

# Draft Environmental Assessment

## Columbus Viaducts Project Platte County, Nebraska

Project Nos. RRZ-TMT-6065(5), RRZ-TMT-6061(8), and RRZ-TMT-6059(7)  
Control Nos. CN 31924, CN 31925, and CN 31927

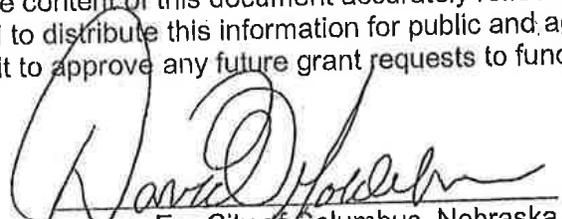
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by the  
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and  
City of Columbus

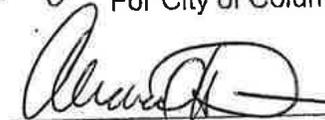
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The City of Columbus, Platte County, Nebraska, is proposing to construct three grade-separated crossings and close six at-grade crossings along the Union Pacific Railroad mainline within City limits. A pedestrian overpass would be constructed at 18<sup>th</sup> Avenue, and vehicular viaducts would be constructed at 12<sup>th</sup> Avenue and 3<sup>rd</sup> Avenue. Vehicular at-grade crossings would be closed at 25<sup>th</sup>, 21<sup>st</sup>, 18<sup>th</sup>, 12<sup>th</sup>, and 3<sup>rd</sup> Avenues, and a pedestrian at-grade crossing would be closed at 17<sup>th</sup> Avenue.

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## **ACRONYMS, ABBREVIATIONS, AND SHORT FORMS**

AASHTO	American Association of State Highway and Transportation Officials
ACM	asbestos-containing material
ADA	Americans with Disabilities Act
ADT	Average Daily Traffic
APEs	areas of potential effect
AST	aboveground storage tank
bgs	below ground surface
BMPs	best management practices
BNSF	Burlington Northern Santa Fe
BTEX	benzene, toluene, ethylbenzene, and xylenes
CART	Columbus Area Recreational Trails, Inc.
CATS	Columbus Area Transportation System
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CFR	Code of Federal Regulations
City	City of Columbus, Nebraska
CO <sub>2</sub>	carbon dioxide
Columbus Viaducts Project	the proposed construction of three grade-separated crossings (a pedestrian overpass at 18 <sup>th</sup> Avenue and vehicular viaducts at 12 <sup>th</sup> and 3 <sup>rd</sup> Avenues) and closure of six at grade crossings (at 25 <sup>th</sup> , 21 <sup>st</sup> , 18 <sup>th</sup> , 17 <sup>th</sup> [pedestrian only], 12 <sup>th</sup> , and 3 <sup>rd</sup> Avenues) in the City of Columbus, Platte County, Nebraska
dB	decibel
dBA	A-weighted decibel
DCE	dichloroethene
EA	environmental assessment
EDR	Environmental Data Resources, Inc.
EIS	environmental impact statement
EJ	environmental justice

EO	Executive Order
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act of 1973
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FINDS	Facility Index System
FIRM	Flood Insurance Rate Map
FMGP	former manufactured gas plant
FPPA	Farmland Protection Policy Act of 1981
FR	Federal Register
FRA	Federal Railroad Administration
FRS	Federal Registry System
FTTS	FIFRA/TSCA Tracking System
GDP	gross domestic product
GET	groundwater extraction and treatment
GHG	greenhouse gas
GNP	gross national product
HDPE	high-density polyethylene
HDR	HDR Engineering, Inc.
ICIS	Integrated Compliance Information System
IPLE	Individual Project Level Evaluation
kV	kilovolt
L <sub>dn</sub>	day-night average sound level
L <sub>eq</sub>	equivalent sound level
Loup Power District	Loup River Public Power District
LUST	leaking underground storage tank
LWCFA	Land and Water Conservation Fund Act of 1965
MCL	maximum contaminant level
MSE	mechanically stabilized earth
µg/L	micrograms per liter
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding

mph	miles per hour
MSE	mechanically stabilized earth
MSL	mean sea level
N/A	not applicable
NAC	noise abatement criteria
NAICS	North American Industry Classification System
NAIP	National Agriculture Imagery Program
NDEQ	Nebraska Department of Environmental Quality
NDOR	Nebraska Department of Roads
Neb. Rev. Stat.	Nebraska Revised Statutes
Nebraska DNR	Nebraska Department of Natural Resources
Nebraska SHPO	Nebraska State Historic Preservation Office
NEPA	National Environmental Policy Act of 1969
NESHAP	National Emission Standards for Hazardous Air Pollutants
NFA	No Further Action
NGPC	Nebraska Game and Parks Commission
NHPA	National Historic Preservation Act of 1966, as amended
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRD	Natural Resources District
NRHP	National Register of Historic Places
NSHS	Nebraska State Historical Society
NWI	National Wetlands Inventory
OSHA	Occupational Safety and Health Administration
OU	operable unit
PAH	polynuclear aromatic hydrocarbons
PCB	polychlorinated biphenyl
PCE	tetrachloroethylene
PEM	palustrine emergent
PPV	peak particle velocity
Project	Columbus Viaducts Project
PRRIP	Platte River Recovery Implementation Program

PSS	palustrine scrub shrub
purpose and need	purpose of and need for the proposed action
RCRA	Resource Conservation and Recovery Act
REC	recognized environmental condition
ROW	right-of-way
SQG	Small Quantity Generator
SSURGO	Soil Survey Geographic
STIP	State Transportation Improvement Program
SVE	soil vapor extraction
SWPPP	Stormwater Pollution Prevention Plan
T&E	threatened or endangered
TCE	trichloroethylene
TCP	Traditional Cultural Property
TDM	travel demand management
TMDL	total maximum daily load
TNM	Traffic Noise Model
TSCA	Toxic Substance Control Act
TSM	transportation system management
Uniform Act	Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970
UPRR	Union Pacific Railroad
US 30	U.S. Highway 30
US 81	U.S. Highway 81
USACE	U.S. Army Corps of Engineers
USC	United States Code
USDA	U.S. Department of Agriculture
USDOT	U.S. Department of Transportation
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UST	underground storage tank
VOCs	volatile organic compounds
vpd	vehicles per day

## **CHAPTER 1**

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# **PURPOSE OF AND NEED FOR THE PROPOSED ACTION**

## **CHAPTER 1**

### **PURPOSE OF AND NEED FOR THE PROPOSED ACTION**

This environmental assessment (EA) pertains to the proposed construction of three grade-separated crossings<sup>1</sup> over the Union Pacific Railroad (UPRR) mainline in the City of Columbus, Platte County, Nebraska (project numbers RRZ-TMT-6065(5), RRZ-TMT-6061(8), and RRZ-TMT-6059(7), and control numbers CN 31924, CN 31925, and CN 31927, respectively). Also included in the proposed action is the closure of six at-grade railroad crossings. The proposed action constitutes the Columbus Viaducts Project (Project).

The purpose of this EA is to identify and evaluate the potential adverse environmental effects, or impacts, that the proposed action would have on the environment and to provide an opportunity for public input in the decision-making process.<sup>2</sup> This EA has been prepared in compliance with the National Environmental Policy Act of 1969 (NEPA),<sup>3</sup> which requires that Federal agencies analyze the impacts of their actions on the environment. The City is the Project sponsor. The Project is being developed in coordination with the Nebraska Department of Roads (NDOR) as a Federal-aid project approved through the Federal Highway Administration (FHWA). FHWA is the lead Federal agency for this action.

This chapter explains the purpose of and the need for the proposed action (the purpose and need) based on current and anticipated transportation problems studied prior to and during preparation of this EA. Sufficient detail is provided to help formulate alternatives for improvements and safety solutions. Chapter 2 presents the range of alternatives evaluated and the screening process used in identifying the preferred alternative. Subsequent chapters address the affected environment, potential environmental consequences, mitigation measures, and agency coordination and public involvement efforts. Figures are located at the end of their respective chapters.

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<sup>1</sup> A grade-separated crossing is an underpass or overpass that serves to isolate motorized and non-motorized traffic from each other at points of intersections.

<sup>2</sup> An EA is a concise public document that has three defined functions: 1) it briefly provides sufficient evidence and analysis for determining whether to prepare an environmental impact statement (EIS); 2) it aids an agency's compliance with the National Environmental Policy Act of 1969 (NEPA) when no EIS is necessary and helps to identify alternatives and mitigation measures; and 3) it facilitates preparation of an EIS when upon completion of the EA, it is determined that an EIS should be prepared.

<sup>3</sup> NEPA (42 United States Code [USC] 4321-4347) is the foundation of environmental policy making in the U.S. The NEPA process includes an environmental review early in the planning for proposed actions. The process is intended to help public officials make decisions based on an understanding of environmental consequences and take actions that protect, restore, and enhance the environment.

## 1.1 BACKGROUND

The City of Columbus, Nebraska (the City), was established in the 1850s in Platte County based on the planned location of the transcontinental railroad. During its early history, Columbus was primarily a railroad town and developed along the UPRR mainline north of the Loup River (see **Figure 1-1**). As the City grew and industries developed, the railroad became a barrier as well as an asset, dividing the community. As automobile transportation came into vogue in the early 1900s, the conflicts and delay associated with at-grade automotive street crossings of the railroad were clearly evident, and in 1933, the Federal government and UPRR partnered to construct the Meridian viaduct along present-day 33<sup>rd</sup> Avenue (U.S. Highway 81), the first viaduct in the City (City of Columbus, October 2005).

Since construction of the Meridian viaduct, the City has continued to grow and prosper with the development of the electric power industry and other industries in the City. The community has expanded to the east along the UPRR mainline as well north and south of the UPRR mainline. As the City has grown, so too has UPRR. UPRR is one of the largest railroads in the United States and transports agricultural products, coal, raw materials, durable goods, and consumer goods (UPRR, 2010). As the City expanded, UPRR grew, and citizens increasingly relied on automobiles for transportation, the conflicts and delays associated with at-grade railroad crossings have been a topic of discussion in Columbus for most of the past 100 years.

Today, Columbus is the largest city in Platte County, with an estimated population of 21,399 (U.S. Census Bureau, July 9, 2008). The UPRR rail corridor traverses the City from east to west, dividing it with approximately two-thirds of the City to the north of the UPRR rail corridor and one-third of the City to the south of the UPRR rail corridor. The UPRR mainline currently consists of two parallel tracks (double track) and serves between 65 and 70 trains per day through the City. The original Meridian viaduct was recently replaced and remains the only vehicular viaduct crossing within the City limits.

