TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

1.0 INTRODUCTION/PURPOSE AND NEED

The State of Ohio has been working to re-establish passenger rail service on the rail corridor between Cleveland, Columbus, and Cincinnati (3C Corridor). Ohio's proposed 3C Quick Start Phase 2 connects Cleveland, Columbus, Dayton and Cincinnati with modern, conventional speed (79 mph) passenger trains in the state's most densely-populated travel corridor, a corridor that last had passenger rail service in 1971. This initial service will respond to a growing demand for passenger rail in Ohio and set the stage for more and faster (110 mph) trains, which are being planned by Ohio and its neighboring states.

The project consists of track and capacity improvements along an existing freight rail corridor from Cleveland (Cleveland Amtrak Station) through Columbus and Dayton to Cincinnati (at or near the RailAmerica Undercliff Yard), through the communities of Berea, Olmstead, Grafton, Shelby, Crestline, Galion, Delaware, Springfield, Fairborn, Riverside (East Dayton Station), Middletown, and Sharonville, a distance of approximately 250 miles. The proposed operating plan consists of three round trips per day.

The 3C Quick Start Phase 2 contains three segments of independent utility. Each of the segments include: track infrastructure capacity; signals; track speed improvements; grade crossing safety improvements; stations; and service, inspection and layover facilities. In the best case scenario, the three segments could commence simultaneously. However, actual construction phasing will be developed in coordination with the host railroads and finalized in the Master Agreement. Construction phasing will be contingent upon material (ties, rail, etc.) and workforce (labor) availability. For the purpose of advancing the project through the next phase, the three segments will be developed in separate, but related National Environmental Policy Act (NEPA) documents. In the event that the Ohio Department of Transportation (ODOT) is unable to advance the entire 250 mile corridor, the independent segments can be advanced as separate, but related, projects.

The segments are:

- Cleveland to Columbus, with stations located in Cleveland, Southwest Cleveland and Columbus
- Columbus to North Cincinnati, with stations located in Springfield, East Dayton, Dayton and North Cincinnati
- North Cincinnati to Cincinnati with a station located in Cincinnati

In accordance with Section 1506.1 of the President's Council on Environmental Quality's (CEQ) regulations governing NEPA process (40 CFR Part 1500-1508), until the Federal Railroad Administration (FRA) completes the environmental process or complies with NEPA, no action concerning the proposed project will be taken that would limit the choice of reasonable alternatives to be explored. No action covered by this project will be taken that would significantly affect the quality of the human environment unless it is justified independently of this project, is accompanied by adequate environmental documentation, and will not prejudice the ultimate decision of this project. The 3C Quick Start project would enable the re-establishment of passenger rail service on the 3C Corridor at speeds up to 79 mph.

1.1 Project History

Passenger rail service has not been available to most Ohioians since the Penn Central Railroad terminated passenger operations in 1970. The State of Ohio has planned for the reinstitution of passenger train service on its 3C Corridor and vested several state agencies with that responsibility.

Current initiatives to advance passenger rail service in Ohio have been the responsibility of the Ohio Rail Development Commission (ORDC), which was established by the Ohio General Assembly in 1994. The Ohio Hub Study, which began in 2002, is a cooperative effort led by Ohio with support from several adjacent states, Amtrak, and Via Rail Canada to further develop the financial and economic feasibility of an intercity/interstate passenger rail system serving all of the major metropolitan areas in the region while connecting to the proposed Midwest Regional Rail System (MWRRS) and the developing corridors in neighboring states. The establishment of the Ohio Hub would add critical links between Chicago and Columbus and extend the reach of the MWRRI network to the Northeast and Canada.

The federal government has demonstrated new commitment and funding for intercity and high speed rail. In response, ORDC has accelerated planning efforts for both the 3C Corridor and the Ohio Hub. These efforts include successful application in 2008 for FRA high speed planning funds, which were used to begin a fresh update of previous 3C Corridor planning efforts. In 2009, ORDC has focused on the preparation of an application for initial 3C service called Quick Start. The 3C Quick Start Passenger Rail project was added to the State Transportation Improvement Program (STIP) by amendment on May 20, 2009. This amendment included $7 million for the environmental phase of project development work.

In mid-2010, ODOT and ORDC advanced a Tier 1 Environmental Assessment and Preliminary Engineering for the 3C Quick Start project.

With the election of a new Governor in November 2010, the project changed direction. ODOT and ORDC instructed the project team to develop an Interim Summary Report to document data collection activities and other project work that had been advanced to date. This document also addresses next steps should the project be further developed in the future.

This project does not currently appear on any Long Range Plan or Transportation Improvement Program (TIP) at the Metropolitan Planning Organization (MPO) level. ORDC and ODOT will work in close coordination with the appropriate MPO agencies to pursue these amendments and the necessary project-specific air quality analyses, as funds are identified.

1.2 Project Area

The project area lies along an approximately 250 mile long rail corridor that extends in a northeast direction across the state of Ohio between Cleveland and Cincinnati via Columbus, Springfield, and Dayton. The corridor is generally in the area parallel to I-71 between Cleveland and Columbus, north of I-70 between Columbus and Dayton, west of I-75 between Dayton and West Chester Township, and east of I-75 between West Chester Township and Cincinnati. The action proposed in this document is within and adjacent to existing railroad rights-of-way within this corridor.

1.3 Logical Termini

FRA regulations do not specifically address the definition of independent utility, the Federal Highway Administration (FHWA) definition of the term is sufficiently broad enough to apply to rail actions. FHWA regulation (23 CRF 771.111(f)) provides guidance on defining a reasonable project definition to be considered in a NEPA document: "In order to ensure meaningful evaluation of alternatives and to avoid commitments to transportation improvements before they are fully evaluated, the action evacuated in each EIS or finding of no significant impact (FONSI) shall:

- Connect logical termini and be of sufficient length to address environmental matters on a broad scope;
- Have independent utility or independent significance, i.e. be usable and be a reasonable expenditure even if no additional transportation improvements in the area are made; and
- Not restrict consideration of alternatives for other reasonably foreseeable transportation improvements."

The logical termini for this project are rational end points for the transportation improvement and limits for the review of the environmental impacts resulting from implementation of the improvement. The logical termini are:

- The northern terminus is the Lakefront Amtrak Station located at 200 Cleveland Memorial Shoreway, in Cleveland.
- The southern terminus is a new passenger rail station to be located off of Lunken Park Drive in Cincinnati, less than 1,000 feet west of Lunken Municipal Airport.

The terminus locations were selected as the logical termini for the project because they are the most northern and southern assumed station locations for 3C Quick Start Passenger Rail service.

The northern terminus is the existing Amtrak Station serving Cleveland. At the northern terminus, the Cleveland Lakefront Amtrak Station is an urban location near parklands, recreational destinations and open space. This location will connect to existing passenger rail service to major regional destinations in the eastern half of the United States, including Chicago, New York, Boston, and Washington D.C.

Connections to other forms of transportation are also available at this site. These include a shared station location with both Blue and Green rapid transit lines in downtown Cleveland. Existing bus transit is available within three blocks and major highway connections are available within 1.5 miles.

The 3C Quick Start Passenger Rail service southern terminus location is approximately one-half mile from a major roadway connection at Columbia Parkway (US Route 50) and SR 32. Current land uses at the southern terminus in Cincinnati consist of an existing rail freight yard, light industrial businesses and Lunken Municipal Airport. Local bus transit options will be provided to establish direct access between the assumed station location and various destinations in Cincinnati.

The southern terminus of this project in Cincinnati connects to the Oasis Line, which has been identified as the preferred rail route for local commuter service as part of the HAM/CLE-Oasis Rail Corridor project currently under development by ODOT. This light

rail commuter service is proposed to offer future local connections at the following southern and eastern locations:

- Downtown Cincinnati
- East Riverfront
- Pendleton/East End
- Columbia-Tusculum
- Newtown
- Anchor Industrial Park
- Milford

While this project will provide improved mobility and connections throughout the state, it does stand on its own in terms of independent utility. If development of the HAM/CLE-Oasis Rail Corridor Project is delayed, the 3C Corridor will continue to function via local bus transit options and direct connections to major highway facilities. The two projects both have independent NEPA actions and will function exclusive of each other and do not preclude any existing or future transportation networks/projects.

1.4 Purpose and Need

Purpose and need are closely linked but subtly different. The *need* is the definition of a problem and the *purpose* is an intention to address the problem. Purpose describes why the sponsoring agency is proposing an action that may have environmental impacts and provides the basis for selecting reasonable and practicable alternatives for consideration, comparing the alternatives, and selecting the preferred alternative (40 CFR § 1502.13 ["The statement shall briefly specify the underlying purpose and need to which the agency is responding in proposing the alternatives including the proposed action"]; see also NEPA § 102.).

1.5 Purpose of 3C Quick Start Phase 2

The purpose of reestablishing a conventional (up to 79 mph) passenger rail service in the 3C Corridor is to provide a reliable train system that links Ohio's three largest cities (Cincinnati, Columbus, and Cleveland) and delivers predictable and consistent travel times. The service is intended to provide travel options and to develop the passenger rail market for further development in the future. This Quick Start service, once established, will allow for future improvements and expansion projects that will advance the 3C Corridor toward meeting the FRA's definition of "Emerging High Speed Rail" with top speeds of 90 to 110 mph. Further objectives are to provide interfaces between this new passenger rail system, major commercial airports, other mass transit systems, and the highway network; and to relieve capacity constraints of the existing transportation system in a manner sensitive to and protective of Ohio's human and natural resources.

This purpose is consistent with recent federal transportation policies, most notably are those listed below.

- Vision for High-Speed Rail in America, United States Department of Transportation (USDOT), April 2009.
- The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) (Public L.109-59; 119 Stat. 1144 [2005]).
- Transportation Equity Act for the 21st Century (TEA-21) (Pub. L. 105-178; 112 Stat. 107 [1998]), and its predecessor.
- The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) (Pub. L. 102-240; 105 Stat. 1914 [1991]), which encourage public transportation

investment that increases national productivity, and domestic and international competition, while improving safety and social and environmental conditions.

Specifically, these policies encourage investments that offer benefits such as those listed below.

- Link all major forms of transportation.
- Improve public transportation systems and services.
- Provide better access to seaports and airports.
- Enhance efficient operation of transportation facilities and service.

ODOT and ORDC plan to establish a passenger rail system that is coordinated with the state's existing transportation infrastructure network, particularly bus lines, urban transit lines, highways, and airports. Stakeholder input, combined with ongoing engineering, planning, economic, and ridership studies have helped refine the purpose of the 3C Quick Start Phase 2.

1.6 Goals and Objectives for the 3C Quick Start Phase 2

A 3C Quick Start Passenger Rail/High Speed Rail Purpose and Need stakeholder workshop was held on July 7, 2009 at the Fawcett Center in Columbus. The goal of the workshop was to obtain a broad cross section of ideas on the project's purpose and need, objectives, benefits, issues, and opportunities of both a Quick Start conventional rail service and a future higher speed system. Stakeholders from across the state convened to provide their input regarding anticipated and hoped for objectives of the short-term conventional passenger rail service and longer term efforts to achieve high speed rail. The stakeholder input gathered from this workshop was useful in identifying the desired outcomes of the stakeholders. The following list summarizes the 3C passenger rail goals and objectives developed by ORDC, ODOT, and stakeholders:

1. Improve the intercity travel experience for all Ohioans regardless of age by providing comfortable, safe, frequent, and reliable high-speed travel.
2. Refocus development opportunities along rail corridors and create opportunities to strengthen assets in the downtown cores and help to reduce sprawl.
3. Maximize intermodal transportation opportunities by locating stations and future stations to connect with local transit, airports, and highways.
4. Enhance the "image" of the 3C Corridor and Ohio thus increasing the region's competitiveness for future employers and employees.
5. Provide a travel choice that would be desirable to many of today's younger generation that seek a less car-dependent lifestyle, and help to keep a younger workforce in Ohio.
6. Connect an aging population to health facilities generally located in the major cities.
7. Preserve environmental quality and protect Ohio's sensitive environmental resources by reducing emissions and vehicle miles traveled for intercity trips.
8. Maximize the use of existing transportation corridors and rights-of-way, to the extent feasible.
9. Attract an entirely new passenger rail support economy to Ohio and thus help to create local employment and associated benefits.
10. Enhance freight rail efficiency and operations, where possible.
11. Support and expand tourism opportunities.

1.7 Purpose and Need for 3C Quick Start Conventional Passenger Rail

The purpose of reestablishing conventional passenger rail service in the 3C Corridor is to provide a reliable train system that links Ohio's three largest cities and delivers predictable and consistent travel times. Taking into account the aforementioned stakeholder input and ongoing studies, the following lists the various needs identified for the 3C Quick Start service.

Expand travel options between Ohio's largest cities

- The three largest cities in Ohio, Cleveland, Columbus, and Cincinnati, are not currently served by passenger rail service that links them. Ohio's existing intercity passenger rail service consists of long-distance service with four Amtrak trains operating along three east-west routes. This system connects 11 Ohio cities and towns with Pittsburgh, Chicago, Indianapolis, and Buffalo. Ohio station locations include Akron, Alliance, Bryan, Cleveland, Elyria, Hamilton, Sandusky, Toledo, and Cincinnati. Columbus and Dayton are not served at all with passenger rail service. Existing service is infrequent and inconvenient and does not serve the travel markets between Cincinnati, Columbus, Cleveland, and points north.
- To meet goals outlined in ACCESS OHIO 2004 – 2030, Ohio's statewide multimodal transportation plan, there needs to be a full complement of transit services with flexibility, mobility options, and intermodal connections within Ohio.
- Between 2000 and 2030, the Ohio Department of Development estimates that the state's population of those aged 65 or older will increase by approximately 750,000 people, or 49.8 percent. Ohio's population is steadily growing older and senior mobility will become increasingly important. Intercity passenger rail service is one means of providing alternative transportation options to this elderly population.
- The population of the metro areas of Cleveland, Columbus, Dayton, and Cincinnati are expected to grow by 10.4 percent in the next 20 years, from 6,280,150 in 2008 to 7,003,810 in 2030 (Table 1-1).
- This growth is expected to increase the number of person trips between the major cities over the next 20 years by as much as 33 percent, especially Columbus (Table 1-2).

Table 1-1. Population Changes in 3C Corridor Major Metropolitan Areas

City	2005 Population	2030 Population	Percent Change
Cleveland	2,131,880	2,134,850	0.14%
Columbus	1,708,410	2,222,490	30.09%
Cincinnati	1,595,800	1,810,240	13.44%
Dayton	844,060	836,230	-0.93%
Total	6,280,150	7,003,810	10.4%

Source: Ohio Department of Development, Office of Strategic Research, March 2004
Note: The metropolitan areas are defined as follows:
Cleveland: Cleveland, Elyria, Mentor metropolitan areas, the counties of Cuyahoga, Geauga, Lake, Lorain, and Medina
Columbus: Columbus metropolitan area, the counties of Delaware, Fairfield, Franklin, Licking, Madison, Morrow, Pickaway, and Union
Cincinnati: Cincinnati-Middletown, OH-KY-IN (Ohio Part) metropolitan areas, the counties of Brown, Butler, Clermont, Hamilton, and Warren
Dayton: Dayton metropolitan area, the counties of Greene, Miami, Montgomery, and Preble

Table 1-2. Person Trips between the 3C Corridor Major Cities 2005 – 2030

Major City	Year	Person Trips Cleveland	Person Trips Columbus	Person Trips Cincinnati
Cleveland	2005		5,150	1,240
	2030		6,550	1,230
	% change		27%	-1%
Columbus	2005	5,080		9,610
	2030	6,620		12,790
	% change	30%		33%
Cincinnati	2005	1,160	9,780	
	2030	1,190	13,050	
	% change	3%	33%	
Dayton	2005	800	7,910	5,610
	2030	860	8,930	6,260
	% change	8%	13%	12%

Source: ODOT, 2005

Meet travel demand in the I-71 and segments of I-70 and I-75 corridors

- Ohio contains one of the nation's largest and most heavily traveled roadway systems. I-71, I-70, and I-75, experience heavy congestion, especially in the urban areas. Population growth outside of these cities has created a higher demand for capacity and increased vehicle miles traveled.
- Average daily traffic (ADT) volumes on many key links of the interstate highways connecting the 3C cities are expected to increase 15 to 83 percent over the next 20 years, increasing congestion and reducing travel times. As identified in Table 1-3, several links along the interstate system are expected to reach saturation by 2030, causing delays to intercity travel.

Table 1-3. Daily Traffic Volumes on Key Interstate Links along the 3C Corridor

			Daily Vehicle Average Daily Traffic (ADT)		Peak Period Volume to Capacity Ratio (V/C)		Daily Vehicle Flow	Peak Period (V/C)
Corridor	**Location**	**Dire-ction**	**2005**	**2030**	**2005**	**2030**	**2005-2030**	**2005-2030**
Cleveland to Columbus	I-71 South of I-80 Junction	SB	44800	56200	0.37	0.48	25%	30%
	I-71 South of I-80 Junction	NB	45700	56700	0.64	0.78	24%	22%
	I-71 South of I-271 Junction	SB	30200	41800	0.55	0.70	38%	27%
	I-71 South of I-271 Junction	NB	33200	47200	0.57	0.91	42%	60%
	I-71 Btw CLE & COL	SB	23200	32500	0.45	0.63	40%	40%
	I-71 Btw CLE & COL	NB	26300	35500	0.52	0.70	35%	35%
	I-71 North of I-270 Junction	SB	50900	93100	0.64	1.08	83%	69%
	I-71 North of I-270 Junction	NB	54300	97400	0.36	0.58	79%	61%
Columbus to Cincinnati	I-71 South of I-270 Junction	SB	51400	68400	0.49	0.68	33%	39%
	I-71 South of I-270 Junction	NB	53000	71200	0.76	0.90	34%	18%
	I-71 Btw COL & CIN	SB	20800	27200	0.36	0.46	31%	28%
	I-71 Btw COL & CIN	NB	21400	27500	0.42	0.54	29%	29%
	I-71 North of I-275 Junction	SB	65300	87600	0.74	1.08	34%	46%
	I-71 North of I-275 Junction	NB	67000	89600	0.45	0.50	34%	11%
Columbus to Dayton	I-70 West of I-270 Junction	WB	38800	48100	0.36	0.45	24%	25%
	I-70 West of I-270 Junction	EB	36400	45400	0.64	0.74	25%	16%
	I-70 Btw COL & DAY	WB	21600	24900	0.39	0.49	15%	26%
	I-70 Btw COL & DAY	EB	21900	26900	0.44	0.48	23%	9%
	I-70 East of I-675 Junction	WB	35900	42000	0.50	0.64	17%	28%
	I-70 East of I-675 Junction	EB	39400	46900	0.38	0.43	19%	13%
Dayton to Cincinnati	I-75 South of I-675 Junction	SB	61700	74200	0.50	0.60	20%	20%

			Daily Vehicle Average Daily Traffic (ADT)		Peak Period Volume to Capacity Ratio (V/C)		Daily Vehicle Flow	Peak Period (V/C)
Corridor	**Location**	**Dire-ction**	**2005**	**2030**	**2005**	**2030**	**2005-2030**	**2005-2030**
	I-75 South of I-675 Junction	NB	58200	69600	0.85	0.99	20%	16%
	I-75 North of I-275 Junction	SB	69200	83700	0.83	1.10	21%	33%
	I-75 North of I-275 Junction	NB	68700	81900	0.33	0.37	19%	12%

Source: ODOT, 2005

Respond to statewide air quality concerns, work to alleviate current and future regional congestion, and help foster environmental sustainability

- Side-by-side comparisons by the United States Department of Transportation (USDOT) show that the overall energy consumption per passenger traveling by train is nearly half that of airplanes or cars.
- Since the introduction of the Congestion Mitigation/Air Quality program in 1990, FHWA has documented several cases of passenger rail projects resulting in improved air quality. These include service start-ups, expansions and even purchase of higher capacity rail passenger cars.
- Passenger rail will provide an alternative to automobile and air travel, resulting in environmental benefits that include decreased energy consumption and reduced air pollutant emissions from automobiles. Reducing the amount of vehicular trips will, therefore, provide an incremental improvement to air quality and minimize impacts to ecological resources.

Improve travel reliability in the 3C Corridor

- Interstate travel time is impacted by many factors. Delays can be caused by weather, construction, and congestion in both car and airplane trips. Corridor trains have a relatively high on-time performance record providing greater predictability in travel time over other modes. A breakdown of peak travel speeds on key interstate links in the 3C Corridor for 2005 and 2030 are listed in Table 1-4. Table 1-5identifies the interstate travel time between the major metropolitan areas along the 3C Corridor. Several key links in the interstate system are expected to reach capacity by 2030, resulting in congestion and delays. Overall travel speeds are expected to decrease as much as 53 percent over the next 21 years, with intercity travel times increasing by as much as 10 percent for what is currently a two hour trip.
- Multi-modal connections between rail, transit rail, bus transit, roadway, bicycle and pedestrian modes will supplement the 3C Quick Start service in order to link passengers with their final destinations. Representatives from numerous transit agencies in Ohio were present at the project's second Stakeholder Workshop meeting on August 20, 2009. The transit agencies of Cincinnati, Dayton, Columbus, Shelby, Akron, and Cleveland all indicated their eagerness to work with ODOT to provide transit service to and from 3C stations.

Table 1-4. Peak Travel Speed on Key Interstate Links 2005 and 2030

			Peak Travel Speed		Peak Travel Speed
Corridor	**Location**	**Dir-ection**	**2005**	**2030**	**2030**
Cleveland to Columbus	I-71 South of I-80 Junction	SB	62	61	-2%
	I-71 South of I-80 Junction	NB	58	51	-12%
	I-71 South of I-271 Junction	SB	63	58	-8%
	I-71 South of I-271 Junction	NB	63	43	-32%
	I-71 between Cleveland & Columbus	SB	65	64	-2%
	I-71 between Cleveland & Columbus	NB	65	58	-11%
	I-71 North of I-270 Junction	SB	64	30	-53%
	I-71 North of I-270 Junction	NB	68	65	-4%
Columbus to Cincinnati	I-71 South of I-270 Junction	SB	66	61	-8%
	I-71 South of I-270 Junction	NB	57	46	-19%
	I-71 between Columbus & Cincinnati	SB	66	65	-2%
	I-71 between Columbus & Cincinnati	NB	66	64	-3%
	I-71 North of I-275 Junction	SB	59	30	-49%
	I-71 North of I-275 Junction	NB	67	67	0%
Columbus to Dayton	I-70 West of I-270 Junction	WB	67	66	-1%
	I-70 West of I-270 Junction	EB	63	58	-8%
	I-70 between Columbus & Dayton	WB	66	65	-2%
	I-70 between Columbus & Dayton	EB	65	65	0%
	I-70 East of I-675 Junction	WB	67	64	-4%
	I-70 East of I-675 Junction	EB	68	67	-1%
Dayton to Cincinnati	I-75 South of I-675 Junction	SB	66	64	-3%
	I-75 South of I-675 Junction	NB	50	38	-24%
	I-75 North of I-275	SB	52	28	-46%

			Peak Travel Speed		Peak Travel Speed
Corridor	**Location**	**Dir-ection**	**2005**	**2030**	**2030**
	Junction				
	I-75 North of I-275 Junction	NB	68	68	0%

Source: ODOT, 2005

Table 1-5. Interstate Travel Time between Major Metropolitan Areas along the 3C Corridor

Origination City	Destination City	2005 Time (Minutes)	2030 Time (Minutes)	Percent Increase
Cleveland	Columbus	146	152	4
Columbus	Dayton	75	82	9
Columbus	Cincinnati	115	127	10
Dayton	Cincinnati	69	74	7

Source: ODOT, 2005

Create multi-model connections between the 3C rail and bus transit systems, existing interstate rail, and alternative transportation modes

- Linking the urban transit systems of Cleveland, Columbus, Dayton, and Cincinnati would help improve mobility options for residents of all four cities. A resident of Cleveland, for example, might be able take a light rail train to the downtown Amtrak station and transfer to an intercity train ride to Columbus or Cincinnati.

Improve travel safety in the 3C Corridor

- The safety advantages of rail travel over automobiles are well documented. Driver fatigue and other factors increase the potential for accidents as trip lengths increase, especially if hotel and restaurant breaks are skipped to save expense or time. Trains have state-of-the-art safety equipment and technology, and are driven by trained professionals who are regularly required to review tests and checks. Many of the intersections and road segments with the highest crash rates in Ohio are near the 3C Corridor. Table 1-6 identifies the accidents and fatalities, by service location, that occurred along I-71, which runs between Cleveland, Columbus, and Cincinnati.
- According to FRA statistics, Ohio ranked seventh nationally in terms of collisions at railroad grade crossings and eighth nationally in the number of fatalities in 2008. Improvements associated with this project at grade rail crossings including associated warning and lighting systems throughout the corridor will enhance the overall safety for auto travelers, pedestrians, and cyclists.

Table 1-6. Interstate Accidents and Fatalities by 3C Corridor Service Location

Interstate	Location	2008 Accidents	2008 Fatalities
I-71	Cleveland/Cuyahoga County	797	2
I-71	Columbus/ Franklin County	1228	4
I-70	Columbus/Franklin County	1137	8
I-75	Dayton/Montgomery County	1202	1
I-75	Cincinnati/Hamilton County	1682	4
I-71	Cincinnati/Hamilton County	1175	3

Source: Ohio Department of Public Safety, 2008

Stimulate economic growth

- Investment in public transportation creates jobs and puts dollars back into the community. For every $1 invested in public transit, $6 are generated in the local economy. (ACCESS OHIO 2004-2030, November 2004) In addition, Ohio's public transit systems employ approximately 60,000 people.
- As noted during public meetings for the Ohio's 21st Century Transportation Priorities Task Force, business owners view connecting the workforce to workplace as critical. Good jobs frequently go unfilled due to the lack of connection between those who need jobs and the businesses that have them. (Report of Ohio's 21st Century Transportation Priorities Task Force, January 2009).
- Passenger rail service and new stations encourage the development of nearby properties. The *Ohio and Lake Erie Regional Rail Ohio Hub Study* (July 2007) estimates that the Ohio Hub will create 16,700 permanent jobs and generate more than $3 billion in development activity near stations. Reliable rail service in urban centers will foster establishment of commercial and retail opportunities in the form of restaurants, shops, and office space. Additionally, passenger rail service and new stations will provide thousands of construction jobs.
- The Midwest's largest cities are too far from one other—and from the small towns that separate them—to function as an efficient economic unit. Driving times are long, airfares are high, and flying time-plus-ground travel makes many airline trips almost the same amount of time as driving trips between the same destinations. Regional growth depends on region wide collaboration. However, travel times between most Midwestern cities exceed the 2-to-3-hour "day trip zone" upon which successful collaboration depends. Business thrives best when business people can visit customers and suppliers and return home within the same day. (Midwest High Speed Rail Association, ***http://www.midwesthsr.org/benefits/economy.html (2009)***.

1.8 Purpose and Need Summary

The purpose of the project is to establish a new passenger transportation system in the 3C Corridor, providing additional mobility options and an entirely new transportation mode choice for travelers, with associated benefits. In order to successfully achieve this purpose, the project must meet the following identified needs in the 3C Corridor.

- Expand travel options between Ohio's largest cities.
- Meet travel demand in the I-71 corridor and segments of the I-70 and I-75 corridors.

- Respond to statewide air quality concerns, work to alleviate current and future regional congestion, and help foster environmental sustainability.
- Improve travel reliability.
- Improve travel safety.
- Stimulate economic growth.

While addressing the above discussed needs in the 3C Corridor, ODOT is committed to incorporating additional goals and objectives identified by the stakeholders. These considerations include improving the intercity travel experience for all Ohioans, refocusing development opportunities along rail corridors, creating opportunities to strengthen downtown cores and reduce sprawl, maximizing intermodal transportation opportunities, enhancing the image of the 3C Corridor and Ohio to increase the region's and state's competitiveness, providing a desirable travel choice for those seeking a less car dependent lifestyle, connecting an aging population to health facilities located in the major cities, preserving environmental quality and protect Ohio's sensitive environmental resources, maximizing the use of existing transportation corridors, attracting an entirely new passenger rail support economy to Ohio and create local employment, enhancing freight rail efficiency and operations, and supporting and expanding tourism opportunities.

1.9 Tiered NEPA Process

Council on Environmental Quality regulations (40 CFR 1502.20) allow NEPA studies for large, complex transportation projects to be carried out in a tiered process. This tiered approach to transportation decision making under NEPA involves preparation of a Tier 1 NEPA document that focuses on broad issues such as purpose and need, general location of alternatives, transportation mode composition (auto, truck, rail, utilities), and the avoidance and minimization of potential environmental effects.

The Tier 1 Environmental Assessment (EA) for this project addressed the range of program decisions (i.e. cities and stations served, route alternatives, service levels, ridership projections, and type of operation – electric, diesel, speed, etc.) associated with the high speed rail corridor from Cincinnati to Cleveland. The Tiered NEPA process is appropriate to make broad program decisions for large expansive corridor projects that are: 1) too large to be addressed in detail in one document; 2) are phased over time; 3) where future phases are not fully defined; or 4) when major routing or service alternatives need to be evaluated. FRA has issued guidance specific to the current program. The following is excerpted from "Compliance with the National Environmental Policy Act in *Implementing the High-Speed Intercity Passenger Rail Program*" issued August 13, 2009.

> *"In many, if not most, of the corridors around the country where substantial improvements are needed to implement significantly expanded conventional or high-speed rail services, what FRA has defined in the guidance as "Service NEPA" is an essential first step. Service NEPA (which CEQ refers to as programmatic) typically addresses the broader questions relating to the type of service(s) being proposed, including cities and stations served, route alternatives, service levels, types of operations (speed, electric, or diesel powered, etc.), ridership projections, and major infrastructure components. For a major rail corridor improvement program, this type of environmental review must be completed before any substantial investments in the corridor can be made."*

> *"Several different approaches are available to accomplish Service NEPA, including Tiered NEPA (Tier 1 environmental impact statement (EIS) or environmental assessment (EA) followed by Tier 2 EISs, EAs or categorical exclusion determinations (CE)) or non-Tiered NEPA (one EIS or EA covering both service issues and individual project components)."……."The decision on the appropriate level of documentation for a particular proposed action would be made by the FRA in consultation with the applicant."*

ODOT consulted with the FRA on the 3C project and determined that a Tier 1 EA was the appropriate form of documentation for the previous stage of project development.

Upon approval of the Tier 1 EA the project would then advance to Tier 2. The Tier 2 NEPA process would address site-specific alignment alternatives, project impacts, costs and mitigation measures. In addition, individual properties that may be affected would be identified. The second tier generally involves the preparation of several separate NEPA documents including Environmental Impact Statements (EISs); EAs; or Categorical Exclusions for specific stand alone projects within the overall corridor that have independent utility.

1.10 Next Steps

Following approval of the Tier 1 EA and identification of the Preferred Alternative, the project was then advanced to the Tier 2 NEPA process. The Tier 2 NEPA process consists of individual environmental and engineering studies addressing location-specific design details and environmental impacts to smaller sections called Sections of Independent Utility (SIU). SIUs are portions of the preferred corridor alternative that can be constructed independently of each other. Tier 2 NEPA studies focus on individual SIUs. Once a Tier 2 NEPA process is completed for a SIU, engineering plans will be developed and construction of that SIU could begin.

This Interim Project Summary Report is being submitted to provide an overall update on project activities through the end of December 2010. It includes work that was performed to collect environmental field data, information on how route alternatives and recommended capacity alternatives were developed and an update on the status of development for station and maintenance facility locations. The information in this report will be included in the Tier 2 NEPA documents prepared for the three SIUs.

2.0 ALTERNATIVES

2.1 Introduction

Numerous alternatives have been identified for the route alignment, station locations, and facility locations for 3C Quick Start Passenger Rail service. These alternatives have been reviewed at varying levels during past phases of the project.

The following references pertain to the evaluation and development of the 3C alignment, stations, and facilities:

- *3C Quick Start Passenger Rail Environmental Assessment*, prepared by Parsons Brinckerhoff, dated August 2010.
- *3C Railroad Capacity Analysis: Recommended Capacity Additions (Preliminary)*, prepared by the Woodside Consulting Group, Inc., dated July 22, 2009.
- *Capital Cost Estimates Associated with 3C Rail Corridor Stations*, prepared by R.L. Banks & Associates, Inc. in association with Burgess & Niple, dated September 22, 2009.
- *Feasibility Report on Proposed Amtrak Service: Cleveland-Columbus-Cincinnati*, prepared by Amtrak, dated December 18, 2009.
- *Ohio High Speed Intercity Passenger Rail Application: 3C Quick Start Corridor Program Financial Plan*, prepared by Ohio Department of Transportation, dated October 2009.
- *Ohio High Speed Intercity Passenger Rail Application: 3C Quick Start Corridor Program Service Development Plan*, prepared by Ohio Department of Transportation, dated October 2009.
- *White Paper: Rail Freight Congestion Issues in the Cincinnati Mill Creek/Queensgate/Cincinnati Union Terminal Area*, prepared by the Ohio Rail Development Commission, dated March 1, 2010.

The evaluation procedures and current recommendations for 3C service are detailed in the sections below.

2.2 Alignment Development

Route alternatives were initially evaluated during the 3C Quick Start Passenger Rail Tier 1 Environmental Assessment (EA). The following sections describe the project development process for identifying the preferred alternative and its various components.

2.2.1 History of Route Evaluations

Thirty-three route options were developed for the 3C Corridor in 2009. These routes are listed below as well as shown in

Figure 2-1. There were 28 route options for the north segment between Cleveland and Columbus and five route options for the south segment between Columbus and Cincinnati. Some segments had one or more defined sub-segments.

North Segment (Routes between Cleveland and Columbus):

1. Direct Route
2. via Elyria
3. via Lorain
4. via Medina
5. via Marion
6. Akron-Medina
7. Akron-Wadsworth
8. Akron-Barberton

9A. Kent-Akron-Medina (Kent-Akron via CSX)
9B. Kent-Akron-Medina (Kent-Akron via METRO)
9C. Kent-Akron-Medina (Kent-Akron via W&LE)
10A. Kent-Akron-Wadsworth (Kent-Akron via CSX)
10B. Kent-Akron-Wadsworth (Kent-Akron via METRO)
10C. Kent-Akron-Wadsworth (Kent-Akron via W&LE)
11A. Kent-Akron-Barberton (Kent-Akron via CSX)
11B. Kent-Akron-Barberton (Kent-Akron via METRO)
11C. Kent-Akron-Barberton (Kent-Akron via W&LE)

12. Akron-Medina-Marion
13. Akron-Barberton-Marion
14. Kent-Akron-Medina-Bucyrus-Marion
15. Akron-Mansfield via Abandoned Erie
16. Kent-Akron-Mansfield via Abandoned Erie

17A. Akron-Canton-Mansfield via North Canton to NS
17B. Akron-Canton-Mansfield via Hartville to NS

18. Akron-Massillon-Wooster-Mansfield via RJC/NS

19A. Akron-Wooster-Mansfield via abandoned Warwick-Orrville-NS
19B. Akron-Mt. Vernon via abandoned Warwick-Orrville-Mt. Vernon

20A. Kent-Akron-Canton-Mansfield via North Canton to NS
20B. Kent-Akron-Canton-Mansfield via Hartville to NS
20C. Kent-Canton-Mansfield via Hartville to NS

21A. Akron-Brewster-Newark via Massillon
21B. Akron-Brewster-Newark via North Canton and Canton
21C. Akron-Brewster-Newark via Hartville and Canton

22A. Kent-Akron-Brewster-Newark via Massillon
22B. Kent-Akron-Brewster-Newark via North Canton and Canton
22C. Kent-Akron-Brewster-Newark via Hartville and Canton

23. Kent-Akron-Brewster-Newark direct via Hartville-Canton
24. Akron-Brewster-Zanesville-Newark via Massillon
25. Elyria-Bellevue
26. Elyria-Sandusky-Bellevue
27. Lorain-Bellevue
28. Lorain-Sandusky-Bellevue

South Segment (Routes between Columbus and Cincinnati):

29. South Route to Cincinnati Union Terminal
30. Direct South Route to Lunken Airport
31. Hamilton-Cincinnati to Cincinnati Union Terminal

32. Hamilton-Cincinnati to Lunken Airport
33. Hamilton-Cincinnati via Washington Court House

Figure 2-1. Potential 3C Quick Start Passenger Rail Routes

As described in Section 1.6, goals and objectives were development by the Ohio Department of Transportation (ODOT) and the stakeholders as a result of the workshop help on July 7, 2009 in Columbus. Nine evaluation measures were created to address the goals and objectives. The evaluation measures are listed in Table 2-1.

Table 2-1. Evaluation Measures

Evaluation Measure	Goal(s) Addressed
Travel time – measures the end-to-end travel time, including station dwell time. Better travel times are more attractive to passengers and generate more ridership.	1, 2, 3, 4, 6
Annual riders – measures the number of passengers estimated to ride the service. Ridership is affected by travel time, station location, and station access.	1, 3, 5, 6, 7, 8
Annual passenger miles – measures the length of passenger trips. Higher numbers represent longer passenger trips; i.e. passengers find the service more attractive for longer journeys.	1, 3, 5, 6, 7, 8
10-mile and 15-mile population/track miles – measures the potential market served by each alternative. Higher numbers indicate a larger population with access to the rail line.	1, 3, 5, 6, 7, 9, 11
Reliability – measures the expected reliability of the line. Reliability is a major determinant in a person's choice to take transit.	1, 2, 4, 5, 6, 7, 9, 10, 11
Operations and maintenance costs – measures the relative cost of the provided service. Reducing operating costs is important in providing a cost-effective project and service.	1, 5
Refocus development opportunities – measures whether the alternative can be used to help focus development in station areas, increasing potential ridership and reducing sprawl.	2, 4, 8
Connect to all modes – measures whether the alternative connects with existing transit services in the cities along each alignment. Providing connections to existing transit enlarges the potential market by expanding the transit network.	3, 11
Connect to major health facilities – measures whether the alternative connects with major medical facilities, thereby providing another mode of transportation for Ohio residents to obtain quality health care.	6

For the consideration of alternative 3C Quick Start Rassenger Rail alignments, the route screening process was performed in a three tiered approach:

- Level 1 Screening – Considering a wide array of alignment options, the alternatives were evaluated to determine the viability of the alternative routes and the appropriateness of the alignments. Alternatives with most favorable characteristics were retained for Level 2 Screening.

- Level 2 Screening – Alternatives that were retained from Level 1 Screening were developed in detail with regard to geometric characteristics of alignment and service characteristics. Evaluation criteria addressed critical factors such as capital costs, safety, reliability, ridership forecasts and travel time competitiveness.
- Level 3 Screening – Alternatives retained from Level 2 Screening were evaluated based on criteria including markets served, reliability, as well as additional qualitative measures.

The alternative routes were evaluated against the above measures presented in Table 2-1. For screening purposes, the direct route between Cleveland and Columbus (North Alternative #1) and direct route between Columbus and Cincinnati (South Alternative #30) were used as baseline for comparing the options. Screening measures were employed in phases based on evaluation criteria, as shown in (Table 2-2).

