access to unpublished or proprietary information and well as limits in time and resources. This project also does not provide a comparison between the CUT and other potential sites for an intercity passenger rail station in Cincinnati.

This project does not draw a definitive conclusion on the feasibility or desirability of the CUT station for expanded intercity passenger rail services. It does identify several constraints and pending issues which should be explored in more detail in future studies. Some of these conclusions highlight conflicts with prior rail planning studies or raise topics which were not considered in detail by these studies.

The Ohio Department of Transportation (ODOT) as initiated consultant led environmental studies for future implementation the 3-C Corridor. Presumably the scope of this study
(although corridor wide in its breadth) should include an evaluation of the likely environmental impacts of use of the CUT including not only the 3-C operations but provisions for a future layover/service yard it is not known if the studies will evaluate potential connections to the MWRRS Cincinnati-Chicago corridor as well. For Cincinnati, this corridor is forecast to generate the most ridership and would provide a direct link to Chicago which will remain the hub of Midwest passenger rail service and should be included in all future rail planning activities in the region although completion of this corridor is largely under the prevue of the State of Indiana.

The Cincinnati Port Authority in conjunction with the CMC submitted an application to the Ohio Transportation Review Advisory Council (TRAC) for approximately $1 million in funding to conduct a feasibility study for construction of a 4th railroad main in the Mill Creek Valley in the fall of 2009. This study would also include a review of improvements to passenger rail access at the CUT. The funding for this study has been tentatively approved by the Ohio Department of Transportation. While the final scope of work and funding for this study remain to be determined, it is readily apparent that detailed capacity analysis and a preliminary engineering study of the railroad operations in the Mill Creek is critical to improving the efficiency of freight operations and to accommodate future implementation of intercity passenger rail service. NS and CSX will play a critical role in determining if they can provide additional physical space to accommodate passenger rail operations without degrading freight operations.

As noted previously, the intermodal yards of the respective railroad would likely need to be reconfigured to accommodate dedicated station tracks, platforms and supporting infrastructure.
The sources of funding for these improvements remain to be determined and are not specifically included in the recent award of ARRA funding for implementation of the 3-C “Quickstart” service. Further study for connections to the CIND to facilitate passenger rail service to Chicago envisioned by the MWRRI have not been discussed in the scope of work for this study.

Beyond the railroad facilities use of the CUT will require ongoing negotiations to evaluate how joint operations for the CMC and passenger rail would affect each party and to provide an equitable share of operational and maintenance costs as well as capital improvements such as increased parking, security, etc. Future planning efforts should recognize the existing cultural use of the CUT and surrounding land uses and not anticipate significant generation of on site or TOD related revenues to support station operations.

Complaints that the station remains too remote from the CBD remain and the City of Cincinnati, ODOT, SORTA and others should take proactive steps to improve accessibility to the station including improvements in public transportation and linkages to the surrounding neighborhood. Opportunities may also exist to integrate the relocation of the existing Greyhound passenger station which will be displaced by a proposed Casino development at Broadway Commons.

Lastly, the presumption that the CUT should serve as the City of Cincinnati’s future rail station by political leaders and public advocates may be rooted more in nostalgia than in a technical evaluation of existing conditions and forecasted demand. Further evolution of the CUT should be balanced with a comparative evaluation of other potential station sites which may provide
adequate provisioned for passenger rail service without the physical and operational constraints of the CUT.
Bibliography