The Columbus Viaducts Project is the culmination of many years of discussion and is a cooperative effort by NDOR, the City, and UPRR to improve safety, reduce delay, and improve access by constructing viaducts over the UPRR mainline in Columbus and closing at-grade railroad crossings.

## 1.2 STUDY AREA

There are currently eight vehicular at-grade crossings and one pedestrian at-grade crossing of the UPRR mainline within the City limits. **Table 1-1** lists each existing crossing and provides a brief description of the facility.

**Table 1-1  
Existing At-Grade Crossings of the UPRR Mainline**

Roadway	Use <sup>1</sup>	Facility	Functional Class	Speed Limit <sup>2</sup>	Traffic Control Devices
26 <sup>th</sup> Avenue	Vehicles	2 driving lanes 34-foot total width	Minor Arterial	20 mph	Crossbucks, gates, flashing lights, bells
25 <sup>th</sup> Avenue	Vehicles	2 driving lanes 33-foot total width	Local Road	20 mph	Crossbucks, gates, bells
23 <sup>rd</sup> Avenue	Vehicles	2 driving lanes 34-foot total width	Major Arterial	20 mph	Crossbucks, gates, flashing lights, bells
21 <sup>st</sup> Avenue	Vehicles	2 driving lanes 37-foot total width	Local Road	20 mph	Crossbucks, advanced warning signs, pavement markings, gates, flashing lights, bells
18 <sup>th</sup> Avenue	Vehicles and Pedestrians	2 driving lanes 41-foot total width	Minor Arterial	30 mph	Crossbucks, gates, flashing lights, bells
17 <sup>th</sup> Avenue	Pedestrians	33-foot total width	N/A <sup>3</sup>	N/A	Crossbucks, advanced warning signs
12 <sup>th</sup> Avenue	Vehicles	2 driving lanes 33-foot total width	Minor Arterial	30 mph	Crossbucks, advanced warning signs, gates, flashing lights, bells
3 <sup>rd</sup> Avenue	Vehicles	2 driving lanes 32-foot total width	Collector	35 mph	Crossbucks, advanced warning signs, pavement markings, gates, flashing lights, bells

*Notes:*

<sup>1</sup> Sidewalks are not present at the vehicular at-grade crossings (with the exception of 18<sup>th</sup> Avenue). However, this does not preclude pedestrians from using these crossings by using the street or adjacent areas behind the curb.

<sup>2</sup> mph = miles per hour.

<sup>3</sup> N/A = not applicable.

Source: HDR Engineering, Inc. (HDR), February 18, 2009, Memo regarding Traffic Analysis with the Construction of the 3<sup>rd</sup> [Avenue] and 12<sup>th</sup> [Avenue] Viaducts.

The west-east limits of the Study Area for consideration of grade-separated crossings generally include the existing at-grade railroad crossings within City limits with the exception of the East 14<sup>th</sup> Avenue crossing. The East 14<sup>th</sup> Avenue crossing was not included in the Study Area because it is on the far eastern edge of the City. Additionally, the roadway south of the East 14<sup>th</sup> Avenue crossing is not within City limits and is under Platte County jurisdiction. The west-east limits were extended approximately two blocks (0.15 mile) beyond the existing crossings to include consideration of the impacts of proposed grade-separated crossings on adjacent resources. The west limit of the Study Area is 28<sup>th</sup> Avenue, and the east limit is approximately 0.15 mile east of 3<sup>rd</sup> Avenue. The north-south limits of the Study Area include an area approximately 0.4 mile north and 0.5 mile south of the UPRR mainline to provide sufficient distance for development of reasonable roadway profiles over the rail line. The boundaries of the Study Area are shown in **Figure 1-2**.

### 1.3 PROPOSED ACTION

The City is proposing to construct three grade-separated crossings and close six at-grade crossings along the UPRR mainline within City limits. A pedestrian overpass would be constructed at 18<sup>th</sup> Avenue, and vehicular viaducts would be constructed at 12<sup>th</sup> Avenue and 3<sup>rd</sup> Avenue. Vehicular at-grade crossings would be closed at 25<sup>th</sup>, 21<sup>st</sup>, 18<sup>th</sup>, 12<sup>th</sup>, and 3<sup>rd</sup> Avenues, and a pedestrian at-grade crossing would be closed at 17<sup>th</sup> Avenue.

### 1.4 PURPOSE OF THE PROPOSED ACTION

The purpose of the proposed action is to improve the efficiency of the City's transportation system by reducing delay for vehicle and pedestrian traffic (including for emergency response) during the passage of trains, to improve safety by reducing the potential for trains to collide with vehicles and pedestrians, and to improve accessibility by increasing the number of grade-separated crossings in the City.

### 1.5 NEED FOR THE PROPOSED ACTION

The needs analysis addresses three key problems in the Study Area:

- Delay
- Safety
- Accessibility and emergency response

#### 1.5.1 Delay

Delay was evaluated using data on current traffic delays and projected changes in train and vehicle volumes.

The UPRR double-track mainline serves approximately 65 to 70 trains per day through the City; on average, approximately 29 of these trains operate during the day and the remainder operate at night (Federal Railroad Administration [FRA], May 25, 2010). In addition, UPRR has a siding track that begins between 12<sup>th</sup> and 3<sup>rd</sup> Avenues and continues to just west of East 44<sup>th</sup> Avenue. Trains on the mainline are typically 6,200 feet long and travel from 40 to 70 miles per hour (mph), resulting in a crossing time of 2 to 3 minutes per train. Crossing blockages also occur from stopped trains, which cause longer delays. Trains block each crossing up to 4 hours each day, causing extended vehicular delay on a regular basis. The current at-grade crossing delay reduces the efficiency of the City's transportation system.

The UPRR double-track mainline is nearing capacity, and UPRR has plans to construct third and fourth mainlines in 5 to 10 years and 20 or more years in the future, respectively, or sooner if demand requires expansion (HDR, March 5, 2009). The third mainline would increase capacity from approximately 70 trains per day to about 100 trains per day, and the fourth mainline would increase capacity to 120 to 130 trains per day using current operating practices. The existing lengthy and frequent delays would increase with additional tracks and train traffic.

The existing (2007) and future (2035) Average Daily Traffic (ADT) volumes at vehicular at-grade crossing locations in the Study Area are shown in **Table 1-2**. Projected traffic volumes are no-build volumes (that is, they represent future traffic without construction of viaducts). By 2035, traffic is projected to increase from a range of approximately 17 percent on 25<sup>th</sup> Avenue

to 158 percent on 3<sup>rd</sup> Avenue.<sup>4</sup> These traffic increases will result in substantial additional vehicular delay as well as a noticeable increase in train-vehicle exposure if these locations remain vehicular at-grade crossings in the future.

**Table 1-2  
Existing and Future No-Build Traffic Volumes for At-Grade Crossings**

Roadway	2007 (ADT)	2035 (ADT)	Percent Increase (2007 to 2035)
26 <sup>th</sup> Avenue	2,080	4,100	97
25 <sup>th</sup> Avenue	770	900	17
23 <sup>rd</sup> Avenue	3,570	4,200	18
21 <sup>st</sup> Avenue	1,180	1,400	19
18 <sup>th</sup> Avenue	2,200	2,800	27
12 <sup>th</sup> Avenue	4,400	5,900	34
3 <sup>rd</sup> Avenue	2,440	6,300	158

*Source: HDR, February 18, 2009, Memo regarding Traffic Analysis with the Construction of the 3<sup>rd</sup> [Avenue] and 12<sup>th</sup> [Avenue] Viaducts.*

Daily vehicular delay (the total time of crossing blockages) was estimated for the crossings based on the existing and projected vehicular and train traffic, as shown in **Table 1-3**. At present, a combined total of almost 3,000 hours of vehicular delay occurs each day at the crossings listed in **Table 1-3**. As noted above, train volumes are projected to increase in the future, and UPRR is planning future construction of one or two additional tracks by the year 2035. If these crossings remain open in 2035, the delay is expected to double if UPRR has added one track (triple track) and increase more than two and one-half times if UPRR has added two tracks (quadruple track).

**Table 1-3  
Daily Existing and Future Delay**

At-Grade Crossing	Existing (2007) (Hours)	Future (2035)	
		Triple Track (Hours)	Quadruple Track (Hours)
26 <sup>th</sup> Avenue	350	1,000	1,250
25 <sup>th</sup> Avenue	175	250	313
23 <sup>rd</sup> Avenue	613	1,000	1,250
21 <sup>st</sup> Avenue	263	375	469
18 <sup>th</sup> Avenue	350	625	781
12 <sup>th</sup> Avenue	700	1,375	1,719
3 <sup>rd</sup> Avenue	438	1,375	1,719
<b>TOTAL</b>	<b>2,888</b>	<b>6,000</b>	<b>7,500</b>

Pedestrians also experience delay when trains block roadway crossings; however, estimates of total pedestrian delay were not calculated because complete pedestrian counts are not available. Increases in train volumes would also result in increased pedestrian delay at blocked crossings.

<sup>4</sup> The projected traffic increases do not justify a need for increasing the capacity of the transportation system. The existing two-lane roadways would provide adequate levels of service for the foreseeable future. Capacity expansion would not be warranted until traffic volumes increase to 15,000 to 20,000 vehicles per day.

## 1.5.2 Safety

A safety analysis was conducted to evaluate the potential for vehicle and pedestrian collisions involving trains at existing vehicular at-grade crossing locations in the Study Area. Safety was evaluated primarily using exposure factors for potential train-vehicle crashes; however, other risk factors, such as number of accidents and crash costs, were also used to identify high-risk areas.

An exposure index is the most often-used indicator of crash potential at a vehicular at-grade crossing. The index is the product of the average number of vehicles per day (ADT) crossing the tracks and the average number of trains per day at a crossing. According to the Nebraska Administrative Code, Title 415, Chapter 5, a minimum exposure index of 50,000 is required for a crossing to be identified as a potential location for grade separation. The 2007 ADT volumes, estimated number of trains per day, and calculated exposure indices for the at-grade crossing locations in the Study Area are shown in **Table 1-4**. A range of exposure indices were developed based on the range of 65 to 70 trains per day. The exposure indices vary from a high of 308,000 for 12<sup>th</sup> Avenue, to a low of 50,100 for 25<sup>th</sup> Avenue. All of the crossings in the City exceed the NDOR threshold for consideration of a grade-separated crossing; five crossings are more than double the threshold. Additionally, ADT volumes and the number of trains per day are projected to increase, which would result in an even higher exposure index at all locations in the future, as shown in **Table 1-4**.