Table 2-2. Route Evaluation Criteria

Screening Level	Evaluation Criteria	Measure
1	Route Characteristics	• Route length compared to direct route • Percent of single vs. double track • Percent abandoned and out-of-service track • Percent Class 1 main vs. secondary and shortline
1, 3	Market Size	• Support economic development by serving major town centers/cities • Population served within 10 miles and 15 miles of alignment
2, 3	Capital and Operating Costs	• Cost to upgrade from out-of-service, abandoned or shortline • Right-of-way costs • Dispatching costs • Operating costs • Track maintenance costs
2, 3	Travel Time	• Travel time at 79 mph (after accounting for recovery, dwell and handoff times)
2	Safety	• Number of at-grade rail crossings • Number of at-grade road crossings • Other safety factors
2, 3	Reliability	• Number of hand-offs from Class 1 to Class 1 • Number of hand-offs from Class 1 to shortline • Percent of joint trackage • Extent of shared freight track usage • Typical freight traffic
2, 3	Other Factors	• Commuter rail use • Modal connections • Special geometry issues: turnouts, crossovers, etc. • Train control (signals and communications) • Existing stations, terminals and maintenance facilities

2.2.2 Preferred Alignment from Tier 1 EA

As a result of the Tier 1 EA process and public involvement feedback, the direct route option was recommended as the Preferred Alignment Alternative for the following reasons:

- Travel Time – EA-1 has the shortest estimated travel time among all alternatives.
- Market Size – Annual riders in horizon year 2014 for EA-1 are the highest among all alternatives. Additionally, annual passenger miles in 2014 are also the highest among all alternatives.
- Capital Costs – Capital costs for EA-1 are lower than or comparable to those of other alternatives and thus rates favorably for cost consideration.

- Operating and Maintenance Costs – Operating costs for EA-1 are comparable to the capital costs of other remaining alternatives.
- Safety – EA-1 has a moderate number of rail crossings and a low number of at-grade highway crossings and has comparable safety issues as compared to other alternatives.
- Reliability – EA-1 has the same or fewer operational hand-offs from Class 1 to Class 1 or Shortline railroads compared to other alternatives. Freight traffic is high to medium compared to other alternatives. This alternative uses NS, CSX, and RailAmerica's IORY trackage rights. Assuming all necessary agreements are in place with the host railroads, no significant operational issues exist for EA-1. Proposed service for EA-1 is more likely to have better reliability compared to other alternatives.
- Other Factors – EA-1 has comparable opportunities for future commuter rail use on the corridor as compared to other alternatives. Additionally, the number of modal connections is high compared to other alternatives. Key stakeholder interest for this alternative is high. This alternative meets the goal of refocusing development opportunities in the communities served and adequately connects to major health facilities. Thus, in regard to these factors, this alternative rates favorably.

The direct route, referred to as EA-1, is a combination of North Alternative #1 and South Alternative #30 as shown in (
Figure 2-1).

Figure 2-2. Preferred Alternative for 3C Quick Start Passenger Rail Service

2.2.3 Project Segments

The 3C Quick Start Phase 2 project is being considered in three distinct segments of independent utility as described below:

Segment 1 – Cleveland to Columbus

The Cleveland to Columbus segment includes stations in Cleveland, Southwest Cleveland and Columbus; maintenance and layover yards in Cleveland and Columbus; capacity addition projects and track upgrades on the rail line segment; and grade crossing improvements. Tracks in this segment are operated by both Norfolk Southern Railroad Company (NS) and CSX Transportation (CSX).

Segment 2 - Columbus to North Cincinnati

The Columbus to North Cincinnati segment includes passenger rail stations in Springfield, East Dayton, Dayton and North Cincinnati; capacity addition projects and track upgrades on the rail line segment; and grade crossing improvements. Tracks in this segment are operated by Norfolk Southern Railroad Company (NS).

Segment 3 - North Cincinnati to Cincinnati

The North Cincinnati to Cincinnati segment includes a station in Cincinnati, a maintenance and layover facility in Cincinnati, capacity addition projects and track upgrades on the rail line segment, and grade crossing improvements. Tracks in this segment are operated by RailAmerica.

2.2.4 Alignment Improvements

Infrastructure Improvements

Infrastructure improvements were identified by the Woodside Consulting Group during a previous phase of the project. The proposed work would provide capacity additions required to allow for passenger rail service without affecting existing freight operations. The freight operators within the 3C Corridor are NS, CSX, and RailAmerica.

Eleven projects for achieving the necessary capacity were identified by Woodside. The projects range from construction of new track, crossovers, and siding to rehabilitation of existing siding. A twelfth improvement project, providing new connection track between NS and RailAmerica's IORY Line in Sharonville, was identified by Amtrak. All twelve projects were included in ODOT's Financial Plan and Service Development Plan for the Ohio High Speed Intercity Passenger Rail Application to the Federal Railroad Administration (FRA).

A summary of all the improvement projects is provided in (Table 2-3). Limits of each improvement project are shown on a statewide map provided in Appendix A1.

Table 2-3. Infrastructure Capacity Addition Projects

Segment	Project No.	Location	Description of Improvements
(1) Cleveland to Columbus	1	NS/CSX Berea Interlocking	Construct new connection track and crossovers
	2	CSX Greenwich Subdivision	Construct new 2nd main track from CP 54 to CP 71
	3	CSX Edison Siding	Rehabilitate and extend siding from QE 90.8 to QE 93.9
	4	CSX Paget Siding	Construct new siding from QE 110.8 to QE 112.9
	5	CSX Powell Road Siding	Construct new siding from QE 125.1 to QE 127.1
	6	CSX/NS Columbus Crossovers	Construct new crossovers to create a paired track arrangement at QE/CJ 134.4
	7	CSX/NS Columbus Station Track	Construct new station track and crossover at CP 138
(2) Columbus to North Cincinnati	8	NS Plattsburg to Brooks	Construct new 2nd main track on from CJ 172.5 to CJ 177.7
	9	NS Cold Springs to Enon	Construct new 2nd main track on from CJ 187.0 to CJ 193.0
	10	NS Riverside to Dayton	Construct new 2nd main track from CJ 202.1 to CJ 208.5 and from CJ 208.6 to CJ 209.8
	11	NS Sharonville	Convert existing yard lead to 2nd main track, construct 2.1 mile by-pass track through Sharonville Yard, install three crossovers and construct new bridge
(3) North Cincinnati to Cincinnati	12	NS/IORY Sharonville	Construct connection track between NS and IORY to allow train movement to and from the Oasis Line

Track Upgrades

In order to achieve maximum speeds of 79 mph where possible, track improvements will be required. Amtrak has identified specific segments where such upgrades would be required, as shown in (Table 2-4). Each of the listed upgrade projects was included in ODOT's Financial Plan and Service Development Plan for the Ohio High Speed Intercity Passenger Rail Application to the FRA.

Ultimately, any specifically proposed track upgrade must be negotiated with the host railroad company. These agreements must be in place before the project can proceed.

Limits of each proposed track upgrade project are shown on a statewide map provided in Appendix A2.

Table 2-4. Summary of Proposed Track Upgrades

Segment	Location	Description of Improvements
(1)	NS Dearborn Division MP 180.7 to MP 181.6	Replace existing rail with continuous welded rail Cleveland to Columbus
		Replace cross ties
		Ballast & surface mainline track
	CSX Great Lakes Division CP 54 to CP 71	Replace cross ties
		Ballast & surface mainline track
	CSX Great Lakes Division CP 80 to CP 138	Replace cross ties
		Ballast & surface mainline track
(2) Columbus to North Cincinnati	NS Lake Division CP 150 to CP 209	Replace cross ties
		Ballast & surface mainline track
(3) North Cincinnati to Cincinnati	IORY Oasis Line	Replace existing rail with continuous welded rail
		Replace cross ties
		Ballast & surface mainline track

Grade Crossings

ODOT initially identified approximately 270 grade crossings along the 3C Corridor. With maximum passenger rail speeds of 79 mph, ODOT is proposing a "sealed corridor" to provide safety for both roadway and railway travelers. Crossings that currently have signage or flashing light warning devices will need to be upgraded to both lights and roadway gates.

ODOT has an ongoing, separate contract with NS to perform crossing improvement work. This contract includes crossings within the 3C Corridor.

Following internal review in June 2010, ODOT prepared a revised inventory list of all crossings within the 3C Corridor. The crossing requirements were analyzed for a "sealed corridor" using ODOT's revised inventory list as well as track charts and aerial maps of the 3C Preferred Alignment. The revised list accounts for 280 total crossings of which 274 require improvements.

2.3 Station Development

Station locations were initially evaluated during the Tier 1 3C Quick Start Passenger Rail EA. It is envisioned that a significant portion station development costs will be provided by local jurisdictions. Negotiations with the appropriate jurisdictions regarding station development is a logical next step. In addition to screening of 33 route alternatives, a total of 32 station sites within 12 communities were evaluated. The following sections describe the evaluation process for the stations.

2.3.1 History of Station Evaluations

The proposed 3C passenger rail service was divided into three categories based on the planned order of route and station development:

- Initial 3C passenger rail service serving the areas of Cleveland, Southwest Cleveland, Columbus, Dayton, North Cincinnati, and Cincinnati
- Phased 3C passenger rail service serving the areas of Springfield and East Dayton
- Future 3C passenger rail service serving the areas of Akron, North Central, North Columbus, and Middletown/Hamilton

Station locations were initially identified based on the need to provide rail passenger service competitive to other modes of transportation in terms of time, proximity, and other technical issues. Evaluation criteria for station locations included:

- Ability to accommodate basic station facilities
- Accessibility to transportation and population density
- Ease of implementation
- Long-term development potential
- Impacts to adjacent properties, traffic patterns and freight rail operations
- Environmental impacts
- Safety and security
- Local input

As part of the public involvement plan for the Tier 1 EA, a series of stakeholder workshops and public open house meetings were held in July, August and September 2009. These meetings occurred in Columbus, Cleveland and Cincinnati. Presentations from the public meetings were also available online at the *3C is Me* website (3Cisme.ohio.gov). Public feedback was encouraged through online submission as well as using comment forms provided at meetings. A toll free hotline (877-7-3CisME) was also established to provide the public with project information and allow for feedback. A total of 7,500 comments were received during Tier 1 EA process, which included input on the proposed station locations.

2.3.2 Preferred Station Sites from Tier 1 EA

As a result of the Tier 1 EA process and public involvement feedback, recommendations were made on preferred site locations for 11 of the 12 communities.

Six station sites were identified for initial 3C Quick Start service:

- Lakefront Amtrak Station in Cleveland
- West 150th Street/Puritas Avenue/GCRTA Station in Southwest Cleveland
- Convention Center Site in Columbus
- Main Street Site in Dayton
- Kemper Road Site in North Cincinnati
- Lunken Airport Site in Cincinnati

Two station sites were identified for phased 3C Quick Start service:

- Downtown Station Site in Springfield
- Riverside Site in East Dayton

Three station sites were identified for 3C Quick Start future service:

- Galion Pershing Site in North Central Ohio
- Crosswoods Site in North Columbus
- Middletown Historic Depot Site in Middletown/Hamilton

The Transit Center Site in Akron was eliminated from consideration for 3C Quick Start service during the Tier 1 EA station evaluation. The increased travel time and estimated ridership did not warrant retaining the station at this stage in the project. The Akron site, however, may be considered in the future for high speed rail service.

2.3.3 Alternate Station Sites

Although preferred site locations were identified, alternate sites are still under review in Springfield, North Cincinnati and Cincinnati. These alternate sites will be further evaluated in the Tier 2 environmental and preliminary engineering phase of the 3C Quick Start project. Final decisions will be made following further development of the station options.

In Springfield, a site adjacent to the assumed station location will be under consideration because due to the potential for economic development potential and access issues. This adjacent site was not evaluated in the Tier 1 EA.

For North Cincinnati, the Kemper Road Site and the Downtown Sharonville Municipal Lot are being considered. Both these sites were evaluated in the Tier 1 EA.

In addition to Lunken Airport, the Sawyer Point site, which was included in the Tier 1 EA station evaluation, is still being considered as an alternate station location for Cincinnati. As a result of the public input from the Tier 1 EA, two additional sites were identified in Fairfax and Bond Hill to serve the passenger rail travelers of Cincinnati.

The City of Cincinnati Department of Transportation and Engineering requested the site in Bond Hill be included in the review of potential station locations for Cincinnati because it is more centrally located compared to Lunken Airport with better access for both vehicular and pedestrian traffic. The site is located near the intersection of I-75 and the Norwood Lateral north of downtown Cincinnati.

A potential station site has also been identified at the former location of Milacron Manufacturing Technologies. The site is located near the intersection of I-71 and the Norwood Lateral northeast of downtown Cincinnati surrounded by the neighborhoods of Hyde Park, Oakley, and Pleasant Ridge. The site is currently being managed by Vandercar Holdings, Inc., a commercial real estate development company. Vandercar was involved with the redevelopment of a nearby Milacron site that resulted in a 440,000 square foot retail center known as the Center of Cincinnati. This newly developed retail center is just north of the proposed station site. Vandercar has expressed interest in the possible use of the property as a 3C Quick Start station location.

These five sites will be evaluated during the Tier 2 phase of the project to assess a preferable station location for Quick Start service in Cincinnati:

- Lunken Airport Site
- Sawyer Point Site
- Fairfax Site
- Bond Hill Site

- Milacron Site

Community input from Springfield, North Cincinnati and Cincinnati will again be solicited as part of the evaluation process.

2.3.4 Station Mapping

The following station maps for initial and phased 3C Quick Start service are provided in Appendix A3 of this report:

1) Lakefront Amtrak Station in Cleveland
2) West 150th Street/Puritas Avenue/GCRTA Station in Southwest Cleveland
3) Convention Center Site in Columbus
4) Downtown Station Site in Springfield
5) Riverside Site in East Dayton
6) Main Street Site in Dayton
7) Kemper Road Site in North Cincinnati
8) Downtown Sharonville Municipal Lot in North Cincinnati*
9) Lunken Airport Site in Cincinnati
10) Sawyer Point Site in Cincinnati*
11) Fairfax Site in Cincinnati*
12) Bond Hill Site in Cincinnati*
13) Milacron Site in Cincinnati*

**Alternate site location*

Drawings are also provided in Appendix A3 detailing options for track and station layout at the Milacron and Fairfax sites in Cincinnati.

2.3.5 Station Design Guidelines

Station planning and design guidelines have been developed to provide planners, station designers and all stakeholders with a set of standards for the design of passenger rail stations associated with this project.

These guidelines are a compilation of applicable codes, standards, recommended practices and design features from other similar passenger rail systems. Their application to the design of stations in Ohio is dependent upon many factors including changes in philosophy, policy, funding, technology, site conditions, regulatory requirements, and community interaction among other transient factors.

These guidelines are understood to be a dynamic overview and point of departure for the designer and are not to limit the designs. They have been established to provide parameters for the eight stations identified for this project but are intended to be equally applicable to the extensions of the system to additional passenger stations, as appropriate.

The Station Planning & Design Guidelines document can be found attached to this report as Appendix A3.

2.4 Facilities Development

Facility locations were initially evaluated during the 3C Quick Start Passenger Rail EA. This Tier 1 EA process was performed during the summer and fall of 2009.

2.4.1 History of Facility Location Evaluations

Three locations are proposed for equipment maintenance and layover facilities for 3C service. The primary maintenance facility will be located in Cleveland and layover and turnaround facilities will be in Columbus and Cincinnati.

The facility at Cleveland is assumed to be a "medium-duty" maintenance facility that could handle minor repairs to locomotives and railcars, as well as provide routine train servicing. The facility would have three, single-ended tracks, each capable of storing one train, a double-ended track passing through a service and inspection (S&I) building, and a double-ended lead and runaround track. The S&I building should include a 540 foot-long, enclosed structure in which a five-car train, including the locomotive, can be located for maintenance. The track in the S&I building would be on a continuous inspection pit between the rails. The S&I building would also include fuel and lubrication storage and delivery systems, 480V standby power connections, a compressed air system, a railcar toilet dump system, a wheel truing station, heavy jacks for raising locomotives and railcars, an office area, and a material control area. Property acquisition and site work to construct the facility would also be required.

The facilities in Columbus and Cincinnati would be single-ended storage yards large enough to hold two, five-car trains, each including the locomotive. For these sites to be properly utilized, the properties would need to be acquired. Each yard would need two turnouts, 1,040 feet of new track, and the installation of two concrete pads where locomotives will be re-fueled via a tanker truck. Additionally, two 480V standby power cabinets, a railcar toilet dump system, and a small building for crew welfare facilities and train cleaning supplies would all need to be added to the sites.

Several factors that weigh into the decisions related to the yard and shop locations include schedules, storage, staging, and varying levels of maintenance. Additionally, appropriate land availability, proximity, and access are other important considerations. Non-revenue service would be minimized while also accounting for these other factors. The facilities must also accommodate workers and consider the ability for future site expansion.

2.4.2 Recommended Facility Locations from Tier 1 EA

The following facility sites were identified during the Tier 1 EA process:

- East 26th Street Yard in Cleveland
- Grogan Yard in Columbus
- Pennor Yard in Columbus
- Joyce Avenue Yard in Columbus
- Grandview Yard in Columbus
- Undercliff Yard in Cincinnati

The proposed yard location in Cleveland is located at East 26th Street along the lakefront, just east of the preferred Cleveland station site. The East 26th Street Yard consists of mostly vacant properties. Owners within the extent of land needed for 3C service include Amtrak, CSX, and other private owners.

The NS Grandview Yard on the Buckeye Line was identified as a potential site to lay over the trains and conduct light service. The Grandview Yard is located on the west side of downtown and access would require crossing a CSX mainline.

Alternatively, additional yard sites east of downtown, including the Joyce Avenue Yard, the Pennor Yard, and the Grogan Yard, could provide layover and maintenance facilities. More evaluation is needed on each of these potential sites to determine their viability for use.

The Undercliff Yard, which is more than 2,500 feet in length and includes six siding tracks, is owned by RailAmerica. It could be the location for a train layover and limited maintenance and inspection of equipment. The yard is underutilized and serves primarily staging and sorting functions for freight service to area industries. It is assumed that the yard property is sufficient for the development of a station facility, platform, parking and vehicular access.

Mapping for the proposed yard sites are provided in Appendix A4 of this report.

2.5 Congestion in Cincinnati

The Preferred Alignment operates via the Oasis Line in the Cincinnati area. In response to the existing freight congestion in Cincinnati, a route alignment that utilizes the Oasis Line is preferred rather than operating service through the Mill Creek Rail Corridor. The Mill Creek Corridor, which runs west of the city through the Queensgate Yard and Cincinnati Union Terminal, is heavily congested and considered one of Ohio's largest freight rail choke points.

Amtrak currently provides service to Cincinnati with a stop at Union Terminal. Amtrak's Cardinal runs from Chicago to New York, via Washington D.C., with overnight stops in Cincinnati three days per week. Currently, Union Terminal does not have passenger train layover tracks.

While the public generally favors use of Union Terminal as a station site, the City of Cincinnati, freight railroads, and Amtrak all agree the Mill Creek Corridor is not a realistic route for Quick Start service. As detailed in the White Paper prepared by Ohio Rail Development Commission (ORDC), the Oasis Line is lightly used compared to the heavily congested Mill Creek Rail Corridor. CSX is already rerouting freight traffic that, based on distance, should travel through Mill Creek and the Queensgate Yard. Longer distance routes are instead used to avoid delays caused by the Mill Creek Corridor congestion.

Based on a Terminal Clock Report by CSX dated September 14, 2009, over 110 trains entered and over 110 trains left Queensgate within a 24 hour period. Both NS and CSX expressed concern that Mill Creek Corridor may be too complicated to be properly captured in Rail Traffic Control (RTC) modeling. At this time, NS and CSX are discouraging passenger rail service through the Mill Creek Corridor.

RailAmerica, however, is supportive of passenger rail service on the Oasis Line running east of Cincinnati and extending to the Boathouse at Sawyer Point. There are two parallel tracks on the Oasis Line. SORTA owns the land and the unused track. RailAmerica owns the used track and related assets such as signals.

Infrastructure and operational improvements necessary to introduce 3C Passenger Rail service to the Mill Creek Corridor would require considerable analysis and negotiation. An endeavor of this magnitude is beyond the scope of the Quick Start project. There may be future opportunity to relocate the Cincinnati station to Union Terminal as passenger rail service expands provided a long term solution for the capacity issues has been developed.

2.6 Next Steps

The preliminary engineering tasks to be completed during the Tier 2 phase of the 3C project have been outlined in ODOT's 3C Quick Start Project NEPA and Preliminary Engineering Statement of Work dated September 2010.

For the entire 3C Corridor, the following tasks are to be performed:

- Review of Highway/Railroad Crossing Warning Devices
    - Pursue a "sealed corridor" approach to enhance safety for both motorists and 3C Corridor rail passengers.
    - Conduct a review of the existing warning devices and prioritize the required modifications to all of the public 3C Corridor highway/rail crossing warning devices.
    - Complete a design review of the engineering requirements, advanced technologies and costs for all of the crossings on the 3C Corridor.
- Review of Engineering Requirements Needed to Increase Authorized Train Speeds and Reduce Passenger Train Run Times
    - Examine all of the locations along the line where the maximum authorized railroad track speeds of 79 mph are reduced to a range of 40 to 60 mph to determine the impact that reductions in speed have on total corridor run time.
    - Identify the primary cause of the restrictive speeds (e.g., freight railroad operations, track and turnout conditions, signal requirements, interlocking issues, or municipal speed orders).
    - Advance the conceptual engineering needed to identify what is required to raise the authorized speeds.
    - Identify projects that have the greatest benefit and may be advanced under the NEPA and Preliminary Engineering phase of the 3C Quick Start project development process.
    - Develop a rail corridor investment strategy that reduces total corridor train run time by prioritizing future capital investments needed to effectively increase the authorized speed in select locations along the line.
- Review of Engineering Requirements and Implementation Strategy for Positive Train Control
    - Review the freight railroad plans and Federal safety requirements for the implementation of positive train control and its implications on the construction and timing of the 3C Quick Start Service and develop an implementation strategy for Positive Train Control.
- System Safety Program Plan

  - Produce a System Safety Plan (SSPP) which will include a Collision Hazard Analysis. The SSPP will be developed in cooperation with the active participation of designated representatives of the host railroads, the operator of the service, FRA, and ODOT.

Additional preliminary engineering tasks for alignment development will be advanced simultaneously for three segments along the 3C Corridor:

- Cleveland to Columbus
  - Complete the preliminary engineering for all of the capacity additions and modifications to NS and CSX mainline tracks, including second mainline tracks, sidings, connecting tracks, interlockings, turnouts, crossovers, and all related signal improvements, track upgrades and highway/rail crossing warning device upgrades.
  - Advance conceptual design and preliminary engineering for passenger stations as well as the related alignment improvement projects at the station sites in Cleveland, Southwest Cleveland, and Columbus.
  - Advance the engineering and analysis of alternative sites considered in for the passenger train service, inspection, and maintenance facility; finalize the selection of a preferred site; and advance the conceptual site design for the preferred site for the maintenance facility in Cleveland. Agreements are needed with all private property owners as well as CSX and Amtrak.
  - Advance the engineering and analysis of alternative sites considered for the train layover facilities and advance the conceptual site plan for the preferred sites for the layover facilities in Columbus.
- Columbus to North Cincinnati
  - Complete the preliminary engineering for all of the capacity additions and modifications to NS mainline tracks including, second mainline tracks, sidings, connecting tracks, interlockings, turnouts, crossovers, and all related signal improvements, track upgrades and highway/rail crossing warning device upgrades.
  - Advance conceptual design and preliminary engineering for passenger stations as well as the related alignment improvement projects at the station sites in Springfield, East Dayton, Dayton, and North Cincinnati.
- North Cincinnati to Cincinnati
  - Complete the reevaluation of alternatives and the engineering analysis of new information related to route and alignment decisions and alternative station locations in Cincinnati; involve the public and stakeholders in the alternatives analysis process; and finalize the route, alignment and station location decisions.
  - Complete the preliminary engineering for all of the capacity additions and modifications to NS mainline tracks, including second mainline tracks, sidings, connecting tracks, interlockings, turnouts, crossovers, and all related signal improvements, track upgrades and highway/rail crossing warning device upgrades.
  - Complete the preliminary engineering for all of the capacity additions and modifications to I&ORY tracks, including track upgrades, connecting tracks, interlockings, turnouts, crossovers, sidings, and sidings or pocket tracks needed for additional track capacity and all related signal improvements.

- Advance conceptual design and preliminary engineering for passenger stations as well as the related alignment improvement projects at the station site in Cincinnati.
- Advance the engineering and analysis of alternative sites considered for the train layover facilities and advance the conceptual site plan for the preferred sites for the layover facilities in Cincinnati.

To further the development of the 3C Preferred Alignment, the host railroads need to review the proposed improvements for capacity additions, track upgrades, and grade crossings. The proposed work must be agreed upon and approved by the host freight railroads. This includes NS, CSX, and RailAmerica.

For the success of the 3C Quick Start Passenger Rail project, agreements with the host railroads are needed in the following categories:

- Passenger train schedule.
- Corridor capacity additions.
- Capital and operating cost allocation.
- Passenger train preferences, schedules, frequency, reliability and speed.
- Monetary payments for track access or use of rights-of-way, track maintenance, dispatching and on-time performance.
- Responsibilities for final design, engineering and construction of corridor capital improvements.
- Implementation of Positive Train Control.
- Corridor development strategy or corridor investment plan.
- Agreement duration, liability insurance and labor protection.

Discussions and agreements regarding land acquisition are also needed with the property owners of the proposed station and yard sites which are located on private property.

3.0 COST ANALYSIS

As part of the Federal Stimulus Application submitted to the Federal Railroad Administration (FRA) in October 2009, the Ohio Department of Transportation (ODOT) prepared a financial plan for 3C Quick Start identifying the capital and operating costs associated with passenger rail service operating at a maximum of 79 mph between Cleveland and Cincinnati. Had the project progressed to its logical conclusion, significantly more analysis would have been undertaken to further develop the capital costs. Fundamental to a valid final cost estimate are discussions and negotiations with the host railroads. These discussions have not yet taken place.

Initial review is the first step toward refinement in every cost estimating procedure. Cost estimating in a transportation project is typically an iterative process. Initial cost estimates carry a high level of contingency as they are developed without the benefit of well developed studies and designs, and therefore must account for a significant number of "unknowns."

A Financial Plan was developed by ODOT for use in the 2009 3C Federal Stimulus Grant Application. In addition to ODOT sources, cost assumptions from secondary sources would contribute to the refinement effort. Those include:

- *3C Railroad Capacity Analysis: Recommended Capacity Additions (Preliminary)*, prepared by the Woodside Consulting Group, Inc., dated July 22, 2009
- *Feasibility Report of Proposed Amtrak Service: Cleveland-Columbus-Cincinnati*, prepared by Amtrak, dated December 18, 2009
- *Capital Cost Estimates Associated with 3C Rail Corridor Stations*, prepared by RL Banks & Associates, Inc. in association with Burgess & Niple, dated September 22, 2009

As design of the project is advanced and input from the host railroads is received, refinements to the capital costs from the 2009 Financial Plan will be needed. Areas to be reevaluated include:

- Infrastructure Improvements
- Track Upgrades
- Grade Crossings
- Stations
- Facilities
- Rolling Stock

A goal of the 3C Quick Start project is to construct and implement a first phase of passenger service on the corridor within the budget of the FRA's selection of the project for $400 million in funding. Potential strategies include:

- Review of improvement projects in coordination with host railroads to best match capacity with operating needs for both freight and passenger services, potentially reducing infrastructure needs and costs.
- Consideration of alternative equipment strategies.
- Consideration of use of other funding sources, such as separate funding for grade crossing improvements.

In the 3C Quick Start Corridor Program Financial Plan dated October 2009, ODOT included operating costs that had been prepared by Amtrak as part of their feasibility study:

- *Feasibility Report of Proposed Amtrak Service: Cleveland-Columbus-Cincinnati*, prepared by Amtrak, dated December 18, 2009

Review of these estimated costs and the development of strategies for reducing operating costs to the 3C project is the logical next step.

Following a review of the likely sources of operating expenses as proposed by Amtrak as well as known costs from similar lines of service, PB would identify opportunities to minimize operating costs in several expense categories, which are identified below.

- Agreements with Host Railroads
- Servicing and Maintenance
- Station Maintenance and Staffing
- Crew Facilities
- Rolling Stock
- Fuel Cost
- Information and Reservation Services
- Revenue Development

4.0 ENVIRONMENTAL RESOURCES

4.1 Introduction

The setting and environmental resources within the segments of the 3C Corridor are discussed in the chapter. The information is presented in order by segment from north to south:

- Segment 1 – Cleveland to Columbus. This segment would extend between downtown Cleveland and downtown Columbus. It includes stations in Cleveland, Southwest Cleveland and Columbus; maintenance and layover yards in Cleveland and Columbus; capacity addition projects and track upgrades on the rail line segment; and grade crossing improvements.
- Segment 2 - Columbus to North Cincinnati. The Columbus to North Cincinnati segment would extend between downtown Columbus and Sharonville. It includes passenger rail stations in Springfield, East Dayton, Dayton and North Cincinnati; capacity addition projects and track upgrades on the rail line segment; and grade crossing improvements.
- Segment 3 - North Cincinnati to Cincinnati. The North Cincinnati to Cincinnati segment would extend between the North Cincinnati and Cincinnati. The Cincinnati station and a maintenance and layover facility are included in this segment. The location of the Cincinnati station has not been identified at this time. Five potential sites include Sawyer Point, Lunken Airport, Bond Hill, Fairfax and Milacron in Oakley.

4.2 Human Environment

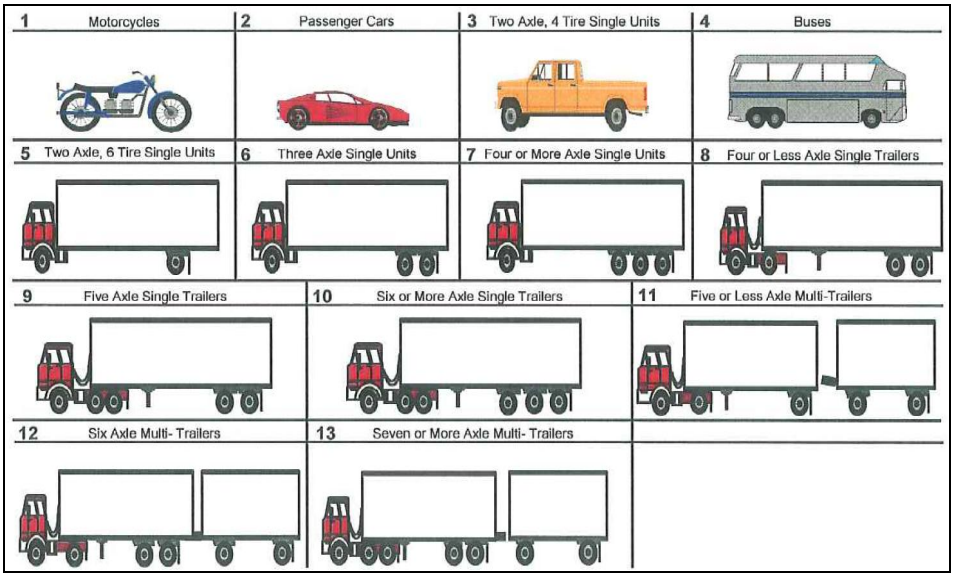
4.2.1 Traffic and Transportation

As a part of the data collection effort, 24-hour traffic counts were conducted at approximately 41 locations throughout the state along several key roadway facilities in November and December 2010. No counts were conducted over the week of November 22 due to atypical traffic patterns associated with the Thanksgiving holiday.

The traffic count locations are identified by unique traffic station number references. These reference numbers are included on the traffic count maps included in Appendix B1. The tube counts were conducted for a minimum 24-hour period by direction and by lane during average weekdays (Tuesday to Thursday). Free flow conditions are required for effective machine classification.

The Federal Highway Administration (FHWA) “F-Scheme” was used to classify vehicle types. This classification scheme is separated into categories depending on whether the vehicle carries passengers or commodities. In addition, the number of axles and number of units, including both power and trailer units, further subdivide non-passenger vehicles. Figure 4-3 below shows the various vehicle types.

Figure 4-3. FHWA Vehicle Classifications



4.2.1.1 Traffic Counts

Segment 1 – Cleveland to Columbus

Cleveland (Lakefront Amtrak Station)
The existing Lakefront Amtrak Station could accommodate the 3C passenger rail service, and is located close to and southeast of the Cleveland Browns Stadium along the existing freight rail line, south of the Cleveland Memorial State Highway and west of East 9th Street in Cleveland. This existing station operates primarily during the early-morning and evening hours.

As a part of the data collection effort, 24-hour traffic volumes were collected at key locations within a 2,000-foot radius of the existing station using machine tube counters. Count location reference numbers are included on the traffic count maps located in Appendix B1. Volume information was not obtained for all of the identified count locations due to construction detours established at the time of the data collection. These locations are specified in Appendix B1. As the project proceeds in the project development process, a complete traffic analysis will be necessary and missing traffic volume data would need to be collected near the station.

Table 4-1 summarizes the data collected in the proximity of the existing Lakefront Amtrak Station. Additional information related to vehicle classification and speed is included in Appendix B1.

Table 4-1. Cleveland (Lakefront Amtrak) Station Counts

Reference Number	Count Locations	Traffic Volume (Average Daily Traffic)
1	North Marginal Rd – East of 9th Street	1,555
4	South Marginal Rd – West of 13th Street	1,194
5a/b	3rd Street – South of Alfred Lerner Way	8,128
8a/b	Lakeside Avenue – East of Ontario Street	9,650
12	Lakeside Avenue – East of 13th Street	5,170
14a/b	3rd Street – South of Lakeside Avenue	12,543
15a/b	9th Street – South of Lakeside Avenue	12,458
16a/b	12th Street – South of Hamilton Avenue	2,916
17	13th Street – South of Hamilton Avenue	3,501
19a/b	Street Clair Avenue – East of Mall Drive	10,213

Southwest Cleveland (West 150th Street/Puritas Avenue Station)
The West 150th Street/Puritas Avenue Greater Station is located in southwest Cleveland along the existing freight rail line north of I-71, west of West 150th Street, and north of Puritas Avenue.

As a part of the data collection effort, 24-hour traffic volumes were collected at key locations within a 2,000-foot radius of the proposed station using machine tube counters. Count location reference numbers are included on the traffic count maps included in Appendix B1.

Volume information was not obtained for all of the identified count locations due to construction detours established at the time of the data collection. These locations are specified in Appendix B1. As the project proceeds in the project development process, a complete traffic analysis will be necessary and missing traffic volume data would need to be collected around the station location.

Table 4-2 summarizes the data collected in the proximity of the West 150th Street/Puritas Avenue Station. Additional information related to vehicle classification and speed is included in Appendix B1.

Table 4-2. Southwest Cleveland (West 150th Street/Puritas Avenue) Station Counts

Reference Number	Count Locations	Traffic Volume (Average Daily Traffic)
23	157th Street – South of Chatfield Avenue	1,809
25	Emery Avenue – East of 150th Street	3,904
26	Melgrave Avenue – West of 157th Street	261
27a/b	150th Street – South of Emery Avenue	30,766
28	Valleyview Avenue – West of 157th Street	515
29	Terminal Avenue – West of I-71 ramp	2,575
31	Terminal Avenue – West of 148th Street	1,279
32	Westdale Avenue – East of 162nd Street	943
33	154th Street – North of Kenny Street	1,873

Table 4-2. Southwest Cleveland (West 150th Street/Puritas Avenue) Station Counts

Reference Number	Count Locations	Traffic Volume (Average Daily Traffic)
35a/b	150th Street – North of Sprengel Avenue	23,968
35c	156th Street – North of Barbara Street	194

Columbus (Convention Center Station)
The proposed Columbus Convention Center Station would be located along the existing freight rail line adjacent to the Convention Center, south of I-670 and west of I-71, in downtown Columbus.

As a part of the data collection effort, 24-hour traffic volumes were collected at key locations within a 2,000-foot radius of the existing station using machine tube counters. Count location reference numbers are included on the traffic count maps included in Appendix B1. Volume information was not obtained for all of the identified count locations due to construction detours established at the time of the data collection. These locations are specified in Appendix B1. As the project proceeds in the project development process, a complete traffic analysis will be necessary and missing traffic volume data would need to be collected.

Table 4-3 summarizes the data collected in the proximity of the proposed Columbus Convention Center Station. Additional information related to vehicle classification and speed is included in Appendix B1.

Table 4-3. Columbus (Convention Center) Station Counts

Reference Number	Count Locations	Traffic Volume (Average Daily Traffic)
37	4th Street – South of Warren Street	12,148
38a/b	High Street – South of Lincoln Street	15,920
39	Summit Street – North of Cedar Street	12,157
48a/b	4th Street – North of Nationwide Boulevard	26,948
51	Nationwide Boulevard – East of High Street	8,299
52	Mt Vernon Avenue – East of 5th Street	4,176
53a/b	High Street – North of Chestnut Street	16,974

Segment 2 – Columbus to North Cincinnati

Springfield (Downtown Springfield Station)
The proposed Downtown Springfield Station would be located along the existing freight Rail line just southwest of the intersection of East Washington Street and Linden Avenue and east of South Spring Street, in downtown Springfield.

As a part of the data collection effort, 24-hour traffic volumes were collected at key locations within a 2,000-foot radius of the existing station using machine tube counters. Count location reference numbers are included on the traffic count maps included in

Appendix B1. Volume information was not obtained for all of the identified count locations due to construction detours established at the time of the data collection. These locations are specified in Appendix B1. As the project proceeds in the project development process, a complete traffic analysis will be necessary and missing traffic volume data would need to be collected.

Table 4-4 summarizes the data collected in the proximity of the proposed Downtown Springfield Station. Additional information related to vehicle classification and speed is included in Appendix B1.

Table 4-4. Springfield (Downtown Springfield) Station Counts

Reference Number	Count Locations	Traffic Volume (Average Daily Traffic)
72	Limestone Street – North of Monroe Street	3,905
73	Limestone Street – North of Washington Street	4,021
77	Fountain Avenue – North of Jefferson Street	2,886

East Dayton (Riverside Station)
The proposed Riverside Station would be located northwest of National Museum of the United States Air Force at Wright-Patterson Air Force Base, along the existing freight rail line, just east of Harshman Road and north of Huberville Avenue in Dayton.

As a part of the data collection effort, 24-hour traffic volumes were collected at key locations within a 2,000-foot radius of the existing station using machine tube counters. Count location reference numbers are included on the traffic count maps included in Appendix B1. Volume information was not obtained for all of the identified count locations due to construction detours established at the time of the data collection. These locations are specified in Appendix B1. As the project proceeds in the project development process, a complete traffic analysis will be necessary and missing traffic volume data would need to be collected.

Table 4-5 summarizes the data collected in the proximity of the proposed Riverside Station. Additional information related to vehicle classification and speed is included in Appendix B1.

Table 4-5. East Dayton (Riverside) Station Counts

Reference Number	Count Locations	Traffic Volume (Average Daily Traffic)
86a/b	Springfield Street – West of Harshman Avenue	8,984
89	Springfield Street – East of Harshman Avenue	10,629

Dayton Station (Main Street)
The proposed Dayton Station would be located along the existing freight rail line where the line crosses South Main Street, south of East 5th Street and north of State Route (SR) 35 in Dayton.

As a part of the data collection effort, 24-hour traffic volumes were collected at key locations within a 2,000-foot radius of the existing station using machine tube counters. Count location reference numbers are included on the traffic count maps included in Appendix B1. Volume information was not obtained for all of the identified count locations due to construction detours established at the time of the data collection. These locations are specified in Appendix B1. As the project proceeds in the project development process, a complete traffic analysis will be necessary and missing traffic volume data would need to be collected.

Table 4-6 summarizes the data collected in the proximity of the proposed Dayton Station. Additional information related to vehicle classification and speed is included in Appendix B1.

Table 4-6. Dayton (Main Street) Station Counts

Reference Number	Count Locations	Traffic Volume (Average Daily Traffic)
97	Wayne Avenue – South of 4th Street	6,978
99	St. Clair Street – South of 4th Street	5,782
104	4th Street – West of Perry Street	5,359
106	6th Street – East of Ludlow Street	1,227
107a/b	Patterson Boulevard – South of 5th Street	11,550
110	Jefferson Street – South of 6th Street	5,304
111a/b	Main Street – North of Franklin Street	12,752
114a/b	Patterson Boulevard – North of Jefferson Street	13,291

Segment 3 – North Cincinnati to Cincinnati

Numerous potential station locations for the Cincinnati area have been identified. The potential locations include Lunken Airport, Sawyer Point, Fairfax, Bond Hill and Milacron. No traffic information was collected for Segment 3. As the project proceeds in the project development process, including a preferred station location, a complete traffic analysis will be necessary and missing traffic volume data would be collected.