**Table 1-4  
Vehicular At-Grade Crossing Exposure**

Roadway	2007 (ADT)	2007 Trains per Day	2007 Exposure Index (ADT x Trains per Day)	2035 (ADT)	2035 Trains per Day		2035 Exposure Index (ADT x Trains per Day)	
					Triple Track	Quadruple Track	Triple Track	Quadruple Track
26 <sup>th</sup> Avenue	2,080	65-70	135,200 - 145,600	4,100	100	125	410,000	512,500
25 <sup>th</sup> Avenue	770	65-70	50,100 - 53,900	900	100	125	90,000	112,500
23 <sup>rd</sup> Avenue	3,570	65-70	232,100 - 249,900	4,200	100	125	420,000	525,000
21 <sup>st</sup> Avenue	1,180	65-70	76,700 - 82,600	1,400	100	125	140,000	175,000
18 <sup>th</sup> Avenue	2,200	65-70	143,000 - 154,000	2,800	100	125	280,000	350,000
12 <sup>th</sup> Avenue	4,400	65-70	286,000 - 308,000	5,900	100	125	590,000	737,500
3 <sup>rd</sup> Avenue	2,440	65-70	158,600 - 170,800	6,300	100	125	630,000	787,500

Sources: HDR, February 18, 2009, Memo regarding Traffic Analysis with the Construction of the 3<sup>rd</sup> [Avenue] and 12<sup>th</sup> [Avenue] Viaducts;

FRA, April 3, 2009, "Highway-Rail Crossing Inventory, 8.01, Query Crossing Inventory," Federal Railroad Administration Office of Safety Analysis, retrieved on April 3, 2009, <http://safetydata.fra.dot.gov/officeofsafety/publicsite/crossing/xingqryloc.aspx>.

Each at-grade crossing includes traffic control devices, such as crossbucks, advanced warning signs, pavement markings, gates, flashing lights, and bells, that are placed at and on the approach to the crossing “to permit reasonably safe and efficient operation of both rail and highway traffic” (FHWA, December 2007). However, these warning devices are not sufficient to eliminate crashes at the crossings.

Six of the seven vehicular at-grade crossings in the Study Area (26<sup>th</sup>, 23<sup>rd</sup>, 21<sup>st</sup>, 18<sup>th</sup>, 12<sup>th</sup>, and 3<sup>rd</sup> Avenues) were in the top 300 most dangerous crossings (the top 10 percent of public at-grade railroad crossings) in the State of Nebraska in 2008 (FRA, June 15, 2009). From 1975 to the present (35 years), a total of 24 train-vehicle crashes and three train-pedestrian accidents, resulting in three fatalities, have occurred at the at-grade crossings in the Study Area, as shown in **Table 1-5** (FRA, May 25, 2010).

Over the last 3 years, a total of four train-vehicle crashes have occurred at these crossings, costing \$1.9 million based on statewide average costs (NDOR, April 19, 2010). One of these crashes occurred at 26<sup>th</sup> Avenue, one occurred at 21<sup>st</sup> Avenue, and two occurred at 18<sup>th</sup> Avenue. All of these crossings are equipped with crossbucks, gates, flashing lights, and bells. In addition, the 21<sup>st</sup> Avenue crossing is equipped with advanced warning signs and pavement markings. All of these crashes occurred after dark; there was snow during the crash at 26<sup>th</sup> Avenue, and speeding was a factor in one of the crashes at 18<sup>th</sup> Avenue. In three of the crashes, the driver drove around the gate, and one of the crashes occurred because the driver stopped on the tracks (FRA, May 25, 2010). The most recent of these crashes occurred in November 2008. The most recent fatality in the Study Area occurred in 1993 and involved a train and a vehicle.

**Table 1-5  
Accidents at At-Grade Crossings in the Study Area, 1975-2009**

Roadway <sup>1</sup>	Date	Type of Accident	Number of Fatalities	Traffic Control Devices <sup>2</sup>
26 <sup>th</sup> Avenue	September 13, 1975	Vehicle-train	0	Crossbucks, gates, flashing lights, bells
	March 23, 1978	Vehicle-train	0	
	December 29, 1978	Vehicle-train	0	
	October 28, 1979	Vehicle-train	0	
	January 24, 1981	Vehicle-train	0	
	April 24, 1982	Vehicle-train	0	
	November 10, 1988	Pedestrian-train	1	
	July 3, 1992	Vehicle-train	0	
25 <sup>th</sup> Avenue	February 16, 2007	Vehicle-train	0	Crossbucks, gates, bells
	May 24, 1975	Vehicle-train	0	
	November 30, 1976	Vehicle-train	0	
	June 14, 1980	Vehicle-train	0	
	May 12, 1989	Pedestrian-train	0	
23 <sup>rd</sup> Avenue	June 2, 1992	Vehicle-train	0	Crossbucks, gates, flashing lights, bells
	January 31, 1979	Vehicle-train	0	
	April 10, 1979	Vehicle-train	0	
21 <sup>st</sup> Avenue	May 21, 1993	Vehicle-train	1	Crossbucks, advanced warning signs, pavement markings, gates, flashing lights, bells
	March 5, 1981	Vehicle-train	0	
	September 16, 1984	Pedestrian-train	1	
18 <sup>th</sup> Avenue	November 15, 2008	Vehicle-train	0	Crossbucks, gates, flashing lights, bells
	January 9, 1989	Vehicle-train	0	
	February 26, 1990	Vehicle-train	0	
	December 23, 2007	Vehicle-train	0	
	October 24, 2008	Vehicle-train	0	

Roadway <sup>1</sup>	Date	Type of Accident	Number of Fatalities	Traffic Control Devices <sup>2</sup>
17 <sup>th</sup> Avenue <sup>3</sup>	November 26, 1978	Vehicle-train	0	Crossbucks, advanced warning signs, flashing lights
3 <sup>rd</sup> Avenue	October 24, 1999	Vehicle-train	0	Crossbucks, advanced warning signs, pavement markings, gates, flashing lights, bells
	July 9, 2001	Vehicle-train	0	

*Notes:*

- <sup>1</sup> There have been no accidents at the 12<sup>th</sup> Avenue at-grade crossing from 1975 to the present.
- <sup>2</sup> The traffic control devices present during each specific accident are not provided because this information was inconsistent on FRA's Highway-Rail Grade Crossing Accident/Incident Reports; rather, the traffic control devices listed are those currently provided at each crossing (or those present before 17<sup>th</sup> Avenue was converted to a pedestrian-only crossing).
- <sup>3</sup> The 17<sup>th</sup> Avenue at-grade crossing was open to vehicular traffic until 1984; this crossing currently is open only to pedestrians.

Sources: FRA, May 25, 2010, "5.02 - Generate Crossing Inventory and Accident Reports." Federal Railroad Administration Office of Safety Analysis. Retrieved on May 25, 2010. <http://safetydata.fra.dot.gov/OfficeofSafety/publicsite/crossing/crossing.aspx>.

As shown in **Table 1-6**, if the crossings remain open in the future, it is estimated that 11 crashes could occur in the next 25 years, costing \$5.4 million dollars based on accident prediction values estimated by FRA.

**Table 1-6  
Projected Accidents and Costs at At-Grade Crossings in the Study Area**

Roadway	Estimated Accidents (25 years)	Cost (Millions)
26 <sup>th</sup> Avenue	2.5	\$1.2
23 <sup>rd</sup> Avenue	1.1	\$0.5
21 <sup>st</sup> Avenue	2.1	\$1.0
18 <sup>th</sup> Avenue	3.6	\$1.7
12 <sup>th</sup> Avenue	1.1	\$0.5
3 <sup>rd</sup> Avenue	1.0	\$0.5
<b>TOTAL</b>	<b>11.4</b>	<b>\$5.4</b>

Sources: FRA, May 25, 2010, "5.03 – Accident Prediction - WBAPS." Federal Railroad Administration Office of Safety Analysis. Retrieved on May 25, 2010. <http://safetydata.fra.dot.gov/OfficeofSafety>.  
 NDOR, April 19, 2010, "Societal Costs of Nebraska Traffic Accidents," Data derived from Federal Highway Administration Research Report Number FHWA-RD-91-055, "The Cost of Highway Crashes," October 1991; Nebraska Department of Roads Accident Data 2007 – 2009; Adjusted to January 2010 costs using the Gross Domestic Product (GDP) Implicit Price Deflator, U.S. Department of Commerce, Bureau of Economic Analysis (2010).

### 1.5.3 Accessibility and Emergency Response

Accessibility and emergency response were evaluated based on the distribution of the City's population and the location of public facilities, including emergency response facilities, north and south of the UPRR mainline.

Accessibility within the City is limited because there is a single grade-separated crossing (the 33<sup>rd</sup> Avenue viaduct) over the east-west UPRR rail corridor, which divides the City (approximately two-thirds of the City is north of the rail corridor and one-third is south of the rail corridor). **Figure 1-3** indicates the location of the 33<sup>rd</sup> Avenue viaduct and shows that many public facilities in or near the Study Area are located north of the UPRR mainline; these facilities include 12 schools (6 public and 6 private<sup>5</sup>), the public library, and facilities dedicated to emergency response—police stations, hospitals, medical clinics, and the Columbus Fire Department’s main fire station<sup>6</sup> (with ambulance and paramedic services). Two schools (one public and one private) and the Columbus Fire Department’s Charlie Louis Station<sup>7</sup> are located south of the UPRR mainline.

Although sidewalks are not present at the vehicular at-grade crossings (with the exception of 18<sup>th</sup> Avenue), pedestrians and bicyclists use these crossings by using the street or adjacent areas behind the curb. In addition, pedestrians and bicyclists may cross the UPRR mainline at the pedestrian at-grade crossing at 17<sup>th</sup> Avenue. The majority of pedestrian and bicycle traffic in the Study Area is from school children who reside south of the UPRR mainline and attend schools (including Scotus Central Catholic High School, Columbus Middle School, and Saint Bonaventure Catholic School) located north of the UPRR mainline (see **Figure 1-3**). It is likely that the majority of school children crossing the UPRR mainline as pedestrians or bicyclists would not use the 33<sup>rd</sup> Avenue viaduct (which has a separate pedestrian/bicycle path) because the population center of the City is primarily east of the viaduct. No pedestrian/bicycle origin/destination/crossing study has been performed, but 18<sup>th</sup> and 17<sup>th</sup> Avenues are popular crossings based on the presence of Scotus Central Catholic High School and Saint Bonaventure Catholic School near 18<sup>th</sup> Avenue (Columbus Public Schools, June 17, 2009).