4.2.1.2 Peak Hour Turning Movement Counts

As a part of the data collection effort, peak hour turning movement counts were conducted at approximately 37 intersections throughout the state along several key roadways between November 2, 2010 and December 2, 2010 (no counts were conducted over the week of Thanksgiving due to atypical traffic patterns). The peak hour turning movement counts were conducted from 7-9 am and 4-6 pm on average weekdays (Tuesday to Thursday). From this data, the AM peak hour and PM peak hour were identified for each intersection. Peak hour volumes are summarized below.

The traffic count locations are identified by unique traffic station number references. These reference numbers are included on the traffic count maps included in Appendix B1. Peak hour turning movement information has not yet been collected at all of the identified count locations due to construction detours. These locations are specified on

the attached traffic count maps. Table 4-7 summarizes the turn count data collected in proximity to the proposed station. The raw turn count data is included in Appendix B1.

Table 4-7. Turn Counts

Reference Number	Count Location	Peak Hour	Southbound			Westbound			Northbound			Eastbound			Total
			Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Cleveland (Lakefront Amtrak) Station															
2	East 9th Street and SR 2 SB ramp	AM	5	54	0	93	0	1,297	0	108	62	0	0	0	1,619
		PM	65	185	0	28	5	349	0	61	681	0	0	0	1,374
3	East 9th Street and SR 2 NB ramp	AM	0	1,416	43	0	0	0	343	110	0	814	7	47	2,780
		PM	0	442	110	0	0	0	1,002	736	0	194	8	72	2,564
7	Ontario Street and Lakeside Avenue	AM	0	0	0	1	221	125	233	0	296	156	604	0	1,636
		PM	0	0	0	0	571	206	145	0	209	149	212	0	1,492
9	East 6th Street and Lakeside Avenue	AM	0	0	0	0	406	177	98	0	62	186	389	0	1,318
		PM	0	0	0	0	428	41	235	0	144	55	456	0	1,359
10	East 9th Street and Lakeside Avenue	AM	338	1,032	528	151	233	0	111	324	5	77	258	129	3,186
		PM	66	330	0	524	330	1	95	787	0	134	204	359	2,830
11	East 12th Street and Lakeside Avenue	AM	42	28	44	89	357	12	15	13	52	181	488	83	1,404
		PM	57	13	30	47	548	8	16	20	156	107	251	30	1,283
13	East 13th Street and Lakeside Avenue	AM	9	3	2	3	234	23	24	11	159	176	294	20	958
		PM	20	9	12	4	326	18	21	4	214	89	195	7	919
18	Ontario Street and Street Clair Avenue	AM	89	160	0	43	190	68	165	473	149	47	371	42	1,797
		PM	39	322	0	53	281	257	108	224	76	116	269	30	1,775
20	E 6th Street and St. Clair Avenue	AM	75	143	48	154	363	21	76	75	17	52	340	50	1,414
		PM	89	68	65	108	542	40	80	139	28	57	492	43	1,751
21	East 9th Street and St. Clair Avenue	AM	124	722	300	37	256	21	109	323	232	93	232	68	2,517
		PM	62	449	147	170	335	104	33	572	128	222	356	153	2,731
22	East 12th Street and St. Clair Avenue	AM	33	109	14	13	275	22	11	60	22	139	254	51	1,003
		PM	90	108	29	18	304	23	19	84	70	82	372	60	1,259

Table4-7. Turn Counts (continued).

Reference Number	Count Location	Peak Hour	Southbound			Westbound			Northbound			Eastbound			Total
			Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Southwest Cleveland (West 150th Street/Puritas Avenue) Station															
24	W 150th Street and Emery Avenue	AM	67	1,238	60	48	1	69	145	935	72	8	0	13	2,656
		PM	13	1,125	48	65	0	135	69	1,330	7	50	1	50	2,893
30	W 150th Street and W 154th Street	AM	766	645	1	5	34	23	13	1,426	198	248	4	119	3,482
		PM	614	649	1	11	40	17	26	1,197	157	390	4	170	3,276
34	W 150th Street and I-71 NB ramp	AM	0	717	179	0	0	0	474	574	0	374	0	949	3,267
		PM	0	1,046	196	0	0	0	451	742	0	272	1	934	3,642
Columbus (Convention Center) Station															
36	Summit Street and Warren Street	AM	17	1,278	11	0	10	44	0	0	0	131	8	0	1,499
		PM	42	1,098	12	0	19	33	0	0	0	85	41	0	1,330
40	High Street and Russell Street	AM	0	519	5	5	0	29	6	322	0	5	3	4	898
		PM	0	482	12	34	0	28	32	676	0	15	10	12	1,301
41	Park Street and Goodale Street	AM	34	129	53	10	38	168	71	57	14	0	0	0	574
		PM	20	56	27	39	135	44	461	346	97	0	0	0	1,225
43	4th Street and Goodale Street	AM	0	0	0	5	11	0	10	540	37	0	67	242	912
		PM	0	0	0	39	34	1	4	1,884	62	0	7	396	2,427
50	High Street and Nationwide Boulevard	AM	121	430	68	38	169	56	72	209	125	93	155	23	1,559
		PM	23	442	102	103	132	83	89	476	92	210	491	152	2,395
54	3rd Street and Chestnut Street	AM	467	3,336	138	0	142	9	0	0	0	102	49	0	4,243
		PM	108	1,155	25	0	22	9	0	0	0	258	348	0	1,925
56	4th Street and Chestnut Street	AM	0	0	0	0	0	0	0	1,130	157	0	0	193	1,480
		PM	0	0	0	0	0	0	0	3,046	18	0	0	468	3,532

Table 4-7. Turn Counts (continued).

Reference Number	Count Location	Peak Hour	Southbound			Westbound			Northbound			Eastbound			Total
			Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Springfield (Downtown Springfield) Station															
64	Monroe Street and Limestone Street	AM	8	63	11	4	16	2	7	147	17	7	11	7	300
		PM	24	104	48	11	17	3	11	184	17	20	36	18	493
65	Fountain Avenue and Main Street	AM	57	278	0	0	284	67	0	0	0	0	0	0	686
		PM	86	296	0	0	384	66	0	0	0	0	0	0	832
67	Spring Street and Main Street	AM	81	404	71	22	243	71	112	231	209	0	0	0	1,444
		PM	33	412	71	33	223	116	178	329	252	0	0	0	1,647
69	Fountain Avenue and High Street	AM	0	144	184	0	0	0	45	0	0	22	313	0	708
		PM	0	174	225	0	0	0	75	0	0	44	500	0	1,020
71	Spring Street and High Street	AM	0	380	96	242	0	56	68	306	0	48	196	34	1,426
		PM	0	417	117	322	0	104	92	381	4	114	379	81	2,011
81	Spring Street and Limestone Street	AM	49	328	121	94	190	38	38	245	115	62	155	31	1,466
		PM	43	422	163	152	267	57	54	395	138	90	260	52	2,093
East Dayton (Riverside) Station															
83	Springfield Street and Bong Street	AM	3	0	0	0	152	46	1	0	0	49	886	3	1,140
		PM	6	0	0	1	756	11	64	0	60	13	151	5	1,067
87	Springfield Street and Harshman SB ramp	AM	0	0	0	0	253	42	545	0	171	80	299	0	1,390
		PM	0	0	0	0	288	160	32	0	119	185	330	0	1,114
88	Springfield Street and Harshman NB ramp	AM	0	0	0	33	140	0	188	0	151	0	734	103	1,349
		PM	0	0	0	471	357	0	46	1	84	0	168	200	1,327

Table 4-7. Turn Counts (continued).

Reference Number	Count Location	Peak Hour	Southbound			Westbound			Northbound			Eastbound			Total
			Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Dayton (Main Street) Station															
90	5th Street and Wayne Avenue	AM	2	248	59	210	176	81	39	447	87	88	185	0	1,622
		PM	16	468	92	157	116	80	62	326	56	189	331	3	1,896
91	Jefferson Street and 5th Street	AM	0	0	0	24	208	0	28	922	153	0	184	49	1,568
		PM	0	0	0	15	118	0	18	408	24	0	499	58	1,140
92	Main Street and 5th Street	AM	47	360	57	15	311	53	75	304	170	34	115	14	1,555
		PM	11	576	90	17	101	71	78	362	49	188	432	65	2,040
93	Ludlow Street and 5th Street	AM	46	465	122	0	208	63	0	0	0	83	175	0	1,162
		PM	23	1,007	88	0	247	137	0	0	0	280	380	0	2,162
94	Jefferson Street and Patterson Boulevard	AM	5	362	238	465	1,005	5	4	329	170	0	0	0	2,583
		PM	2	458	271	473	351	4	0	454	109	0	0	0	2,122
95	Main Street and Washington Street	AM	71	341	26	193	217	69	1	545	110	33	125	116	1,847
		PM	74	680	56	50	129	57	4	405	82	82	172	101	1,892
96	Washington Street and Ludlow Street	AM	109	423	66	2	308	93	0	0	0	167	234	0	1,402
		PM	52	1,330	83	0	209	117	0	0	0	482	332	0	2,605

4.2.1.3 Traffic and Transportation – Next Steps

Traffic volume information that was not obtained for all of the identified count locations due to construction detours established at the time of the data collection would be completed for the next phase of this project.

Using the data collected, daily averages from the counts, also known as Average Daily Traffic (ADT), will ultimately be converted to Annual Average Daily Traffic (AADT). These traffic volumes will be used to compute highway Vehicle Miles Traveled (VMT) for use in project planning, noise studies and air quality studies.

4.2.2 Land Use/Socioeconomics/Environmental Justice

4.2.2.1 Segment 1 – Cleveland to Columbus

Identification of land usage for the 3C Corridor segments was based upon aerial photography and supplemented by limited field surveys.

Land Use

Land development patterns along Segment 1 vary from urban, suburban and rural. The land use mix in rural and suburban areas tends to be consistent. For the most part, Segment 1 is situated within an active railroad corridor; the impact on adjacent communities would be minimal and limited to areas where stations, yards and sidings are proposed. Segment 1 would include one station in Cleveland, one in southwest Cleveland, and one in downtown Columbus and a maintenance facility in Columbus. The land use characteristics surrounding the proposed station locations are in urban areas that compatible with rail operations. The proposed Segment 1 station locations are described below.

Cleveland (Lakefront Amtrak) Station
The existing Lakefront Amtrak Station is located between Lake Erie and the dense, urban mixed-use area of downtown Cleveland. A large surface parking area currently serves the Amtrak station and the Greater Cleveland Regional Transit Authority (GCRTA) Waterfront Light Rail Line station. Adjacent land uses include: to the north, an eight lane highway with park uses alongside Lake Erie; to the east, parking lots; to the south, six railroad tracks adjacent to medium and high rise office buildings; and, to the west, a six lane urban arterial street.

The Lakefront area is home to several major venues. These include the Cleveland Browns Stadium, the Cleveland Science Center, the Rock and Roll Hall of Fame and Museum, and Voinovich Park. The Lakefront Amtrak station location is depicted in Appendix B2.

Southwest Cleveland (West 150th Street/Puritas Avenue) Station
The proposed West 150th Street/Puritas Avenue Station is currently used as a rail station supporting GCRTA's Red Line rapid transit route. The existing GCRTA station includes a parking lot and passenger shelter area. Adjacent land uses include: to the north, an industrial and office use that appears (2010) to be undergoing redevelopment; to the east, a LaQuinta Inn hotel with open landscape areas; to the south, the eight lane I-71 along with residential areas; and, to the west, six railroad tracks. The residential area is well screened from the proposed station by trees and landscaping. The proposed station is shown in Appendix B2.

Columbus (Convention Center) Station
The proposed Columbus Convention Center station is at the site of the former Columbus Union Station. As shown in Appendix B2, it would be situated within an urbanized area with connections to I-670, United States Route (US) 23, Ohio Central Way, High Street and Nationwide Boulevard. The Convention Center, constructed in the 1980s, was originally designed to accommodate high speed rail. However, subsequent expansions of the building eliminated this accommodation. A renovation plan would now be required for construction of the rail station. Within the proposed station area itself, there are currently no uses other than railroad tracks and the concrete structures that support the buildings and roadways above.

Adjacent land uses at the proposed station include: to the north, the Columbus Convention Center; highways; and commercial, light industrial and redeveloped industrial uses; to the east, two large industrial buildings; to the south, a large parking lot and high rise office buildings above the grade of the railroad, and. to the west, parking

facilities. The station itself would be located between the convention center, to the northwest, and a hotel and a large surface parking lot to the southeast. While there are no residential uses in close proximity to the proposed station location, it is within walking distance of the city's Arena and Short North Entertainment districts.

Neighborhoods and Community Cohesion

Segment 1 contains the following counties and communities:

- Cuyahoga County - Cleveland, Berea;
- Lorain County - Olmstead Falls, Eaton, Grafton, LaGrange, Wellington, Rochester;
- Huron County - New London, Greenwich;
- Richland County - Shiloh, Shelby;
- Crawford County - Crestline, Galion;
- Morrow County – Cardington;
- Delaware County – Ashley; and
- Franklin County - Worthington, Columbus

Community Facilities

Urbanized areas contain most of the residences and businesses in the region, but the smaller unincorporated communities also have clusters of residences and businesses. The rest of the region consists of rural agricultural land with dispersed residences and businesses.

Community services and facilities include schools, religious institutions, parks and recreation facilities, government facilities (e.g., courthouse, city hall, post office, and libraries), cemeteries, fire, police, hospitals, and social institutions (e.g., community centers, senior facilities and food banks), and cultural locations (e.g., entertainment venues and museums). The majority of these services and facilities are located in urban areas, with many situated in downtown business districts.

Community facilities are concentrated within the urban areas, with only a few located in the rural and unincorporated areas. The majority of community facilities are associated with the cities of Cleveland and Columbus. The number and types of community facilities located approximately ¼-mile from the existing rail corridor and within ½-mile of the proposed stations are identified in Table 4-8.

Socioeconomic Conditions

Segment 1 extends southwest through eight counties from Cleveland to Columbus. The combined total population (2009) of all these counties is approximately 3.1 million. This is approximately 27 percent of the total population of the State of Ohio.

Table 4-9 provides population and demographic characteristics about the region's social context. According to the 2000 US Census, the median age of the population in the eight counties was approximately 35 years of age; average household size was 2.4 people; married couples accounted for about 46 percent of all households. The percentage of the population with a disability was approximately 22 percent for all age categories. The US Census Bureau's 2006–2008 American Community Survey (ACS)

indicated that the average household size has increased slightly, and the number of married couple households has decreased in the region (Table 4-10). Race and income information is presented in Table 4-11. Within the eight counties, the Caucasian population comprised the largest percentage of the population (about 75 percent). The African American population represented about 20 percent of the total population.

Table 4-8. Segment 1 - Community Facilities

Community	Number of Facilities								
	Cemetery	Cultural	Governmental[1]	Medical	Public [2]	Religious	Schools	Social [3]	Total
Cleveland	0	12	7	8	7	3	7	4	48
Berea	2	0	0	1	0	0	1	0	4
Olmstead Falls	0	0	0	0	2	0	0	0	2
Eaton	0	0	0	0	0	0	0	0	0
Grafton	0	1	1	0	0	1	1	0	4
LaGrange	0	0	0	0	2	0	3	0	5
Wellington	1	0	1	4	7	0	2	0	15
Rochester	0	0	1	0	0	0	0	0	1
New London	0	1	1	1	3	0	1	0	7
Greenwich	0	0	1	0	0	0	0	0	1
Shiloh	0	0	0	0	2	0	1	0	3
Shelby	0	0	0	0	2	0	2	0	4
Crestline	0	0	1	0	3	0	1	1	6
Galion	0	0	1	1	3	1	1	0	7
Cardington	0	0	1	0	2	0	2	0	5
Ashley	0	0	1	0	4	0	0	0	5
Worthington	0	1	0	0	0	0	1	0	2
Columbus	4	5	4	4	2	2	18	4	43
Total	7	20	20	19	39	7	41	9	162

[1] Government services include facilities such as post offices, courthouses, and city halls.
[2] Public services include police departments, fire departments, and libraries.
[3] Social services include homeless shelters, community centers, and youth and elderly centers.

Table 4-9. Segment 1 - Regional Existing and Projected Populations

County	2000	2009 (Estimated)	2030 (Projected)	Change in Population 2000-2030 (%)	Average Annual Growth Rate (2000-2009) (%)
Cuyahoga	1,393,978	1,275,709	1,274,020	-9	-1.0
Lorain	284,664	305,707	312,540	10	0.8
Huron	59,487	59,720	64,020	8	0.04
Richland	128,852	124,490	132,180	3	-0.4
Crawford	46,966	44,090	43,390	-8	-0.7
Morrow	31,628	34,374	38,650	22	0.9
Delaware	109,989	126,346	266,200	142	4.9
Franklin	1,068,978	1,150,122	1,1326,180	24	0.8

Source: US Census Bureau (2000); Ohio Department of Development Office of Policy, Research and Strategic Planning

Table 4-10. Segment 1 - Population and Demographic Characteristics

County	Total Population	Households (#)	Percent Married Couples (%)	Average Household Size	Median Age	Percent Disabled
Cuyahoga	1,393,978	571,457	42.40	2.39	37	15.00
Lorain	284,664	105,836	55.20	2.61	36	14.00
Huron	59,487	22,307	58.50	2.64	35	Not Available
Richland	128,852	49,534	54.30	2.47	38	18.70
Crawford	46,966	18,957	55.10	2.45	38	19.60
Morrow	31,628	11,499	64.60	2.72	36	Not Available
Delaware	109,989	39,674	67.70	2.70	35	12.20
Franklin	1,068,978	438,778	43.00	2.39	32	17.00

Source: US Census Bureau (2000); Ohio Department of Development Office of Policy, Research and Strategic Planning

Table 4-11. Segment 1 - Minority Population Distribution

County	Percent White	Percent African American	Percent Native American	Percent Asian	Percent Pacific Islander	Percent Other Races	Percent Two or More Races	Percent Hispanic[1]
Cuyahoga	67.35	27.45	0.18	1.81	0.02	1.50	1.68	3.33
Lorain	85.54	8.50	0.30	0.60	0.03	2.87	2.17	6.80
Huron	95.98	0.97	0.18	0.25	0.01	1.63	0.99	3.57
Richland	88.16	9.43	0.20	0.51	0.03	0.38	1.28	0.92
Crawford	97.99	0.59	0.20	0.31	0.02	0.24	0.65	0.86
Morrow	98.37	0.27	0.30	0.15	0.00	0.18	0.74	0.60
Delaware	94.25	2.52	0.14	1.54	0.03	0.38	1.14	0.94
Franklin	75.48	17.89	0.27	3.07	0.04	1.03	2.23	2.26

Source: US Census Bureau (2000); Ohio Department of Development Office of Policy, Research and Strategic Planning
(1) The "Hispanic or Latino" ethnic classification is not considered a "race" by the Census Bureau and includes persons of any race. The race classifications (Black or African-American, Asian, American Indian, etc.) include both Hispanic and non-Hispanic persons. Therefore, the Hispanic/Latino and race classifications are not summed together since the total would exceed 100 percent as a result of double counting.

Economic Setting

Most data sources provide economic data that describe the linkages between various sectors of the economy only at the county level. Some data sources provide economic data for cities, such as tax revenues. Economic data are not available for geographic

areas smaller than cities; therefore, the economic setting for Segment 1 is discussed as part of a regional overview.

Tax Revenues
Segment 1 has experienced substantial increases in unemployment and foreclosure rates and sharp declines in housing prices due to the recession. The increased unemployment rate has resulted in reduced retail sales and associated sales tax revenues. The declining housing values and increased foreclosure rates have also reduced property tax revenues. Table 4-12 summarizes the general fund revenues, including property tax and sales tax revenues, for the two most recent fiscal years for which data is available, and provide estimates of revenues for Fiscal Year (FY) 2009/2010. County and city property and sales tax revenues are anticipated to decline between FY 2009/2010.

Housing Setting
Single-family housing accounted for approximately two-thirds of the total housing units in Segment 1. Among the eight counties, Cuyahoga County has the most total housing units (620,305) while Morrow County has the least amount of housing units (12,132). In 2009, vacancy rates for total housing units ranged between 5 percent in the Morrow County to 14 percent in Cuyahoga County.

According to the 2009 ACS data and Ohio County Profiles prepared by the Ohio Department of Development in 2009, approximately two-thirds of the total housing units in each of the eight counties are owner-occupied while one-third are renter-occupied. The vacancy rates for rental units are higher than for owner-occupied units. In terms of occupied units paying rent, Crawford County has the most units (65 percent) paying the lowest rent category ($0 to $499 a month) while Delaware County has the least (6 percent). The majority of the renters in the region paid between $500 and $749 a month. Delaware County and Franklin County have the highest median monthly rents ($786 and $774 per month, respectively), while Crawford County, Morrow County and Huron County have much lower median monthly rents ($418, $455 and $474 per month, respectively). Delaware County has the most housing units (74 percent) built since 1990. Cuyahoga County and Crawford County appear to have the most (91 percent) housing units built before 1990.

Environmental Justice

Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations*, directs federal agencies to "promote nondiscrimination in federal programs substantially affecting human health and the environment, and provide minority and low-income communities' access to public information and an opportunity for public participation in matters relating to human health or the environment."

Table 4-13and Table 4-14 show the percentages of minority and regional income for persons in the Segment 1 counties, respectively. Among the eight counties, the average percent minority population is 26.4 percent. The average percent low-income population is 11.4 percent. The ACS data indicates the minority low income percentages have increased slightly since the 2000 Census.

The percentage of people living below poverty within the State of Ohio is 13.1. The percentage of people living below poverty within Segment 1 counties averages 11.0. The 2009 ACS data indicates that while median household incomes have increased in the region, a majority of the counties also realized an increase in the number of individuals living below the poverty level.

Table 4-12. Segment 1 - General Fund Revenues

Revenue	FY 2007/2008 ($)	FY 2008/2009 ($)	FY 2009/2010 ($)	Percent Change	
				FY2007/08 to FY2008/09	FY2008/09 to FY2009/10
Cuyahoga County					
Tax	421,400,000	408,800,000	406,600,000	-3.0	-0.5
Property	205,600,000	215,700,000	211,000,000	4.9	-2.2
Sales	215,800,000	193,100,000	195,600,000	-10.5	1.3
Other	198,000,000	191,600,000	183,700,000	-3.2	-4.1
Total	619,400,000	600,400,000	590,300,000	-3.1	-1.7
Lorain County					
Tax	24,444,498	2,279,837	22,713,587	-6.7	-0.4
Property	8,780,727	8,830,647	8,113,587	0.6	-8.1
Sales	15,663,771	13,967,190	14,500,000	-10.8	4.5
Other	34,514,678	37,810,575	23,833,622	9.5	-37.0
Total	58,959,176	60,608,412	46,547,209	2.8	-23.2
Huron County					
Tax	9,928,503.46	9,329,154.87	8,854,000	0.0	-5.1
Property	2,376,501.72	2,373,117.69	2,374,000	-0.1	0.0
Sales	7,552,001.74	6,956,037.18	6,480,000	-7.9	-6.8
Other	3,526,762.15	3,169,976.02	2,951,630.39	-10.1	-6.9
Total	13,455,265.61	12,499,130.89	11,805630.39	-7.1	-5.5
Richland County					
Tax	32,598,315	29767,745	Not Available	-8.7	Not Available
Property	17,995,912	16,052,679	Not Available	-10.8	Not Available
Sales	14602,403	13,715,066	Not Available	-6.1	Not Available
Other	77,829,537	83,007,877	Not Available	6.7	Not Available
Total	110,427,852	112,775,622	Not Available	2.1	Not Available
Crawford County					
Tax	9,922,000	9,630,000	9,081,000	-2.9	-5.7
Property	4,924,000	4,604,000	4,749,000	-6.5	3.1
Sales	4,998,000	5,026,000	4,332,000	-.6	-13.8
Other	3,374,000	3,683,000	2,768,000	9.2	-24.8
Total	13,296,000	13,313,000	11,849,000	0.1	11.0
Morrow County					
Tax	4,896,372	4,554,188	Not Available	-7.0	Not Available
Property	2,101,603	2,103,936	Not Available	0.1	Not Available
Sales	2,794,770	2,450,252	Not Available	-12.3	Not Available
Other	2,831,080	2,393,897	Not Available	-15.4	Not Available
Total	7,727,452	6,948,085	Not Available	-10.1	Not Available
Delaware County					
Tax	57,022	57,859	Not Available	1.5	Not Available
Property	21,315	21,672	Not Available	1.7	Not Available
Sales	35,707	36,187	Not Available	1.3	Not Available
Other	15,450	10,572	Not Available	-31.6	Not Available
Total	72,472	68,431	Not Available	-5.6	Not Available
Franklin County					
Tax	173,787,779	171,435,922	163,235,401	-1.4	-4.8

Table 4-12. Segment 1 - General Fund Revenues

Revenue	FY 2007/2008 ($)	FY 2008/2009 ($)	FY 2009/2010 ($)	Percent Change	
				FY2007/08 to FY2008/09	FY2008/09 to FY2009/10
Property	Not Available	Not Available	Not Available	Not Available	Not Available
Sales	Not Available	Not Available	Not Available	Not Available	Not Available
Other	132,927,934	135,686,298	122,296,854	2.1	-9.9
Total	306,715,713	307,122,220	285,532,255	0.1	-7.0

Sources: Counties of Cuyahoga, Lorain, Huron, Richland, Crawford, Morrow, Delaware, Franklin

Table 4-13. Segment 1 - Regional Minority Population

County	Total Population	Percent Minority (2000)	ACS Population(2009)	ACS Percent Minority
Cuyahoga	1,393,978	34	1,275,781	34
Lorain	284,664	18	305,707	14
Huron	59,487	6	59,720*	6*
Richland	128,852	12	124,490	13
Crawford	46,966	3	44,090*	3*
Morrow	31,628	2	34,374*	Not Available
Delaware	109,989	6	168,708	10
Franklin	1,068,978	26	1,150,122	27

(*) Indicates that data were obtained from 2006-2008 ACS 3-year estimates.
Source: US Census Bureau (2000); US Census Bureau (2008 ACS).

Table 4-14. Segment 1 - Regional Income Characteristics

County	Individuals below Poverty	Percent Low Income (2000)	ACS Percent Low Income (2009)	Median Household Income Census 2000 data ($)	Median Household Income ACS ($)
Cuyahoga	179,372	13	15	39,168	40,101
Lorain	24,809	9	12	45,042	52,738
Huron	4,998	9	14	40,558	48,571
Richland	12,941	11	13	37,397	42,444
Crawford	4,831	10	12	36,227	41,646
Morrow	2,820	9	8*	40,882	49,927*
Delaware	4,118	12	5	67,258	84,710
Franklin	121,843	12	18	42,734	47,416

(*) Indicates that data were obtained from the 2006-2008 ACS 3-year estimates.

Source: US Census Bureau (2000); US Census Bureau (2008 ACS).

As illustrated in Appendix B2, many of the census block groups adjacent to the proposed station locations have no population. In general, these areas have existing freight rail tracks and are surrounded primarily by industrial or commercial areas. The study area for this section is defined as census block groups within ½-mile of stations and within ¼-mile of the rail corridor (Table 4-15).

Table 4-15. Segment 1 – Income and Poverty Information Around Stations

Station Location	Median Household Income (1999 $)	Poverty Status		Households With No Vehicle (%)
		Individuals Below Poverty Level	Percent (%)	
Cleveland (Lakefront Amtrak)	34,421	1,001	31.3	44.1
Southwest Cleveland (West 150 Street/Puritas Avenue)	42,336	745	6.9	10.9
Columbus (Convention Center)	22,008	1,332	34.1	26.8

Source: US Census Bureau (2000)

Cleveland (Lakefront Amtrak) Station
Figures in Appendix B2 show the percentage of minority and low-income populations by census block group and census blocks in the station area. Residential areas are located at the outer edge of the station area. There are low-income and minority communities that exceed the county threshold levels between Davenport and Lakeside avenues.

Southwest Cleveland (West 150th Street/Puritas Avenue) Station
There are no environmental justice target groups in the immediate vicinity of this proposed station.

Columbus (Convention Center) Station
Figures in Appendix B2 show the percentage of minority and low-income populations by Census Block Group and Census Blocks in the station area.

4.2.2.2 Segment 2 – Columbus to North Cincinnati

Land Use

Land development along Segment 2 is a mix of urban, suburban, and rural. This segment would include four stations, located in Springfield, East Dayton (Riverside), Dayton and North Cincinnati (Sharonville). The land use mix in rural and suburban areas tends to be consistent while urban station areas vary from location to location. Land use characteristics of the proposed station are described below.

Springfield (Downtown) Station
This proposed station would be located in downtown Springfield adjacent to Washington Street. One two-story building and a surface parking lot are currently located at the proposed location. The rest of the proposed station site is predominantly vacant with only remnants of former structures. The site is bordered to the south by the rail corridor, beyond which are industrial uses; to the west, SR 72, office buildings and surface parking lots; to the north, warehouses and a church; and, to the east, remnants of former rail facilities.

East Dayton (Riverside) Station
A station is proposed in East Dayton to serve nearby major destinations such as the Air Force Museum, Wright-Patterson Air Force Base, and Wright State University. The proposed station site is primarily vacant but includes some wooded areas and pavement. To the north of site are industrial facilities; to the east, a residential development; to the west, an area that has been subdivided but not yet developed; and, to the south, a hotel located along the opposite side of Harshman Road.

Dayton (Main Street) Station
A station is proposed for Downtown Dayton along Main Street near of the Dayton Convention Center. The proposed site is currently the student parking lot for Sinclair Community College. Surrounding land uses include: to the north, Sinclair Community College; to the east, office and surface parking; to the south, industrial uses; and to the west, parking areas, and industrial uses.

North Cincinnati (Kemper Road) Station
Twp proposed sites are identified in the Sharonville area. Both are near the intersection of Kemper Road and Reading Road and are adjacent to commercial and industrial uses and existing roadways.

Neighborhoods and Community Cohesion

Segment 2 contains the following counties and communities:

- Madison County: West Jefferson, London;
- Clark County: Plattsburg, Springfield, Green Meadows, Holiday Valley;
- Greene County: Fairborn;
- Montgomery County: Riverside, Dayton, Moraine, West Carrollton, Miamisburg;
- Warren County: Chautauqua, Carlisle;
- Butler County: Middletown, West Chester; and
- Hamilton County: Sharonville.

Community Facilities

Urbanized areas contain most of the residences and businesses in the region, but the smaller unincorporated communities also have clusters of residences and businesses. The rest of the region consists primarily of rural agricultural land with dispersed residences and businesses.

Community services and facilities include schools, religious institutions, parks and recreation facilities, government facilities (e.g., courthouse, city hall, post office, and libraries), cemeteries, fire, police, hospitals, and social institutions (e.g., community centers, senior facilities and food banks), and cultural locations (e.g., entertainment venues and museums). The majority of these services and facilities are located in urban areas, with many situated in downtown areas.

Community facilities are concentrated within the urban areas of the study area with only a few community facilities located in the rural and unincorporated areas. The majority of the community facilities are associated with the cities of Dayton, Sharonville and portions of Cincinnati. A summary of the number and types of community facilities located approximate ¼-mile from the rail corridor and within ½-mile of the proposed stations are identified in Table 4-16.

Table 4-16. Segment 2 - Community Facilities

Community	Number of Facilities								
	Cemetery	Cultural	Governmental[1]	Medical	Public [2]	Religious	Schools	Social [3]	Total
West Jefferson	0	0	0	0	0	0	0	0	0
London	0	0	3	0	5	1	2	1	12
Springfield	2	1	5	1	8	4	8	2	31
Green Meadows	0	0	0	0	0	0	1	0	1
Holiday Valley	0	0	0	1	0	0	1	0	2
Fairborn	0	1	0	0	0	0	3	0	4
Riverside	1	0	0	0	0	0	0	0	1
Dayton	1	0	3	3	3	2	24	3	39
Moraine	0	0	1	0	1	0	0	0	2
West Carrollton	0	0	0	1	3	0	2	0	6
Miamisburg	0	0	0	0	4	0	3	1	8
Carlisle	0	0	1	0	2	0	0	0	3
Middletown	2	0	1	1	4	0	1	0	9
Sharonville	1	0	3	1	4	0	5	0	14
Evendale	0	0	0	0	2	0	0	0	2
Reading	0	0	1	2	5	0	2	0	10
Cincinnati	4	1	0	6	1	0	10	3	25
Total	11	3	18	16	42	7	62	10	169

[1] Government services include facilities such as post offices, courthouses, and city halls.
[2] Public services include police departments, fire departments, and libraries.
[3] Social services include homeless shelters, community centers, and youth and elderly centers.

Socioeconomic Conditions

Segment 2 includes portions of seven counties with a combined total population (2009) of 3.3 million, which is approximately 29 percent of the total population of the State of Ohio (Table 4-17).

Population and demographic characteristics provide information about the region's social context (Table 4-18). Age, household, and disability characteristics are discussed to identify special needs and transportation needs. Race and income information is presented to identify low-income and minority populations (Table 4-19).

According to the 2000 US Census, the average median age of the population in the seven counties was approximately 36 years of age. The average household size was 2.5 people; married couples accounted for about 49 percent of all households. The percentage of the population with a disability was about 14 percent for all age categories. The ACS indicated that the average household size has increased slightly and the number of married couple households has decreased in the region.

Within the seven counties, the Caucasian population comprised the largest percentage of the population (about 83 percent), and the African American population represented about 13 percent of the population. The American Community Survey (ACS) data indicate that the total percentage of the Hispanic population has increased in the region.

Economic Setting

Most data sources provide economic data that describe the linkages between various sectors of the economy only at the county level. Some data sources provide economic data for cities, such as tax revenues. Economic data are not available for geographic areas smaller than cities; therefore the economic setting for the segment is discussed in the regional overview.

Tax Revenues

The counties and cities in the study area have experienced substantial increases in unemployment and foreclosure rates and sharp declines in housing prices due to the recession. The increased unemployment rates have reduced retail sales and associated sales tax revenues in the study area. The declining housing values and increased foreclosure rates have reduced property tax revenues. Table 4-20 summarizes the general fund revenues, including property tax and sales tax revenues, for the two most recent fiscal years for which data are available, and provide estimates of revenues for Fiscal Year (FY) 2009/2010. County and city property and sales tax revenues are anticipated to decline between FY 2008/2009 and FY 2009/2010.

Table 4-17. Segment 2 - Regional Existing and Projected Populations

County	2000	2009 (Estimated)	2030 (Projected)	Change in Population 2000-2030 (%)	Average Annual Growth Rate (2000-2009) (%)
Madison	40,213	42,539	46,520	15	0.6
Clark	144,742	139,671	143,960	-1	-0.4
Greene	147,886	159,823	158,860	7	0.8
Montgomery	559,062	532,562	524,060	-6	-0.5
Warren	158,383	210,712	338,350	114	3.2
Butler	332,807	363,184	439,740	32	1.0
Hamilton	845,303	855,062	730,570	-14	0.1

Source: US Census Bureau 2000; Ohio Department of Development Office of Policy, Research and Strategic Planning

Table 4-18. Segment 2 - Population and Demographic Characteristics

County	Total Population	Households	Percent Married Couples	Household Size	Median Age	Percent Disabled (2009)
Madison	40,213	13,672	59.2	2.62	36	Not Available
Clark	144,742	57,648	52.6	2.49	38	Not Available
Greene	147,886	55,312	58.0	2.53	36	Not Available
Montgomery	559,062	229,229	46.3	2.37	36	15.0
Warren	158,383	55,966	66.2	2.72	35	10.0
Butler	332,807	123,082	57.0	2.61	34	12.0
Hamilton	845,303	346,790	43.4	2.38	36	13.0

Source: US Census Bureau 2000; Ohio Department of Development Office of Policy, Research and Strategic Planning

Table 4-19. Segment 2 - Minority Population Distribution

County	Percent White	Percent African American	Percent Native American	Percent Asian	Percent Pacific Islander	Percent Other Races	Percent Two or More Races	Percent Hispanic[1]
Madison	91.75	6.24	0.20	0.44	0.01	0.35	1.01	0.73
Clark	88.12	8.95	0.28	0.53	0.02	0.53	1.58	1.07
Greene	89.24	6.37	0.29	2.03	0.03	0.38	0.99	1.28
Montgomery	88.16	9.43	0.20	0.51	0.03	0.38	1.66	1.15
Warren	94.66	2.73	0.18	1.26	0.03	0.31	0.84	0.92
Butler	91.20	5.27	0.21	1.55	0.03	0.62	1.13	1.30
Hamilton	72.93	23.43	0.18	1.61	0.03	0.51	0.32	1.08

Source: US Census Bureau 2000; Ohio Department of Development Office of Policy, Research and Strategic Planning
(1) The "Hispanic or Latino" ethnic classification is not considered a "race" by the Census Bureau and includes persons of any race. The race classifications (Black or African-American, Asian, American Indian, etc.) include both Hispanic and non-Hispanic persons. Therefore, the Hispanic/Latino and race classifications are not summed together since the total would exceed 100 percent as a result of double counting.

Housing Setting

Single-family housing accounted for approximately two-thirds of the total housing units in the seven county region. Hamilton County has the most total housing units (384,597), while Madison County has the least (15,436). In 2009, vacancy rates for housing units ranged between six percent in Madison and Warren counties to 13 percent in Montgomery and Hamilton counties.

According to the 2009 ACS, about two-thirds of the total housing units are owner-occupied and one-third are renter-occupied. The vacancy rates for the rental units are higher than for the owner-occupied units. Clark County has the most units (29 percent) with the lowest rent category ($0 to $499 a month), while Warren County has the least (11 percent). The majority of the renters in the region pay between $500 and $749 a month. Warren County has the highest median monthly rent ($886 per month) while Clark County has the lowest ($613 per month). Warren County has the most housing units (51 percent) built since 1990. Montgomery and Hamilton counties have the most (88 percent) housing units built prior to 1990.

Environmental Justice

Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations*, directs federal agencies to "promote nondiscrimination in federal programs substantially affecting human health and the environment, and provide minority and low-income communities access to public information and an opportunity for public participation in matters relating to human health or the environment."

Table 4-21 shows the total population and percentages of minority and low-income persons in the seven counties of Segment 2. According to the 2000 Census, the average percent minority population is approximately 22 percent and the average percent low-income population is approximately 10 percent. The ACS indicates that since 2000, the minority percentage has increased in all counties in Segment 2 except Clark County, while the low-income percentage has decreased in most cities and counties (Table 4-22). The percentage of minorities residing within Segment 2 averages

22 percent. It varies from 6.2 percent in Warren County to 77.6 percent in Hamilton County.

The percentage of people living below poverty within the state of Ohio is 13.1 percent, compared to 11.0 percent of the counties within Segment 2. The 2009 ACS data indicate that median household incomes have increased in the region, as did the number of individuals living below the poverty level.