The lack of grade-separated crossings hinders emergency response. Fire and rescue vehicles heading south of the UPRR mainline primarily use the 33<sup>rd</sup> Avenue viaduct to avoid potential delays at the at-grade crossings. Based on observance of train movements by the fire or rescue responders, fire and rescue vehicles sometimes use the 26<sup>th</sup> Avenue crossing because of its proximity to the main fire station but also could use other at-grade crossings (Columbus Fire Department, March 4, 2009). Police vehicles use the 33<sup>rd</sup> Avenue viaduct but frequently use at-grade crossings along a direct route to respond to an emergency because responders are often already away from the police station and are aware of whether a crossing is open (Columbus Police Department, March 4, 2009). Delays of only a few minutes can cause loss of life when emergency services vehicles are picking up or delivering patients or responding to volatile situations.

## 1.6 TRANSPORTATION PLANNING

Additional railroad viaducts were identified in the 2004 *City of Columbus Transportation Plan Update* as a “critical missing element of the transportation system,” and providing viaducts were noted as a major transportation improvement that is needed to ensure the future efficiency of the transportation network (Olsson Associates, August 2004). The viaduct proposal evaluated in this EA is consistent with the 2004 *City of Columbus Transportation Plan Update*. Although the proposed Project is not specifically cited in the 2005 *Columbus Comprehensive Plan Update*, the

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<sup>5</sup> Although private schools are not, by definition, public facilities, they were included because they serve a large portion of the general population.

<sup>6</sup> The main fire station, at 26<sup>th</sup> Avenue and 15<sup>th</sup> Street, hosts 12 full-time staff and many volunteers.

<sup>7</sup> The Charlie Louis Station, northeast of 5<sup>th</sup> Avenue and 8<sup>th</sup> Street, is unmanned and stores equipment and a vehicle for use when a fire requires additional equipment.

proposal is consistent with land use plans and will be included in the next update of the *Columbus Comprehensive Plan* (City of Columbus, March 4, 2009).

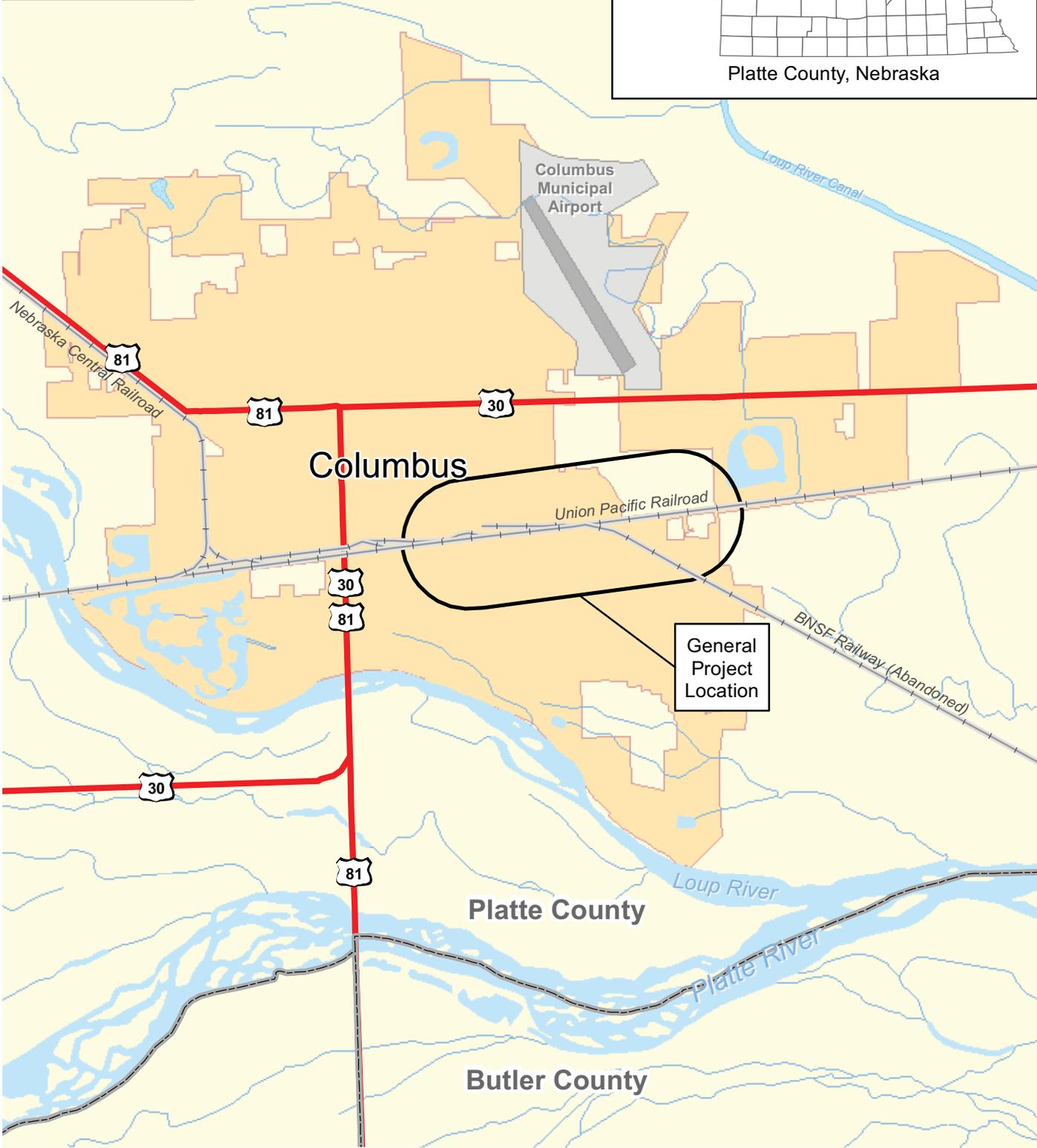
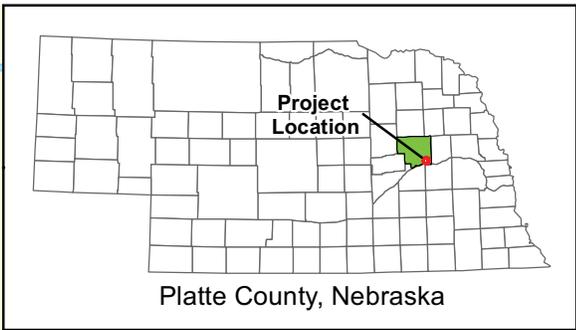
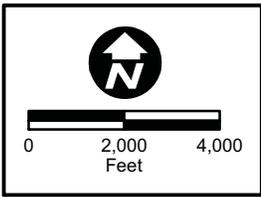
Nebraska's State Transportation Improvement Program (STIP) includes a list, by fiscal year, of state highway and local projects that involve Federal funding. The proposed Project is included in the STIP for 2011–2015. The majority of funds for construction would be provided by NDOR through Federal safety funding, with UPRR and the City contributing the remainder of funding.

## **1.7 PURPOSE AND NEED SUMMARY**

Trains that travel through the City block at-grade crossings up to 4 hours each day, causing nearly 3,000 hours of delay and reducing the efficiency of the City's transportation system. In addition, vehicular at-grade crossings of the UPRR mainline have a high risk of train-vehicle crashes and have resulted in nearly \$2 million in damage in the past 3 years. At present, only one viaduct (33<sup>rd</sup> Avenue) crosses the UPRR mainline within City limits, thus limiting accessibility and hindering emergency response within the City. Emergency responders traveling across the UPRR mainline either need to take the 33<sup>rd</sup> Avenue viaduct or risk delay at at-grade crossings. Delays of only a few minutes can cause loss of life when emergency services vehicles are picking up or delivering patients or responding to volatile situations.

The proposed Project—construction of additional viaducts and closure of existing at-grade crossings—would address the identified needs as follows:

- Existing delay (3,000 hours) and future delay (7,500 hours) caused by trains blocking the crossings would be eliminated.
- Safety would be improved, and millions of dollars in crash costs would be avoided.
- Accessibility and emergency response would be improved by providing reliable crossing times in the eastern portions of the City.



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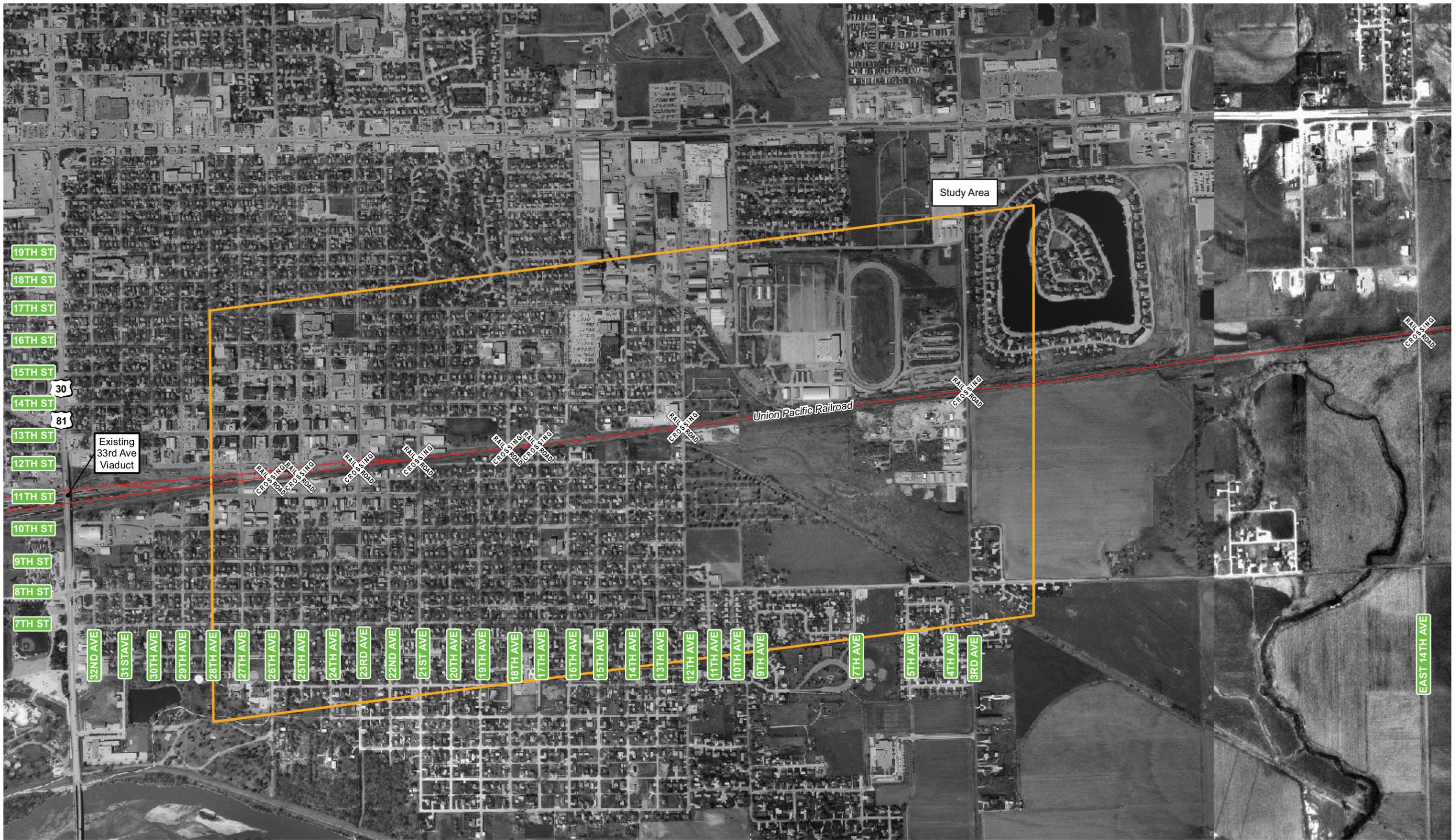