Table 4-20. Segment 2 - General Fund Revenues

Revenue	FY 2007/2008 ($)	FY 2008/2009 ($)	FY 2009/2010 ($)	Percent Change	
				FY2007/08 to FY2008/09	FY2008/09 to FY2009/10
Madison County					
Tax	10,101,677	10,287,167	10,111,114	1.8	-1.7
Property	5,802,865	5,594,483	6,261,276	-3.6	11.9
Sales	4,298,812	4,692,684	3,849,838	9.2	-18.0
Other	3,007,982	2,514,209	2,347,338	-16.4	-6.6
Total	13,109,659	12,801,376	12,458,452	-2.4	-2.7
Clark County					
Tax	22,288,777	22,928,874	22,899,129	2.9	-0.1
Property	4,283,619	4,305,515	4,033,829	0.5	-6.3
Sales	18,005,158	18,623,359	18,865,300	3.4	1.3
Other	13,395,840	11,517,994	11,781,307	-14.0	2.3
Total	35,684,617	34,446,868	34,680,436	-3.5	0.7
Greene County					
Tax	29,644,910	29,878,038	29,741,530	0.0	-0.5
Property	8,592,780	9,334,024	9,341,530	8.6	0.1
Sales	21,052,130	20,544,014	20,400,000	-2.4	-0.7
Other	17,569,733	15,449,702	13,689,228	-12.1	-11.4
Total	47,214,643	45,327,740	43,430,758	-4.0	-4.2
Montgomery County					
Tax	80,325,413	80,834,684	76,215,566	0.6	-5.7
Property	15,825,413	15,534,684	14,997,489	-1.8	-3.5
Sales	64,500,000	65,300,000	61,218,077	1.2	-6.3
Other	80,412,920	77,081,751	65,124,963	-4.1	-15.5
Total	160,738,333	157,916,435	141,340,529	-1.8	-10.5
Warren County					
Tax	Not Available	Not Available	Not Available	Not Available	Not Available
Property	Not Available	Not Available	Not Available	Not Available	Not Available
Sales	Not Available	Not Available	Not Available	Not Available	Not Available
Other	Not Available	Not Available	Not Available	Not Available	Not Available
Total	Not Available	Not Available	Not Available	Not Available	Not Available
Butler County					
Tax	49,195,413	44,732,836	43,827,156	-9.1	-2.0
Property	14,150,379	15,060,898	13,804,336	6.4	-8.3
Sales	35,045,034	29,671,938	30,022,820	-15.3	1.2
Other	47,291,850	41,162,164	36,043,378	-13.0	-12.4
Total[1]	96,487,263	85,895,000	79,870,534	-11.0	-7.0
Hamilton County					
Tax	108,800,000	103,300,000	107,100,000	-5.1	3.7
Property	41,200,000	39,400,000	49,500,000	-4.4	25.6
Sales	67,600,000	63,900,000	57,600,000	-5.5	-9.9
Other	162,700,000	136,100,000	104,600,000	-16.3	-23.1
Total	271,500,000	239,400,000	211,700,000	-11.8	-11.6

Sources: Ohio Counties of Madison, Clark, Green, Montgomery, Warren, Butler
(1) Includes in/out refunding of debt.

Table 4-21. Segment 2 - Regional Minority Population

County	Total Population	Percent Minority (2000)	ACS Population (2009)	ACS Percent Minority
Madison[1]	40,213	8.7	42,539	9.0
Clark[1]	144,742	12.4	139,671	12.0
Greene[1]	147,886	11.6	159,823	12.0
Montgomery	559,062	24.2	532,562	25.0
Warren	158,383	6.2	210,712	9.0
Butler	332,807	9.7	363,184	12.0
Hamilton	845,303	27.6	855,062	29.0

(1) Indicates that data were obtained from 2006-2008 ACS 3-year estimates.

Source: US Census Bureau (2000); US Census Bureau (2008 ACS).

Table 4-22. Segment 2 - Regional Income Characteristics

County	Individuals below Poverty	Percent Low Income (2000)	ACS Percent Low Income (2009)[1]	Median Household Income Census 2000 data ($)	Median Household Income ACS[1] ($)
Madison	2,790	7.8	9.6	44,212	51,684
Clark	15,054	10.7	14.3	40,340	45,413
Greene	11,847	8.5	10.3	48,656	57,953
Montgomery	61,440	11.3	15.0	40,156	44,749
Warren	6,425	4.4	6.2	57,952	71,521
Butler	27,946	8.7	11.9	47,885	55,209
Hamilton	97,692	11.8	13.6	40,964	49,343

(1) Indicates that data were obtained from 2006-2008 ACS 3-year estimates.
Source: US Census Bureau (2000). US Census Bureau (2008 ACS).

As illustrated in Appendix B2, many of the census block groups adjacent to the proposed station locations have zero populations. In general, these areas have existing freight rail tracks and are surrounded primarily by industrial or commercial areas. The study area for this section is defined as Census Block Groups within ½-mile of stations and within ½-mile of the rail corridor (Table 4-23).

Table 4-23. Segment 2 - Income and Poverty Information Around Stations.

Station Location	Median Household Income (1999) ($)	Poverty Status		Households With No Vehicle (%)
		Individuals Below Poverty Level	%	
Springfield (Downtown)	20,673	2,132	33.6	28.7
East Dayton (Riverside)	36,393	609	9.3	2.6
Dayton (Main Street)	19,250	1,795	39.1	44.7
North Cincinnati (Kemper Road)	37,857	173	5.1	17.9

Source: US Census Bureau (2000)

Springfield (Downtown Springfield) Station

This site would be located on undeveloped land. There are low-income and minority communities that exceed the county threshold levels adjacent to the site. Poverty-level

populations that exceed the county levels are in the areas just beyond the immediate station area (Appendix B2).

East Dayton (Riverside) Station

The area surrounding the proposed station location has been developed for commercial and industrial uses. There are low income and minority communities adjacent to this location that exceed county poverty levels (Appendix B2).

Dayton (Main Street) Station

There are low-income populations that exceed county levels for the area surrounding the proposed station location (Appendix B2).

North Cincinnati (Kemper Road/Municipal Lot) Station

The area adjacent and surrounding this proposed station locations exceeds the poverty level for the county (Appendix B2).

4.2.2.3 Segment 3 – North Cincinnati to Cincinnati

Segment 3 is entirely within Hamilton County. The sections below discuss the existing conditions for socioeconomic conditions within the approximately 11-mile Segment 3 study area.

Land Use

Land development patterns along the Segment 3 corridor are essentially urban. For the most part, the 3C Corridor segment is situated within an active railroad corridor. The impact on adjacent neighborhoods would be minimal and limited to areas where stations, yards and sidings are proposed.

Segment 3 would include one station in Cincinnati. Five sites have been considered for the proposed station. The sites will be evaluated once the project proceeds in the project development process.

Neighborhoods and Community Cohesion

Segment 3 would pass through various neighborhoods. These neighborhoods will be identified once a preferred station location has been identified during the project development process.

Community Facilities

Segment 3 contains residences and businesses in addition to community services and facilities such as schools (public and private), religious institutions, parks and recreation facilities, government facilities (e.g., courthouse, city hall, post office, and libraries), cemeteries, fire, police, hospitals, and social institutions (e.g., community centers, senior facilities and food banks), and cultural locations (e.g., entertainment venues and museums). The majority of these are in the downtown area of Cincinnati (Table 4-24). Additional community facilities may be identified once a preferred station location has been identified during the project development process.

Table 4-24. Segment 3 - Community Facilities

Location	Number of Facilities								
	Cemetery	Cultural	Governmental[1]	Medical	Public Services[2]	Religious	Schools	Social[3]	Total
Cincinnati	4	1	0	6	1	0	10	3	25

[1] Government services include facilities such as post offices, courthouses, city hall, etc.
[2] Public services include police departments, fire departments, and libraries.
[3] Social services include homeless shelters, community centers, youth and elderly centers, etc.

Socioeconomic Conditions

According to the 2000 US Census, the total population in Hamilton County was 845,303. The total 2009 estimated population and the 2030 projected populations are 855,062 and 730,570 persons, respectively. Average annual growth rate between the years 2000 to 2009 was 1.2 percent. The change in the population between the years 2000-2030 was -13 percent.

In 2009, there were 335,000 households in Hamilton County. The average household size was 2.5 people. Families made up 58 percent of the households including both married-couple families (40 percent) and other families (19 percent). The median age was 37 years and the percentage of the population with a disability was about 22 percent for all age categories.

Seventy-one percent of the Hamilton County population was White; 24 percent was African American; two percent was Hispanic; less than 0.5 percent apiece was American Indian and Alaska Native, Native Hawaiian and Other Pacific Islander, and some other race.

Economic Conditions

Most data sources provide economic data that describe the linkages between various sectors of the economy only at the county level. Economic data are not available for geographic areas smaller than cities; therefore, the economic setting for Segment 3 is discussed in the regional overview.

According to the 2000 US Census, the median household income in Hamilton County was $40,964. Approximately 11.8 percent of the Hamilton county total population (97,692 individuals) was living below the poverty level. The 2000 US Census indicates that 13.5 percent of the households within Hamilton County had no automobile.

Tax Revenues

Hamilton County and Cincinnati have experienced substantial increases in unemployment and foreclosure rates and sharp declines in housing prices due to the recession. Increased unemployment rates have reduced retail sales and associated sales tax revenues in the study area. Declining housing values and increased foreclosure rates have reduced property tax revenues. Table 4-25 summarizes general fund revenues, including property tax and sales tax revenues, for the two most recent fiscal years for which data is available, and provide estimates of revenues for Fiscal Year (FY) 2009/2010. County and city property and sales tax revenues are anticipated to decline between FY 2009/2010.

Table 4-25. Segment 3 - General Fund Revenues

Revenue	FY 2007/2008 ($)	FY 2008/2009 ($)	FY 2009/2010 ($)	Percent Change	
				FY2007/08 to FY2008/09	FY2008/09 to FY2009/10
Hamilton County					
Tax	108,800,000	103,300,000	107,100,000	-5.1	3.7
Property	41,200,000	39,400,000	49,500,000	-4.4	25.6
Sales	67,600,000	63,900,000	57,600,000	-5.5	-9.9
Other	162,700,000	136,100,000	104,600,000	-16.3	-23.1
Total	271,500,000	239,400,000	211,700,000	-11.8	-11.6

Housing Setting

In 2009, Hamilton County had a total of 385,000 housing units, 13 percent of which were vacant. Of the total housing units, 62 percent was in single-unit structures and one percent was mobile homes. Twelve percent of the housing units were built since 1990.

In 2009, 335,000 housing units were occupied. Of this amount, 200,000 (60 percent) were owner occupied and 135,000 (40 percent) were renter occupied. The median monthly housing cost for mortgaged owners was $1,365. Non-mortgaged owner costs were $495 and renter costs were $646. Approximately 14 percent of the households did not have access to a car, truck or van for private use.

Environmental Justice

Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations*, directs federal agencies to "promote nondiscrimination in federal programs substantially affecting human health and the environment, and provide minority and low-income communities access to public information and an opportunity for public participation in matters relating to human health or the environment."

According to the 2000 US Census, the total population was 845,303 for Hamilton County. The minority percentage was approximately 28 percent and approximately 97,692 persons (11.8 percent) were living below the poverty level. The median household income in 2000 was $40,964.

ACS data indicate that the minority population has increased slightly and the low-income population has increased even more in the Segment 3 region since the 2000 Census. According to 2009 ACS data, approximately 13.6 percent of the Hamilton County population was living below the poverty level. The median household income in 2009 was $49,343.

The potential for environmental justice impacts is greatest in residential areas, where people live, and greatest in urbanized areas, where higher numbers of residences exist. Four potential station locations have been identified for Segment 3. Once a preferred station location is identified during the project development process, additional analyses will be completed to identify potential environmental justice concerns Segment 3.

4.2.2.3 Land Use/Socioeconomics/Environmental Justice Next Steps

As the project proceeds through the project development process, additional analyses would be completed to identify and address land use, socioeconomic and environmental justice issues associated with the proposed 3C Corridor. These analyses would include:

- Identify a preferred Cincinnati station location within Segment 3 and complete analyses to identify potential environmental justice impacts in the segment.
- Calculation of the total population within ½-mile of the stations.
- Determine the total population within ¼ mile of the rail corridor
- Determine income levels within ½-mile of stations and ¼-mile of the rail corridor.
- Calculate the percentage of population below poverty level within ½-mile of stations and ¼-mile of the rail corridor.
- Calculate the percentage of households with no vehicle within ½-mile of stations and ¼-mile of the rail corridor.

4.2.3 Cultural Resources

Cultural resources within the study area of the three project segments were identified through literature reviews and supplemented by field surveys.

4.2.3.1 History/Architecture

The following sources of information available from the Ohio Historic Preservation Office (OHPO) were consulted during the literature review: Online Mapping System; lists of formal, preliminary, and consensus National Register of Historic Places (NRHP) determinations of eligibility; NRHP nomination forms; Ohio Historic Inventory (OHI) forms; contract history/architecture reports; Troutman's (2003) *Ohio Cemeteries: 1803–2003*, and the Resource Protection and Review Department's project administrative files. The Ohio Department of Transportation's (ODOT) online Historic Bridge List and Buckeye Assets were also consulted. Lists of cultural resources listed as locally significant were checked online for the Certified Local Governments of Cincinnati, Cleveland, Columbus, and Dayton.

Segment 1 – Cleveland to Columbus

Literature Review
The literature review for Segment 1 identified 40 history/architecture resources (Appendix B3 and Table 4-26). Three of these resources are listed in the NRHP:

- Cleveland Mall,
- Glen Echo Historic District, and
- North Market Historic District.

In addition, one resource (FRA-5333-18/Smith Brothers Hardware Company) was determined eligible for the NRHP as a result of an application for the federal historic preservation tax credits. The history/architecture components of 24 resources have been determined not eligible for the NRHP, including 12 bridges and eight buildings in Morrow County. These resources, however, are listed on Appendix B3 and in Table 4-26 for archaeological review because these components have not been evaluated against the NRHP criteria in an archaeological context. In addition, Appendix B3 identifies previous history/architecture surveys that have been conducted on or adjacent to Segment 1.

Table 4-26. Segment 1 - History/Architecture Literature Review

OHI/ Structure Number/ Property Name	Date(s) of Construction/ Occupation	Style and Type of Building/ Structure	National Register Eligibility Status/ (Reference/Date)/Current Condition
1808192	1959	Steel beam continuous bridge	Determined not eligible/condition unknown
1809415	1959	Steel beam continuous bridge	Determined not eligible/condition unknown
1870041	1983	Steel girder through bridge	Unevaluated/ condition unknown
1800094	1940/1990	Steel beam continuous bridge	Determined not eligible/condition unknown
1866338	1931/1989	Steel truss through bridge	Unevaluated/ condition unknown
1866370	1949	Steel truss through bridge	Unevaluated/ condition unknown
The Cleveland Mall	1903–1935	Seven public government and education buildings and structures on 26 acres in Cleveland, Cuyahoga County	Listed in NRHP 1975/extant
CUY-6664-8	1940	Colonial Revival house in Cleveland, Cuyahoga County	Determined not eligible (L. Adkins to T. Clark, letter, 17 July 2002, OHPO)/condition unknown
CUY-6665-8	1942	Vernacular house in Cleveland, Cuyahoga County	Determined not eligible (L. Adkins to T. Clark, letter, 7 November 2002, OHPO)/condition unknown
CUY-6677-8	1950	Bungalow house in Cleveland, Cuyahoga County	Determined not eligible (L. Adkins to T. Clark, letter, 17 July 2002, OHPO)/ condition unknown
CUY-6800-8	1942	Colonial Revival house in Cleveland, Cuyahoga County	Determined not eligible (L. Adkins to J. Almady, letter, 13 August 2003, OHPO)/condition unknown
1804839	1968/2000	Steel beam continuous bridge	Determined not eligible/condition unknown
RIC-96-5	1832	Greek Revival house	Unevaluated/ condition unknown
HUR-208-9	1870	Vernacular mill and elevator building	Unevaluated/ demolished
MRW-243-7	1870	Vernacular house	Determined not eligible/condition unknown
MRW-244-7	1880	Vernacular house	Determined not eligible/condition unknown
MRW-245-7	1870	Vernacular house	Determined not eligible/condition unknown
MRW-246-7	1910	Vernacular house	Determined not eligible/condition unknown
MRW-247-7	1900	Vernacular house	Determined not eligible/condition unknown
MRW-248-7	1875	Italianate house	Determined not eligible/condition unknown
MRW-249-7	1910	Vernacular railroad building	Determined not eligible/condition unknown
MRW-250-7	1910	Quonset railroad building	Determined not eligible/demolished
DEL-482-8	1890	Vernacular house	Unevaluated/ condition unknown
Glen Echo Historic District	1910–1912	45 residential buildings, structures, and sites on 46 acres in Columbus, Franklin County	Listed in NRHP 1997/extant
2500124	1925	Concrete slab continuous bridge	Determined not eligible/condition unknown
2507897	1960	Steel girder deck bridge	Determined not eligible/condition unknown
FRA-8495-14	Unrecorded	Railroad planning mill building	Unevaluated/ demolished
FRA-8496-14	Unrecorded	Railroad machine shop building	Unevaluated/ demolished
FRA-8497-14	Unrecorded	Railroad machine shop building	Unevaluated/ demolished
FRA-8498-14	Unrecorded	Railroad tower building	Unevaluated/ demolished
FRA-8501-14	Unrecorded	Railroad planning mill building	Unevaluated/ demolished

Table 4-26. Segment 1 - History/Architecture Literature Review

OHI/ Structure Number/ Property Name	Date(s) of Construction/ Occupation	Style and Type of Building/ Structure	National Register Eligibility Status/ (Reference/Date)/Current Condition
FRA-5333-18/Smith Brothers Hardware Company	1927	Industrial/ commercial building in Columbus, Franklin County	Determined eligible for NRHP 1989/ extant
2506149	1993	Steel beam simple span bridge	Unevaluated/ condition unknown
2500663	1915/1965	Steel beam continuous bridge	Determined not eligible/condition unknown
2500868	1993	Steel beam continuous bridge	Determined not eligible/condition unknown
2560704	1979	Steel beam continuous bridge	Determined not eligible/condition unknown
North Market Historic District	1880, 1915	25 commercial, industrial and religious properties on 13 acres in Columbus, Franklin County	Listed in NRHP 1982/extant
2501538	1957	Steel girder deck bridge	Determined not eligible/condition unknown
2501503	1956	Steel girder thru bridge	Determined not eligible/condition unknown
2506068	1958	Steel girder thru bridge	Determined not eligible/condition unknown

Field Survey

No history/architecture survey fieldwork was conducted in Segment 1. Except for the Berea Interlocking area, all of Segment 1 was included within the Tier I EA, and The Ohio Historic Preservation Office's (OHPO) concurrence with the ODOT-Office of Environmental Services' (ODOT-OES) finding of "no historic properties affected." ODOT-OES submitted documentation for the finding of "no historic properties affected" to the OHPO on September 8, 2009, and OHPO concurred with the finding on September 9, 2009 (letter from Timothy M. Hill, Administrator, ODOT-OES, to Mark Epstein, Resource Protection and Review Department, Ohio Historic Preservation Office, September 8, 2009). Improvements in the Berea Interlocking area will require field surveys and coordination as the project proceeds through the project development process.

Segment 2 –Columbus to North Cincinnati

Literature Review

The literature review for Segment 2 identified 51 history/architecture resources (Appendix B3.2, and Table 4-27). Eight of these resources are listed in the NRHP:

- CLA-1228-1/St. Raphael Church,
- CLA-1239-1/Warder Public Library,
- Dayton Motor Car Company Historic District,
- Dayton Power and Light Building Group,
- East Third Street Historic District,
- Oregon Historic District,
- MOT-4450-56/Eagles Building, and
- Dayton Terra-Cotta Historic District.

Sixteen resources, including 15 bridges and BUT-349-14, have been determined not eligible for the NRHP. The remaining 27 history/architecture resources have not been evaluated against the NRHP criteria. As the project proceeds through the project development process, these resources would have to be evaluated for NRHP eligibility.

Table 4-27. Segment 2 - History/Architecture Literature Review

OHI/Structure Number/ Property Name	Date(s) of Construction/ Occupation	Style and Type of Building/ Structure	National Register Eligibility Status/ (Reference/ Date)/ Current Condition
CLA-1228-1/ St. Raphael Church	1885, 1892, 1920	Church in Springfield, Clark County	Listed in NRHP 1976/extant
CLA-1239-1/ Warder Public Library	1890	Public library in Springfield, Clark County	Listed in NRHP 1978/extant
CLA-300-1	1875	Vernacular industrial	Unevaluated/ condition unknown
CLA-301-1	1905	Vernacular industrial	Unevaluated/ condition unknown
CLA-302-1	1890	Vernacular industrial	Unevaluated/ condition unknown
CLA-306-1	1905	Vernacular industrial	Unevaluated/ condition unknown
CLA-1253-1	1900	Vernacular railroad building	Unevaluated/ condition unknown
1205463	1970	Steel beam continuous bridge	Determined not eligible/condition unknown
2937557	1971/2003	Steel beam continuous bridge	Determined not eligible/condition unknown
MOT-293-10	1860	Italianate house	Unevaluated/ condition unknown
5770777	1978	Steel beam continuous bridge	Unevaluated/ condition unknown
5760208	1900	Concrete slab simple span bridge	Determined not eligible/condition unknown
5760348	1956	Steel girder through bridge	Determined not eligible/condition unknown
5760321	1976	Steel girder through bridge	Determined not eligible/condition unknown
MOT-4418-15	1910	Commercial building	Unevaluated/ condition unknown
MOT-4419-15	1875	Italianate house	Unevaluated/ condition unknown
MOT-4410-15	1900	Vernacular industrial/railroad building	Unevaluated/ condition unknown
MOT-4411-15	1900	Vernacular industrial/railroad building	Unevaluated/ condition unknown
5760305	1926	Steel girder through bridge	Unevaluated/ condition unknown
Dayton Motor Car Company Historic District	1873, 1925	12 industrial/ commercial buildings on 12 acres in Dayton, Montgomery County	Listed in NRHP 1984/extant
Dayton Power and Light Building Group	1895, 1907, 1912	Three commercial properties on 1.4 acres in Dayton, Montgomery County	Listed in NRHP 2006/extant
MOT-4818-15	1970	Vernacular commercial building	Unevaluated/ condition unknown
East Third Street Historic District	Late 19th–20th century	Six commercial buildings on 1.1 acres in Dayton, Montgomery County	Listed in NRHP 2001/extant
5760291	1926	Steel girder through bridge	Unevaluated/ condition unknown
Oregon Historic District	1830–1905	39 residential, commercial, government, and recreation properties in Dayton, Montgomery County	Listed in NRHP 1975/extant
5760283	1926	Steel girder through bridge	Unevaluated/ condition unknown
5760194	1926	Steel girder through bridge	Determined not eligible/condition unknown
5703719	1926	Steel girder through bridge	Unevaluated/condition unknown

Table 4-27. Segment 2 - History/Architecture Literature Review

OHI/Structure Number/ Property Name	Date(s) of Construction/ Occupation	Style and Type of Building/ Structure	National Register Eligibility Status/ (Reference/ Date)/ Current Condition
MOT-4448-56	1880	Italianate house	Unevaluated/ condition unknown
MOT-4450-56/Eagles Building	1916, 1926	Second Renaissance Revival commercial structure built 1910 in Dayton, Montgomery County	Listed in NRHP 1982/extant
5760267	1926	Steel girder through bridge	Unevaluated/ condition unknown
5703662	1930	Steel girder through bridge	Determined not eligible/condition unknown
Dayton Terra-Cotta Historic District	1905, 1926	Six commercial properties on 4.2 acres in Dayton, Montgomery County	Listed in NRHP 1984/extant
5760232	1926	Steel girder through bridge	Unevaluated/ condition unknown
MOT-4171-15	1900	Vernacular commercial building	Unevaluated/ condition unknown
MOT-4442-56	1920	Late Gothic Revival industrial building	Unevaluated/ condition unknown
MOT-4393-18	Late 19th century	Vernacular commercial building	Unevaluated/ condition unknown
5760623	Unknown	Steel girder orthotropic bridge	Determined not eligible/condition unknown
5707277	1968	Steel beam continuous bridge	Determined not eligible/condition unknown
5707641	1968	Steel beam continuous bridge	Determined not eligible/condition unknown
5707269	1968	Steel beam continuous bridge	Determined not eligible/condition unknown
5707617	1968	Steel beam continuous bridge	Determined not eligible/condition unknown
MOT-4324-18	1900	Victorian industrial building	Unevaluated/ condition unknown
5701627	1969	Steel beam continuous bridge	Determined not eligible/condition unknown
5701651	1967	Steel beam simple span bridge	Determined not eligible/condition unknown
5701597	1969	Steel beam continuous bridge	Determined not eligible/condition unknown
BUT-358-14	1873	Village of Gano	Unevaluated/ condition unknown
Whallon Cemetery	19th and Early 20th Century	Cemetery in Butler County	Unevaluated/22 burials moved in 1928/condition unknown
BUT-349-14	1880	Vernacular house	Determined not eligible/condition unknown
HAM-5012-50	1890	Vernacular house	Unevaluated/ condition unknown
HAM-5035-50	1880	Italianate commercial building	Unevaluated/ condition unknown

In addition, Appendix B3 (Figures B3.2 and B3) identifies previous history/architecture surveys that have been conducted on or adjacent to Segment 1 components. No cultural resources were identified during the previous surveys.

Field Survey

Most of the project elements in Segment 2 received a Section 106 finding of "no historic properties affected" through cultural resource investigations conducted by ODOT-OES regardless of assumptions made for the purpose of developing the scope of service. ODOT-OES submitted documentation for the finding of "no historic properties affected" to the OHPO on September 8, 2009, and OHPO concurred with the finding on

September 9, 2009 (letter from Timothy M. Hill, Administrator, ODOT-OES, to Mark Epstein, Resource Protection and Review Department, Ohio Historic Preservation Office, September 8, 2009). The letter from OHPO also identified an additional resource in the area (5201 Huberville Avenue [MOT-293-10; the Harshman-Weiffenbach House]), as previously been determined eligible for listing in the NRHP.

The one project element requiring survey fieldwork was a capacity improvement to construct a second main track on NS Dayton District from CJ 202.1 (near Wrights) to CJ 208.5 (Miami River Bridge) and from CJ 208.6 to CJ 209.8 (CP209 – near Moraine Yard) [Appendix B3]. The history/architecture survey fieldwork was conducted in Segment 2 on November 10, 11, and 22, 2010 and identified 47 history/architecture resources within or immediately adjacent to the capacity improvement. These resources include 12 railroad bridges, nine houses, 23 industrial/warehouse resources, and three other miscellaneous resources.

Following completion of the fieldwork, the location of the capacity improvement west of I-75 was shifted to the east. No history/architecture fieldwork has been conducted along the new portion of the capacity improvement, and the recorded properties in Table 4-28 include those in the now-excluded western alignment. At the time of the survey, agreements with NS and RailAmerica were not in place to access rail property directly, it is possible that additional railroad-related resources, especially bridges, are present within the right-of-way. Such resources, if any, will most likely be found along the right-of-way north and east of First Street in downtown Dayton, as most of the rest of the capacity improvement area is readily visible from public roads. These resources would need to be evaluated as the project proceeds through the project development process.

Segment 3 – North Cincinnati to Cincinnati

Literature Review

The literature review identified 10 history/architecture resources in Hamilton County (Appendix B3 and Table 4-28). Four of the resources are bridges and three have been determined not eligible for the NRHP; the other is unevaluated. Two resources are listed in the NRHP, one of which, the Mariemont Historic District, adjacent to the proposed Fairfax station, is a National Historic Landmark. The other NRHP-listed resource, adjacent to the Cincinnati Undercliff Yard, is a cemetery. The Cincinnati Planning Commission (2004) indicated that HAM-1315-11/Cincinnati Municipal Airport (Lunken Field), near the proposed Lunken Airport Station, was NRHP-eligible. The remaining three history/architecture resources have not been evaluated against the NRHP criteria. One, HAM-5060-50, a railroad yard complex along the NS/IORY-Sharonville capacity improvement, has had most of its buildings demolished. The East End-Columbia Tusculum-Linwood cluster includes numerous late nineteenth and twentieth century buildings and structures adjacent to the Cincinnati Undercliff Yard and the proposed Lunken Airport Station. The final resource is HAM-2012-17/Front Street Water Works/Pumping Station. These building ruins are located in Cincinnati's Sawyer Point Park near the potential Sawyer Point Station location.

Table 4-28. Segment 3 - History/Architecture Literature Review

OHI/ Structure Number/ Property Name	Date(s) of Construction/ Occupation	Style and Type of Building/ Structure	National Register Eligibility Status/ (Reference/Date)/Current Condition
HAM-5060-50	1911	Industrial/ railroad buildings	Unevaluated/some buildings demolished
Mariemont Historic District	1924, 1960	1,030 contributing resources in Mariemont, Hamilton County	Listed in NRHP 1979/designated a National Historic Landmark 2007/extant
3103870	1960	Steel beam continuous bridge	Determined not eligible/condition unknown
3103846	1962	Steel girder deck bridge	Determined not eligible/condition unknown
3103811	1962	Steel beam continuous bridge	Determined not eligible/condition unknown
3102068	1994	Prestressed concrete box beam continuous bridge	Unevaluated/ condition unknown
HAM-1315-11/Cincinnati Municipal Airport (Lunken Field)	1920s–1930s	Art Deco airport terminal and three airport hangars	Recommended eligible, Cincinnati Planning Commission (2004)/condition unknown
East End-Columbia Tusculum-Linwood	Late 19th–20th Century	Vernacular residential and commercial buildings	Unevaluated/ condition unknown
Columbia Baptist Cemetery/ HAM-1923-11 (part of Historic Resources of Columbia-Tusculum multiple resources nomination)	1790–1890	Pioneer cemetery established 1790, Hamilton County	Listed in NRHP 1979/extant
HAM-2012-17/Front Street Water Works/ Pumping Station	1865	Industrial building	Unevaluated/ condition unknown

Field Survey

Most of the project elements in Segment 3 received a Section 106 finding of "no historic properties affected" through cultural resource investigations conducted by ODOT-OES regardless of assumptions made for the purpose of developing the scope of service. ODOT-OES submitted documentation for the finding of "no historic properties affected" to the OHPO on September 8, 2009, and OHPO concurred with the finding on September 9, 2009 (letter from Timothy M. Hill, Administrator, ODOT-OES, to Mark Epstein, Resource Protection and Review Department, Ohio Historic Preservation Office, September 8, 2009).

The Segment 3 project elements that were surveyed for history/architecture resources include a capacity improvement to create a second main track on NS Dayton District from CJ 244.2 (CP 244) to IORY Connection at CJ 248.4 (CP 28 south of Sharonville Yard) and proposed station locations at Bond Hill and Fairfax (Appendix B3).

History/architecture survey fieldwork was conducted in Segment 3 on November 11 and 12, 2010 and one resource was identified (Appendix B3). At the time of the survey,

agreements with NS and RailAmerica were not in place to access rail property directly, it is possible that additional railroad-related resources, especially bridges, are present within the right-of-way. Most of the buildings adjacent to the capacity improvement are modern commercial or industrial buildings. No resources were identified at the Bond Hill station location. Fourteen resources were identified within or immediately adjacent to the proposed Fairfax station (Appendix B3). These resources include four railroad bridges, five industrial facilities, three houses, and two commercial buildings. At the time of the survey, agreements with the railroads were not in place to access rail property directly, it is possible that additional railroad-related resources, especially bridges, are present within the right-of-way. These resources would need to be evaluated as the project proceeds through the project development process.

4.2.3.2 Archaeology

The following sources of information available from the OHPO were consulted during the literature review: Online Mapping System; lists of formal, preliminary, and consensus NRHP determinations of eligibility; NRHP nomination forms; OHI forms; contract history/architecture reports; USGS 7.5 minute series topographic maps associated with the Ohio Archaeological Inventory (OAI); OAI forms; contract archaeology reports; Mills' (1914) Archeological Atlas of Ohio; Troutman's (2003) Ohio Cemeteries: 1803–2003, and the Resource Protection and Review Department's project administrative files. Lists of cultural resources listed as locally significant were checked online for the Certified Local Governments of Cincinnati, Cleveland, Columbus, and Dayton.

No archaeological fieldwork has been conducted for the project.

Segment 1 - Cleveland to Columbus

The literature review for Segment 1 identified four resources inventoried in the OAI (Appendix B3 and summarized in Table 4-29). Three sites (33DL1080, 33DL2198, 33DL2199), along the Powell Road Siding capacity improvement, have been determined not eligible for the NRHP. The fourth site, 33FR2016, the North Graveyard in Columbus, near the proposed Convention Center Station, was determined eligible for the NRHP.

The literature review for Segment 1 also identified eight history/architecture resources in Morrow County, along the CSX Edison Siding, whose history/architecture components have been determined not eligible for the NRHP, but whose archaeological components are unevaluated (Appendix B3). One resource (MRW-250-7) appears to have been demolished. The archaeological components of three other history/architecture resources are also unevaluated (Appendix B3). Two of these resources (HUR-208-9 and RIC-96-5) occur on the CSX Greenwich Subdivision capacity improvements. Resource HUR-208-9 appears to have been demolished. Resource DEL-482-8 is on the CSX Paget Siding. In addition, Appendix B3 identifies previous archaeological surveys that have been conducted on or adjacent to Segment 1.

Segment 2 – Columbus to North Cincinnati

The literature review for Segment 2 identified three resources inventoried in the Ohio Archaeological Inventory (Appendix B3 and summarized in Table 4-30). One site, 33GR30/Wright Brothers Memorial Mound Group, is listed in the NRHP. It is located along the NS-Riverside to Dayton capacity improvement. The other two sites, 33CL5

and 33CL90, have not been evaluated against the NRHP criteria. Site 33CL5 is reportedly the location of a burial mound that was excavated in 1878. Portions of the site may remain. Site 33CL90 is the location of a late nineteenth and early twentieth century lime kiln and quarry complex (Appendix B3). In addition, Appendix B3 identifies previous archaeological surveys that have been conducted on or adjacent to Segment 2.

Table 4-29. Segment 1 - Archaeology Literature Review

Site Identifier	Temporal Period and Site Type	Landform	Site Dimensions	National Register Criteria Status/ (Reference/Date)/ Condition
33DL1080	Archaic and Woodland, unknown	Moraine	75 m x 100 m	Determined not eligible/condition unknown
33DL2198	Unassigned prehistoric, unknown	Moraine	1 m x 1 m	Determined not eligible/condition unknown
33DL2199	Unassigned prehistoric, unknown	Moraine	15 m x 1 m	Determined not eligible/condition unknown
33FR2016	1813–1874, cemetery	Moraine	9 acres	Determined eligible/condition unknown

Table 4-30. Segment 2 - Archaeology Literature Review

Site Identifier	Temporal Period and Site Type	Landform	Site Dimensions	National Register Criteria Status/ (Reference/Date)/ Condition
33CL5	Woodland mound	Terrace	Unknown	Unevaluated/ excavated in 1878 but remnants may remain
33CL90	1863–1920 lime kiln and quarry complex	Moraine	800 m x 40 m	Unevaluated/ condition unknown
33GR30/ Wright Brothers Memorial Mound Group	Six prehistoric burial mounds and associated site, Greene County	Bluff	5 acres	Listed in NRHP 1974/extant

Segment 3 – North Cincinnati to Cincinnati

Segment 3 did not require archaeological literature review because the proposed capacity improvements and yards were previously coordinated with OHPO. ODOT-OES submitted documentation for the finding of "no historic properties affected" to the OHPO on September 8, 2009, and OHPO concurred with the finding on September 9, 2009 (letter from Timothy M. Hill, Administrator, ODOT-OES, to Mark Epstein, Resource Protection and Review Department, Ohio Historic Preservation Office, September 8, 2009). Impacts to proposed station locations will be coordinated with the OHPO once a preferred station location is identified as part of the project development process.

4.2.3.3 Cultural Resources Next Steps

Cultural resources were not examined for the NS/CSX-Berea Interlocking capacity improvement in Cuyahoga County, the NS-Riverside to Dayton capacity improvement from Washington Street to the Great Miami River Bridge in Montgomery County, and the proposed station locations in Segment 3 in Hamilton County. In addition, archaeological surveys may need to be completed in areas where new right-of-way is required for tracks or stations. As the project proceeds through the project development process, this information would be gathered and summarized as part of the Section 106 process.

4.2.4 Public Health and Safety

Possible project impacts on public safety include impacts on the response times of emergency service providers (which often must cross over rail corridors to reach their service areas), as well as impacts on the likelihood of rail-auto crashes and rail-only crashes (e.g., derailments). Existing conditions related to public safety are described below.

4.2.4.1 Emergency Service Provision

Emergency services are provided by police, fire departments, and ambulances. In areas where emergencies may occur across the rail corridor from the dispatching location, there is a possibility that additional rail traffic could reduce overall response times. This impact can result directly by passenger rail trains blocking at-grade road crossings or indirectly by any additional freight rail service that may arise from project track improvements that make rail travel more competitive with truck travel.

In areas where there are grade-separated rail crossings, the impact of additional train service will be less than where there are few or no grade-separated crossings. An assessment of possible impacts to emergency service response times was conducted using Geographic Information Systems (GIS) maps. The analysis was done to determine which emergency service providers are located in areas where grade-separated crossings were more than one mile from the nearest at-grade crossing(s).

Appendix B4 shows the location of hospitals, other ambulance services, and fire and police stations within 2.5 miles of the 3C Corridor segments. Many of the service providers may not be impacted by the project, depending on their service area, and whether the facilities (e.g., some hospitals or ambulette dispatchers) provide emergency response services. In areas where there are similar emergency response services on both sides of the tracks, the project may have little or no impact. Similarly, where police dispatchers communicate with cars stationed on both sides of the tracks, there would be no project impact on police services. Potential impacts associated with these situations will be identified during subsequent analysis completed during the project development process.

<u>Segment 1 – Cleveland to Columbus</u>

Most of the segment is rural with a few grade-separated crossings. Due to the low population densities, there are also limited emergency response locations, which is an indication that providers are responsible for serving areas on both sides of the tracks. This is clearly the case in many of the small towns that the corridor passes through, including Ashley, Marion, Galion, Crestline, Shiloh, Greenwich, New London and

LaGrange. For larger cities, such as Cleveland and Columbus, emergency responders are located on both sides of the tracks, and the potential for response time impacts is lower.

Throughout most of the city of Cleveland (between the airport and the Innerbelt Freeway), all of the road crossings are grade-separated, so there could be no impacts from rail traffic. For the northernmost mile of Segment 1, all road crossings are at-grade, and there are no service providers identified on the north side of the tracks. This indicates a high potential for response time impacts in this limited area.

Table 4-31 lists all service providers in Segment 1 which may rely on at-grade crossings. These providers are mapped in Figure B4, with the map numbers indicated in the table below.

Table 4-31. Segment 1 - Potential Impact on Emergency Response Times

Map #	Type of Service	Location	Comments
1	All	Between the northeastern project limits and 9th Street in Cleveland (approximately 2 miles)	East of 9th Street in Cleveland, there are no grade-separated local streets connecting both sides of the tracks. Numerous fire and ambulance stations are within the 2.5 mile buffer south of the rail corridor, which could experience delays in reaching areas north of the rail corridor.
3	Ambulance	Between Sheldon Road and Bagley Road, west of I-71	Closest access point to areas west of the tracks are at-grade and greater than 1 mile from grade-separated crossings.
3	Fire/ Ambulance	On Bagley Road, east of I-71	Closest access point to areas west of the tracks are at-grade and greater than 1 mile from grade-separated crossings.
3	Police	Prospect Street, near Sprague Road, Berea	Closest access point to areas west of the tracks is at-grade and over 1 mile from the nearest grade-separated crossing to the south.
3	All	Olmstead Falls	Two fire departments, an ambulance service and a police station are located west of the tracks in/near Olmstead Falls. Closest access points for all of these locations (since the I-80 overpass is inaccessible) are at-grade and greater than 1 mile from the nearest grade-separated crossings.
3	Fire/ Ambulance	Columbia Township Fire Department	Closest access points to areas west of the tracks are all at-grade and greater than 1 mile from the nearest grade-separated crossings.
4	Fire/ Ambulance	On Elyria-Twinsburg Road, near Easton Estates	Closest access points to areas east of the tracks are all at-grade and greater than 1 mile from the nearest grade-separated crossings.
4	Fire/ Ambulance	City of Grafton	Closest access points to areas west of the tracks are all at-grade and greater than 1 a mile from the nearest grade-separated crossings.
5	Police and Ambulance	City of Lagrange	Closest access points to areas west of the tracks are all at-grade and greater than 1 mile from the nearest grade-separated crossings.
5	Fire	Twp. Highway 72, south of Lagrange	Closest access points to areas west of the tracks are all at-grade and greater than 1 mile from the nearest grade-separated crossings.
5	Fire,	Wellington	Closest access points across the tracks are all at-

Table 4-31. Segment 1 - Potential Impact on Emergency Response Times

Map #	Type of Service	Location	Comments
	Ambulance and Police		grade and greater than 1 mile from the nearest grade-separated crossings.
6	Fire	Twp. Highway 42, north of New London	Closest access points to areas east of the tracks are all at-grade and greater than 1 mile from the nearest grade-separated crossings.
7	Fire and Ambulance	New London	Closest access points to areas west of the tracks are all at-grade and greater than 1 mile from the nearest grade-separated crossings.
7	Fire	Greenwich	Closest access points to areas east of the tracks are all at-grade and greater than 1 mile from the nearest grade-separated crossings.
8	Fire	Shiloh	Closest access points to areas east of the tracks are all at-grade and greater than 1 mile from the nearest grade-separated crossings.
10	Fire/ Ambulance	Galion	Closest access points to areas east of the tracks are all at-grade and greater than 1 mile from the nearest grade-separated crossings.
10	Hospital	Galion	Closest access points to areas east of the tracks are all at-grade and greater than 1 mile from the nearest grade-separated crossings.
11	Fire	SR 309 between Galion and Mount Gilead	Closest access points to areas east of the tracks are all at-grade and greater than 1 mile from the nearest grade-separated crossings.
11	All	Edison and Mount Gilead	Closest access points to areas west of the tracks are all at-grade and greater than 1 mile from the nearest grade-separated crossings.
12	Fire & Police	Cardington	Closest access points to areas west of the tracks are all at-grade and greater than 1 mile from the nearest grade-separated crossings.
13	All	Ashley	Closest access points to areas west of the tracks are all at-grade and greater than 1 mile from the nearest grade-separated crossings.
14	All	Delaware (portion within the 2.5-mile buffer)	Closest access points to some of the areas east of the tracks are at-grade and greater than 1 mile from the nearest grade-separated crossings.
14	Fire/ Ambulance	Berlin Twp Fire Dept, CR 72	Closest access points to areas west of the tracks are all at-grade and greater than 1 mile from the nearest grade-separated crossings.
15	Ambulance	South Old State Road, Lewis Center	Closest access points to areas west of the tracks are all at-grade and greater than 1 mile from the nearest grade-separated crossings.
15	Fire/ Ambulance	Orange Twp fire Department, Gooding Blvd, Lewis Center	Closest access points to areas east of the tracks are all at-grade and greater than 1 mile from the nearest grade-separated crossings.
15	Fire/ Ambulance	Sharon Twp fire Dept, US 23, Worthington	Closest access points to some areas east of the tracks are at-grade and greater than 1 mile from the nearest grade-separated crossings.
15	Police	Worthington-Galena Road near US 23, Worthington	Closest access points to some areas east of the tracks are at-grade and greater than 1 mile from the nearest grade-separated crossings.

Segment 2 – Columbus to North Cincinnati

Segment 2 has a large number of at-grade crossings and grade-separated crossings are often far apart. However, Segment 2 is more urbanized, and is more likely to have emergency response facilities located on both sides of the tracks. For this reason, many of these providers may not be impacted by increased rail traffic (Table 4-32).

Table 4-32. Segment 2 - Potential Impact on Emergency Response Times

Map #	Type of Service	Location	Comments
16	Fire & Ambulance	Grandview	While it is unlikely that this facility serves the other side of the tracks, some of the nearest road crossings are at-grade and greater than 1 mile from accessible grade-separated crossings.
16	Ambulance	SR 33 near Urin Avenue	While it is unlikely that this facility serves the other side of the tracks, some of the nearest road crossings are at-grade and greater than 1 mile from accessible grade-separated crossings.
16	Hospital	Twin Valley Behavioral Healthcare	This facility may or may not have emergency facilities. Some of the nearest road crossings are at-grade and greater than 1 mile from accessible grade-separated crossings.
16	Police	Broad Street and Lechner Avenue, Columbus	Closest access points to some areas north of the tracks are at-grade and greater than 1 mile from the nearest grade-separated crossings.
16	Police	Valleyview	Closest access points to areas north of the tracks are all at-grade and greater than 1 mile from the nearest grade-separated crossings.
17	Ambulance	Sullivant Avenue, Columbus	Closest access points to some areas north of the tracks are at-grade and greater than 1 mile from the nearest grade-separated crossings.
17	Hospital	Doctors Hospital, Columbus	Closest access points to some areas north of the tracks are at-grade and greater than 1 mile from the nearest grade-separated crossings.
17	Fire/ Ambulance	Prairie Twp Fire Department, Palmetto Street, Columbus	Closest access points to some areas north of the tracks are at-grade and greater than 1 mile from the nearest grade-separated crossings.
18	Fire	US 40 near US 42, north of London	Closest access points to areas on the other side of the tracks are all at-grade and greater than 1 mile from the nearest grade-separated crossings.
19	All	London	Closest access points to areas on the other side of the tracks are all at-grade and greater than 1 mile from the nearest grade-separated crossings.
19	Fire/ Ambulance	US 40, East of South Vienna	Closest access points to areas south of the tracks are all at-grade and greater than 1 mile from the nearest grade-separated crossings.

Table 4-32. Segment 2 - Potential Impact on Emergency Response Times

Map #	Type of Service	Location	Comments
20	Police	South Vienna	While this police station may not serve areas south of the tracks, the closest access points are all at-grade for greater than 6 miles in either direction.
20	Police	SR 41, Springfield	Closest access points to some areas south of the tracks are at-grade and greater than 1 mile from the nearest grade-separated crossings.
20	Fire/ Ambulance	US 40, Springfield	Closest access points to some areas south of the tracks are at-grade and greater than 1 mile from the nearest grade-separated crossings.
21	Hospital	Burnett & SR 41, Springfield	Closest access points to some areas south of the tracks are at-grade and greater than 1 mile from the nearest grade-separated crossings.
21	All	West of Plum Street, Springfield	The closest access points to areas on the other side of the tracks for service providers on this side of Springfield are at-grade, many of which are greater than 1 mile from the nearest accessible at-grade crossing.
21	Fire/ Ambulance	US 40 , west of Springfield	Closest access points to some areas south of the tracks are at-grade and greater than 1 mile from the nearest accessible grade-separated crossings.
21	Police	Donnellsville	While this police station may not serve areas south of the tracks, the closest access points are all at-grade and greater than 1 mile from the nearest accessible grade-separated crossings.
22	All	Holiday Valley	The closest access points to areas north of the tracks are at-grade, many of which are greater than 1 mile from the nearest accessible grade-separated crossing.
22	Hospital	88th Medical Group, Wright-Patterson AFB, Dayton	This facility may or may not have emergency facilities. Some of the nearest road crossings are at-grade greater than 1 mile from accessible grade-separated crossings.
23	Ambulance	American Ambulette & Ambulance, Jergens & Kuntz Road, Dayton	Closest access points to some areas south of the tracks are at-grade and greater than 1 mile from the nearest grade-separated crossings.
23	Hospital	Dayton Children's Medical Center	Closest access points to some areas south of the tracks are at-grade and greater than 1 mile from the nearest grade-separated crossings.
24	All	Emergency service providers south of Main Street, Moraine, (continues 5-6 miles south into West Carrolton and Miamisburg)	Many of the service providers in this area are located greater than 1 mile from the few grade-separated crossings in this area.

Table 4-32. Segment 2 - Potential Impact on Emergency Response Times

Map #	Type of Service	Location	Comments
25	All	Carlisle	Closest access points for these service providers are at-grade and greater than 1 mile from the nearest grade-separated crossings.
25	All	Franklin	Closest access points to some areas on the other side of the tracks are at-grade and greater than 1 mile from the nearest grade-separated crossings.
26	Fire/ Ambulance	Yankee Road, Middletown	The closest access points to areas on the other side of the tracks are at-grade and greater than 1 mile from the nearest grade-separated crossing.
26	Ambulance	SR 4, Middletown	Closest access points to some areas on the other side of the tracks are at-grade and greater than 1 mile from the nearest grade-separated crossings.

Segment 3 – North Cincinnati to Cincinnati

Segment 3 is a highly urbanized area and grade-separated crossings are common. As shown in Table 4-33, there are two areas where there is a higher potential for impacts. In Reading, there is an area where there are few grade-separated crossings. This area contains service providers on both sides of the tracks. The second area is along the riverfront near downtown Cincinnati. This narrow area contains no emergency service facilities, and has few grade-separated crossings. Given the prominence of this area and its frequent use for large festivals, it is likely that local service providers already have a response system developed that reduces the impact of rail traffic on response times.

Table 4-33. Segment 3 - Potential Impact on Emergency Response Times

Map #	Type of Service	Location	Comments
28	All	Numerous providers between Route 126 and Losantiville Road, north Cincinnati	There is only one grade-separated crossing in this nearly five-mile long section of track. Many of the numerous service providers are located close to at-grade crossings greater than 1 mile from the nearest grade-separated crossing.
1	All	Narrow strip of land between the proposed rail corridor and the Ohio River between the Riverside Drive station and Lunken Airport.	This area is difficult to reach from the north, with grade-separated crossings a mile or more apart. There are no police, fire, or ambulance services shown south of the tracks in this area. This area contains a large restaurant (Montgomery Inn) and a park that are occasionally used for festivals and special events. Additional research should be done with local officials to determine if a system is in place to ensure availability of vehicles on the south side of the rail corridor at all times, particularly for large events.

4.2.4.2 Public Safety Next Steps

As the project proceeds through the project development process, additional analyses would be completed to identify and address public safety issues associated with the proposed action. These analyses would include:

- Additional research to list the type of safety devices currently in place at all at-grade crossings along the proposed project,
- Identifying areas where there is currently a high rate of rail-auto crashes, or where there is rail service proposed in areas where there is currently no rail service, and
- Identifying areas where there is a higher likelihood of derailments or train-train crashes.

4.2.5 Hazardous Materials

Hazardous materials investigations included review of regulatory databases, a city directory review where possible, and site visits to describe the existing conditions of the project. Features indicative of hazardous material/waste handling, storage, or disposal include staining, underground storage tanks (USTs); above-ground storage tanks (ASTs), surface lagoons, soil disturbance, drums, and distressed vegetation.

The following sections provide a brief overview of observed and potential environmental concerns for the 3C project. The Hazardous Materials Investigations report is included as Appendix B5 in its entirety.

4.2.5.1 Environmental Databases and Sources

FirstSearch (2010) provided current and historic environmental database information for the three segments. A complete listing of the databases searched and an overview of information contained are each database is found in Appendix B5.

4.2.5.2 Field Reviews

Field visits were conducted from November 8, 2010, through November 19, 2010 to verify the existing conditions of the proposed rail facilities. Due to access restrictions, not all areas were investigated. The following discussions are based upon the rail facility contained in the three segments.

<u>Segment 1 – Cleveland to Columbus</u>

Cleveland (Lakefront Amtrak) Station
The search of the databases identified six hazardous materials sites adjacent to the proposed station location. On November 17, 2010, a visual inspection of the station location and adjacent properties was completed to identify land use features or other areas that indicated a potential for contamination by hazardous substances. No indicators of hazardous substances were observed on any of the adjacent properties.

Cleveland: East 26th Street Yard
The search of the environmental databases identified 11 hazardous materials sites adjacent to the proposed rail yard. On November 17, 2010, a visual inspection of the station location and adjacent properties was completed to identify land use features or other areas that indicated a potential for contamination by hazardous substances.

Potential hazardous substances were observed on four of the adjacent properties (Appendix B5).

Southwest Cleveland (West 150th Street/Puritas Avenue) Station
The search of the databases identified no hazardous materials sites adjacent to the study area. On November 17, 2010, a visual inspection of the station location and adjacent properties was completed to identify land use features or other areas that indicated a potential for contamination by hazardous substances. Potential hazardous substances were observed on one of the adjacent properties (Appendix B5).

Columbus (Convention Center) Station
The search of the databases identified six sites of concern adjacent to the proposed station. On November 9, 2010, a visual inspection of the station location area and adjacent properties was completed to identify land use features or other areas that indicated a potential for contamination by hazardous substances. No indicators of hazardous substances were observed on any of the adjacent properties.

Columbus: Grogan Yard
The search of the databases identified five sites within and adjacent to the proposed rail yard. On November 10, 2010, a visual inspection of the area and adjacent properties was completed to identify land use features or other areas that indicated a potential for contamination by hazardous substances. Potential hazardous substances were observed on four of the adjacent properties (Appendix B5).

Columbus: Pennor Yard
The search of the databases identified eight hazardous materials sites within and adjacent to the proposed rail yard. On November 10, 2010, a visual inspection of the area and adjacent properties was completed to identify land use features or other areas that indicated a potential for contamination by hazardous substances. Potential hazardous substances were observed on two of the adjacent properties (Appendix B5).

Columbus: Joyce Avenue Yard
The search of the environmental databases identified three hazardous materials sites adjacent to the proposed rail yard. On November 10, 2010, a visual inspection of the area and adjacent properties was completed to identify land use features or other areas that indicated a potential for contamination by hazardous substances. No indicators of hazardous substances were observed on any of the adjacent properties.

Columbus: Grandview Yard
The search of the databases identified 14 sites adjacent to the proposed rail yard. On November 9, 2010, a visual inspection of the area and adjacent properties was completed to identify land use features or other areas that indicated a potential for contamination by hazardous substances. Potential hazardous substances were observed on three of the adjacent properties (Appendix B5).

NS/CSX Berea Interlocking
A search of the environmental databases, site inspection, fire insurance map search, or city directory review was not completed for this capacity improvement. This rail corridor would need to be evaluated for hazardous materials concerns as the project proceeds through the project development process.

CSX Greenwich Subdivision
The search of the databases identified 11 hazardous materials sites within and adjacent to the rail corridor. On November 19, 2010, a visual inspection of the area and adjacent properties was completed to identify land use features or other areas that indicated a potential for contamination by hazardous substances. Potential hazardous substances were observed on 12 of the adjacent properties (Appendix B5).

CSX Edison Siding
The search of the databases identified no sites within or adjacent to the rail corridor. On November 19, 2010, a visual inspection of the area and adjacent properties was completed to identify land use features or other areas that indicated a potential for contamination by hazardous substances. Potential hazardous substances were observed on 12 of the adjacent properties (Appendix B5). No indicators of hazardous substances were observed on any of the adjacent properties.

CSX Paget Siding
The search of the environmental databases identified no sites within or adjacent to the rail corridor. On November 11, 2010, a visual inspection of the study area and adjacent properties was completed to identify land use features or other areas that indicated a potential for contamination by hazardous substances. No indicators of hazardous substances were observed on any of the adjacent properties.

CSX Powell Road Siding
The search of the databases identified 11 sites within and adjacent to the rail corridor. On November 11, 2010, a visual inspection of the area and adjacent properties was completed to identify land use features or other areas that indicated a potential for contamination by hazardous substances. Potential hazardous substances were observed on two of the adjacent properties (Appendix B5).

CSX/NS Columbus Crossovers
The search of the databases identified four sites adjacent to the rail corridor. On November 17, 2010, a visual inspection of the area and adjacent properties was completed to identify land use features or other areas that indicated a potential for contamination by hazardous substances. No indicators of hazardous substances were observed on any of the adjacent properties.

Columbus (Downtown) Station
The search of the databases identified two sites within and adjacent to the proposed station. On November 9, 2010, a visual inspection of the station location area and adjacent properties was completed to identify land use features or other areas that indicated a potential for contamination by hazardous substances. No indicators of hazardous substances were observed on any of the adjacent properties.

<u>Segment 2 – Columbus to North Cincinnati</u>

Springfield (Downtown Springfield) Station
No hazardous sites of concern were identified on the databases for the proposed station. On November 12, 2010, a visual inspection of the proposed station location and adjacent properties was completed to identify land use features or other areas that

indicated a potential for contamination by hazardous substances. Potential hazardous substances were observed on one of the adjacent properties (Appendix B5).

East Dayton (Riverside) Station

The search of the databases identified two hazardous materials sites adjacent to the proposed station. On November 15, 2010, a visual inspection of the proposed station and adjacent properties was completed to identify land use features or other areas that indicated a potential for contamination by hazardous substances. No indicators of hazardous substances were observed on any of the adjacent properties.

Dayton (Main Street) Station

The search of the databases identified two hazardous materials sites adjacent to the proposed station. On November 15, 2010, a visual inspection of the proposed station location and adjacent properties was completed to identify land use features or other areas that indicated a potential for contamination by hazardous substances. No indicators of hazardous substances were observed on any of the adjacent properties.

NS Plattsburg to Brooks

The search of the databases identified zero hazardous materials sites adjacent to the rail corridor. On November 11, 2010, a visual inspection of the proposed rail corridor and adjacent properties was completed to identify land use features or other areas that indicated a potential for contamination by hazardous substances. No indicators of hazardous substances were observed on any of the adjacent properties.

NS-Cold Springs to Enon

The search of the databases identified one hazardous materials site adjacent to the rail corridor. On November 12, 2010, a visual inspection of the proposed rail corridor and adjacent properties was completed to identify land use features or other areas that indicated a potential for contamination by hazardous substances. No indicators of hazardous substances were observed on any of the adjacent properties.

NS-Riverside to Dayton

The search of the databases identified 34 hazardous materials sites adjacent to the rail corridor. On November 12 and 15, 2010, a visual inspection of the proposed rail corridor and adjacent properties was completed to identify land use features or other areas that indicated a potential for contamination by hazardous substances. Potential hazardous substances were observed on four of the adjacent properties.

North Cincinnati (Kemper Road) Station

The search of the databases identified six hazardous materials sites adjacent to the proposed station. On November 18, 2010, a visual inspection of the proposed station location and adjacent properties was completed to identify land use features or other areas that indicated a potential for contamination by hazardous substances. No indicators of hazardous substances were observed on any of the adjacent properties.

North Cincinnati (Sharonville Municipal Lot) Station

The search of the databases identified two hazardous materials sites adjacent to the proposed station location. On November 18, 2010, a visual inspection of the proposed station and adjacent properties was completed to identify land use features or other areas that indicated a potential for contamination by hazardous substances. No indicators of hazardous substances were observed on any of the adjacent properties.

Segment 3 – North Cincinnati to Cincinnati

NS/IORY
The search of the databases identified 26 hazardous materials sites adjacent to the rail corridor. On November 16 and 17, 2010, a visual inspection of the proposed rail corridor and adjacent properties was completed to identify land use features or other areas that indicated a potential for contamination by hazardous substances. Potential hazardous substances were observed on one of the adjacent properties (Appendix B5).

Lunken Station
The search of the databases did not identify any hazardous materials sites adjacent to the proposed station location. On November 19, 2010, a visual inspection of the proposed station location and adjacent properties was completed to identify land use features or other areas that indicated a potential for contamination by hazardous substances. No indicators of hazardous substances were observed on any of the adjacent properties.

Sawyer Point Station
The search of the databases identified three hazardous materials sites adjacent to the proposed station location. On November 19, 2010, a visual inspection of the proposed station location and adjacent properties was completed to identify land use features or other areas that indicated a potential for contamination by hazardous substances. No indicators of hazardous substances were observed on any of the adjacent properties.

Fairfax Station
The search of the databases identified eight hazardous materials sites adjacent to the station location. On November 19, 2010, a visual inspection of the proposed station location and adjacent properties was completed to identify land use features or other areas that indicated a potential for contamination by hazardous substances. Potential hazardous substances were observed on four of the adjacent properties (Appendix B5).

Bond Hill Station
The search of the databases identified one hazardous materials site adjacent to the proposed station location. On November 19, 2010, a visual inspection of the proposed station location and adjacent properties was completed to identify land use features or other areas that indicated a potential for contamination by hazardous substances. No indicators of hazardous substances were observed on any of the adjacent properties.

Milacron Station
A search of the site inspection, fire insurance map search, or city directory review was not completed for the proposed station location.

Undercliff Yard
The search of the databases identified two hazardous materials sites adjacent to the rail yard. On November 19, 2010, a visual inspection of the proposed rail facility and adjacent properties was completed to identify land use features or other areas that indicated a potential for contamination by hazardous substances. No indicators of hazardous substances were observed on any of the adjacent properties.

4.2.5.3 Hazardous Materials Next Steps

Hazardous materials concerns would be identified for the Berea interlocking and Riverside to Dayton rail corridors. In addition, a site inspection search, fire inspection search, or city directory review would need to be conducted for the Milacron station location. All proposed rail facilities adjacent to properties with hazardous materials concerns would need to be further evaluated for potential impacts as the project proceeds through the project development process.

4.2.6 Section 4(f)/6(f) Resources

4.2.6.1 Section 4(f) of the Department of Transportation Act

Section 4(f) of the Department of Transportation Act of 1966 (49 USC §303) grants special protection to publicly-owned public parks, recreation areas, and wildlife and waterfowl refuges, and significant historic sites that may be publicly or privately owned. Historic sites are protected under Section 4(f) if they are listed on or determined eligible for inclusion on the National Register of Historic Places (NRHP). Archeological sites are protected only if they are listed or eligible for the NRHP and contain resources that warrant preservation in place. Within NRHP listed or eligible historic districts, Section 4(f) applies to the use of those properties that are considered contributing to the eligibility of the historic district, as well as any individually eligible property within the district. Generally, properties within the bounds of a historic district are assumed to contribute, unless it is otherwise stated or they are determined not to contribute.

The US Secretary of Transportation may approve a USDOT project or program that "uses" a Section 4(f) resource only if the Secretary makes the following findings:

- There is no feasible and prudent alternative to the use of the Section 4(f) resources; and
- The project includes all possible planning to minimize harm to the Section 4(f) resource resulting from the use.

In general, a "use" occurs with a transportation project or a program when:

- Section 4(f) land is permanently incorporated into a transportation facility;
- There is a temporary occupancy of Section 4(f) land that is adverse to the protected activities, features, or attributes that qualify the resource for protection under Section 4(f); or
- Land from a Section 4(f) resource is not incorporated into the project but the proximity effects of the project or program are so severe that the protected activities, features, or attributes that qualify the resource for protection under Section 4(f) are substantially impaired, which is considered a "constructive use".

An alternative is not considered to be prudent if it does not meet the project need, or if it involves truly unusual factors, unique problems, or environmental impacts, cost or community disruption reaching an extraordinary magnitude. An alternative is not considered to be feasible if it cannot be constructed in accordance with sound engineering practices.

In the Tier 1 Environmental Assessment, Section 4(f) resources were identified along the entire 3C Corridor through review of available GIS mapping and databases, secondary data source review and limited field verification. A list of these resources is provided in Appendix B6, Table B-6.1.

Additional map review, secondary data source review and selective field verifications were conducted for the current study to determine which Section 4(f) resources merited closer scrutiny for potential impacts. Based upon the current level of design planning, the proposed project does not require acquisition of land from any Section 4(f) resources. Therefore, the potential for proximity impacts was the primary concern in determining which resources merited closer study.

The following sections discuss in more detail Section 4(f) public lands that were considered for further study as part of the project. Section 4(f) historic sites and districts listed here are described in more detail in Section 4.2.3 of this report.

Segment 1 - Cleveland to Columbus

As described below, fourteen Section 4(f) resources were identified for further analysis in Segment 1.

Kirtland Park, Cleveland
This city park lies north of the rail corridor and features an outdoor amphitheater, playground and baseball field. The amphitheater could be subject to noise impacts, pending further evaluation, but the ambient noise levels from nearby I-90 may already be high and the park is already subject to noise from existing freight rail traffic. The park is accessed via Marginal Road, on the opposite side of the park (north) from the corridor and two streets (East 40th and 49th) that cross the rail line.

Willard Park, Cleveland
The Free Stamp Sculpture is the major feature of this 1.8-acre city park southeast of the Lakefront Amtrak Station. Ninth Street, which currently overpasses the rail corridor to the north, provides access to the park from the south, as well.

Cleveland Mall (Cleveland Group Plan Historic District), Cleveland
See Section 4.2.3, Cultural Resources.

Mall B (Hanna Plaza), Cleveland
Part of the Cleveland Group Plan Historic District, this city park is a 5.45-acre, landscaped public space with primarily pedestrian access. It lies southeast of the Lakefront Amtrak Station.

Fort Huntington Park, Cleveland
This is a 2.1-acre city park located south of the Lakefront Amtrak Station, features a police memorial and commemorative statues. Access is provided by local city streets.

Edgewater Park, Cleveland
Edgewater Park is a 131-acre unit of the Cleveland Lakefront State Park on the north side of the rail corridor. It features various lakeside recreational facilities and activities. Vehicular and pedestrian access is currently provided via overpasses and underpasses across the existing rail corridors.

Rocky River Reservation, multiple jurisdictions
The nearly 3,200-acre park is located in portions of Berea, Brook Park, Cleveland, Fairview Park, Lakewood, North Olmsted, Olmsted Township, and Rocky River and

features a broad variety of outdoor athletic and nature-oriented activities. The rail corridor crosses a narrow portion of the reservation in Berea. The character of the reservation is strongly influenced by the Rocky River, with shale cliffs rising above woodlands and trails winding through the valley's floodplain forests and meadows, where wildlife is common. The park features the Rocky River Nature Center, an outdoor educational facility, and is part of the Cleveland Metroparks District.

LaGrange Community Park, LaGrange
This 15-acre village/township park borders the rail corridor on the south. All access points lie to the north. The park features picnic shelters, athletic playing fields, lakes and walking trails. Plans for the park call for development of an outdoor amphitheater.

Caley Reservation, Pittsfield Township
The reservation, which totals 507 acres and abuts the rail corridor along its southeast corner, is managed primarily as a wildlife refuge by the Lorain County Metropolitan Park District. Natural features include wetland, forest and field habitats; two ponds; and numerous bird species. Fishing and hiking are permitted on the reservation.

New London Reservoir Park, New London
The 368-acre park is a recreational resource of the Ohio Department of Natural Resources. The rail corridor borders the park on the north and public roads provide access from all directions, including two roads that cross the rail corridor. The park features a campground, swimming, fishing, and play/sports areas.

Glen Echo Park, Columbus
This 4.2-acre park is one of several ravine parks in the city's park system, with woods and wildlife areas along a creek. The park features a walkway and picnic areas. Pedestrian access is provided from public streets. The east end of the park borders a portion of the rail corridor where improvements are proposed. This public space also lies within the Glen Echo Historic District.

Glen Echo Historic District, Columbus
See section 4.2.3, Cultural Resources for further details.

Smith Brothers Hardware Company, Columbus
See section 4.2.3, Cultural Resources for additional details.

North Market Historic District, Columbus
See section 4.2.3, Cultural Resources for additional details.

<u>Segment 2 (Columbus to North Cincinnati)</u>

As described below, seventeen Section 4(f) resources were identified for further analysis in Segment 2.

Battelle Riverfront Park, Columbus
This 4.1-acre city park lies southeast of the rail corridor on the Scioto River in downtown Columbus. It features a riverside outdoor amphitheater (although ambient noise levels seem high), a replica of the Santa Maria, one of Christopher Columbus's ships, considerable landscaping, and riverside trail access.

Clover Parkland, Columbus
This resource comprises approximately 25 acres of undeveloped parkland in southwestern Columbus that borders the rail corridor on the south.

Big Darby Creek and Little Darby Creek State and National Scenic Rivers, Franklin County
These two scenic rivers represent public recreational and wildlife preservation resources that are each traversed by an existing railroad trestle. They are under jurisdiction of the Ohio Department of Natural Resources.

St. Raphael Church, Springfield
See section 4.2.3, Cultural Resources for additional information.

Warder Public Library, Springfield
See section 4.2.3, Cultural Resources for additional information.

Wright Brothers Memorial Mound Group, Bath Township
This historic district lies south of and adjacent to a portion of the rail right-of-way where improvements are proposed. The district features prehistoric burial mounds. See section 4.2.3, Cultural Resources for additional information.

Eastwood Metropark, Dayton
The 437-acre park is owned by the City of Dayton and leased to Five Rivers Metroparks. Eastwood MetroPark features a 185-acre lake with boating and fishing, as well as nature trails and picnic areas/shelters. The main entrance to the park is on Harshman Road, which overpasses a portion of the rail corridor where improvements are proposed. The southern boundary of the park abuts the rail corridor.

Dayton Motor Car Company Historic District, Dayton
See Section 4.2.3, Cultural Resources for additional information.

Dayton Power and Light Building Group, Dayton
See Section 4.2.3, Cultural Resources for additional information.

East Third Street Historic District, Dayton
See Section 4.2.3, Cultural Resources for additional information.

Oregon Historic District, Dayton
See Section 4.2.3, Cultural Resources for additional information.

Dave Hall Plaza, Dayton
This 3.8-acre park is a public plaza in downtown Dayton that is the site of several summer music festivals and other community events—a potentially noise sensitive facility, although existing noise levels seem high. It is shielded from the rail corridor by office buildings.

Eagles Building, Dayton
See Section 4.2.3, Cultural Resources for additional information.

Dayton Terra Cotta Historic District, Dayton
See Section 4.2.3, Cultural Resources for additional information.

Miamisburg Community Park, Miamisburg
This 42-acre city park lies along both sides of the rail corridor. It features basketball courts, bike trails, a nature trail, picnic tables, playgrounds, a pond, and a skate park. The park has both pedestrian and vehicular access.

Miami River County Park, Middletown
A bike trail is proposed for land owned by the State of Ohio along the Miami River. The existing railroad trestle traverses this park.

Dixie Heights Park, Middletown
This is an 8.0-acre park adjacent to and north of the rail corridor. The park features a playground, picnic tables, a basketball court, and ball field. Access is provided from public roads.

Segment 3 - North Cincinnati to Cincinnati

Eleven Section 4(f) resources were identified for further analysis in Segment 3. Additional sites may be identified once a preferred station location has been identified for the segment.

Bemmes Park, Reading
Bemmes Park is a 7.6-acre city recreational facility with athletic practice and playing fields, a running track, community swimming pool, football stadium and playground. It is also used for Ohio High School Athletic Association and Sandlot America competitions. The park is bordered by the rail corridor to the east. Access is provided by city streets within the City of Reading.

Roselawn Park, Cincinnati
This 35.6-acre city property is managed by the Cincinnati Recreation Commission (City of Cincinnati) and features baseball and basketball facilities, a playground, and picnic shelters. It borders the rail corridor on the east. Access is provided via local streets.

Fenwick Park, Norwood
This is a 25.6-acre city park featuring playing fields and courts, a covered picnic area, and playground equipment. It borders the rail corridor on the north and access is provided via city streets.

Village of Mariemont Historic District, Mariemont
See Section 4.2.3, Cultural Resources for additional information.

Ault Park, Cincinnati
This 224-acre city park features a historic Italianate style pavilion with grand terraces, a cascading fountain, and rooftop access offering panoramic views in all directions, which is used for events such as weddings and private parties. The landscape elements include lawn areas, formal gardens, picnic tables, nature trails, and children's play areas. Ault Park is located west of the proposed Fairfax Station on the east side of Cincinnati. The park has ample access from local streets.

Linwood Field, Cincinnati
The 8.5-acre city recreation area features a soccer field. Linwood Field is adjacent to the rail corridor on the east, with access provided via local streets.

Columbia Baptist Cemetery, Cincinnati
See Section 4.2.3, Cultural Resources for additional information.

Frederick H. Alms Memorial Park, Cincinnati
Frederick H. Alms Memorial Park, a 94-acre city property, features a historic stone pavilion with a second floor arcade offering views of the Ohio River valley. Pavilion amenities include a patio, electricity, water, and restrooms. Park amenities include picnic tables, grills, play equipment, and hiking trails through natural areas. The park lies north of the rail corridor and has ample public access.

Rakestraw Memorial Field, Cincinnati
This 7.6-acre recreational area features several athletic playing fields and courts, as well as a playground. It lies southwest of the rail corridor with city street access to areas between the alignment and the Ohio River.

Theodore M. Berry International Friendship Park, Cincinnati
This riverside city park of approximately 20-acres features a pavilion for communal gatherings, celebrations and events; an international plaza with ceremonial flags, walkways, gardens, sculptures and a bike trail. Access to the park requires crossing the rail corridor. The park is bounded by the rail corridor to the northwest and the Ohio River to the southeast.

Sawyer Point, Cincinnati
Sawyer Point is a 9.1-acre city park operated by the Cincinnati Recreation Commission located on the southwest side of the I-471 bridge opposite the proposed rail corridor and the proposed Sawyer Point Station. The park features an outdoor performance pavilion, concessions, outdoor tennis courts, sand volleyball courts, a playground, fountain and gardens, fishing pier, skating rink, rowing and fitness center, and boat launch. Pedestrian access is provided via sidewalks, trails and walkways. Vehicular access is limited although paid parking is available.

4.2.6.2 Section 6(f)(3) of the Land and Water Conservation Fund Act

Section 6(f)(3) of the Land and Conservation Fund (LWCF) Act of 1965, as amended (Public Law 88-578; 16 USC 4601-4 et seq.)—commonly referred to as Section 6(f)—protects recreational resources that have been developed with funding authorized under the LWCF Act. The LWCF is a nationwide program providing grants to create and maintain high quality outdoor recreation resources. The LWCF is administered by states and local governments with funding made available through the National Park Service (NPS).

Section 6(f)(3) states that:

> No property acquired or developed with assistance under this section shall, without the approval of the Secretary [of the Interior], be converted to other than public outdoor recreation uses. The Secretary shall approve such conversion only if [the Secretary] finds it to be in accord with the then existing comprehensive statewide outdoor recreation plan and only upon such conditions as [the Secretary] deems necessary to assure the substitution of other recreation properties of at least equal fair market value and of reasonably equivalent usefulness and location.

This "anti-conversion" requirement applies to all parks and other sites that have been the subject of LWCF grants of any type, whether for the acquisition of land or for the development or rehabilitation of facilities.

The identification of Section 6(f) resources was completed through a review of county lists maintained by the National Park Service (http://waso-lwcf.ncrc.nps.gov/public/index.cfm) during development of the Tier 1 Environmental Assessment. In total, there were six Section 6(f) resources identified in the Tier I Environmental Assessment. These included four in Segment 1 and two in Segment 2. Based upon the current level of design planning, the proposed project does not require acquisition of right-of-way from any Section 6(f) resource. As a result, there would be no conversion of land to a non-recreational use.

4.2.6.3 Section 4(f)/6(f) Resources Next Steps

Based upon the current level of design planning, the proposed project does not require acquisition of land from any Section 4(f)/6(f) resource.

As the project continues through the project development process, proximity impacts would need to be evaluated to determine if they would constitute a “use” to a Section 4(f) property. If necessary, additional analyses would be completed in order to determine that there are no feasible and prudent alternatives available, and that all possible planning measures to minimize harm to the Section 4(f) resource have been considered.

4.3 Natural Environment

4.3.1 Wetlands, Waterbodies, Streams, Floodplains

A literature review was conducted to determine characteristics of the watersheds and waterbodies within the 3C corridor segments. Each waterbody in Ohio is assigned one or more aquatic life habitat use designations. In addition, each waterbody may be assigned one or more water supply use designations and/or one recreational use designation. Waterbodies are assigned use designations under rules 3745-1-08 to 3745-1-32 of the Ohio Administrative Code (OAC). These designations for streams include Warm Water Habitat (WWH), Limited Warm Water Habitat (LWWH), Exceptional Warm Water (EWW), Modified Warm Water (MWW), Limited Resource Water (LRW), Seasonal Salmonid (SS), and/or Coldwater (CWH). Water supplies are designated as public, agricultural, and/or industrial. Additionally, recreational lakes are considered “bathing waters, primary contact, or secondary contact” waters, dependent on public heath requirements.

In addition to the literature review, field investigations were conducted in order to identify locations and characteristics of wetlands, waterbodies, and streams within the 3 segments. The field investigations were conducted between October 21 and November 23, 2010. Wetland and stream boundaries were established utilizing global position system (GPS) units with sub-meter accuracy. Results of the field investigations are summarized in the following sections. Maps, photo documentation and datasheets are provided in Appendix B7.

The *Qualitative Habitat Evaluation Index (QHEI)* (Ohio Environmental Protection Agency [OEPA] 1989) was used to evaluate the in-stream habitat of resources with a defined

bed and bank, with continuous/periodical flowing water and a watershed area of greater than one square mile.

Resources with a watershed of less than one square mile were characterized by computing the Headwater Habitat Evaluation Index (HHEI) in accordance with OEPA's *Field Evaluation Manual for Ohio's Primary Headwater Habitat Streams, Final Version 1.0* (September 2002). All field evaluations for the project were completed except for the macro-invertebrate and fish evaluations of the HHEI which have to be conducted in the spring.

Wetlands were identified using the routine procedures set forth by the 1987 *Corps of Engineers Wetland Delineation Manual* and *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region* (September 2008). These manuals outline the three parameter approach to identify jurisdictional wetlands. In order to categorize the quality of wetlands, the *Ohio Rapid Assessment Method for Wetlands (ORAM) v. 5.0*, (OEPA 2001) was used. The objective of this assessment is to determine the functional quality of each wetland so that appropriate measures can be proposed for mitigation of unavoidable impacts resulting from development of the area. Once an ORAM sheet was completed, a provisional rating was assigned. The three categories of wetland quality assessment are based on the function of a wetland in its environment, its sensitivity to disturbance, and its potential for adequate compensation by wetland mitigation (OAC 3745-1-54).

Segment 1 - Cleveland to Columbus

Segment 1 is located within the Mohican (HUC # 05040002), Rocky River (HUC #04110001) Huron, Vermillion River (HUC # 04100012), and the Scioto River (HUC # 05060001) watersheds.

The Mohican watershed drains south to the Walhonding River, the Rocky, Huron and Vermillion drain north to Lake Erie. The Mohican watershed covers 999 square miles in north-central Ohio while the Rocky River covers 294 square miles and the Huron and Vermillion cover 674 square miles. The Mohicans's high magnitude impairment sources include major industrial point source, major municipal point source and urban run-off. The Rocky, Huron and Vermillon's high magnitude impairment sources include major municipal point source, highway/bridge/sewer line pollution, land development/suburbanization, non-irrigated crop production and channelization development.

Segment 1 contains portions of the Black Fork Mohican River, the West Branch Huron River, the Southwest Branch Vermillion River and numerous unnamed tributaries to each (Appendix B7).

The Black Fork Mohican River within Segment 1 does not have an aquatic life use designation due to the close proximity of the Shelby Wastewater Treatment Plant. The plant is immediately upstream of the existing railroad bridge. The water supply uses include primary, industrial and agricultural water supply. The river is considered primary contact water for recreation purposes (OAC 3745-1-24).

The West Branch Huron River within Segment 1 has an aquatic life use designation of WWH. The water supply uses include industrial and agricultural water supply. The river is considered primary contact water for recreation purposes (OAC 3745-1-19).

The Southwest Branch Vermilion River within Segment 1 has an aquatic life use designation of is at partial attainment of its aquatic life use designation of WWH. The water supply uses include industrial and agricultural water supply. The river is considered primary contact water for recreation purposes (OAC 3745-1-28).

The Scioto River Watershed (HUC # 05060001) drains south to the Ohio River. It encompasses 6,517 square miles in central and south-central Ohio. Its high magnitude impairment sources include municipal point source, non-irrigated crop production and land development/suburbanization.