**Project Location Map**

Columbus Viaducts  
Platte County, Nebraska  
Environmental Assessment

City of Columbus

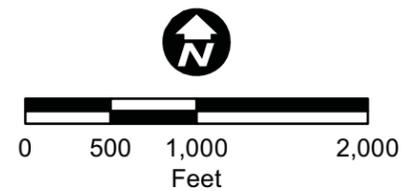
DATE	March 2011
FIGURE	1-1



**Legend**

- Existing At-Grade Crossings
- Railroad
- Study Area

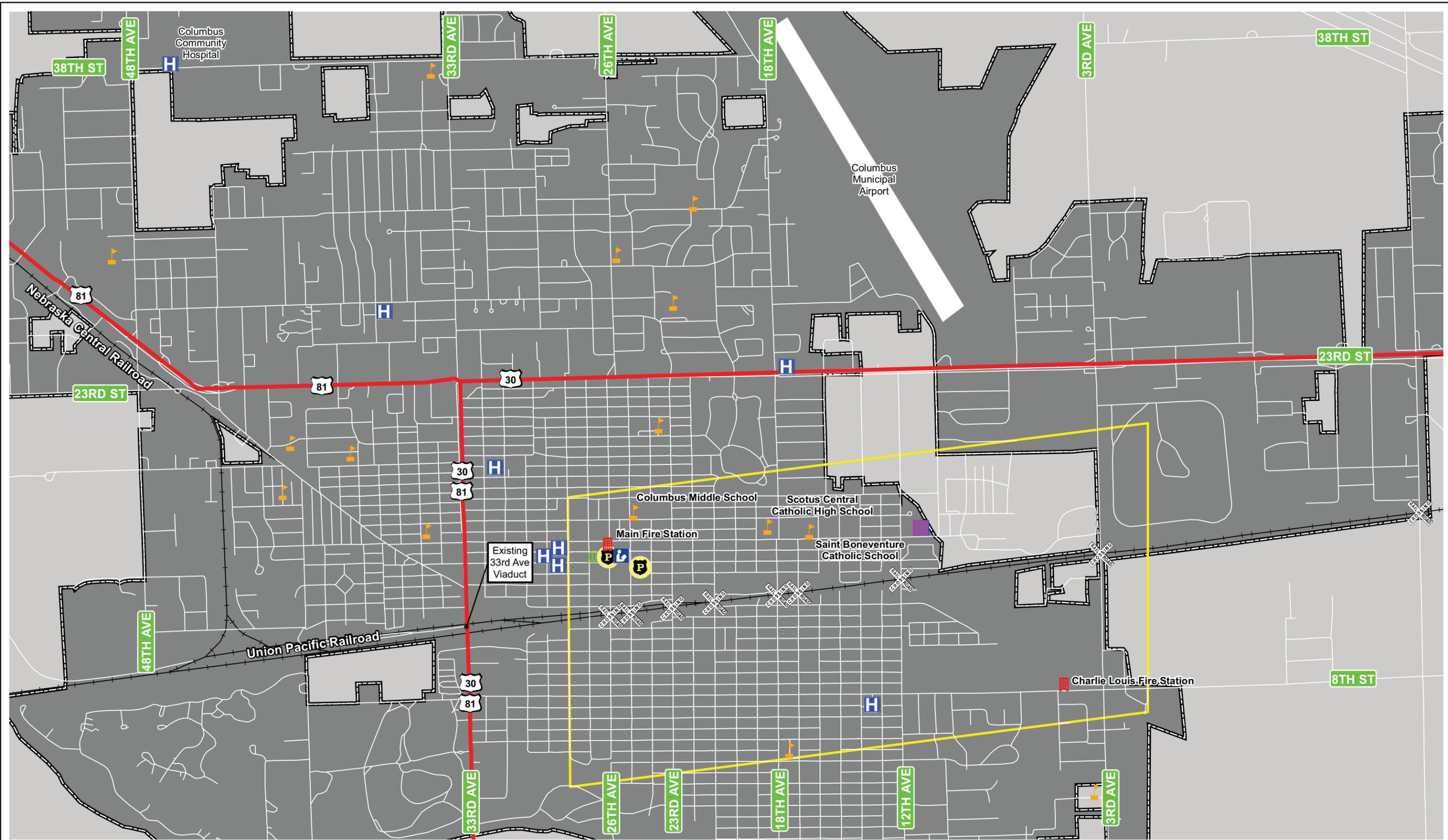
Aerial Photography - Western Air Maps, 2007



**Study Area**  
 Columbus Viaducts  
 Platte County, Nebraska  
 Environmental Assessment



DATE	March 2011
FIGURE	1-2



**Legend**

Police Station	Court House	Nursing Home	Study Area
Fire Department	Library	Existing At-Grade Crossings	City Limits
School	Medical Facilities	Railroad	Platte County

0 750 1,500 3,000  
Feet



**Public Facilities**

Columbus Viaducts  
Platte County, Nebraska  
Environmental Assessment

DATE  
March 2011

FIGURE  
1-3

**CHAPTER 2**  
**ALTERNATIVES**

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## CHAPTER 2 ALTERNATIVES

Chapter 2 addresses the alternatives considered in order to meet the purpose of and need for the proposed action. Specifically, this chapter discusses the development of a range of alternatives, describes the alternatives considered, identifies the preferred alternative, and summarizes the potential impacts of implementing the preferred alternative. Other major actions proposed by government agencies for the Study Area are also outlined.

### 2.1 BACKGROUND

As discussed in Chapter 1, viaducts have been a topic of discussion in the City for several decades. Since the 1980s, the City has conducted numerous studies to determine how best to meet the identified need to reduce delay, improve safety, and improve accessibility and emergency response related to at-grade railroad crossings. The following studies were completed by the City prior to initiation of this EA for the Columbus Viaducts Project:

- Columbus Viaduct Location Study, December 6, 1988
- City of Columbus Transportation Study, April 1997
- Columbus Grade Separation Feasibility Study, August 2000
- Columbus Grade Separation Feasibility Study, Traffic Study and 23<sup>rd</sup> Avenue and 3<sup>rd</sup> Avenue Overpass Concepts, January 2001
- Columbus Grade Separation Feasibility Study, 27<sup>th</sup> Avenue to 3<sup>rd</sup> Avenue, February 2001
- Columbus Grade Separation Feasibility Study, 12<sup>th</sup> Avenue Viaduct, October 15, 2001

These studies considered a wide range of options to address the City's needs, including relocating the UPRR tracks on a new alignment outside of the City, elevating the UPRR tracks through the City, and constructing underpasses and/or viaducts at various locations in the City. Relocating the UPRR tracks on a new alignment outside of the City and elevating the UPRR tracks through the City were eliminated because they were determined to be not feasible due to cost, potential impacts on the natural environment (specifically threatened and endangered species) associated with construction of a new railroad alignment, and future expandability for UPRR. Underpasses were also determined to be not feasible due to drainage concerns associated with the high water table in the City, utility impacts, and impacts on traffic circulation.

The following locations for viaducts were considered in the previous studies:

- 23<sup>rd</sup> Avenue
- 23<sup>rd</sup> Avenue to 21<sup>st</sup> Avenue
- 21<sup>st</sup> Avenue
- 14<sup>th</sup> Avenue
- 13<sup>th</sup> Avenue
- 12<sup>th</sup> Avenue
- 10<sup>th</sup> Avenue to 7<sup>th</sup> Avenue
- 3<sup>rd</sup> Avenue
- East 6<sup>th</sup> Avenue

All of these locations are within the Study Area for the current Project and are shown in **Figure 2-1**. The majority of these locations were at or near existing at-grade crossings because of the desire to maintain current traffic patterns given the developed nature of the Study Area. Evaluation in the previous studies focused on engineering considerations (such as traffic circulation, access, and roadway profiles and clearances) and public input. Although construction of viaducts at these locations was determined to be feasible and would meet the needs related to reducing delay, improving safety, and improving access and emergency response, public consensus and support could not be achieved on the locations of viaducts and at-grade crossings to be closed.

To address issues related to public support for the locations of viaducts and at-grade crossing to be closed, the City established the Columbus Viaduct Committee in 2005. This committee was composed of 15 members, including residents, local business leaders, and school officials. The Columbus Viaduct Committee considered the recommendations contained in past studies on viaducts and at-grade crossing closures and developed the following comprehensive recommendation to address delay, safety, and accessibility concerns associated with UPRR at-grade crossings throughout the City:

- Construct viaducts at 23<sup>rd</sup> Avenue and 3<sup>rd</sup> Avenue
- Close at-grade crossings at 27<sup>th</sup>, 25<sup>th</sup>, and 21<sup>st</sup> Avenues
- Keep open at-grade crossings at 26<sup>th</sup>, 18<sup>th</sup>, 12<sup>th</sup>, and East 14<sup>th</sup> Avenues as railroad quiet zones with safety improvements to prevent vehicles from going around the crossing gates.

The Columbus Viaduct Committee also recommended that the 3<sup>rd</sup> Avenue viaduct be constructed first and that a design advisory panel be used during design to develop aesthetic treatments to ensure that the viaducts complement the surrounding neighborhoods.

The City discussed the recommendations of the Columbus Viaduct Committee with NDOR and UPRR. NDOR indicated that additional crossing closures would be required to be eligible for viaduct funding and noted that quiet zones and safety improvements at at-grade crossings do not provide the same safety benefits as closure and construction of viaducts. Based on the City's discussions with NDOR and UPRR, the viaduct proposal was refined to include construction of vehicular viaducts at 23<sup>rd</sup>, 12<sup>th</sup>, and 3<sup>rd</sup> Avenues and to close all but one at-grade crossing (East 14<sup>th</sup> Avenue) within City limits. Construction of pedestrian overpasses at 25<sup>th</sup> and 18<sup>th</sup> Avenues was also included in the proposal. The City Council approved the revised viaduct proposal in January 2007.

The City determined that construction of the entire viaduct proposal was not feasible due to funding constraints; therefore, the proposal was divided into two separate projects of independent utility:

- First viaduct project – Construct a pedestrian overpass at 18<sup>th</sup> Avenue and vehicular viaducts at 12<sup>th</sup> and 3<sup>rd</sup> Avenues. Close at-grade crossings at 25<sup>th</sup>, 21<sup>st</sup>, 18<sup>th</sup>, 17<sup>th</sup> (pedestrian only), 12<sup>th</sup>, and 3<sup>rd</sup> Avenues.<sup>1</sup>
- Second viaduct project – Construct a pedestrian overpass at 25<sup>th</sup> Avenue and a vehicular viaduct at 23<sup>rd</sup> Avenue. Close at-grade crossings at 26<sup>th</sup> and 23<sup>rd</sup> Avenues.

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<sup>1</sup> The 27<sup>th</sup> Avenue at-grade crossing was closed in summer 2008 to accommodate UPRR signal improvements.

Public funding for project planning (NEPA and preliminary design sufficient for analysis of environmental impacts) has been approved for the first project. This EA evaluates the first project. The second project is independent of the first project and would be evaluated in compliance with NEPA upon completion of the first project.

## **2.2 PROCESS OF IDENTIFYING AND SCREENING ALTERNATIVES**

In the process of identifying and screening alternatives to meet the purpose of and need for the Project, the City was cognizant of the work that had been previously conducted as well as the recommendations of the Columbus Viaduct Committee and the discussions with NDOR and UPRR. As a result, the range of alternatives considered was limited to alternatives in the corridors agreed to by the City, NDOR, and UPRR (18<sup>th</sup>, 12<sup>th</sup>, and 3<sup>rd</sup> Avenues). In addition, non-build alternatives were considered. This evaluation of limited viaduct locations is consistent with the purpose of an EA: to determine whether a Project would have significant impacts on the environment.

Within each corridor, various build alternatives were evaluated with respect to engineering feasibility, impacts on the human and natural environment, and public input in order to identify a preferred alternative.

## **2.3 RANGE OF ALTERNATIVES**

The following range of alternatives was considered:

- The No-Build Alternative (see Section 2.3.1)
- Improvements not requiring major construction (see Section 2.3.2)
- Build Alternatives (see Section 2.3.3)

The following sections describe the alternatives, the evaluation process used in eliminating alternatives from further consideration, and the alternatives carried forward for detailed study.

### **2.3.1 No-Build Alternative**

Under the No-Build Alternative, grade-separated crossings would not be constructed nor would existing at-grade crossings be closed. Instead, the existing crossings would continue to serve traffic. Routine maintenance would be conducted as needed, including repair of crossing equipment and potential resurfacing of the approaches to the crossings. Construction of a third and fourth mainline by UPRR would occur at some point in the future, the timing of which is dependent on UPRR's freight volumes and other economic factors. The No-Build Alternative would also include the following construction projects as well as maintenance activities for transportation facilities throughout the City:

- The City plans to reconstruct 3<sup>rd</sup> Avenue from 8<sup>th</sup> to 5<sup>th</sup> Streets from an asphalt road to a concrete major urban arterial road and to construct storm sewers. In addition, 2<sup>nd</sup> Avenue and 10<sup>th</sup> Street are planned to be converted from gravel roads to concrete roads with associated storm sewers.
- The City plans to continue construction (Phases III and IV) of Lost Creek Parkway (North Arterial Roadway) from 18<sup>th</sup> Avenue west to U.S. Highway 81 (US 81).
- The City plans to reconstruct roads and to construct storm sewers on 12<sup>th</sup> Street from 19<sup>th</sup> to 18<sup>th</sup> Avenues and from 16<sup>th</sup> to 12<sup>th</sup> Avenues; on 20<sup>th</sup>, 15<sup>th</sup>, 14<sup>th</sup>, and 13<sup>th</sup> Avenues from 12<sup>th</sup> to 11<sup>th</sup> Streets; and on various streets west of 12<sup>th</sup> Avenue and south of 5<sup>th</sup> Street.

- The City plans to reconstruct and improve roads and to construct storm sewers in neighborhoods south of 3<sup>rd</sup> Avenue, including parts of 7<sup>th</sup> and 6<sup>th</sup> Streets southwest of the 3<sup>rd</sup> Avenue and 8<sup>th</sup> Street intersection, 6<sup>th</sup> and 5<sup>th</sup> Streets southeast of the 3<sup>rd</sup> Avenue and 8<sup>th</sup> Street intersection, and Lover's Lane southwest of the 3<sup>rd</sup> Avenue and 8<sup>th</sup> Street intersection.

Under the No-Build Alternative, delay associated with blocked railroad crossings would more than double by 2035 with a third mainline, 11 vehicle-train crashes are projected to occur, and access would not be improved. Therefore, the No-Build Alternative does not meet the purpose of and need for the Project.

**Although it does not meet the purpose and need, the No-Build Alternative was carried forward for detailed study because it provides a baseline for comparing the potential impacts of other alternatives and is required by Council on Environmental Quality regulations for implementing NEPA (40 Code of Federal Regulations [CFR] 1500-1508).**

### 2.3.2 Improvements Not Requiring Major Construction

Strategies to avoid major new construction were considered to determine if they could meet the purpose of and need for the Project, including transportation system management (TSM),<sup>2</sup> travel demand management (TDM),<sup>3</sup> and alternate modes of transportation. These strategies typically focus on reducing roadway congestion or increasing traffic capacity and cannot address delay, safety, and accessibility needs associated with at-grade railroad crossings. Because the need for the Columbus Viaducts Project is to reduce delay, improve safety, and improve accessibility and emergency response, TSM, TDM, and use of alternate modes of transportation would not be effective in meeting these needs. **Consequently, these strategies were eliminated from further consideration.**

### 2.3.3 Build Alternatives

As noted in Section 2.2, Process of Identifying and Screening Alternatives, evaluation of build alternatives was limited to the three corridors included in the first viaduct project as agreed to by the City, NDOR, and UPRR: 18<sup>th</sup> Avenue, 12<sup>th</sup> Avenue, and 3<sup>rd</sup> Avenue. Within each corridor, build alternatives were evaluated with respect to engineering feasibility, impacts on the human and natural environment, and public input in order to identify a preferred alternative.

#### 18<sup>th</sup> Avenue

18<sup>th</sup> Avenue is an optimal location for a pedestrian overpass because of its proximity to schools and recreation facilities (areas where children would likely walk or ride bicycles). In addition, the 18<sup>th</sup> Avenue location is adjacent to the existing 17<sup>th</sup> Avenue pedestrian-only at-grade crossing and would require a negligible change in pedestrian/bicycle travel patterns when the 17<sup>th</sup> Avenue at-grade crossing would be closed as part of the Project.

An on-alignment alternative was developed for the 18<sup>th</sup> Avenue pedestrian overpass. This alternative could be constructed completely within existing 18<sup>th</sup> Avenue roadway right-of-way (ROW) with only minor (approximately 0.1 acre) temporary easements required to modify driveway access for adjacent properties. **Because the pedestrian overpass can be constructed within the existing ROW with minimal impacts, the on-alignment location at 18<sup>th</sup> Avenue**

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<sup>2</sup> TSM is an approach that seeks to enhance the capacity of a transportation system through better management and operation of existing facilities, such as intersection and signal improvements.

<sup>3</sup> TDM is a set of strategies for more effective use of the existing resources and infrastructure of a transportation system, such as carpooling, vanpooling, mass transit, and telecommuting.

**for the pedestrian overpass was carried forward for detailed evaluation and additional alternatives were not evaluated.**

### **12<sup>th</sup> Avenue**

Two alternatives were considered for the 12<sup>th</sup> Avenue corridor, on-alignment and modified alignment alternatives, as shown in **Figure 2-2**. Each alternative was developed using a typical section of two 12-foot-wide lanes with 4-foot-wide shoulders on each side and a 10-foot-wide pedestrian walkway on the west side, and an additional 12-foot-wide center lane would be provided as needed for a turn lane, for a total width of 45 to 57 feet. The alternatives would accommodate a 30-mph speed, consistent with the current posted speed limit, and would provide touchdown of the viaduct somewhere between 8<sup>th</sup> Street on the south and 17<sup>th</sup> Street on the north. These two roadways were chosen because 8<sup>th</sup> Street is a major thoroughfare in Columbus and because 12<sup>th</sup> Avenue becomes an industrial access road north of 17<sup>th</sup> Street.

There are a number of constraints in the 12<sup>th</sup> Avenue corridor that could be impacted by viaduct construction, and these were key considerations in evaluation of these alternatives:

- Electric power, sanitary sewer, natural gas, and stormwater sewer lines
- Columbus Cemetery on the east side, south of the UPRR mainline
- Saint Bonaventure Catholic Cemetery on the east side, north of the UPRR mainline
- Loup River Public Power District (Loup Power District) building and storage yard on the west side, north of the UPRR mainline (contains a historic building eligible for listing on the National Register of Historic Places)
- Residential area on the west side
- Scotus Central Catholic High School athletic practice field on the west side (privately owned)

An on-alignment alternative was developed with an essentially straight alignment, with a minor (6- to 8-foot) centerline shift to the west to avoid major impacts on the cemeteries. This alternative would require a 7 percent grade to meet the touchdown criteria of 8<sup>th</sup> and 17<sup>th</sup> Streets. The on-alignment alternative would result in numerous impacts on adjacent properties. At the two cemeteries, ROW would be required, access would be affected, visual impacts would occur, and graves would potentially be impacted. The 12<sup>th</sup> Avenue entrance to the Loup Power District building and storage yard would need to be closed, and customer parking in the front of the building would be eliminated. The existing ROW is 40 feet wide, and the desired roadway cross section with sidewalk is 45 to 57 feet. Consequently, even with mechanically stabilized earth (MSE) walls rather than slope fill, acquisition of property along 12<sup>th</sup> Avenue could not be avoided. The on-alignment option would require relocation of a water main and overhead power lines. Additionally, the 7 percent grade exceeds the American Association of State Highway and Transportation Officials (AASHTO) recommended grade of 5 percent for bicyclists and would require flat landing areas to meet requirements of the Americans with Disabilities Act (ADA). The on-alignment alternative would also be very difficult to construct because of the numerous constraints in close proximity to the roadway.