The Scioto River within the rail corridor is at full attainment of its aquatic life use designation of MWH. The water supply uses include industrial and agricultural water supply. The river is considered primary contact water for recreation purposes (OAC 3745-1-09). This river system drains Ohio's first and sixth most rapidly populating counties, Delaware and Morrow, respectively. Delaware County's most rapidly developing townships - Delaware, Liberty and Orange - overlap the river's State Scenic River section. Areas of the Whetstone Creek sub-watershed, located within Morrow County, are designated as Exceptional Warm Water Habitat (EWH) with two tributaries being designated as Coldwater Habitat (CWH). Approximately two miles of the Olentangy River is designated as EWH within Franklin County. This area is currently receiving the greatest pressure for development within Franklin County's portion of the watershed.

As a result, OEPA has developed an alternative general permit for storm water associated with construction activity specific for portions of the Olentangy River and Big Darby Creek watersheds. This alternative permit implements many of the basic recommendations regarding the programs, activities and Best Management Practices developed through the Total Maximum Daily Load process, the State Water Quality Management Plan and the 208 plan for the Big Darby Creek Watershed. These plans usually require mitigation for impacts to buffer zones adjacent to the waters within the watershed and mitigation in the Big Darby Creek watershed for impacts to groundwater. Ohio EPA believes implementation of these recommendations is necessary to protect the unique water quality and biological integrity of the Olentangy River and the Big Darby Creek watersheds.

The Scioto River Watershed contains the Olentangy State Scenic River and the Big Darby State and National Scenic River. It should be noted that wetlands and streams are located within the Olentangy River Watershed.

The field evaluation for Segment 1 identified 30 streams totaling approximately 21,584 linear feet of channel, 64 wetlands (totaling 6.83 acres), and four jurisdictional ditches (totaling 0.54 acres) located within the assessment boundaries. Appendix B7 contains information on the designation of streams, jurisdictional ditches, ponds, and wetlands. Corresponding resource mapping and photographic documentation are located in Appendix B7, Figure B 7.1 and Figure B 7.2.

Segment 2 - Columbus to Northern Cincinnati

Segment 2 is located within the Great Miami River Watershed (HUC # 05080002) which drains to the Ohio River and covers 5,373 square miles. Its high magnitude impairment sources include industrial point sources, landfills, and contaminated sediments.

The Mad River within Segment 2 has an aquatic life use designation of WWH. The water supply uses include industrial and agricultural water supply. The river is considered a primary contact water for recreation purposes (OAC 3745-1-21).

Warden Ditch occurs within Segment 2 near Springfield, Ohio. Warden Ditch drains to Smith Ditch, which then drains to the Mad River. No water quality information regarding this waterway is available in the OAC.

The field evaluation for Segment 2 identified 13 streams totaling approximately 9,881 linear feet of channel, 16 wetlands (totaling 2.19 acres), and three jurisdictional ditches (totaling 0.924 acres) located within the assessment boundaries. Appendix B7 contains information on the designation of streams, jurisdictional ditches, ponds, and wetlands. Corresponding resource mapping and photographic documentation are located in Appendix B7, Figure B 7.1 and Figure B 7.2.

Segment 3 - Northern Cincinnati to Cincinnati

Segment 3 is located within the Mill Creek Watershed (HUC # 05090203) which drains to the Ohio River and encompasses 164 square miles in southwest Ohio. Its high magnitude impairment sources include industrial point source, major municipal point source and combined sewer overflow (CSO). This section contains portions of Mill Creek and Sharon Creek, which drains to Mill Creek. Mill Creek within Segment 3 has an aquatic life use designation of WWH. The water supply uses include industrial and agricultural water supply. The creek is considered primary contact water for recreation purposes (OAC 3745-1-30).

Sharon Creek occurs within the Segment 3 and has an aquatic life use designation of WWH. The water supply uses include industrial and agricultural water supply. The creek is considered a primary contact water for recreation purposes (OAC 3745-1-30).

According to the field data collected Segment 3 contains approximately 0.14 acres of wetlands and 7,175 linear feet of stream cannel. Appendix B7 contains information on the designation of streams, jurisdictional ditches, ponds, and wetlands. Corresponding resource mapping and photographic documentation are located in Appendix B7, Figure B 7.1 and Figure B 7.2, respectively.

4.3.1.1 Wetlands, Waterbodies, Streams, Floodplains Next Steps

As the project continues through the project development process, the wetland and stream boundaries established must be agreed upon by the Army Corps of Engineers (ACOE). Once the ACOE agrees on the boundaries a jurisdictional determination (JD) letter will be issued to ODOT and coordinated with the OEPA.

In order to impact a Water of the US, an application including the type and quantity of discharge and/or fill, the location and nature of the project, and supporting information

may be submitted to the ACOE/OEPA for a permit to discharge dredge and/or fill material as described. Impacts are cumulative if they are conducted in conjunction with a single projects so one permit would be issued for this project.

As part of the permitting process, an anti-degradation alternatives analysis must be conducted to describe the proposed project and all alternatives which were considered for the project. Three designs for the permit (preferred, minimal, and non-degradation analysis) will also be required as part of the 401 permit process. The description of the proposed action should include the nature of the work, economic, social and technical matters that must be addressed in the application. In addition to the proposed action, the OEPA requires that a mitigation discussion be included to determine their compliance with state compensatory mitigation requirements. This application must also include a discussion of the presence of significant resources, including fish and wildlife habitat, endangered species, wetlands, flood plains, rivers designated under the Wild and Scenic Rivers Act, scenic and aesthetic resources, recreational resources, and cultural resources. The US Fish and Wildlife Service and Ohio Department of Natural Resources endangered species response letter will be required to be submitted along with the application.

Isolated wetlands are wetlands that are not regulated through the ACOE because they do not have a surface or groundwater connection to waters of the US; and are then considered waters of the State of Ohio. If these wetlands are to be impacted by the project then they must be covered under the 401 permit and an isolated wetlands permit.

4.3.2 Threatened and Endangered Species

Based upon the Tier I EA for the 3C Quick Start Project, an evaluation for the following threatened and endangered species would be required for at least some portion of the 3C Corridor segments: bald eagle, running buffalo clover, clubshell mussel, eastern hellbender, eastern massasauga rattlesnake, elktoe mussel, Indiana bat, peregrine falcon, plains clubtail, pondhorn mussel, rayed bean mussel, river redhorse, smooth green snake, snuffbox mussel, and yellow crowned night heron.

In accordance with recommended guidelines from the Ohio Department of Transportation (ODOT), the Ohio Environmental Protection Agency (OEPA), and the Ohio Department of Transportation (ODNR), most of the species habitat evaluations should occur sometime between the spring and early fall. As a result, the only threatened and endangered species assessment completed for the project at this time was for potential Indiana bat habitat.

<u>Segment 1 - Cleveland to Columbus</u>

The field verification determined that there are 216 potential roost trees and 27 potential maternal roost trees for Indiana bats located within Segment 1.

<u>Segment 2 - Section 2 Columbus to Northern Cincinnati</u>

The field verification was completed for Franklin and Clark counties portions of Segment 2. There are 89 potential roost trees and 21 maternal roost trees for Indiana bats identified within Segment 2.

Segment 3 - Northern Cincinnati to Cincinnati

The evaluation of the Indiana bat habitat was not completed for Segment 3.

4.3.2.1 Threatened and Endangered Species Next Steps

As the project proceeds through the project development process, Indiana bat mist net surveys would be completed for Segments 1 and 2 to determine the potential presence of Indiana bats within the proposed rail improvements. In addition, the Indiana Bat habitat evaluation for Segment 3 would be completed along with the habitat evaluations for bald eagle, running buffalo clover, clubshell mussel, eastern hellbender, eastern massasauga rattlesnake, elktoe mussel, Indiana bat, peregrine falcon, plains clubtail, pondhorn mussel, rayed bean mussel, river redhorse, smooth green snake, snuffbox mussel, and yellow crowned night heron. Based upon the results of the evaluations, the project would be coordinated with the US Fish and Wildlife Service (USFWS) in accordance with ODOT's policies and procedures.

4.4 Physical Environment

4.4.1 Air Quality

Existing air quality conditions within the 3C Corridor segments were identified. "Air Pollution" is a general term that refers to one or more chemical substances that degrade the quality of the atmosphere. Individual air pollutants degrade the atmosphere by reducing visibility, damaging property, reducing the productivity or vigor of crops or natural vegetation, and/or reducing human or animal health. Air quality is a term used to describe the amount of air pollution the public is exposed to.

Air quality in the United States is governed by the Federal Clean Air Act (CAA) and is administered by the United States Environmental Protection Agency (USEPA). The USEPA is responsible for establishing the National Ambient Air Quality Standards (NAAQS) and enforcing the CAA, and regulates emission sources, such as aircraft, ships, and certain types of locomotives, under the exclusive authority of the federal government. The USEPA also has jurisdiction over emission sources outside state waters (e.g., beyond the outer continental shelf) and establishes various emission standards.

4.4.1.1 Clean Air Act Amendments of 1990

The Clean Air Act Amendments (CAAA) of 1990 and the Final Transportation Conformity Rule [40 CFR Parts 51 and 93] direct the USEA to implement environmental policies and regulations that will ensure acceptable levels of air quality. The CAA and the Final Transportation Conformity Rule affect proposed transportation projects. According to Title I, Section 176 (c) 2:

> "No federal agency may approve, accept, or fund any transportation plan, program, or project unless such plan, program, or project has been found to conform to any applicable State Implementation Plan (SIP) in effect under this act."

The Final Conformity Rule defines conformity as follows:

> "Conformity to an implementation plan's purpose of eliminating or reducing the severity and number of violations of the NAAQS and

achieving expeditious attainment of such standards; and that such activities will not:

- Cause or contribute to any new violation of any NAAQS in any area,
- Increase the frequency or severity of any existing violation of any NAAQS in any area, or
- Delay timely attainment of any NAAQS or any required interim emission reductions or other milestones in any area."

4.4.1.2 National and State Ambient Air Quality Standards

The USEPA has established NAAQS for six major air pollutants. These pollutants are: carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM_{10} and $PM_{2.5}$), sulfur dioxide (SO_2), and lead (Pb). The "primary" standards have been established to protect the public health. The "secondary" standards are intended to protect the nation's welfare and account for air pollutant effects on soil, water, visibility, materials, vegetation and other aspects of the general welfare.

4.4.1.3 Ambient Air Quality Data

The project area is located within the northern limit of the humid subtropical climate and the southern limit of the humid continental climate zone, with average temperatures by US standards. Summers are hot, humid and wet. July is the warmest month, with an average high of 87°F (31°C) and an average low of 68°F (20°C). Winters are generally cool to cold, with occasional snowfall. January is the coldest month, with an average high of 38°F (3°C) and an average low of 21°F (-6°C). Precipitation is fairly evenly distributed each month, averaging 41 inches of rainfall and 14 inches of snowfall annually.

4.4.1.4 Local Monitored Air Quality

Segment 1 - Cleveland to Columbus

The monitored information for the monitoring stations nearest to Segment 1 for the last three years is found in Table 4-34. Locations of the sites are found in Appendix B8.

Segment 2 - Columbus to North Cincinnati

The monitored information for the monitoring stations nearest to Segment 2 for the last three years is found in Table 4-35. Locations of the sites are found in Appendix B8.

THIS PAGE INTENTIONALLY LEFT BLANK

Table 4-34. Segment 1 - Air Quality Summary for Area Monitoring Stations

Parameter		2036 East 9th Street Cleveland			13013 Corlett Avenue Cleveland			2547 Street Tikhon Cleveland			4950 Broadway Avenue Cleveland			5750 Maple Canyon Columbus		
Year		2006	2007	2008	2006	2007	2008	2006	2007	2008	2006	2007	2008	2006	2007	2008
Carbon Dioxide (CO) (ppm)																
1 Hour	Maximum	5	6	4.8	2.5	3.8	2									
	2nd Maximum	2.8	5	4.8	2.3	3	1.8									
	# of Exceedences	0	0	0	0	0	0									
8 Hour	Maximum	1.8	2.4	2.6	1.6	1.6	1.5									
	2nd Maximum	1.6	2.1	1.5	1.5	1.5	1.3									
	# of Exceedences	0	0	0	0	0	0									
Particulate Matter (ug/m3)																
PM_{10}	Maximum 24-Hour							76	84	67	45	48	49			
	Mean Annual							28	29	28	25	27	26			
	# of Exceedences							0	0	0	0	0	0			
$PM_{2.5}$	Maximum 24-Hour							41.2	42	41.4	31.9	37.8	39	32	45.1	43.8
	Mean Annual							14.93	16.25	13.83	14.05	15.27	13.26	12.89	13.11	10.43
	# of Exceedences							1	1	1	0	1	0	0	0	0
Ozone (O_3) (ppm)																
	First Highest													0.085	0.086	0.088
	Second Highest													0.084	0.083	0.073
	Third Highest													0.08	0.08	0.066
	Fourth Highest													0.077	0.079	0.066
	# of Days Standard Exceeded													4	8	1
Nitrogen Dioxide (NO_2) (ppm)																
	1-Hour Maximum				0.175	0.098	0.074									
	1-Hour Second Maximum				0.075	0.075	0.069									
	Annual Mean				0.014	0.016	0.014									
	# of Days Standard Exceeded				0	0	0									
Sulfur Dioxide (SO_2) (ppm)																
	1-Hour Maximum							0.095	0.195	0.108	0.103	0.107	0.055			
	3-Hour Maximum							0.053	0.103	0.064	0.062	0.057	0.037			
	24-Hour Maximum							0.024	0.032	0.025	0.018	0.018	0.011			
	Annual Mean							0	0	0	0.004	0.003	0.003			

Table 4-35. Segment 2 - Air Quality Summary for Area Monitoring Stations[1]

Parameter		901 W. Fairview Avenue Dayton			100 E. 5th Street Cincinnati			Hook Field Airport Middletown			250 William Howard Taft Cincinnati		
Year		2006	2007	2008	2006	2007	2008	2006	2007	2008	2006	2007	2008
Carbon Monoxide (CO) (ppm)													
1 Hour	Maximum	4.5	4.7	1.5	10.6	4.9	5.9						
	2nd Maximum	4.2	4.2	1.4	9.9	4.1	5.1						
	# of Exceedences	0	0	0	0	0	0						
8 Hour	Maximum	2.6	2.5	2.1	4.3	3.1	3.6						
	2nd Maximum	1.5	1.6	1	3.3	2.8	2.7						
	# of Exceedences	0	0	0	0	0	0						
Particulate Matter (ug/m3)													
PM_{10}	Maximum 24-Hour										43	58	46
	Mean Annual										19	22	25
	# of Exceedences										0	0	0
$PM_{2.5}$	Maximum 24-Hour							36	37.6		34.5	41.9	31.5
	Mean Annual							13.38	14.63		13.57	15.09	12.13
	# of Exceedences							0	0		0	1	0
Ozone (O_3) (ppm)													
	First Highest										0.089	0.097	0.086
	Second Highest										0.08	0.093	0.083
	Third Highest										0.079	0.088	0.081
	Fourth Highest										0.078	0.086	0.08
	# of Days Standard Exceeded										8	15	7
Nitrogen Dioxide (NO_2)													
	1-Hour Maximum										0.061	0.081	0.079
	1-Hour Second Maximum										0.061	0.072	0.073
	Annual Mean										0.018	0.017	0.016
	# of Days Standard Exceeded										0	0	0
Sulfur Dioxide (SO_2)													
	1-Hour Maximum							0.076	0.06	0.037			
	3-Hour Maximum							0.058	0.035	0.029			
	24-Hour Maximum							0.019	0.017	0.015			
	Annual Mean							0.004	0.004	0.004			

(1) data would also include the 5750 Maple Canyon site listed in Table 4-35.

Segment 3 - North Cincinnati to Cincinnati

The monitored information for the monitoring stations nearest to Segment 3 for the last three years is found in Table 4-36. Locations of the sites are found in Appendix B8.

Table 4-36. Segment 3 - Air Quality Summary for Monitoring Stations[1]

Parameter		11580 Grooms Road Cincinnati			6950 Ripple Road Cleves		
Year		2006	2007	2008	2006	2007	2008
Carbon Monoxide (CO) (ppm)							
1 Hour	Maximum						
	2nd Maximum						
	# of Exceedences						
8 Hour	Maximum						
	2nd Maximum						
	# of Exceedences						
Particulate Matter (ug/m^3)							
PM_{10}	Maximum 24-Hour						
	Mean Annual						
	# of Exceedences						
$PM_{2.5}$	Maximum 24-Hour	35	40.8	33.9			
	Mean Annual	13.29	14.63	12.03			
	# of Exceedences	0	0	0			
Ozone (0_3) (ppm)							
	First Highest	0.095	0.112	0.112	0.112	0.109	0.094
	Second Highest	0.092	0.111	0.106	0.111	0.104	0.092
	Third Highest	0.092	0.109	0.095	0.098	0.102	0.091
	Fourth Highest	0.092	0.106	0.095	0.09	0.102	0.09
	# of Days Standard Exceeded						
Nitrogen Dioxide (NO_2) (ppm)							
	1-Hour Maximum						
	1-Hour Second Maximum						
	Annual Mean						
	# of Days Standard exceeded						
Sulfur Dioxide (SO2) (ppm)							
	1-Hour Maximum				0.141	0.118	
	3-Hour Maximum				0.121	0.089	
	24-Hour Maximum				0.036	0.022	
	Annual Mean				0.005	0.005	

(1) Data would also include the 250 West William Howard Taft and 100 East 5th Street sites.

4.4.1.1 Pollutant Description

Pollutants that have established national standards are referred to as "criteria pollutants." Descriptions of pollutants are found in Appendix B8.

4.4.1.2 Attainment Status

Section 107 of the 1977 CAAA requires that the USEPA publish a list of all geographic areas in compliance with the NAAQS, plus those not attaining the NAAQS. Areas not in NAAQS compliance are deemed non-attainment areas. Areas that have insufficient data to make a determination are deemed unclassified, and are treated as being attainment areas until proven otherwise. An area's designation is based on the data collected by the state monitoring network on a pollutant-by-pollutant basis.

Segment 1 - Cleveland to Columbus

The project area is located in Crawford, Cuyahoga, Delaware, Franklin, Huron, Lorain, Morrow and Richland counties. As shown Table 4-37, the USEPA has classified Cuyahoga, Delaware, Franklin and Lorain counties as nonattainment areas for $PM_{2.5}$.

Table 4-37. Segment 1 - Project Area Attainment Status

County	CO	O_3	PM_{10}	$PM_{2.5}$	SO_2
Crawford	Attainment	Attainment	Attainment	Attainment	Attainment
Cuyahoga	Maintenance	Maintenance	Maintenance	**Nonattainment**	Maintenance
Delaware	Attainment	Maintenance	Attainment	**Nonattainment**	Attainment
Franklin	Attainment	Maintenance	Attainment	**Nonattainment**	Attainment
Huron	Attainment	Attainment	Attainment	Attainment	Attainment
Lorain	Attainment	Maintenance	Attainment	**Nonattainment**	Maintenance
Morrow	Attainment	Attainment	Attainment	Attainment	Attainment
Richland	Attainment	Attainment	Attainment	Attainment	Attainment

Source: Environmental Protection Agency (EPA), 2010

Segment 2 – Columbus to North Cincinnati

Segment 2 is located in Butler, Clark, Green, Hamilton, Madison, Montgomery and Warren counties. As shown in Table 4-38, the USEPA has classified Butler, Hamilton and Warren counties as nonattainment areas for O_3 and Butler, Clark, Greene, Hamilton, Montgomery and Warren counties as nonattainment for $PM_{2.5}$.

Table 4-38. Segment 2 - Project Area Attainment Status

County	CO	O_3	PM_{10}	$PM_{2.5}$	SO_2
Butler	Attainment	**Nonattainment**	Attainment	**Nonattainment**	Attainment
Clark	Attainment	Maintenance	Attainment	**Nonattainment**	Attainment
Greene	Attainment	Maintenance	Attainment	**Nonattainment**	Attainment
Hamilton	Attainment	**Nonattainment**	Attainment	**Nonattainment**	Attainment
Madison	Attainment	Maintenance	Attainment	Attainment	Attainment
Montgomery	Attainment	Maintenance	Attainment	**Nonattainment**	Attainment
Warren	Attainment	**Nonattainment**	Attainment	**Nonattainment**	Attainment

Source: Environmental Protection Agency (EPA), 2010

Segment 3 – North Cincinnati to Cincinnati

Segment 3 is located in Hamilton County which is classified as a nonattainment area for O_3 and $PM_{2.5}$.

4.4.1.3 State Implementation Plan and Transportation Improvement Program Status

The CAAA requires federal agencies to ensure that their actions conform to the appropriate State Implementation Plan (SIP). The SIP is a plan that provides for implementation, maintenance, and enforcement of the NAAQS. Prior to approval or funding by a federal agency, a proposed project must demonstrate compliance with USEPA's Conformity Rule by determining that it would not cause or exacerbate an exceedance of a NAAQS.

As a project being developed under the Federal Railroad Administration (FRA), this project falls under the General Conformity Rule, which requires a conformity determination for each pollutant where the total of direct and indirect emissions in a nonattainment or maintenance area caused by a federal action would equal or exceed USEPA-specified significant threshold values. General Conformity's *de minimis* values for the project area are 100 tons per year for $PM_{2.5}$, O_3 precursors (VOCs and NOx), SO_2 and CO.

Since the proposed project does not currently appear on any Long Range Plan or Transportation Improvement Program (TIP) at the Metropolitan Planning Organization (MPO) level and the Ohio Department of Transportation will work in close coordination with the appropriate MPO agencies to include this project on these planning tools.

4.4.1.4 Air Quality Next Steps

To evaluate the project's impact on air quality pollutants, the following analyses would be conducted as the project continues through the project development process:

- Review of Applicable Standards, Attainment Status and Regulations - National Ambient Air Quality Standards would be reviewed to insure that they have not changed since this document was issued. SIP and TIP status would be updated as well as the area's attainment status.
- Regional emissions analysis on the No Build and Build alternatives - The analysis would be based on regional vehicle miles traveled (VMT) estimates by roadway type along with associated vehicle hours traveled (VHT) estimates. Emission factors would be obtained using the latest EPA emission factor program for on-road vehicles and for diesel locomotives as applicable.
- Localized assessment of potential operational impacts on CO, $PM_{10,}$ $PM_{2.5}$ and mobile source air toxics (MSAT) air quality levels – The following analyses would be taken to determine if the proposed project causes or exacerbates a violation of the applicable NAAQS or adversely affects MSAT levels:
    - Sites would be selected for the CO analysis using a screening procedure based on the AM and PM peak hour overall intersection volumes, changes in intersection volumes, and changes in traffic level of service (LOS).
    - Microscale air quality modeling would be performed on the sites selected through the screening process using the most recent version of the USEPA mobile source emission factor model (currently MOBILE6.2) and the latest air quality microscale dispersion model (currently CAL3QHC version 2.0). CO levels for the existing year, future No Build (without the proposed project) and future Build (with each proposed project alternative) for the project's opening and design year would be estimated. Appropriate backgrounds and meteorological conditions would be applied.
    - Since the project area is currently classified as a nonattainment area for $PM_{2.5}$, a qualitative hotspot analysis following USEPA's March 29, 2006 guidance T*ransportation Conformity Guidance for Qualitative Hot-spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas* (EPA420-B-06-902) would be conducted, as recommended in USEPA's Final Rule regarding the localized or "hot-spot" analysis of $PM_{2.5}$ and PM_{10} (40 CFR Part 93 – issued on March 10, 2006). Before this analysis is

conducted, however, it would be determined if this guidance is still the most current and if the area is still classified as nonattainment for $PM_{2.5}$.

- FHWA's Interim Guidance would be followed to perform a MSAT analysis, once it has been determined that no newer guidance is available. If newer guidance is issued, that guidance would be followed.

- Localized assessment of potential construction impacts on CO, $PM_{10,}$ and $PM_{2.5}$ air quality levels – if the construction period is estimated to take longer than five years in one location, a detailed quantitative construction analysis must be conducted. Local and federal agencies would be contacted to determine if they would like a quantitative analysis even if the construction is less than five years. If a quantitative analysis is not required, a qualitative analysis would be conducted, describing the sources of emissions during construction and suggested mitigation measures to reduce these emissions.

4.4.2 Noise Resources

A number of factors affect sound when it is perceived as noise. These factors include the actual level of sound (or noise), the frequencies involved, exposure time interval, and the changes or fluctuations in the noise levels during exposure. Noise levels are measured in units called decibels. Since the human ear does not respond equally to all frequencies (or pitches), measured sound levels (in decibel units at standard frequency bands) are often adjusted or weighted to correspond to the frequency response of human hearing range and perception of loudness. The weighted sound level is expressed in units called A-weighted decibels (dBA) and is measured with a calibrated sound meter.

Road traffic and transit noise and other noises found in communities tend to fluctuate from moment to moment, depending on volume and source of the noise, such as that generated from a passing heavy truck, an airplane, a train horn, or children as they play in a nearby schoolyard. To measure the variation in noise intensity accurately, noise energy, expressed in dBA, produced by different activities are averaged over a period of time in order to obtain a single number. This single number is called the equivalent noise level (Leq). Averaged over one hour it is abbreviated as Leq (1hr) dBA and is defined as the equivalent steady-state sound level that, in a period of one hour, contains the same acoustic energy as the time-varying sound level during that hour. All measured or calculated noise levels in this noise study report are reported in dBA.

Another measure of sound energy considers people's increased sensitivity to noise during sleeping hours. This noise descriptor is not a measured noise level, but instead is calculated by determining the total noise exposure over a 24-hour period. This noise descriptor is referred to as the day-night sound level (Ldn). At any given noise monitoring location, the Ldn level is derived from logarithmetic sum of the average daytime noise level (Lday) and average nighttime noise level (Lnight). The Lday time period consists of 15 hours of the day from 7 AM to 10 PM and the Lnight time period consists of the remaining 9 hours from 10 PM to 7 AM. Estimated Lday and Lnight noise levels are derived from individual hours of measured Leq (1hr) levels. However, to account to the greater noise sensitivity to people during the nighttime hours, the Lnight noise level is adjusted by adding 10 dBA to each of the measured Leq (1hr) levels recorded between 10:00 PM and 7:00 AM. FTA criteria utilize both the peak hour Leq and 24 hour Ldn noise descriptors for noise impact assessment. For those properties or land use activities limited to daytime uses the peak hour Leq descriptor is applied and

those land uses involving places where people normally sleep are assessed for impact using the Ldn matrix.

4.4.2.1 Human Perception to Changes in Noise Levels

Generally, changes in noise levels less than 3 dBA will be barely perceived by most listeners, whereas a 10-dBA change normally is considered significant and is perceived as a doubling, or halving, of noise levels. Community noise levels in urban areas usually range between 45 dBA which is the daytime level in a typical quiet living room, and 75 dBA which is the approximate noise level near a sidewalk adjacent to heavy traffic.

4.4.2.2 FTA Noise Criteria for Transit Projects

FTA noise impact criteria, like the Federal Highway Administration (FHWA) criteria establish impacts based on land use categories. Since the proposed rail service does not include any modification or expansions to existing primary roadways, the impact assessment can be evaluated based solely using FTA guidelines.

FTA impact assessment guidelines group sensitive areas into three specific land use categories. The noise descriptor used to complete the impact assessment is chosen based on that land use type. The noise impact assessment completed for this study was primarily FTA Category 2 land uses, which consist of buildings where people normally sleep and the sensitivity to noise is of the utmost importance, such as residential buildings, hotels, and hospitals. A summary of the description of each of the three land use categories is provided in Table 4-39. The Leq (1hr) dBA descriptor is utilized for land uses limited to primarily daytime activity and the Ldn descriptor is applied when to land uses involving properties where people sleep and therefore sensitivity to noise at night is of utmost importance.

Table 4-39. FTA Guidelines Land Use Categories and Metrics for Transit Noise

Land Use Category	Noise Metric (dBA)	Description of Land Use Category
1	Outdoor Leq (h)[1]	Land where quiet is an essential element in their intended purpose. This category includes lands set aside for serenity and quiet, and such land used as outdoor amphitheaters and concert pavilions, as well as National Historic Landmarks with significant outdoor use.
2	Outdoor Ldn	Residences and buildings where people normally sleep. This category includes homes, hospitals and hotels where a nighttime sensitivity to noise is assumed to be of utmost importance.
3	Outdoor Leq (h)[1]	Institutional land uses with primary daytime and evening use. This category includes schools, libraries, and churches where it is important to avoid interference with such activities as speech, meditation and concentration on reading material.

(1) Leq for the noisiest hour of transit-related activity during hours of noise sensitivity.

4.4.2.3 FTA Impact Assessment Based on Project Noise Exposure

FTA guidelines are based on relative impact criteria whereby noise impacts are determined by comparing the estimated future noise levels generated solely by the proposed operations of the high speed rail system against the existing ambient noise levels without the project. The FTA criteria, categorizes project noise into three principle levels of estimated noise exposure defined as “No Impact”, “Moderate Impact”, or

"Severe Impact". A summary of the impact criteria thresholds based on the existing noise exposure as defined by the three land use categories is provided in Table 4-40**.**

Table 4-40. Noise Levels Defining Impact for Transit Projects

Existing Noise Exposure Leq (1-hr) or Ldn (dBA)[1]	Project Noise Impact Exposure[1], Leq (1-hr) or Ldn (dBA)					
	Category 1 or 2 Sites			Category 3 Sites		
	No Impact	Moderate Impact	Severe Impact	No Impact	Moderate Impact	Severe Impact
51	<54	54-60	>60	<59	59-65	>65
52	<55	55-60	>60	<60	60-65	>65
53	<55	55-60	>60	<60	60-65	>65
54	<55	55-61	>61	<60	60-66	>66
55	<56	56-61	>61	<61	61-66	>66
56	<56	56-62	>62	<61	61-67	>67
57	<57	57-62	>62	<62	62-67	>67
58	<57	57-62	>62	<62	62-67	>67
59	<58	58-63	>63	<63	63-68	>68
60	<58	58-63	>63	<63	63-68	>68
61	<59	59-64	>64	<64	64-69	>69
62	<59	59-64	>64	<64	64-69	>69
63	<60	60-65	>65	<65	65-70	>70
64	<61	61-65	>65	<66	66-70	>70
65	<61	61-66	>66	<66	66-71	>71
66	<62	62-67	>67	<67	67-72	>72
67	<63	63-67	>67	<68	68-72	>72
68	<63	63-68	>68	<68	68-73	>73
69	<64	64-69	>69	<69	69-74	>74
70	<65	65-69	>69	<70	70-74	>74
71	<66	66-70	>70	<71	71-75	>75
72	<66	66-71	>71	<71	71-76	>76
73	<66	66-71	>71	<71	71-76	>76
74	<66	66-72	>72	<71	71-77	>77
75	<66	66-73	>73	<71	71-78	>78
76	<66	66-74	>74	<71	71-79	>79
77	<66	66-74	>74	<71	71-79	>79
>77	<66	66-75	>75	<71	71-80	>80

Source: *Transit Noise and Vibration Impact Assessment, FTA, May 2006*

(1) Ldn is used for land use where nighttime sensitivity is a factor; Leq during the hour of maximum transit noise exposure is used for land use involving only daytime activities.

4.4.2.4 Noise Prediction Methodology

The noise exposure calculations were completed following the procedures and methodologies described in the in the FTA document *Transit Noise and Vibration Assessment Manual* (FTA report FTA-VA-90-1003-06, May 2006).

4.4.2.5 Ambient Noise Measurement Survey

In accordance with FTA recommended procedures, noise monitoring for duration of a full continuous twenty-four hours provides the most accurate method to determine baseline ambient day-night (Ldn) noise levels at representative impact assessment locations. As a result, 24-hour noise readings were collected at all Category 2 land uses identified within the study area. Each measurement location was selected based on the properties' potential sensitivity and proximity to noise generated from the proposed passenger rail

operations. Day-night noise levels measured at each of the monitoring locations is representative of ambient noise conditions at other nearby adjacent noise sensitive properties near the proposed passenger rail corridor. Furthermore, prior to the actual noise monitoring survey, all proposed measurement sites were sent to ODOT for review and approval.

All field measurements were conducted according to procedures described in *Sound Procedures for Measuring Highway Noise* (Report Number FHWA-DP-45-1R May 1996). All measurements were collected during periods of dry weather with wind speeds of less than 15 mph. Noise measurements collected under poor weather conditions with either rain or snow were not reported and are indicated as such in the noise monitoring summary tables. Each sound level meter was mounted on a tripod at a height of approximately 5.5 feet above ground level. Six sets of certified Larson Davis LD 720 noise meters were used in the collecting the ambient noise readings outfitted with Larson Davis condenser microphones and windshields. The Larson Davis equipment was supplemented with one Bruel and Kjaer Type 2238 sound level meter fitted with a Type 5155 condenser microphone enclosed in a weatherproof pelican case. Power for the B & K equipment was provided by an external dry cell battery and the Larson Davis noise meters were powered by standard 9 volt batteries. Short term, peak hour noise measurements were collected using a Bruel and Kjaer Type 2231 sound level meter outfitted with its Type 4165 condenser microphone and windshield. Calibration before and after each noise measurement was completed using a Larson Davis LD 250 and B&K Type 4231 calibrators.

Twenty-four hour noise measurements were collected at 86 representative properties. Most were located next to the proposed rail corridor; others were located near proposed stations and maintenance and storage yard facilities. In addition, peak hour daytime noise measurements were collected at a few FTA Category 3 land uses that were identified near the project corridor. Noise measurements collected near the passenger rail corridor are identified with a “N” prefix, those near proposed Yard locations were identified with a “Y” prefix, those near a station location are identified with a “S” prefix and those which are short term daytime peak hour are identified with a “ST” prefix. A summary of the noise monitoring findings for each of the three corridor segments is described below.

<u>Segment 1 Cleveland to Columbus</u>

Appendix B9 (Figure B9.1) depicts the location of the 23 representative noise monitoring sites (N-1 to N-23) adjacent to the rail corridor where 24 hour noise readings were measured. A summary of all noise measurements collected in Segment 1 is provided in Table 4-41 along with the property address and a brief description of each site. Measured day-night noise levels showed wide variability due to varying range in freight noise exposure that currently takes place within some portions of the corridor. For the most part, measured noise levels were typical of high ambient noise exposure that occur near an active freight line with Ldn levels in excess of 80 dBA reported at many monitoring sites. In areas where freight pass-bys were not as frequent, Ldn levels were found to be below 75 dBA. Overall, within Segment 1 portion of the study area, the Ldn readings ranged from a maximum level of 88 dBA at Site N-10 to a minimum level of 63 dBA at Site N-17.

Noise measurements collected at properties adjacent to the two proposed stations are not presented in Table 4-41 due to heavy snow squalls that developed during the time of the measurements. Snow cover significantly increases sound absorption resulting in lower noise levels. Similarly, inclement weather adversely impacted the data collection effort at noise sensitive properties adjacent to proposed maintenance and storage yards. Viable noise measurements were collected at only two residential properties adjacent to the six proposed yard areas. Because these residential properties are far away from the existing freight line service movements, measured noise levels were much lower with, Ldn levels of 65 and 60 dBA recorded at Sites Y-3 and Y-6, respectively. Peak hour AM noise measurements collected at Kirtland Park ranged from an Leq (1hr) of 65 to 63 dBA at Sites ST-1 and ST-2, respectively.

Table 4-41. Segment 1 - Summary of 24 Hour Noise Measurements (L_{dn})

Site #	Location	Land Use	Distance to Track (ft)	Date	L_{dn} (dBA)
N-1	1275 W 91st Street Cleveland	Residential	95	11-1-10	72
N-2	12711 Plover Street Lakewood	Residential	55	11-1-10	76
N-3	15922 Eleanore Drive, Cleveland	Residential	150	11-1-10	71
N-4	558 Rocky River Road, Berea	Residential	180	11-1-10	72
N-5	8795 Roberts Court, Olmsted Falls	Residential	80	11-1-10	80
N-6	196-198 Parklane Drive, La Grange	Residential	80	11-1-10	80
N-7	122 Clay Street, Wellington	Residential	45	11-1-10	85
N-8	97 Maple Street, New London	Residential	70	11-3-10	84
N-9	20 Pleasant Street, Greenwich	Residential	75	11-3-10	73
N-10	50[1]/2 N Gamble Street, Walnut	Residential	35	11-3-10	88
N-11	416 Railroad Street, Crestline	Residential	95	11-3-10	85
N-12	875 Market Street, Galion	Residential	120	11-4-10	73
N-13	8571 State Route 61, Galion	Residential	45	11-4-10	70
N-14	Corner of State & Railroad Street, Edison	Residential	115	11-4-10	78
N-15	186 Williams Street, Cardington	Residential	145	11-4-10	69
N-16	1 Taylor Street, Ashley	Residential	150	11-10-10	72
N-17	4919 North US 42, Delaware	Residential	250	11-10-10	63
N-18	2753 Berlin Station Road, Delaware	Residential	80	11-10-10	68
N-19	8257 North Point Meadow Boulevard, Lewis Center	Residential	230	11-10-10	74
N-20	8165 Bertston Place, Columbus	Residential	85	11-10-10	79
N-21	631-657 Worthington Woods Apartments, Worthington	Residential	40	11-10-10	81
N-22	620 Longview Avenue, Columbus	Residential	145	11-10-10	71
N-23	519 Clinton Street, Columbus	Residential	55	11-10-10	75
S-1	Snow Invalidated Noise Measurements	Residential	Invalidated due to weather		
S-2	Snow Invalidated Noise Measurements	Residential	Invalidated due to weather		
Y-1	Snow Invalidated Noise Measurements	Residential	Invalidated due to weather		
Y-2	Snow Invalidated Noise Measurements	Residential	Invalidated due to weather		
Y-3	1956 Dartmouth Avenue	Residential	140	12-6-10	65
Y-4	Snow Invalidated Noise Measurements	Residential	Invalidated due to weather		
Y-5	Snow Invalidated Noise Measurements	Residential	Invalidated due to weather		
Y-6	941 Dupont Avenue, Columbus	Residential	240	12-6-10	60
ST-1	Kirtland Park 1140 East 49th Street, Cleveland	Park	50	12-08-10	65[2]
ST-2	Kirtland Park 1140 East 49th Street, Cleveland	Park	150	12-08-10	63[2]

Segment 2 Columbus to North Cincinnati

Appendix B9 (Figure B9.2) depicts the location of the 35 representative noise monitoring sites (N-1 to N-35) adjacent to the alignment where 24 hour noise readings were collected and the location of the four properties (Sites S-1 thru S-3 and Y-1) where noise readings were collected adjacent to proposed stations and maintenance and storage yards. A summary of all noise measurements collected in Segment 2 is provided in Table 4-42 along with the property address and a brief description of each site. Measured day-night noise levels showed wide variability due to varying range in freight noise exposure that currently takes place within some portions of the corridor. For the most part, measured noise levels are typical of ambient noise conditions that occur adjacent to moderately active freight tracks with Ldn levels in excess of 70 dBA reported at many monitoring sites. Noise levels in Segment 2 are generally much lower than those reported in Segment 1 due to the somewhat lower usage of the existing freight service within this segment. In some communities where freight pass-bys were not as frequent, Ldn levels were found to be below 65 dBA. Overall within Segment 2 portion of the study area, the Ldn readings ranged from a maximum level of 87 dBA at Site N-18 to a minimum level of 58 dBA at Site N-8.

Table 4-42. Segment 2 - Summary of 24 Hour Noise Measurements (L_{dn}).