In addition, Section 4(f) of the U.S. Department of Transportation (USDOT) Act of 1966<sup>4</sup> applies to transportation projects with public funding. As described in Section 3.19 of this EA, Section 4(f)/6(f) Properties, the original 1943 Loup Power District building at 1350 12<sup>th</sup> Avenue is considered to be a significant historic property protected under Section 4(f). The historic boundary of the Loup Power District building includes only the exterior walls of the original structure constructed in 1943 and does not include any building additions or the surrounding property. Even with construction of an MSE wall to limit ROW impacts, impacts on the front façade of the building along 12<sup>th</sup> Street are likely and could result in an adverse effect on the historic property. Impacts on the Loup Power District building must be avoided unless there is no feasible and prudent alternative to use of the land.

A modified-alignment alternative was developed with an alignment that curves to the west of the Loup Power District building. This alternative would require a 5 percent grade to meet the touchdown criteria of 8<sup>th</sup> and 17<sup>th</sup> Streets, which would meet AASHTO guidelines for bicyclists and would be ADA compliant. The modified-alignment alternative would avoid impacts on the two adjacent cemeteries and a power line and 6-inch water main along 12<sup>th</sup> Avenue. The modified-alignment alternative would result in several residential property impacts and minor impacts on site circulation at the Loup Power District facility. There is also the potential to encounter contamination on the Loup Power District material storage yard. A bridge pier would be placed in the Scotus Central Catholic High School athletic practice field; however, the practice field is privately owned and is not considered a protected Section 4(f) resource. The modified alignment alternative would avoid impacts on the Loup Power District building that is considered to be a significant historic property and protected under Section 4(f).

**Table 2-1** provides a comparison of anticipated impacts of the on-alignment and modified alignment alternatives for the 12<sup>th</sup> Avenue corridor.

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<sup>4</sup> Section 4(f) stipulates that FHWA and other USDOT agencies cannot approve the use of land from publicly owned parks, recreational areas, wildlife and waterfowl refuges, or public and private historical sites unless the following conditions apply: there is no feasible and prudent alternative to the use of land and the action includes all possible planning to minimize harm to the property resulting from use (FHWA, April 2009).

**Table 2-1  
Anticipated Impacts of 12<sup>th</sup> Avenue Alternatives**

Resource	On Alignment	Modified Alignment
ADA Compliant	Yes, but requires flat landing areas	Yes
Bicycle Accessibility	Unacceptable – 7 percent grade	Acceptable – 5 percent grade
Utilities	Relocation of a power line and an 8-inch water main	No impact on major utilities
Residential Impacts	9 houses	13 houses
Loup Power District Building Impacts	Major impact on access and parking in front of building; no impact on fuel pumps	Minor impact on mobility in storage area; fuel pumps would be relocated
Columbus Cemetery Impacts	ROW required; major visual impact as MSE walls would be 10 feet from cemetery fence; existing accesses would be maintained	Minor visual impact as MSE walls would be no less than 80 feet from cemetery fence; minor realignment of main entrance
Saint Bonaventure Cemetery	ROW required; major visual impact as MSE walls would be 10 feet from cemetery fence; access provided from 14 <sup>th</sup> Street instead of 12 <sup>th</sup> Avenue	No impact
Scotus Central Catholic High School Athletic Practice Field	No impact	Bridge constructed over practice field with piers placed in playing field
Historic Properties	Major impact on Loup Power District building	No impact
Section 4(f) Properties Impacted	Loup Power District Building	None

**Because the on-alignment alternative would result in impacts on a Section 4(f) property that would be avoided with a modified-alignment alternative, the on-alignment alternative at 12<sup>th</sup> Avenue was eliminated from further evaluation and the modified-alignment alternative was carried forward for detailed evaluation.**

### **3<sup>rd</sup> Avenue**

Two alternatives were considered for the 3<sup>rd</sup> Avenue corridor, on-alignment and modified alignment alternatives, as shown in **Figure 2-3**. Each alternative was developed using a typical section of two 12-foot-wide lanes with 4-foot-wide shoulders on each side and a 10-foot-wide pedestrian walkway on the west side, and an additional 12-foot-wide center lane would be provided as needed for a turn lane, for a total width of 45 to 57 feet. The alternatives would accommodate a 35-mph speed, consistent with the current posted speed limit, and would provide touchdown of the viaduct somewhere between 8<sup>th</sup> Street and 19<sup>th</sup> Street, which are the nearest intersections north and south of the at-grade crossing that need to remain open.

There are a number of constraints in the 3<sup>rd</sup> Avenue corridor that could be impacted by viaduct construction, and these were key considerations in evaluation of these alternatives:

- Electric power, sanitary sewer, and water main lines
- A residential subdivision (Christopher’s Cove) on the east side, north of the UPRR mainline
- A residential development on the east side, south of the UPRR mainline
- Fairgrounds (Agricultural Park) on the west side
- An industrial park on the west side

- Two wetlands on the west side, south of the UPRR mainline
- The 100-year floodplain for portions of 3<sup>rd</sup> Avenue

An on-alignment alternative was developed with a straight alignment. This alternative would require a 5 percent grade to meet the touchdown criteria of 8<sup>th</sup> and 19<sup>th</sup> Streets, which would meet AASHTO guidelines for bicyclists and would be ADA compliant. The on-alignment alternative would result in numerous impacts on adjacent properties. The on-alignment alternative would require relocation of a high-voltage (115 kilovolt [kV]) two-pole power line and would eliminate access to industrial park businesses. There would be minor impacts on the two wetlands, and fill would be required in the 100-year floodplain. The use of embankment would require acquisition of some industrial park buildings and Agricultural Park horse barns whereas the use of retaining walls could avoid building acquisition but eliminate the current access road serving the industrial park businesses. These businesses would likely need to be acquired unless suitable, alternative access could be provided. A review of potential access routes did not identify a reasonable location to provide access to all business owners.

A modified-alignment alternative was developed with an alignment that curves to the east. This alternative would also require a 5 percent grade to meet the touchdown criteria of 8<sup>th</sup> and 19<sup>th</sup> Streets, which would meet AASHTO guidelines for bicyclists and would be ADA compliant. The modified-alignment alternative would also result in impacts on adjacent properties. Approximately 6.6 acres of farmland would be required for ROW and a center pivot would have to be relocated. There would be minor impacts on the two wetlands, and fill would be required in the 100-year floodplain. However, relocation of the high-voltage power line would not be required. The curve to the east allows the existing 3<sup>rd</sup> Avenue roadway to serve as a frontage road and maintains access to the industrial park buildings and Agricultural Park horse barns.

**Table 2-2** provides a comparison of anticipated impacts of the on-alignment and modified alignment alternatives for the 3<sup>rd</sup> Avenue corridor.

**Table 2-2**  
**Anticipated Impacts of 3<sup>rd</sup> Avenue Alternatives**

Resource	On Alignment	Modified Alignment
ADA Compliant	Yes	Yes
Bicycle Accessibility	Acceptable – 5 percent grade	Acceptable – 5 percent grade
Utilities	Relocation of a high-voltage (115 kV) two-pole power line and minor impacts on service lines	Minor impacts on service lines
Industrial Park Access	Eliminated	Maintained
Business/Building Impacts	2 businesses 1 horse barn	None
Farmland (acres)	0	6.6
Prime farmland (acres)	0	4 A center pivot would have to be relocated
Wetlands	Minor impacts on two wetlands	Minor impacts on two wetlands (slightly less than on alignment)
Floodplain	Fill would be required	Fill would be required (similar to on alignment)

**Because the on-alignment alternative does not maintain access to adjacent industrial and Agricultural Park properties to the west and has greater impacts on utilities, the on-alignment viaduct at 3<sup>rd</sup> Avenue was eliminated from further evaluation, and the modified-alignment alternative was carried forward for detailed evaluation.**

### **Summary**

**The on-alignment alternative for the 18<sup>th</sup> Avenue pedestrian overpass and the modified-alignment alternatives for the 12<sup>th</sup> Avenue and 3<sup>rd</sup> Avenue viaducts were carried forward for detailed evaluation. Given the constraints and impacts identified above, the on-alignment alternatives for 12<sup>th</sup> and 3<sup>rd</sup> Avenues were eliminated from further consideration.**

## **2.4 PREFERRED ALTERNATIVE**

The preferred alternative for the Project is to construct a pedestrian overpass across the UPRR mainline at 18<sup>th</sup> Avenue and vehicular viaducts across the UPRR mainline at 12<sup>th</sup> and 3<sup>rd</sup> Avenues (Build Alternative). In addition, at-grade crossings at 25<sup>th</sup>, 21<sup>st</sup>, 18<sup>th</sup>, 17<sup>th</sup>, 12<sup>th</sup>, and 3<sup>rd</sup> Avenues would be closed. **Figures 2-4 through 2-12** show the designs for construction of grade-separated crossings and closure of at-grade crossings. Although environmental constraints were considered in the design process, they are not identified in the Chapter 2 figures; figures in Chapter 3 show both the design and environmental constraints to facilitate a better understanding of potential impacts of the Project.

The locations and alignments of grade-separated crossings were selected through a public involvement process led by the City and supported by the public. Three open-house-style public information meetings were held in 2007 and 2008 to show concepts for the Project and to allow the public to comment on the City's plans for reducing traffic delays, improving public safety, and improving accessibility and emergency response (see Section 4.3 for a discussion of public involvement activities and input and Appendix A for the public comment letters received).