Site #	Location	Land Use	Distance to Track (ft)	Date	L_{dn}
N-1	117 Meek Avenue, Columbus	Residential	150	10-25-10	62
N-2	2480 Dibblee Avenue, Columbus	Residential	80	10-25-10	67
N-3	500 Lodge Court, Columbus	Residential	130	10-27-10	64
N-4	5656 Summerville Drive, Columbus	Residential	35	10-27-10	74
N-5	445 Moss Court, Galloway	Residential	80	10-27-10	59
N-6	7881 London Road, West Jefferson	Residential	80	10-26-10	70
N-7	5181 Gregg Road, West Jefferson	Residential	130	10-27-10	74
N-8	72 Arlington Avenue, London	Residential	175	10-27-10	58
N-9	10661-10663 Plattsburg Road, South Charleston	Residential	170	10-28-10	74
N-10	2739 Morton Drive, Springfield	Residential	80	10-28-10	69
N-11	102-104 Race Street, Springfield	Residential	28	10-28-10	68
N-12	1661 South Tecumseh Road, Springfield	Residential	150	11-8-10	74
N-13	8314 Haddix Road., Fairborn	Residential	175	11-8-10	70
N-14	408 Gilbert Avenue, Fairborn	Residential	220	11-8-10	65
N-15	1534 Phyllis Avenue, Riverside	Residential	65	11-8-10	72
N-16	1148 Wildwood Avenue Dayton	Residential	85	11-8-10	71
N-17	3246 Sheffield Road, West Carrollton	Residential	110	11-8-10	70
N-18	68 Alexander-Bellbrook Road, West Carrollton	Residential	70	11-8-10	87
N-19	128 S Elm Street, West Carrollton	Residential	165	11-8-10	74
N-20	423 Sycamore Street, Miamisburg	Residential	75	11-30-10	73
N-21	6230 Saxony Road, Miamisburg	Residential	45	11-30-10	73
N-22	89 Janet Avenue, Carlisle	Residential	180	11-30-10	65
N-23	220 Auburn Meadows Court, Carlisle	Residential	110	11-30-10	84
N-24	1000D Poinciana Drive, Middletown	Residential	220	11-30-10	63
N-25	7522 Franklin-Trenton Road, Middletown	Residential	75	11-30-10	71
N-26	4210 Jewell Avenue, Middletown	Residential	115	12-1-10	64
N-27	3500 Jewell Avenue, Middletown	Residential	65	12-1-10	73
N-28	2803 Armco Drive, Middletown	Residential	75	12-1-10	76
N-29	1804 Sherman Avenue, Middletown	Residential	210	12-1-10	74
N-30	3018 Omaha Street, Middletown	Residential	155	12-1-10	71
N-31	4570 Salaman Road, Middletown	Residential	70	12-1-10	67

Table 4-42. Segment 2 - Summary of 24 Hour Noise Measurements (L_{dn}).

Site #	Location	Land Use	Distance to Track (ft)	Date	L_{dn}
N-32	6537 Hansbrinker Drive, Middletown	Residential	160	11-3-10	64
N-33	7547 Hidden Trace, Westchester	Residential	40	10-30-10	65
N-34	6792 Absaroka Court, Westchester	Residential	250	11-3-10	62
N-35	6271 Oregon Pass, West Chester	Residential	100	11-3-10	63
S-1	354 Gallagher Street, Springfield	Residential	350	12-6-10	57
S-2	5215 Huberville Avenue, Dayton	Residential	125	12-6-10	65
S-3	319 South Main Street, Dayton	Residential	100	12-6-10	71
Y-1	807 Thomas Road, Columbus	Residential	470	12-6-10	57

Noise measurements collected at properties adjacent to the three proposed stations, sites S-1 through S-3, shown in Table 4-42, yielded Ldn levels in the 57 to 71 dBA range. Noise levels measured adjacent to the single proposed maintenance and storage yard facility in Segment 2 Site Y-1 was 57 dBA and this property is located approximately 470 feet from the proposed maintenance facility and is far away from the existing freight line. Hourly noise measurement survey data collected at all properties and detailed illustrations depicting the exact location of each monitoring site within Segment 2 are contained in Appendix B9, Figure B9.2.

Segment 3 North Cincinnati to Cincinnati

Appendix B9 (Figure B9.3) depicts the location of the 16 representative noise monitoring sites (N-1 to N-16) adjacent to the rail corridor where 24 hour noise readings were collected and the location of six properties (S-1 thru S-5 and Y-1) where noise readings were collected adjacent to proposed stations, maintenance and storage yards. In addition Appendix B9 also shows the location of one property (ST-1) FTA Category 3 land uses where peak hour daytime noise levels were measured. A summary of all noise measurements collected in Segment 3 is provided in Table 4-43 along with the property address and a brief description of each site. Measured day-night noise levels showed wide variability due to varying range in freight noise exposure that currently takes place within some portions of the corridor. In general, day-night noise levels in the northern portion of the corridor closer to North Cincinnati were higher than those measured levels closer to Cincinnati, with Ldn levels below 70 dBA reported at majority of monitoring sites. Overall noise levels in Segment 3 were generally lower than those reported in the other two project area segments due to the somewhat lower usage of the existing freight service within this segment. In some communities where freight pass-bys were not as frequent, Ldn levels were found to be in the 60 to 65 dBA range. Within Segment 3 measured Ldn levels ranged from a maximum level of 81 dBA at Site N-2 to a minimum level of 55 dBA at Site N-12.

Noise measurements collected at properties adjacent to the five proposed stations, sites S-1 through S-5, shown in Table 4-43, yielded Ldn levels in the 57 to 66 dBA range. Noise levels measured adjacent to the single proposed maintenance and storage yard facility in Segment 3 Site Y-1 was 57 dBA and is located approximately 80 feet from the center of the proposed maintenance facility and is far away from the existing freight line. Peak hour PM noise level measured at Sawyer Point Park (Site ST-1) reached a peak Leq (1hr) level of 62 dBA. Hourly noise measurement survey data collected at all

properties and detailed illustrations depicting the exact location of each monitoring site within Segment 3 are contained in Appendix B9.1, Figure B9.3.

Table 4-43. Segment 3 - Summary of 24 Hour Noise Measurements (L_{dn})

Site #	Location	Land Use	Distance to Track (ft)	Date	L_{dn}
N-1	11961 Reading Road, Cincinnati	Residential	110	11-2-10	70
N-2	11323 Lebanon Pike, Cincinnati	Residential	20	11-1-10	81
N-3	11 North Street, Cincinnati	Residential	25	11-1-10	70
N-4	1224 Second Street, Cincinnati	Residential	20	11-1-10	72
N-5	18 Anna Street, Cincinnati	Residential	15	11-1-10	61
N-6	5640 Lawndale Place, Cincinnati	Residential	80	10-28-10	59
N-7	5025 Barrow Avenue, Cincinnati	Residential	80	10-28-10	72
N-8	3643 Old Red Bank Road, Cincinnati	Residential	100	10-28-10	65
N-9	3399 Old Red Bank Road, Cincinnati	Residential	60	10-28-10	62
N-10	4841 Eastern Avenue, Cincinnati	Residential	20	10-27-10	56
N-11	270 Worthman Street., Cincinnati	Residential	30	10-27-10	57
N-12	3919 Dumont Avenue, Cincinnati	Residential	40	10-27-10	55
N-13	3334 Walworth Avenue, Cincinnati	Residential	45	10-25-10	61
N-14	3047 Riverside Drive, Cincinnati	Residential	55	10-25-10	74
N-15	2556 Riverside Drive, Cincinnati	Residential	25	10-25-10	61
N-16	2130 Riverside Drive, Cincinnati	Residential	12	10-25-10	62
S-1	3520 Maple Avenue, Cincinnati	Residential	310	11-2-10	65
S-2	3370 Walnut Street, Cincinnati	Residential	150	11-15-10	62
S-3	Old Red Bank Road, Cincinnati	Residential	60	10-28-10	62
S-4	270 Worthman Street., Cincinnati	Residential	60	10-27-10	57
S-5	1102 California Road, Cincinnati	Residential	200	11-15-10	66
Y-1	270 Worthman Street, Cincinnati	Residential	80	10-27-10	57
ST-1	Sawyer Point Pavilion, Cincinnati	Park	25	11-03-10	62[1]

4.4.2.6 Noise Resources Next Steps

As the project proceeds in the project development process, noise measurements affected by poor weather conditions would need to be re-collected, noise and vibration impact assessments would be completed following the FTA criteria, and mitigation measures would be identified based upon applicable regulations. If the noise mitigation measures include the construction of noise barriers their acoustic and cost effectiveness would need to comply with ODOT feasibility and reasonableness guidelines.

4.4.3 Visual Quality

The assessment of existing visual conditions and potential impacts was performed in general accordance with the Federal Highway Administration (FHWA) guidance found in *Visual Impact Assessment for Highway Projects* (Federal Highway Administration, 1990).

A preliminary assessment of the 3C Corridor's visual conditions was conducted by reviewing aerial photographs to see the juxtapositions and distances of typical visually sensitive receptors. Visual sensitive receptors included fixed residences, viewers in vehicles on roadways and viewers from recreational use areas.

A field assessment was completed to assess the visual conditions of the areas identified during the preliminary assessment. These data were catalogued and are presented in Appendix B10.

4.4.3.1 Visual Quality Next Steps

Based upon the information gathered, the following project area visual attributes would be developed as the project proceeds through project development process:

- Regional landscapes would be discussed in terms of landform, topography and/or land cover components, which would include water, vegetation and manmade developments.
- Landscape units are within the regional landscape and would be essentially "outdoor rooms" that often correspond to places or districts that are named (i.e. downtown). Landscape units are usually enclosed by clear landform or land cover boundaries.

With these attributes defined, the visual character and quality of the visual survey locations would be developed. Visual character and quality would be defined as follows:

- Visual character in terms of landform, water, vegetation, and manmade development.
- Visual quality would be discussed in terms of the vividness, intactness, and unity of the location's landscape components. Vividness, intactness and unity are discussed below.
    - Vividness would be defined as the memorability of the visual impression received from contrasting landscape elements as they combine to form a striking and distinctive visual pattern.
    - Intactness would be defined as the integrity of visual order in the natural and human-built landscape, and the extent to which the landscape would be free from visual encroachment.
    - Unity would be defined as the degree to which the visual resources of the landscape join together to form a coherent, harmonious visual pattern. Unity refers to the compositional harmony or compatibility between the landscape elements.

Based upon the above considerations, a visual assessment would be developed to identify impacts for the visual survey locations (identified in Appendix B10). Visual impacts could arise as the result of reduction in the general quality of views, obstruction or obscuring of views, reduction of the duration preferable views can be observed, and introduction of non-preferable attributes into former high quality views.

4.5 Secondary and Cumulative Impacts

Based upon the current level of design planning, secondary and cumulative impacts have not been identified or evaluated. As the project proceeds in the project development process, the analysis of the secondary and cumulative effects would be completed.

The implementation of the proposed improvements, in combination with other past, present, and reasonably foreseeable future projects, may result in environmental impacts similar to those discussed in the Sections 4.1-4.4. The focus of the cumulative impacts on each of the corridor segments would be discussed in a regional context appropriate for the human and natural resources.

4.5.1 Laws, Regulations, and Orders

Under the National Environmental Policy Act (NEPA), a cumulative impact is the impact on the environment that results from the combination of incremental impacts of the action and other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or non-federal), entity, or person undertakes the actions. Cumulative impacts can result from individually minor but collectively significant actions that take place over a period of time (40 CFR 1508.7). A cumulative impact includes the combined effect on a natural resource, ecosystem, or human community that is attributable to past, present, or reasonably foreseeable future activities or actions of federal, nonfederal, public, and private entities. Cumulative impacts may include the effects of natural processes and events, depending on the specific resource. Accordingly, there may be different levels of cumulative impacts on different environmental resources.

4.5.2 Reasonably Foreseeable Impact Causing Activities

Reasonably foreseeable impact causing activities would include:

- The initial project, including its construction, operation, and use (included in the direct impact assessment).
- Future rail improvement projects (included in the direct impact assessment).
- Other currently known development or redevelopment project in the proposed stations.
- Induced development and its associated impacts under certain conditions. Induced development would be considered to be reasonably foreseeable if these conditions are met:
    - It occurs in a station location because that would be the sole location where accessibility is improved, providing an incentive for public or private investment.
    - Local land use plans call for or have encouraged development or redevelopment in the station locations (past or present).
    - The stations would be a major passenger origin or destination in a community that already attracts substantial intercity travelers. Under these conditions, the improved accessibility to the area around a proposed station could attract new development to service intercity travelers, just as an airport can attract hotels, office buildings, or other travel-rated development. Stations in smaller communities are unlikely to induce new development because few passengers would originate at small communities, creating little demand for public or private services. As a destination, small communities lack existing support services for intercity travelers, as well as initiatives to attract substantial economic development. It is not considered reasonably foreseeable to expect that the improved accessibility alone would attract notable new development in smaller communities.

4.5.3 Secondary Impacts

In order for secondary impacts to occur, there would first be a notable feature sensitive to impact within the area. This would be defined in the assessment as an area having a residential land use, containing historic resources, containing sensitive natural features, or containing special population groups. Second, the impact area would need to be in an urbanized area and have known new development or redevelopment projects in the station location or land use plans setting redevelopment or new development as a goal.

4.5.4 Cumulative Impacts

Cumulative impacts would consider question of: would the combination of existing development, the project (initial and future), induced development, and other know reasonably foreseeable development projects together create a substantial loss to a sensitive resource where the individual losses are not substantial?

Cumulative impacts would not be substantial for the following reasons:

- The scale of the direct construction impacts associated with the initial project would generally be expected to be low because, except for stations, the project would be confined to an existing rail corridor.
- In terms of direct operational impacts (noise and traffic), the impact of the project traffic added to forecast traffic in station areas and project noise when added to that of freight traffic would be accounted for in the direct impact assessment.
- The secondary impact assessment found that other known development or redevelopment projects, as well as induced development, in station locations with sensitive resources would not cause a substantial impact to those resources.

4.5.4.1 Cumulative Projects and Growth Forecasts

This section would discuss the historical context of the study area and how development trends in the past that would have influenced the environmental character of the study area. This section would also discuss projected development trends and describes how future urbanization would impact the character of the study area. A cumulative project list (see below) would be developed and include projects identified in municipal capital improvement programs and other long-range plans or in the permitting/entitlement process.

4.5.4.2 Historical Context of Project Area

Passenger rail service has not been available to most Ohioans since the Penn Central Railroad terminated passenger operations in 1970. The purpose of the project would be to establish a new passenger transportation system in the 3C Corridor by providing additional mobility options and an entirely new transportation mode choice for travelers, with the associated benefits (travel reliability, jobs, transit-oriented development, etc.).

4.5.4.3 Projected Growth Trends

The 3C Corridor would serve a large student population, young professionals, leisure travelers, families visiting friends and relatives, business travelers, government employees, college and professional sports fans, seniors 65 years and older (expected to increase from 13 percent of the population in 2000 to 20 percent in 2030) and the residents along the corridor segments who do not have access to a car.

Overall, the 3C Corridor would bring economic development opportunities to businesses, cities, communities and neighborhoods including a potential of more than 11,000 direct and indirect jobs throughout Ohio. Accommodating the new population would require land and the construction of new transportation facilities, electric power generation facilities, utilities, schools, and hospitals, and commercial and industrial facilities. The combined environmental influence of these future changes would be referred to as the “cumulative condition” for the project.

4.5.4.4 Cumulative Project List

A cumulative project list would be developed and would become a part of the cumulative condition described for the project. Reasonably foreseeable development projects and plans and transportation projects considered in the cumulative condition would be identified. These would include projects that would be needed to accommodate the population projections. The list would represent a small number of projects that will be constructed within the study area that would result from construction of the rail improvements.

Regional growth describes induced growth and indirect effects from growth; the cumulative impacts associated with future projects and regional growth would also be identified.

4.5.4.5 Major Foreseeable Projects

Significant projects, by jurisdiction, would be identified. These projects would include mixed-use developments planned for the near term and general plan updates to accommodate long-term development and urbanization. The project list would also include roadway improvements ranging from restriping roads to create additional lanes and interchange and capacity improvements. The amount of environmental information varies for these projects; however, all of these projects would require environmental approvals.

4.5.5 Analysis of Cumulative Impacts

Cumulative impacts discussion for each resource area would consider the resource-specific impact, the condition of the resource, cumulative effects without the project, and the cumulative effects of the project. The No Build Alternative combined with the project list (reasonably foreseeable projects) would be considered the cumulative condition.

4.5.5.1 No Build Alternative

Projected growth and conversion of land to urban uses associated with the No Build Alternative would be anticipated to have the greatest environmental effect in the study area. Urban development would be expected to continue and result in the conversion of agricultural land, especially for housing and associated developments.

4.5.5.2 Build Alternative

The Build Alternative would be identified and assessed based on the 3C Corridor by segment. At this level of analysis, the differences in the cumulative impacts would be expected to be minor, with no apparent discriminators among proposed alternatives. As such, the cumulative analysis would consider the environmental condition of the three segments with and without the project and its cumulative effect with other reasonable foreseeable projects.

4.5.5.3 Air Quality

Build and No Build Alternatives

The reasonably foreseeable projects within each county would be reviewed to determine if they would cause a significantly cumulative impact to air quality. Modeling results would reflect the transportation projects under the No Build Alternative in fiscally

constrained regional transportation plans and other local factors. Therefore, the impacts from Section 4.4.1 (Air Quality) would be similar to the cumulative analysis.

Cumulative Impacts
Construction effects would be compounded if other expansion projects occurred at the same time as the rail improvements are implemented. The air quality cumulative impact would be expected to contribute incremental delays in traffic and detours for travel within the region. Coordination and, to some degree, construction phasing could minimize these temporary effects.

4.5.5.4 Energy and Utilities

New transmission and distribution lines would need to be built, or existing facilities would need to be upgraded to serve the increased demand of the population projections.

The operation of the Build Alternative would result in a net increase of consumption of electricity. This is an increment of additional electric load on the electric power system. However, passenger rail uses less absolute energy than an airplane service, which uses only 25 percent of the passenger carrying capacity. Cumulatively, passenger rail would be beneficial from an energy conservation perspective. Upgrades to existing transmission lines for the each corridor segment would be expected to cumulatively result in minimal impacts.

Water Infrastructure and Resources
By comparison, operation of passenger rail would result in insignificant increases in the use of potable and non-potable water or the generation of wastewater from the proposed station locations. The additional demand because of the project would not be expected to contribute significant cumulative water resource impacts.

Telecommunication Services
Passenger rail improvements would require telecommunication infrastructure. There would be no anticipated negligible impact to telecommunications services as a result of the project.

Solid Waste/Recycling Facilities
Construction debris, such as concrete from demolished structures and asphalt from removed roadways, would result under the No Build Alternative.

Cumulative Impacts
The project would generate solid waste during construction and operation of the passenger rail services, namely stations and maintenance facilities. Where possible, construction and demolition waste would be recycled and diverted from landfills. Similarly, the solid waste generated at the stations and maintenance facilities would be recycled to the extent that the waste management firms and utility districts implement recycling. With recycling, the effect of the project on solid waste facilities would be negligible. Existing solid waste facilities have permits to operate through the early 2030s and can serve the expected increase in population; therefore, the cumulative impacts to this resource are negligible.

4.5.5.5 Noise and Vibration

Build and No Build Alternatives
The study area for the cumulative analysis of noise would include a screening distance of up to 1,300 feet.

Cumulative Impacts
Construction would result in noise and vibration effects that would be managed and limited in duration. There are a few areas where other roadway improvements may result in cumulative construction noise and vibration impacts. It is likely that multiple projects would be under construction at the same time in the area cities, but construction on these projects would typically occur during manageable hours and would be temporary in nature.

Passenger rail would be designed to not exceed the vibration thresholds during operations. In rural areas, where typical noise is approximately 60 dBA, passing trains would result in an average noise increase of approximately 11 dBA. In urban areas, the increases would be expected to range from zero to seven dBA. Noise mitigation may be balanced with other objectives of more importance to the adjoining land uses, such as visual aesthetics and integration with the community context. Therefore, there is the possibility of residual severe noise effects during passenger rail operations along the alignment and the passenger rail stations; the effects would be less at the passenger rail sites, where passenger rail would move slowly and create less noise.

Cumulative noise impacts would result from the project in conjunction with other planned projects, increased development associated with foreseeable projects, and the cumulative condition of the No Build Alternative.

4.5.5.6 Visual Resources

No Build and Build Alternatives
The study area for the cumulative analysis of aesthetics and visual resources is referred to as the potential viewshed (i.e., the area that could potentially view the proposed project features and the area that could be potentially viewed from the project). Accounting for the existing terrain, predominant land uses, and proposed elevated areas, the potential viewshed for the Segments would be ¼-mile on both sides of the corridor improvements in urbanized areas and ½-mile on both sides of the rail corridor in rural areas between cities.

Cumulative Impacts
Construction could have a moderate but temporary cumulative impact where multiple projects are under construction in the same vicinity. This could occur in urban areas where the proposed stations would be under construction for a large area for an extended period of time. However, the cumulative visual quality benefits of these projects would be realized, such as visually iconic stations with landscaped plazas. There may be secondary visual benefits as the proposed stations attract new development in the urban centers. Other areas of the guideway would not provide the same opportunities without mitigation.

Other than the highway widening projects, none of the foreseeable projects that would be expected to occur under the No Build Alternative is within the project viewshed, where there would be permanent, significant impacts to aesthetics and visual resources.

However, a larger roadway can incrementally degrade visual quality. The project and other foreseeable projects would result in a cumulative impact; however, it would not be cumulatively substantial because these areas generally have moderate-low visual quality.

4.5.5.7 Terrestrial Ecological Systems

No Build and Build Alternatives
The study area for the cumulative analysis of biological resources would consider the distribution of their habitats.

Cumulative Impacts
The natural landscape has been converted into agricultural land, rural residential areas, and urban areas, which has reduced and fragmented the available wildlife habitat and limited the movement of wildlife between remaining habitat areas. Even with existing regulations that protect resources and mitigate potential impacts, these trends could persist under the No Build Alternative.

The Build Alternative combined with foreseeable projects could increase the extent and concentration of invasive plant species. Potential impacts resulting from the spread of these species could be substantial without weed control measures.

4.5.5.8 Wetlands, Waterbodies, and Waterways

No Build and Build Alternatives
The cumulative analysis would include the project impacts and upstream and downstream reaches of streams and wetlands within the study area. Potential impacts on hydrology and water resources could, in some cases, extend several thousand feet upstream and downstream from the project.

Cumulative Impacts
The project could result in changes to hydrology and connectivity of natural watercourses, including floodways. Similar impacts could occur where other projects cross or otherwise alter the hydrology of a natural watercourse. However, potential cumulative impacts would be reduced because all projects are subject to project-level environmental analysis and permits. Project-level analysis would identify and analyze, and avoid, minimize, or mitigate potential impacts on hydrology and connectivity of natural watercourses, to the extent feasible.

Reasonably foreseeable projects could result in impacts on flooding if the projects are within a Special Flood Hazard Area (SFHA). Similar impacts would result from operation of the project where the alignment would cross SFHAs. However, potential cumulative impacts would be reduced because all projects in SFHAs are subject to project-level environmental analysis, standards, and permits (prepared by project proponents). Project-level analyses would identify and analyze, and avoid, minimize, or mitigate potential impacts on floodplains, to the extent feasible.

The reasonably foreseeable projects would result in changes to existing onsite drainage patterns and could result in increased stormwater runoff from an increase in impervious surface area. However, new developments would comply with stormwater control ordinances, mitigating the impact of the runoff. On a much smaller scale, similar impacts

would result from operation of the project, which is anticipated to add impervious surfaces from structures and from parking facilities at the proposed stations and the maintenance facilities. Guideway construction materials and soil compaction below the guideway would also inhibit infiltration.

The project would be expected to negligibly reduce the amount of groundwater available for use in the study area. This is because of an increase in impervious surface area and reductions in infiltration. Therefore, the project would minimally contribute to a cumulative impact on groundwater quantity and quality when considered in combination with the projects included in the cumulative impact discussion.

4.5.5.9 Transportation

No Build and Build Alternatives

Because the transportation analysis would be regional, the cumulative transportation impacts would already include the cumulative impacts. Vehicle miles traveled (VMT) in the three segments would be determined under the Build and No Build alternatives. Highway improvements planned in the three segments would not be expected to reduce daily VMT but would help to reduce future congestion. Cumulatively, the Build Alternative and highway improvements would reduce congestion, reduce travel delays, and stimulate economic growth as a result of improvements in mobility. Offering a broad range of transportation modes improves accessibility to the state's urban centers beyond what would occur by only widening freeways, because passenger rail would offer a more reliable and safe mode of travel. Locally, the project would contribute to traffic in the proposed station locations; however, only slight changes would be experienced with mitigation. These changes would be identified as the project proceeds through the project development process.

Cumulative Impacts

Changes in transportation systems can influence nearby land uses either directly through acquisition or indirectly by providing new or improved access. Under the cumulative condition of the No Build Alternative, roadway improvements would address the regional transportation plans to reduce congestion and shorten travel times. This has historically encouraged longer commutes and sprawled development. Because these projects are constrained by regional transportation plans, the projects would be in conformance with existing planning documents. Development projects under the No Build Alternative would be anticipated to be implemented in compliance with local zoning and land use plans.

The cumulative effect of the Build Alternative on land use is expected to be minor compared to the projected growth in population under the No Build Alternative. Although the proposed stations would be anticipated to generate transit oriented development (TOD) that would result in more compact and efficient development, the amount of land within the influence of the proposed stations would be small. Providing an important link to other economic centers makes the proposed stations a focus area for economic investment and changes in land use patterns. Local land use planning agencies generally support an increase in density around the station locations.

4.5.5.10 Environmental Justice

No Build and Build Alternative
The improved roadway network under the No Build Alternative and the addition a passenger rail would provide cumulative benefits for the public. These benefits would include less traffic congestion on the existing highway system, connectivity of stations with local transit services, transit oriented development, promotion of infill development, improved regional air quality, and improved accessibility of environmental justice populations to job markets, education, and social and health services elsewhere.

4.5.5.11 Public Health and Safety

No Build and Build Alternative
The cumulative study area includes the transportation system and fire protection, law enforcement, and other emergency response services areas. This study area allows a review of other projects under the No Build Alternative that would affect emergency response and evacuation routes because of impacts on roadway connectivity and emergency service providers.

Cumulative Impacts
The project would be located in both urban and rural areas. Small- to medium-size populations would be concentrated in urban areas. In rural areas, there are low-density road network; and fewer fire stations, with low staffing levels, that would result in longer emergency response times. Cumulative impacts are anticipated during construction and operation of the project.

Combining the highway projects under the No Build Alternative with the construction of any of the Build alternatives would require several thousand construction workers per year from the surrounding communities. The increase in construction population would temporarily increase the need for fire protection, law enforcement, and other emergency response services. If all of the planned transportation projects are built simultaneously, some emergency services may be overburdened, especially if current budget challenges persist. However, many of the other planned projects associated with the No Build Alternative may not proceed because of economic uncertainty.

Construction sequencing with other projects may effectively mitigate the cumulative impact on emergency services. Construction workers must follow strict Occupational Safety and Health Administration (OSHA) and safety practices, reducing the demand on emergency services.

Travel safety would be a cumulative benefit with the passenger rail safety improvement projects. Passenger rail would provide a transportation option that is safe during inclement weather. In addition, the project would help improve other transportation.

4.5.5.12 Hazardous Materials

No Build and Build Alternatives
The cumulative study area for hazardous materials and wastes is the same as the study area used in the assessment of the proposed project.

Cumulative Impacts
Historically, the corridor has had numerous industrial and agricultural zones, large industrial and agricultural facilities, major transportation routes, and distribution systems including petroleum pipelines. Households, industrial sites, and agricultural operations use hazardous materials and generate hazardous waste. Passenger rail operations would incrementally cause a negligible increase in these activities, because the facility would use, store, and dispose of hazardous materials and petroleum products on a regular basis.

Passenger rail operations would comply with regulatory requirements to minimize the risk of exposure to or release of hazardous materials. Conversely, development of foreseeable future projects and the Build Alternative would result in incidental improved environmental quality because of the discovery and required remediation of existing soil and water contamination.

4.5.5.13 Cultural Resources

No Build and Build Alternative
The study area for the cumulative analysis of historical architectural resources is a corridor extending approximately 300 feet on both sides of the centerline of the rail corridor or station locations.

The study area for archaeological properties is the area where the ground would be disturbed during construction of the project. The study area also includes the footprint of the actual resources that would be built (e.g., guideway, stations, switchyards, and maintenance facilities).

Cumulative Impacts
Unavoidable losses of unique archaeological resources or a historical resource could occur when excavations encounter archaeological deposits that cannot be removed or recovered or where recovery would not be sufficient to prevent the loss of significance of the cultural materials.

Growth under the No Build Alternative would result in land that is outside of existing urbanized areas but within identified urban spheres of influence being developed to urban density levels. Historical architectural resources could also be damaged or require removal from areas in and around the study area. If these resources meet the definition of a historical resource or a historic resource (as defined in Section 106, 36 CFR 800), their modification or destruction could be significant. Although mitigation measures would be implemented to reduce the effects on potentially significant cultural resources, significant impacts may still occur. There could be a loss of significant cultural artifacts.

4.5.5.14 Parks and Recreation Areas

No Build and Build Alternatives
The study area for the station planning and land use cumulative impacts analysis would include the rail improvements.

Cumulative Impacts
Under the cumulative condition demand for and use of most parks and recreation facilities has, and would be expected to continue to increase. The National Recreation and Park Association standards (Lancaster 1999) provide the following guidance for parkland:

- Neighborhood parks – 2.5 acres per 1,000 population
- District parks – 2.5 acres per 1,000 population
- Large urban parks – 5.0 acres per 1,000 population

Because of the passenger rail potential connections to major economic centers, the project could result in an increase in population and the demand for park and recreation facilities in the communities with rail facilities. However, this increase is insignificant compared to the projected population growth without the project. The developers of new TOD projects would be required to contribute park facilities as part of the entitlement process.

4.6 Literature Cited

Acoustical Society of America. *Part 4: Noise Assessment and Prediction of Long-Term Community Response.* American National Standard Quantities and Procedures for Description and Measurement of Environmental Sound, ANSI S12.9-2005/Part 4, 2005.

ASC Group and Hardlines Design Company. 2005 *Phase I History/Architecture Survey for the COTA North Corridor Transit Project*. ASC Group, Columbus, Ohio, and Hardlines Design, Columbus, Ohio. Submitted to DMJM Harris, Columbus, Ohio, and the Central Ohio Transit Authority, Columbus, Ohio. Copies on file at the Ohio Historic Preservation Office, Columbus.
Benjamin D. Rickey & Company. 1989 *Historic District Evaluation for the City of Columbus*. Benjamin D. Rickey & Company, Columbus, Ohio. Submitted to the City of Columbus, Ohio. Copies on file at the Ohio Historic Preservation Office, Columbus.

Brown, Joel. 2003 Phase I Cultural Resources Management Investigations for the Approximately 5.9 ha (14.5 a.) North Bank Park in the City of Columbus, Franklin County, Ohio. EMH & T, Gahanna, Ohio. Submitted to the City of Columbus, Ohio. Copies on file at the Ohio Historic Preservation Office, Columbus.

Cincinnati Planning Commission. 2004 *City of Cincinnati Historic Inventory Phase III*. Cincinnati Planning Commission, Cincinnati, Ohio. Submitted to and copies on file at the Ohio Historic Preservation Office, Columbus.

Darbee, Jeffrey T. 1993 The City of Columbus: Literature Review and Assessment of the Pennsylvania Railroad Yards: I-670 Industrial Park, Columbus, Ohio. Submitted to the City of Columbus, Ohio. Benjamin D. Rickey & Company, Columbus, Ohio. Copies on file at the Ohio Historic Preservation Office, Columbus.

Dobson-Brown, Deborah, Dawn Herr, and Gary McDaniel .1994 *A Literature Review and Reconnaissance Survey for the Proposed Columbus Multi-Modal Transportation Terminal North Corridor Study in the City of Columbus, Clinton, and Sharon Townships, Franklin County, Ohio*. Archaeological Services Consultants, Columbus, Ohio. Submitted to BRW, Minneapolis, Minnesota. Copies on file at the Ohio Historic Preservation Office, Columbus.

Dobson-Brown, Deborah. 1998 *The Ohio Penitentiary: Historic American Building Survey No. OH-2440*. ASC Group, Columbus, Ohio. Submitted to and copies on file at the National Park Service, Omaha, Nebraska.

Federal Highway Administration (FHWA). Federal Highway Administration Procedures for Abatement of Highway Traffic Noise, 23 CFR 772. Last revised July 8, 1982.
Federal Highway Administration, *Interim Guidance Update on Air Toxic Analysis in NEPA Documentation*. 2009.
http://www.fhwa.dot.gov/environment/airtoxic/100109guidmem.htm

Federal Highway Administration, *Transportation Conformity Reference Guide. 2008.*
http://www.fhwa.dot.gov/environment/conform.htm

Federal Transit Administration (FTA). *Transit Noise and Vibration Impact Assessment*. US Department of Transportation Report No. FTA-VA-90-1003-06, May 2006.

Goodfellow, Susan. 1997 *Phase I Cultural Resources Investigations for the Proposed Cardington-Galion Transmission Line, Morrow County, Ohio*. Gray & Pape, Cincinnati, Ohio. Submitted to Dames & Moore, Bethesda, Maryland. Copies on file at the Ohio Historic Preservation Office, Columbus.

Keener, Craig S., and Kevin Nye. 2005 *Phase I Cultural Resource Management Survey of a Proposed 116.5 ha (288 a.) Development in Orange Township, Delaware County, Ohio*. Professional Archaeological Services Team, Plain City, Ohio. Submitted to Floyd Browne Group, Delaware, Ohio. Copies on file at the Ohio Historic Preservation Office, Columbus.

Kelly, Christina E., and Patrick D. Trader. 2006 *Phase I Cultural Resources Survey Short Report of the MOT-Mad River Bikeway in the City of Dayton, Mad River Township, Montgomery County, Ohio*. Gray & Pape, Cincinnati, Ohio. Submitted to LJB, Dayton, Ohio. Copies on file at the Ohio Historic Preservation Office, Columbus.

Lancaster, R.A. (Ed.). (1990). *Recreation, Park, and Open Space Standards and Guidelines*. Ashburn, VA: National Recreation and Park Association.

Ohio Administrative Code 3745-1-09. 2009. Scioto River drainage basin.

Ohio Administrative Code 3745-1-19. 2007. Huron River drainage basin.

Ohio Administrative Code 3745-1-20. 2008. Rocky River drainage basin.

Ohio Administrative Code 3745-1-21. 2008. Great Miami River drainage basin.

Ohio Administrative Code 3745-1-24. 2008. Muskingum River drainage basin.

Ohio Administrative Code 3745-1-28. 2007. Vermilion River drainage basin.

Ohio Administrative Code 3745-1-30. 2001. Mill Creek drainage basin.

Ohio Administrative Code 3745-1-32. 2002. Ohio River standards.
Ohio Administrative Code 3745-1-54. 2003. Wetland antidegradation.

Ohio Environmental Protection Agency (OEPA). 1989. The Qualitative Habitat Evaluation Index (QHEI): Rationale, Methods, and Application. Ohio Environmental Protection Agency, Division of Water Quality Planning & Assessment. Columbus, Ohio.

Ohio Environmental Protection Agency. 2002. Field Evaluation Manual for Ohio's
Pape, W. Kevin, and Rebecca Hawkins Bennett.1985 *Cultural Resource Survey of a Proposed 0.2 Mile Natural Gas Pipeline Replacement in Bath Township, Greene County, Ohio*. WAPORA, Cincinnati, Ohio. Submitted to Columbia Gas Transmission Corporation, Charleston, West Virginia. Copies on file at the Ohio Historic Preservation Office, Columbus.

Picklesimer, John W. II.2003 *Phase I Cultural Resources Investigations for the I-275 Rehabilitation Project, Springfield Township, Hamilton County, Ohio (HAM-IR 275-21.52; PID #22386)*. Gray & Pape, Cincinnati, Ohio. Submitted to LJB, Dayton, Ohio. Copies on file at the Ohio Historic Preservation Office, Columbus.

Potterfield, Ty.1989 *Survey Report for the Warehouse District, Columbus, Ohio*. City of Columbus, Ohio. Submitted to and copies on file at the Ohio Historic Preservation Office, Columbus.

Primary Headwater Habitat Streams. Ohio Environmental Protection Agency, Division of Surface Water. Columbus, Ohio.

Prosser, Teresa. 1987 *Evaluation of the Eastern Industrial Complex*. Teresa Prosser, Dayton, Ohio. Submitted to Ruth Scott, City of Dayton, Ohio. Copies on file at the Ohio Historic Preservation Office, HA Columbus.

Schultz, T.J. *Synthesis of Social Surveys on Noise Annoyance.* Journal Acoustical Society of America, Vol. 64, No.2. August 1978.

Taylor, Terri A. 1998 *Wright Field Cultural Landscape Report, Wright-Patterson Air Force Base, Ohio.* US Army Corps of Engineers, Seattle District. Submitted to the Office of Environmental Management, Wright Patterson Air Force Base, Ohio.

Troutman, K. Roger (editor). 2003 *Ohio Cemeteries: 1803–2003*. Ohio Genealogical Society, Mansfield.

US Army Corps of Engineers Environmental Laborator. 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1. U.S. Army Engineer Waterways Experiment Station. Vicksburg, Mississippi.

US Army Corps of Engineers Regional Supplement to the Corps of Engineers Wetland Delindation Manual: Midwest Region (Version 2.0). U.S. Army Research and Development Center. Vickburgh, Mississippi. 2010

US Census Bureau 2000. 2000 Decennial Census.

US Census Bureau: American Community Survey 2008.
US Census Bureau: American Community Survey 2009.

US Environmental Protection Agency, Air Quality Analysis Branch, *User's Guide to Mobile6.2*, EPA-TEB-92-01. http://www.epa.gov/oms/m6.htm

US Environmental Protection Agency, *Airsdata*. 2010. http://www.epa.gov/air/data/geosel.html

US Environmental Protection Agency, Office of Air Quality Planning and Standards, *User's Guide to CAL3QHC Version 2.0: A Modeling Methodology for Predicting Pollutant Concentrations near Roadway Intersections*, EPA -454/R-92-006 http://nepis.epa.gov

US Environmental Protection Agency, *Transportation Conformity Guidance for Qualitative Hot-spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas*. March 2006. http://www.fhwa.dot.gov/environment/conformity/pmhotspotguid.pdf.

THIS PAGE INTENTIONALLY LEFT BLANK

5.0 STAKEHOLDER AND PUBLIC INVOLVEMENT PLAN

5.1 Introduction

The stakeholder and public involvement plan for the 3C Quick Start Passenger Rail Phase 2 Environmental Assessment (EA) serves as a road map for outreach efforts to stakeholders and the broader public, as appropriate, throughout the project. Specifically, this plan:

- Establishes the overall framework for the involvement of informed stakeholders and the public, including potentially affected state agencies, transportation modes, jurisdictions, elected officials, community organizations and members of the general public with an interest in the outcomes and recommendations.
- Outlines the tools and tactics to be used to achieve the goals.
- Establishes a general calendar of events for informed stakeholder and public involvement activities.

The plan provides detailed involvement strategies for 3C Quick Start Phase 2 process. As the effort progresses and further engages stakeholders, the need may arise for modifications to the public involvement plan to address new or emerging public issues, concerns or interests. As a result, the plan would be reviewed and updated on an as-needed basis during the project duration.

5.2 Public Involvement Goals

The public decision making process requires leadership and a proactive plan to engage review agencies, freight railroads, informed stakeholders and the public in a meaningful, transparent and easy-to-understand way. An effective involvement process builds community consensus around recommendations that are well-considered and necessary to meet the stated goals. This, in turn, increases the likelihood of implementation and success.

The overriding goals of the public involvement plan are to:

- Educate the public about all aspects of 3C Quick Start Phase 2 including determining and communicating the location and amenities available at each station location.
- Provide opportunities for review agencies, informed stakeholders and the public to help guide and shape Ohio's plans for 3C Quick Start Phase 2.

To meet these goals, this plan details how 3C Quick Start Phase 2 will:

- Develop a dialogue with agencies, freight railroads, stakeholders and citizens that will create a clear understanding of the program's needs and ownership in the study's conclusions.
- Develop and distribute easy-to-understand materials and graphics that increase understanding and instruct the public on the multiple opportunities to provide input.
- Be responsive to agency, freight railroad and public comments and concerns; provide feedback as appropriate.
- Develop a proactive relationship with the media to ensure accurate reporting of information.

- Strengthen interstate and local partnerships with various review agencies, communities and organizations by sharing technical information, coordinating planning, and interconnecting projects that offer joint-development potential.
- Ensure proactive outreach to low income, minority, senior and disabled populations so that their voices may also be heard and reflected in the program's recommendations.

5.3 Key Audiences and Contact Database

During Phase 1 of the project, a stakeholder database was developed and maintained. This database would be updated as necessary. It would include elected officials; review agencies; freight railroads; transportation, planning, transit and economic development officials; community, business and environmental leaders; property owners, churches, interested citizens and others who attend public meetings or otherwise request to follow this effort.

This database would be used for various communications, including E-newsletters, updates and public meeting notifications.

5.4 Strategies, Tools & Techniques

Stakeholder outreach would employ a wide range of methods and tools to ensure widespread awareness of and engagement in Phase 2. The public involvement process would seek to engage stakeholders with a wide range of backgrounds, ages and levels of experience. The primary methods and tools to be used include:

- **Initial Stakeholder and Public Involvement Plan** – This document constitutes the preliminary stakeholder and public involvement plan. The public involvement team would work with the Ohio Department of Transportation (ODOT) to benchmark progress and to ensure that the public involvement program is meeting project goals and objectives.
- **Project Identity** – The 3C Quick Start Passenger Rail identity had been created during Phase 1. The existing project logo/masthead was revised to indicate this is the 3C Quick Start Passenger Rail "Service" rather than "Plan", as was used during the first phase of 3C. The revised logo/masthead serves as a unified, visual identifier for all study materials, making the study easily identifiable to stakeholders, elected officials and the public at large.
- **Project Web Site – 3CisMe.ohio.gov** website would be updated as needed and would serve as the centralized resource for all publicly available materials. The website is branded with the graphic identity of the study and will be used to post a calendar of public meetings, provide easy-to-understand project information, provide contact information for questions, and accept public comments and input throughout the study process. All major project documents would be posted in this location, as well as related transportation resources.
- **Style Guide and Communication Manual -** A 3C Quick Start Style Guide/Communication Manual would be developed to ensure a consistent graphic look and tone for the project to reinforce consistency of message and opportunities for public input. Templates would be provided for 3C fact sheets, displays, exhibits and other written public involvement materials.
- **Toll Free Project Hotline –** The already established project hotline, 888-521-RAIL, would be used to both provide information and seek questions and comments. The hotline allows the caller to "press 1 for information on 3C Quick Start, and press 2 for information on the High Speed Rail Ohio Programmatic

Environmental Impact Statement." It includes a brief recorded message with a current project update and then allows the caller to leave contact information and a comment or question. All comments would be documented; questions and responses summarized and posted on the FAQ section of the project website.

- **Outreach to Low Income, Minority, Senior and Disabled Populations -** Low income, seniors and disabled populations who might be affected by the proposed 3C rail program would be identified. The project team would partner with organizations such as churches, libraries, metropolitan planning organizations, local grocery stores and social service agencies to distribute information and notification of public meetings and other opportunities for public input (e.g. hotline and project website also accessible at public libraries). This could include distributing information in church bulletins, on grocery bags or in fliers distributed at schools, or personal outreach to ministers and neighborhood leaders.
- **Public Meetings** – One series of public meetings would be conducted. A kick-off, or "scoping" public meeting would be held in five locations along the 3C Corridor. The public meetings would be held at well-known locations with easy access for people with disabilities and transit riders. Public meetings would be widely promoted via local newspapers and online information starting two weeks prior to the meetings. Printed "hot cards" would also be developed to provide public notification of the public meetings, website and telephone hotline. These would be distributed widely to ensure seniors, disabled and minority groups also receive notice. Meetings would include a presentation about the study process and deliverables prepared to that point.

  The purpose of the series of public meetings is to seek input on the proposed station locations, the study process and schedule, and other issues or concerns. Current and prospective Consulting Parties would be invited to attend the public meetings to review and comment on technical and environmental documents, as part of Section 106 of the National Historic Presentation Act and the implementing regulations at 36 CFR Part 800.

  The meetings would be a combined open house/presentation/facilitated discussion format, allowing stakeholders to learn the overall context of the project and giving them an opportunity to voice their questions and comments in public. Presentation times would be included in all meeting notification materials. All meeting materials would be posted for public review and comment on the project website. The public would have two weeks to provide comment after each public meeting.
- **Public Hearings -** One series of public hearings would be conducted in five locations along the 3C Corridor. The public hearings would be held at well-known locations with easy access for people with disabilities and transit riders. Public hearings would be widely promoted via newspapers and online information starting 15 days prior to the hearings. Printed "hot cards" would also be developed to provide public notification of the public meetings, website and telephone hotline. These would be distributed widely to ensure seniors, disabled and minority groups also receive notice. Hearings would include a presentation about the study process and deliverables prepared to that point. A court reporter would produce a transcript of public testimony.
  The purpose of this public hearing series is to seek public input on the federally-reviewed environmental documents, which would include environmental, socio-economic impacts, and station area impacts; operating and capital costs;

ridership and economic benefits; a summary of public input and other analysis. The draft environmental documents would be posted on the project website 30 days prior to the first public hearing. The draft documents would also be available for public review at public libraries and affected metropolitan planning organizations. The public would have 30 days to provide comment after each public hearing.

- **Online Meetings** – Online versions of the public meetings/hearings outlined above would be available on the project website to facilitate more involvement and reach those who don't have time to participate or convenient access in public meetings. These would include an electronic survey to collect input. Alternatively, during the public meeting phases one or more "webinars" may be held so the interested public can "virtually" attend a meeting by following PowerPoint presentation delivery on their computers at home and dialing into to hear the oral presentation and discussion.
- **Media Relations –** ODOT Staff would serve as the project spokespersons**.** The Public Involvement (PI) team would craft a media strategy that helps reporters understand the purpose and key elements of the 3C Quick Start Phase 2, provides accurate project facts, responds to media inaccuracies and is responsive to expected high media interest. The PI team would draft news releases, as appropriate, for ODOT review, approval and distribution.
- **Fact Sheets and Other Public Information Materials** –Newsletters would be developed and disseminated in an electronic "E-News" format to those in the database. Printed versions would also be made available. All printed information would lead the reader to additional information on the website. Fact sheets would be developed during the course of the project to both provide an overview of the project and address location/station specific issues as they arise. Fact sheets will also be distributed electronically to all those on the project contact database, posted on the website, and made available in print format for other public venues such as public libraries and affected metropolitan planning organizations. Other public informational materials would be developed as needed throughout the study and submitted for review and approval by ODOT. Documents requiring public input would also be available at public libraries and metropolitan planning organizations.
- **Electronic-updates –** The contact database would allow the project team to provide regular updates to interested citizens via e-updates at key project milestones and in each corridor as needed.
- **Contact Database -** All meeting participants, stakeholders, elected officials, media and self-identified stakeholders would have their contact information entered into a searchable Excel and Constant Contact database that would allow the stakeholder engagement team to send notices for public meetings, hearings and other activities that may interest them. Information captured would include: name, title, address, city, state, zip and e-mail.
- **Communication Protocols and Document Storage -** A centralized data storage system would be used to ensure that all comments, phone calls and survey information is properly documented for the public involvement chapter of the environmental assessment.

6.0 BUSINESS PLAN AND ECONOMIC IMPACT STUDY

6.1 Introduction

As part of the development of the business plan and economic impact analysis, the following key areas have been identified:

- Ridership and revenue drivers.
- Public funding sources and alternate revenues.
- Procurement strategies.

The following discussion presents a range of funding options and procurement strategies to consider as part of a comprehensive business plan.

6.2 Ridership and Revenue Drivers

There are generally three components that determine passenger rail ridership forecasts:

- Travel demand analysis, which quantifies the overall travel market that the proposed service would serve.
- Socio-economic growth, which factors in the economic variables that predict future growth in the travel market.
- Service characteristics, which are based on the proposed service and fare structure.

6.2.1 Travel Demand Forecasts

Overall, a travel demand model that takes into account the following:

- Trip generation - where centers of population are.
- Geographic Detail – the land-use surrounding the proposed corridor including the physical constraints around the corridors and the stations.
- Scope/area of proposed service – the type of markets that may benefit from the proposed alignment as well as any intermodal connections and access to key geographic markets.
- Trip distribution - taking into account employment centers, recreation centers, and other destinations.
- Origin-destination surveys – a survey that measures the travel characteristics and behaviors between two end points. The survey includes investigating purpose of the trip, route chosen, frequency of the trips, and modal and vehicle choice.
- Mode split – between origin and destination, mode split looks at the breakdown of different travel options preferred including auto, air, rail, and intercity bus. This includes looking at current data from statewide travel demand models and surveys, ridership volumes on existing Amtrak and other regional passenger rail lines, and commuter air travel. Another potential source of information is the Volpe Center's inter-regional auto trip model in order to help benchmark data from the above sources.
- Trip assignment - predicting the routes that travelers are likely to take.

The projected trips generated are then divided into induced demand and diverted trips. Induced demand is based on new trips generated as a result of the rail service availability. Diverted trips look at the shift in travel volumes from one mode to the next without any new organic growth.

6.2.2 Socio-Economic Growth

Along with the travel patterns and their characteristics, a ridership forecast typically includes socio-economic data and forecasts to estimate growth within markets along the project corridor. There are three distinct measures of socio-economic data derived from sources like the US Census, Bureau of Economic Analysis, Moody's Economy.com, and regional, state and local sources:

- Population/households – based on data from US Census and Bureau of Economic analysis, population data and projected growth will impact the travel demand model.
- Employment – current and projected number of jobs in the markets along the rail corridor.
- Personal income- nominal and real increases in personal income over the project horizon. This analysis also consists of wages and average individual value of time.

6.2.3 Service Characteristics

The actual project itself is perhaps the most direct value driver of ridership. Several characteristics that define the service help determine its demand, especially schedule, frequency and price. Below are some of the characteristics that make up the business case for passenger rail service:

- Line haul travel time – train speed and run time from point to point along the entire corridor. When considering passenger rail service along shared right-of-way, such as existing freight rail lines, the service may require specific capital improvements and modifications in order to accommodate faster track speeds and reduce travel time.
- Access/egress time – the time it takes to travel between the stations and the ultimate origin and destination of trips.
- Frequency of Service/ Service Profile – this is the daily number of trains that run on the corridor and the number of stops. The frequency must be based on the balance between revenue generated by the proposed demand and operating costs.
- Travel cost/fare structure – the proposed fare structure based on comparable passenger rail fares in the region as well as the possibility to apply airline-style yield management. Also, other competitors in each of the relevant the market segments such as air service, bus and auto costs based on estimated fuel and operating costs are typically considered.
- Alignment and station locations – based on location and number of stations of the largest market areas that will drive the rail corridor's demand. There is a tradeoff of between intercity speed and efficiency and station convenience. Variations in stops schedule and run time will impact the rail corridor's performance, which will ultimately impact the ridership demand. For example, commuter stopping services can be focused on rush hour whereas intercity express non-stop services are needed throughout the day.
- Available amenities – since intercity passenger rail competes with both highway and air travel, certain amenities may make it more attractive. These include the size and comfort of the seats, the availability of concessions, and on-board internet service.

Given these three sets of input for ridership and revenue drivers, sensitivity tests are performed to determine which characteristics/assumptions may have a greater impact on the ridership forecast. Furthermore, different scenarios are tested based on varying service plans, station locations and pricing structures.

6.3 Public Funding Sources and Alternative Revenues

The complexity of ambitious passenger rail projects to connect some of the largest metropolitan regions often resides in available funds. While Amtrak has been the primary intercity passenger rail service provider, funding shortfalls have persisted in many of these corridors. The recent economic challenges coupled with mounting capital needs will require a broader breadth and depth of funding sources. This includes not only innovative public funding mechanisms, but also private sector alternatives. This section examines the range of funding options, starting with the current Amtrak funding structure for existing corridors then evaluating public and alternative options that may be leveraged in the future.

6.3.1 Current Funding Structure for Intercity Passenger Rail

Fifteen states currently contract with Amtrak for the operation of trains that supplement the national Amtrak network by extending the reach of passenger rail services or providing additional frequencies on Amtrak routes. State and regional agencies pay most of the operating costs of these services that are not covered by fare revenue. Continued operation of these state-supported routes is subject to annual contracts and state legislative appropriations, along with Amtrak's financial participation.

Funding for these state-supported trains comes from an often complex multitude of sources that can change over time. The funding mechanisms established by each state take a number of different forms ranging from an allocation from the general revenue fund to a specific tax levied to support intercity passenger service. Table 6-1shows the current Amtrak funding structure:

Table 6-1. Current Amtrak Funding Structure

Funding State(s)	Amtrak Service	Funding Authority	Funding Source
Maine	Downeaster	Northern New England Passenger Rail Authority (NNEPRA)	Tax levied on automobile rentals within the State of Maine and Congestion Mitigation and Air Quality (CMAQ) grant
Pennsylvania	Keystone	PennDOT	Motor vehicle fuel tax
New York	Adirondack	New York State DOT	Motor vehicle fuel tax
Vermont	Vermonter, Ethan Allen	Vermont Agency of Transportation	Motor vehicle fuel tax
Virginia	Northeast Regional (Lynchburg extension)	VDOT	Tax levied on automobile rentals
North Carolina	Piedmont, Carolinian	NCDOT	Lease fees from the freight carriers to use the state's railroads
Michigan	Blue Water, Pere Marquette	MDOT	Motor vehicle fuel and the sale of motor vehicles taxes; also ARRA grant
Illinois	Illini, Saluki, Lincoln Service, Illinois Zephyr,	IDOT	Motor vehicle fuel tax

Funding State(s)	Amtrak Service	Funding Authority	Funding Source
	Carl Sandburg		
Illinois and Wisconsin	Hiawatha	IDOT and WisDOT	Motor vehicle fuel tax and vehicle registration fees
Missouri	Missouri River Runner	MoDOT	Motor vehicle fuel tax
Oklahoma and Texas	Heartland Flyer	OklaDOT and TxDOT	Motor vehicle fuel tax
Oregon and Wisconsin	Cascades	ODOT and WSDOT	Oregon-Fee for specialized license plates and motor vehicle fuel tax. Funds allocated from these sources and those received from an ARRA grant make up the state's monetary contribution to the Cascades service. Washington-Tax levied on automobile rentals, motor vehicle sales and vehicle weight fees.
California	San Joaquin, Pacific Surfliner	Caltrans	Tax on motor vehicle fuel
California	Capitol Corridor	Capitol Corridor Joint Powers Authority (CCJPA) and Bay Area Rapid Transit District (BART)	CCJPA and BART jointly fund the Capitol Corridor service. Both of these agencies receive funding from local property and sales taxes that are specifically designated for transportation.

6.3.2 New Trends in Public Funding

According to the US Department of Transportation Vision for High-Speed Rail in America Strategic Plan, April 2009, a new framework was established by the federal government to promote and develop intercity passenger rail. Never before has there been such a broad based program for intercity passenger rail. Specifically, the following recent legislation is provided for intercity passenger rail projects.

Intercity Passenger Rail (IPR) Capital Assistance to States FY 2008 – Approximately $30 million in federal funds (with a 50 percent local match) were competitively awarded to states for rail corridor development and planning.

American Recovery and Reinvestment Act 2009 (ARRA) – ARRA was the landmark $787 billion federal economic stimulus bill designed to encourage spending, create jobs and promote investment. Approximately $48 billion in funds were programmed for transportation infrastructure provisions including specific programs for intercity passenger rail.[1] Two specific programs that were funded by ARRA included the Passenger Rail Investment Improvement Act (PRIIA) and the discretionary grant program, Transportation Investments Generating Economic Recovery (TIGER):

[1] US DOT ARRA Update Report Second Quarter 2010

PRIIA – Passed in 2008, approximately $8 billion was funded from ARRA, to improve Amtrak's service, operations, and facilities. Another $2.5 billion of federal funds came from the FY 2010 Department of Transportation Appropriations Act. In partnership with Amtrak, Federal Railroad Administration (FRA) and the host railroads, the PRIIA legislation was enacted to address much needed intercity passenger rail deficiencies and establish performance standards for improving the overall quality of passenger rail. Furthermore, PRIIA engages the state's participation further by PRIIA requiring the recipient "to establish a state rail transportation authority and develop statewide rail plans to set policy involving freight and passenger rail transportation within their boundaries, establish priorities and implementation strategies to enhance rail service in the public interest, and serve as the basis for Federal and State rail investments within the state."[2] Administered by the FRA, PRIIA consists of three specific capital improvements:

1. Intercity Passenger Rail Service Corridor Capital Assistance Program
2. High Speed Rail Corridor Development Program
3. Congestion Relief

In addition, PRIIA requires a National Rail Plan to be developed that is consistent with a multitude of state rail plans that are currently underway. PRIIA also promotes opportunities to leverage public-private partnerships as a way to offset costs and shift risk.

TIGER – As part American Recovery and Reinvestment Act of 2009, and the FY 2010 Appropriations Bill, approximately $2.1 billion was allocated to a competitive discretionary grant program for surface transportation projects, otherwise known as TIGER. Since PRIIA addressed capital needs along the actual rail alignment, TIGER funds awarded to passenger rail projects were typically for station and terminal improvements. The Niagara Falls International Rail Station is an example of a passenger rail project that received $16.5 million in TIGER funds for the relocation of a passenger rail terminal and construction of rail siding that will help eliminate operational conflicts with freight traffic. Normal, Illinois received $22 million in TIGER funds to construct a new multimodal transportation hub. Normal sits along a key rail corridor that will eventually be enhanced to accommodate high speed rail between Chicago and St. Louis.

Railroad Rehabilitation and Improvement Financing (RRIF) – RRIF is a financing tool that offers federal direct loans and loan guarantees with terms up to 35 years at government cost of borrowing. This program was created under the Transportation Equity Act 21 (TEA-21) authorization and then amended under the "Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users" (SAFETEA-LU) reauthorization. According to the FRA, *the "Administrator is authorized to provide direct loans and loan guarantees up to $35.0 billion. Up to $7.0 billion is reserved for projects benefiting freight railroads other than Class I carriers*."[3] The funds can be applied toward improving, acquiring or rehabilitating railroad tracks, rail equipment or other facilities, including bridges, yards, buildings and shops. The funds could also be applied toward the development of new intermodal yards or to refinance existing debt under this same program. Eligible borrowers include state and local governmental entities, as well as rail carriers and shippers who are seeking to build new rail connections. Recently, the

[2] Source: Federal Railroad Administration Overview, Highlights and Summary of the Passenger Rail Investment and Improvement Act of 2008 (PRIIA) (March 10, 2009)
[3] Source: FRA Website http://www.fra.dot.gov/Pages/177.shtml#RPO

Denver Union Station Project Authority was allocated a $155 million loan through the RRIF program to build a new multimodal transportation hub.[4] The American High Speed Rail Alliance is advocating modifications to RRIF rules to make it more favorable to high speed rail[5].

Transportation Infrastructure Finance and Innovation Act (TIFIA) – The TIFIA program provides federal credit assistance in the form of direct loans, loan guarantees, and standby lines of credit to finance surface transportation projects of national and regional significance. TIFIA credit assistance provides improved access to capital markets, flexible repayment terms, and potentially more favorable interest rates than can be found in private capital markets for similar instruments. Like RRIF, TIFIA was set up under TEA-21 and has subsequently been amended. It is primarily directed at P3s but is also used for public sector companies. Denver Union Station Project also received a TIFIA loan for $152m and Warwick Airport Intermodal Station received $42 million.

Next Transportation Reauthorization – Signed into law on August of 2005, the last Transportation Reauthorization, SAFETEA-LU, provided $286 billion for transportation program investments and projects across a six-year period. Following predecessor legislation, TEA-21, the reauthorization provided broad programmatic funds for many surface transportation projects. SAFTEA-LU expired in 2009 and has been extended several times. It is unclear when the next full reauthorization will be passed.

National Infrastructure Bank - Recently, the current administration outlined a plan to create an infrastructure bank that would invest $50 billion up front in transportation projects, with high speed rail featured prominently along with other surface transportation projects. At this time, it is unclear what prospects there are for funding the infrastructure bank.

6.3.3 Alternative Revenues

With costly statewide passenger rail initiatives, it is crucial for the state to consider a multi-faceted funding strategy to maximize not only public sources of funds, but also ancillary sources of revenue that may help cover capital and operating/maintenance costs. This section provides a summary of ancillary or alternative funding options that generate additional revenue to help cover operating and capital costs for a typical intercity passenger rail project.

Parking – Many municipalities and transportation authorities have begun to realize the value of commercializing parking assets as a lucrative method of funding capital and operations costs. A concession raises revenue by way of lump-sum payment or revenue sharing rights from a private partner. Alternatively, the public authority itself may use parking revenue as a dedicated financing mechanism, without entering into a contract with a private vendor, retaining revenue and cost escalation risk, but also the benefits of unforeseen growth. For example, New Jersey Transit issued a Request for Qualifications in October 2010 for its plan to let a 30-50 year concession for 80 of its parking lots, or approximately 37,000 spaces.

Retail/station concessions, vendor financing – A number of transportation authorities have generated revenue by leasing operations and maintenance responsibilities for all or

[4] Source: FRA Website on RRIF http://www.fra.dot.gov/Pages/177.shtml
[5] Source: AHSRA website http://www.americanhsra.org/advocacy/financing.html#Modify_Programs

part of its passenger rail stations. For example, the Chicago Transit Authority generated nearly $1.2 million in 2009 through retail concessions across the 129 retail spaces throughout its system.

Advertising – the Ohio Department of Transportation (ODOT) has previously considered using advertising revenue derived from road signs on state or DOT-owned property advertising gasoline, restaurants and hotels as a funding mechanism for the 3C Quick Start project. The scope of these advertising initiatives can be scaled to a targeted stream of revenue and dedicated to funding passenger rail operations.

Surcharges – Surcharges added to commercial activity including hotel stays, rental cars, sales tax, or other transactions are increasingly being used to fund transportation programs throughout the country. For example, Pittsburgh enacted a $2 fee in 2007 on rental cars, with revenue going to the Port Authority of Allegheny County. Warwick, Rhode Island issued a surcharge, from which the revenues are used to pay back its TIFIA loan.

Joint Economic Development District (JEDD) – JEDDs are a method of generating revenue unique to the State of Ohio in which municipalities and townships may enter a contract to create a development outside one party's jurisdiction. In such cases, two or more parties recognize the mutual benefits of the project (for instance, a centrally-located rail station), and form a new district allowing both parties to mutually finance the development without altering political borders. The JEDD may levy taxes upon its jurisdiction in order to finance the mutually beneficial project or set of projects. In 2006, "JEDD I" was created by Liberty Township, Middletown, and Mason to finance transportation infrastructure improvements and promote economic development in the area.

Value Capture Mechanisms – Rail investments often go hand-in-hand with increased land value and development potential. Value capture is a tool that can be used by public entities to fund investments in infrastructure, services, or other amenities by "capturing" the added value that these expenditures create for private owners and developers. Interest in these types of opportunities has gained momentum in recent years due to two converging trends. First, investment in transportation infrastructure across the state is insufficient to meet demand. Second, a fundamental shift toward attracting private capital to finance and build transportation infrastructure is underway.

Both private and public sector entities benefit financially from increases in land value; private parties benefit through increased rents and prices and local governments benefit through increased tax revenue. The possibility of unlocking increased land values through transit investment may provide ODOT with an opportunity to be more entrepreneurial in financing future capital projects.

Among the menu of options used elsewhere for implementing value capture, the following mechanisms are most widespread:

- Tax Increment Financing (TIF) – TIF is a mechanism for capturing incremental value from higher property tax revenues generated by new developments. This higher value may result from public improvements, such as a new passenger rail facility that provides broader transportation access to the surrounding communities. TIF does not impose an added tax burden upon property owners, nor does it deprive governments of existing tax revenues. Instead, part or all of

future property taxes resulting from increased property values are used to repay the loans for infrastructure build-out costs. Most often, TIF revenues are used to fund repayment of bonds issued to finance the infrastructure improvement, but can also be used to cover operating costs or fund capital costs on a pay-as-you-go basis. The City of Chicago, for example, has been successful in establishing TIF discticts to support the construction of transit stations near the central business district.

- Special Assessment District – One of the most common forms of value capture in the United States, special assessments impose special charges on parcels of land close to a new facility that receive a direct and unique benefit from the public improvement. The special charges are collected in parity with property taxes over a predetermined number of years, and are removed once collections cover the cost of the improvement. In the Washington, D.C. area, for instance, Washington Metropolitan Area Transit Authority (WMATA) imposed a special assessment on local property owners that yielded $25 million towards a $110 million station improvement.
- Development Impact Fee – Development impact fees are one-time charges collected from developers for the purpose of funding new infrastructure and services necessitated by new residential or commercial development. The fees, based on the relative benefit the infrastructure asset provides to the property owner, are most successful in areas expecting significant growth, or where little or no development exists. For instance, a development impact fee proposed in Monterrey, California in 2008 would raise $328 million towards an estimated $1 billion in necessary transportation improvements over a 14-year span.
- Land Banking – Land banking is a method of value capture in which the public agency purchases parcels of land adjacent to a new development prior to construction, and later sells the land once prices have appreciated. By purchasing land adjacent to a new or improved project area, land banking has the added benefit of granting the public agency control over how and when the area is developed.
- Joint Development – Joint development involves direct participation of the public entity in a revenue-, cost- or financial-risk sharing arrangement with a private developer. In a revenue sharing agreement, a transit agency may retain a share of revenues generated from development near the new or improved transit facility. A revenue sharing joint development may be structured so that the agency either receives upfront payments applied toward capital costs of the improvement, or to provide a stable stream of revenues over a period of time. Payments may also be structured to fluctuate with certain income or price levels. In Maryland, for example, the State and Maryland Department of Transportation (MDOT) have recently negotiated a 75-year ground lease and profit sharing agreement in which MDOT will provide a parking garage in midtown Baltimore and in turn, the State will collect rent and retain an equity position in the project. This will enable the State to share in any project windfalls in the future.

The use of tax increment financing, special assessments, joint development and other forms of value capture is not new to Ohio. Cities such as Cleveland and Cincinnati have relied on such tools for decades to support redevelopment. However, no strategic planning has been conducted to deploy such programs more broadly for transportation purposes, particularly with regard to funding passenger rail investments. The state

should consider what legislation and policies are needed to enable and incentive the use of value capture among local taxing jurisdictions to support the 3C project.

With enabling legislation in place, and development potential in the corridor assessed, analysis can be conducted to test the financial capacity generated by implementing various forms of value capture to support the project. These preliminary calculations can provide a useful gauge of where more in-depth analysis is required. Actual implementation of any value-capture technique would need to take into consideration real estate market fundamentals at the proposed stations, the needs of local jurisdictions that levy and collect taxes, and the willingness of property owners and developers to participate in a value capture program. Reliance on value capture in the 3C financial plan would likely be conditioned on actual implementation and having in place memorandums of understanding with affected property owners and taxing jurisdictions.

6.4 Procurement Strategies

Alternative procurement structures offer the possibility to shift substantial risks to the private sector and provide a lower overall whole life cost of the project. The procurement alternatives outlined below will focus on options for attracting private involvement and capital to the project and thereby shifting risks from the public to the private sector. Procurement alternatives should be considered for all of the project as well as certain components in isolation in order to account for some of the constraints on grant funding sources.

Design-Bid-Build (DBB) – This is a traditional method of project delivery whereby an owner looking towards DBB procurement will typically use separate contracts for the design and construction portions of the project and split each into multiple functional or geographic packages. The owner of the project or property will first hire a contractor to design or engineer the project, followed by a period in which firms bid for the right to build the project packages as designed. Finally, the owner chooses a winning bidder to construct the package. Design-Bid-Build had been the traditional procurement method for transportation projects in the US because the bidding process delivers the lowest initial cost as few risk contingencies are required to be held by the contractor as most risk is retained by the public sector. However when applied to high speed rail projects, where integration between operator, vehicle, signaling and track is the key challenge, the presence of multiple interfaces between contracts greatly increases the risk for the public sector.

Design-Build (DB) – Design-Build projects feature a single agreement with a contractor joint venture to design and build the project. Public agencies employ variations of the DB method due to the cost, financing and time efficiencies associated with procurement under a single contract. These arise as the contractor is typically better placed to manage the design risk provided the project is adequately specified. Currently agencies in many states still have only limited experience in DB which does add to the challenge of their initial procurements as it requires a less prescriptive more output or performance related approach to oversight. States such as Virginia and Michigan, each of which has completed numerous DB projects over several decades, are valuable case studies in determining the proper approach to DB procurement. In Colorado the then innovative use of a DB best value procurement enabled CDOT to deliver the $1.7bn T-REX highway and rail project in a tight timeframe on budget[6].

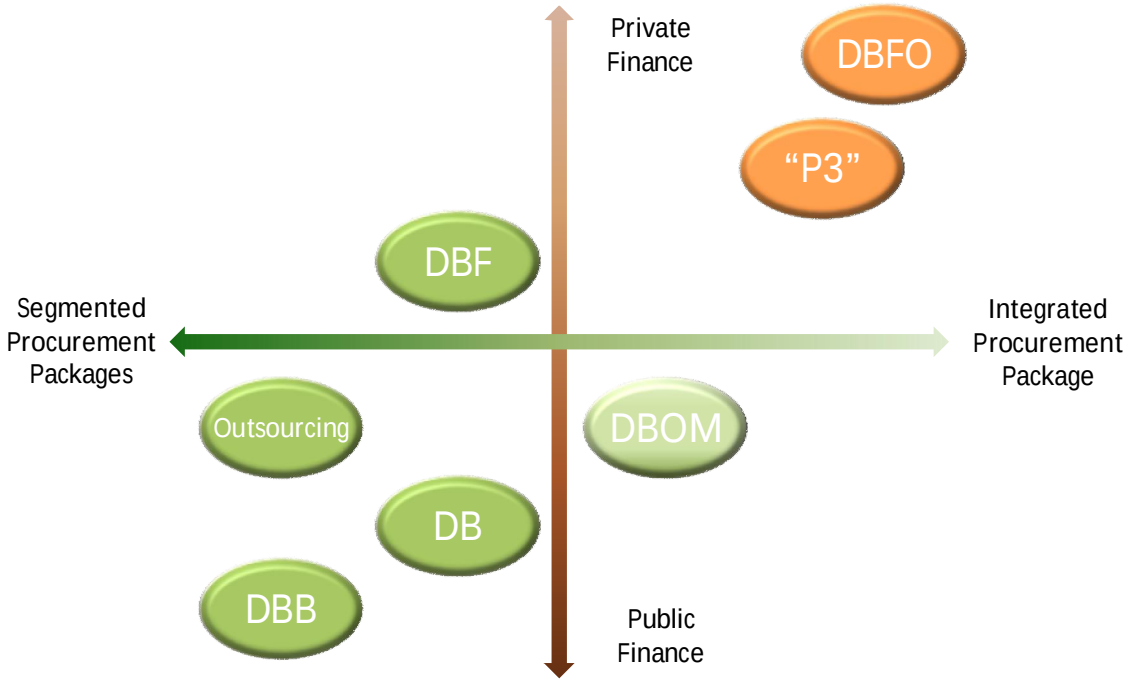
[6] See FHWA analysis at http://www.fhwa.dot.gov/ipd/project_delivery/lessons_learned/trex_lessons.htm#ll4_b

Design-Build-Finance (DBF) - DB contracts may also feature a provision with finance and asset transfer options (DBF or DBFT). In these cases, the contractor assigned to design and build a capital project must also secure its financing. Upon completion of the project, the private sector then transfers responsibility for the completed project back to the public owner.

Design-Build-Finance-Operate-Maintain (DBFOM) or Public-Private Partnership (P3) – DBFOM concessions effectively transfer responsibility for all phases of the project to the private sector for the term of the contract. As with all concessions, underlying ownership of the asset remains with the public sector, who may define a set of performance requirements by which the concessionaire must operate. Such concessions can be applied to a single phase of a project or systemwide. Projects transferring financing responsibility to the private sector typically do so by leveraging the revenue streams from the project itself, such as tolls or availability payments for the service from the public sector procuring authority. In Denver, for example, the Regional Transportation District (RTD) is using DBFOM to procure its Eagle Commuter Rail Project, a multi-billion dollar expansion program to develop rail services in the metropolitan area. This structure will allow RTD to condition the majority of its payments on the completion, entry into service and performance to standards of the system (i.e. availability) of the individual lines. This transfers substantial completion, cost overrun and system integration risks as well as incentivizing the consortium to optimize the operating cost impact of the initial design (i.e. minimize whole life cost). DBFOM is a complex and costly procurement with limited precedents and requires a very performance-based approach and specialist advisors as many of its risk transfer benefits can be lost if an overly prescriptive DBB-style approach is used to the drafting of specifications or contract oversight.

O&M Concession/Franchise for Train Operating Company (TOC) – A state or public agency looking to procure passenger rail services on top of an existing rail network may enter a contract with a TOC to operate and maintain passenger services which may also include infrastructure maintenance. In such O&M concessions, the TOC bids to operate services on an already completed rail network owned by a state or public authority. The TOC may assume some ridership risk, and will also typically enjoy the majority share of alternative revenues. Under such an agreement, the public sector retains some risk in the event that rail operations are not as profitable as forecast public subsidies will be required in order to maintain operations. In the United States and United Kingdom, TOCs often operate as single-city commuter networks or across small regions, For example the Massachusetts Bay Commuter rail services are operated and maintained by a consortium of Veolia, Bombardier and ACI under an initial five year contract with extension options to 10 years. In this case the private sector maintains both the vehicles and the infrastructure.[7]

[7] See http://www.mbcr.net/who_we_are.html



The various procurement approaches can be summarized as above with increasing levels of private finance on the vertical axis and decreasing level of segmentation or packaging of the element of the procurement on the horizontal both of which indicate increasing transfer of risk to the private sector. What fundamentally determines what is the best procurement model is the value over the project life gained from that risk transfer. That clearly depends on many factors such as:

- The scope for the private sector to innovate within legislative, grant and railroad MOU restrictions.
- The policy objectives of the stakeholders and how they affect pricing strategies.
- The extent to which FRA standards are applied or modified for passenger rail.
- The ability to draft performance or output specifications rather than reliance on means and method manuals.

The general approach when structuring a Public-Private Partnership is that a given risk should be allocated to the party best able to manage it.

6.5 Next Steps

Specific activities outside the business planning task must resume in order to support the business plan. This includes all of the preliminary engineering analysis and host railroad negotiations in advance of pressing forward with a financial feasibility analysis. The following describes the preconditions for a useable business case.

1) **Service Definition -** In conjunction with the ridership forecast and policy objectives, the rail service must be clearly defined. Service definition includes all of the service characteristics mentioned under Section 6.2.3 including operating schedules, frequency of trains, number of stations and stops, and fare policy.

2) **Project Definition -** Upon completing the service development, the capital investment, as detailed in Section 3.2, can be fully defined. This includes all the

equipment and infrastructure development (along with their associated costs) required to provide this new service.

3) **Railroad Negotiations -** In tandem with defining the service scenario is the negotiations with the host railroads over the operations and maintenance of the rail corridor. These negotiations will reflect mutually agreed division of responsibilities between the host railroads and the passenger rail provider. Responsibilities may include operating and maintenance costs, labor protection, adherence to specific safety standards, and an operating plan that minimizes passenger-freight rail conflicts.

As the interplay between the commercial aspects of the project and the engineering, operating and maintenance components runs deep, it is critical to engage the business plan activities concurrently with the service and project development. The business plan should build upon existing planning, engineering, costing, stakeholder involvement and outreach, and commercial and economic work completed to date. Agreements between ODOT and existing passenger and freight carriers, and previously developed capital and operating plan requirements and costs, can provide starting points for data collection. As the project and service developments are defined, a business plan that will outline a proposed strategy for achieving project financial feasibility can be fully developed. The financial feasibility analysis consists of forecasting cash flows and annual debt service and indicating any revenue shortfalls that will need to be addressed. Any financial models used throughout the business planning exercise would have to maintain a degree of flexibility to allow for scenario testing based on operating, capital, finance, delivery, ridership forecast and fare estimates. Furthermore, the model should be dynamic enough to allow for any changes to the assumptions in the project plan. The business plan should also consider strategies to mitigate financial risks, and identify opportunities for ancillary or alternative revenue generation, cost and risk sharing, and cost reductions. The business plan will help the public understand how a passenger rail corridor, such as the 3C Quick Start project, will be developed, managed, financed, implemented, operated and maintained.

The following presents components that are featured in a typical passenger rail business plan:

- Policy goals and objectives – Based on the demand for intercity passenger rail, the transportation authority needs to define the goals and objectives that the rail corridor will achieve. This can include goals to promote environmental sustainability, transportation efficiency, and economic development. From these goals, performance standards can be developed to measure the rail corridor's quality of project delivery and service.
- Ridership and farebox revenue forecasts – There are three specific components that determine ridership forecasts: travel demand, socioeconomic growth, and service characteristics. The ridership volumes can be examined through different sensitivity tests based on fares, operating schedules, and station locations. Based on the ridership forecasts, services scenarios are developed. Variations in the service development may also determine the ridership volumes and impact both capital and operating/maintenance costs.
- Project definition – Based on the service definition, the corresponding capital investment can be defined. This includes the scope, project dependencies, and timing of capital investments of a base case capital development scenario and

any variations for sensitivity testing. The project definition would look at breaking down the capital costs into development and maintenance expenditures for both equipment and infrastructure. The projected costs should be based on appropriate escalation factors over a timing horizon of the asset's useful life.

- Operating and maintenance costs – Tied to the service definition and the capital investment required, the operating and maintenance plan would include a detailed breakout of costs along with their appropriate escalation rates over the project's horizon. These costs will depend on the operating schedule, labor negotiations, dispatching requirements, and facility and vehicle maintenance as shared with the host railroads.
- Alternative revenues – As discussed in Section 6.3.3, alternatives revenues can help offset capital or operating and maintenance costs. The business plan should consider and include forecasts of all feasible alternative sources of revenue, including value capture revenue streams as well as revenue from parking, retail concessions and advertisements. In order to assess the potential of various value capture mechanisms to help fund the project, additional tasks will need to be undertaken to understand:
    a. The magnitude and types of residential and non-residential development that is planned for each station area.
    b. The speed at which planned development is likely to be absorbed.
    c. The willingness of local taxing jurisdictions and property owners to participate in a special tax district or some other form of value capture program.
- Project Delivery and Procurement Strategy – In order to optimize the project delivery process, each independent segment of the project should be based on an appropriate procurement strategy. From utilizing traditional tax-exempt debt issuance, competitive discretionary grants or public-private partnerships, each funding option should evaluate the ownership/management structure, advantages and disadvantages of each strategy, and the feasibility of the strategy for the project. The business plan should evaluate the procurement options available from traditional design-bid-build, to more privatized concession agreements including design-build-finance-operate/maintain and where any of these compensation models yield the greatest value for the public sector. Each strategy ought to include a risk analysis. Depending on the nature of the procurement strategy, it would identify the possible risk categories, understand the appropriate risk allocation between the public and private sectors, and assess the commercial impact of these risks on the project.

THIS PAGE INTENTIONALLY LEFT BLANK