The Project is proposed to be constructed in two operationally independent phases.<sup>5</sup> Future phases of Project development, including design, ROW acquisition, and construction, for the 18<sup>th</sup> Avenue pedestrian overpass and the 3<sup>rd</sup> Avenue vehicular viaduct are included in the STIP for 2011 - 2015. After construction of the 18<sup>th</sup> Avenue overpass and 3<sup>rd</sup> Avenue viaduct begins, the at-grade crossings at 18<sup>th</sup> and 3<sup>rd</sup> Avenues would remain open as long as possible until construction activities require closure. The 17<sup>th</sup> Avenue pedestrian-only crossing would be closed after the 18<sup>th</sup> Avenue overpass is open. Construction of the 18<sup>th</sup> Avenue overpass and the 3<sup>rd</sup> Avenue viaduct would be completed before construction of the 12<sup>th</sup> Avenue vehicular viaduct begins. Future phases of Project development for the 12<sup>th</sup> Avenue viaduct, including design, ROW acquisition, and construction, are also included in the STIP for 2011 - 2015. The 12<sup>th</sup> Avenue at-grade crossing would be closed after construction reaches a point that the crossing can no longer remain open, and the 25<sup>th</sup> and 21<sup>st</sup> Avenue at-grade crossings would be closed after the 12<sup>th</sup> Avenue viaduct is open to traffic.

The preferred alternative would require approximately 9.3 acres of new ROW and would cost approximately \$24.8 million for design, ROW acquisition, and construction. **Table 2-3** provides a breakdown of the major costs. A brief discussion of the proposed grade-separated structures and the closures follows the table.

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<sup>5</sup> An operationally independent phase of work is a portion of a project that can be built and function as a viable transportation facility even if the remainder of the project is never built.

**Table 2-3**  
**Construction Cost (2009 dollars)**  
(in thousands of dollars)

Component	Length (feet)	Roadway <sup>1</sup>	Bridge <sup>2</sup>	New ROW (acres)	New ROW <sup>3</sup> (\$)	Engineering <sup>4</sup>	Total
18 <sup>th</sup> Avenue	430	\$100	\$2,400	0	\$0	\$500	\$3,000
12 <sup>th</sup> Avenue	2,600	\$4,600	\$5,800	2.7	\$1,500	\$2,100	\$14,000
3 <sup>rd</sup> Avenue	3,700	\$3,500	\$2,500	6.6	\$500	\$1,200	\$7,700
At-grade Closures	N/A <sup>5</sup>	\$50 <sup>6</sup>	N/A	0	\$0	\$20	\$70

*Notes:*

- <sup>1</sup> Roadway costs include earthwork, pavement, drainage structures, traffic signals, and other miscellaneous costs.
- <sup>2</sup> Bridge costs include an overpass for 18<sup>th</sup> Avenue and viaducts for 12<sup>th</sup> and 3<sup>rd</sup> Avenues.
- <sup>3</sup> ROW costs include relocation assistance and also include easement costs.
- <sup>4</sup> Engineering costs, which include preliminary design, final design, and construction engineering, are estimated at 20 percent of the total construction cost (excluding ROW).
- <sup>5</sup> N/A = not applicable.
- <sup>6</sup> Includes crossing closures at 25<sup>th</sup>, 21<sup>st</sup>, and 17<sup>th</sup> Avenues.

#### 2.4.1 18<sup>th</sup> Avenue Pedestrian Overpass

The 18<sup>th</sup> Avenue pedestrian overpass would be approximately 400 feet long and would have a minimum clearance of 23 feet 10 inches above the UPRR tracks. The overpass would be 10 feet wide and would meet ADA requirements for cross slope and grade (see Section 3.10, Pedestrian, Bicycle, and Recreation Facilities). The overpass would be enclosed by a vinyl-coated, welded-wire, fabric fence. An 8-foot-tall chain link fence would extend 1,000 feet east and 1,100 feet west of the overpass on both the northern and southern sides of UPRR ROW; an access gate to UPRR ROW would be installed along the fence to the north. **Figure 2-4** shows an artist's rendering of and the preliminary impact area<sup>6</sup> for the 18<sup>th</sup> Avenue pedestrian overpass. **Figure 2-5** shows the extent of proposed fencing.

#### 2.4.2 12<sup>th</sup> Avenue Vehicular Viaduct

The total length of the 12<sup>th</sup> Avenue vehicular viaduct and approaches would be approximately 2,500 feet. The viaduct would have a minimum clearance of 24 feet above the UPRR tracks. The viaduct would include one 12-foot-wide travel lane in each direction; on the west side of the viaduct, there would be a 10-foot-wide pedestrian walkway that would meet ADA requirements for cross slope and grade and would be separated by a barrier rail (see Section 3.10, Pedestrian, Bicycle, and Recreation Facilities). Sidewalks connecting to the 12<sup>th</sup> Avenue viaduct would be 5 feet wide. The typical cross section width of the viaduct would be 45 feet 6 inches from the

<sup>6</sup> The preliminary impact area is delineated by the actual outer boundary of the area needed to build all aspects of the respective overpass or viaduct under the Project. The preliminary impact area includes the area affected by grading, excavation, earthwork, and construction of the bridges, roadways, fencing, and drainage.

outside edge of the barriers, with fences.<sup>7</sup> The proposed design speed is 30 mph for the 12<sup>th</sup> Avenue viaduct.

**Figure 2-6** shows an artist's rendering of and the preliminary impact area for the 12<sup>th</sup> Avenue viaduct. **Figure 2-7** shows a typical cross section of the 12<sup>th</sup> Avenue viaduct and roadway.

### 2.4.3 3<sup>rd</sup> Avenue Vehicular Viaduct

The total length of the 3<sup>rd</sup> Avenue vehicular viaduct and approaches would be approximately 3,500 feet. The viaduct would have a minimum clearance of 23 feet 8 inches above the UPRR tracks. The viaduct would have the same typical cross section, including a 10-foot-wide pedestrian walkway that would meet ADA requirements for cross slope and grade, as the 12<sup>th</sup> Avenue viaduct (see Section 3.10, Pedestrian, Bicycle, and Recreation Facilities). Sidewalks connecting to the 3<sup>rd</sup> Avenue viaduct would be 10 feet wide. The proposed design speed is 35 mph for the 3<sup>rd</sup> Avenue viaduct.

**Figure 2-8** shows an artist's rendering of and the preliminary impact area for the 3<sup>rd</sup> Avenue viaduct. The 3<sup>rd</sup> Avenue and 8<sup>th</sup> Street intersection would be stop-controlled; 3<sup>rd</sup> Avenue would have stop signs while 8<sup>th</sup> Street would be free-flowing. A traffic signal would not be warranted at this intersection for 15 to 20 years. **Figure 2-9** shows a typical cross section of the 3<sup>rd</sup> Avenue viaduct and roadway.

### 2.4.4 Closure of At-Grade Crossings

**Figure 1-1** shows the proposed at-grade crossing closure locations. **Figures 2-10, 2-11, and 2-12** show the design elements for the proposed closures of at-grade crossings at 25<sup>th</sup>, 21<sup>st</sup>, and 17<sup>th</sup> Avenues, respectively; proposed closures at 18<sup>th</sup>, 12<sup>th</sup>, and 3<sup>rd</sup> Avenues are shown in the figures for the design of the respective grade-separated crossings.

### 2.4.5 Potential Environmental Impacts

**Table 2-4** lists the potential environmental impacts of the No-Build Alternative and Build Alternative. Chapter 3, Affected Environment and Environmental Consequences, provides more detail concerning impacts under these alternatives and includes figures (**Figures 3-2 through 3-4**) overlaying the preliminary design and the environmental constraints for the proposed pedestrian overpass and vehicular viaducts.

**Table 2-4** focuses on physical impacts of the Project. Needs that the Project would address are not listed in the table but include decreased vehicular delay (including delays in emergency services), improved safety, and improved accessibility; the No-Build Alternative would result in a continuation of the aforementioned needs.

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<sup>7</sup> A fence adjacent to the pedestrian walkway along the outside barrier would extend the length of the viaduct, but the fence on the barrier along the northbound shoulder would extend only across UPRR ROW.

**Table 2-4  
Summary of Potential Environmental Impacts**

Resource	No-Build Alternative	Build Alternative
Right-of-Way New ROW (acres) Residential relocations Business relocations	No likely relocations, although other future projects could involve some ROW acquisition.	9.3 19 <sup>1</sup> 1
Farmland Prime farmland (acres)	Urban development would likely convert prime farmland along 3 <sup>rd</sup> Avenue to ROW or residential property.	4
Affected noise receivers	Urban development would introduce additional receivers to be affected by traffic noise.	1
Waters of the U.S. Wetlands <sup>2,3</sup> (acres) Waterways <sup>4</sup> (linear feet)	Urban development along 3 <sup>rd</sup> Avenue would potentially impact wetlands and other waters of the U.S.	0.1 0
Floodplain (acres)	Urban development could impact the floodplain along 3 <sup>rd</sup> Avenue.	7
Historic and archaeological sites	Impacts from future urbanization are unknown.	0
Section 4(f) properties	Impacts from future urbanization are unknown.	0
Regulated materials sites <sup>5</sup> Monitoring wells Sites	Impacts from future urbanization are unknown.	5 4

*Notes:*

<sup>1</sup> The number of residential relocations is higher than discussed in Section 2.3.3 and shown in Table 2-1 because the initial screening of alternatives did not include room for construction and contractor staging. Additional relocations also would be required for the 12<sup>th</sup> Avenue on-alignment alternative to provide room for construction and contractor staging.

<sup>2</sup> The U.S. Army Corps of Engineers (USACE) will determine jurisdiction after final wetland delineations are completed (expected to be a nationwide authorization).

<sup>3</sup> Includes palustrine wetlands (wetlands in this category include inland marshes and swamps as well as bogs, fens, tundra, and floodplains).

<sup>4</sup> Waterways are determined by the presence of a definable bed and bank.

<sup>5</sup> A regulated materials site is a property with an identified recognized environmental condition, which, according to the American Society for Testing and Materials, is the presence or likely presence of hazardous substances or petroleum products that may be released into structures on a property or into the ground, groundwater, or surface water of that property.

## 2.5 OTHER MAJOR ACTIONS PROPOSED BY GOVERNMENT AGENCIES

The scoping process used to identify and address key issues for the Columbus Viaducts Project resulted in a list of other reasonably foreseeable projects by government agencies that could occur in or near the Study Area. For a project to be reasonably foreseeable, it must have advanced far enough in the planning process that its implementation is likely. The following major reasonably foreseeable Federal, state, and local projects in or near the Study Area have been identified as additional actions to be considered:

- 10<sup>th</sup> Street National Priorities List Site – The U.S. Environmental Protection Agency (EPA) is overseeing the cleanup of volatile organic compounds associated with dry cleaning activities near downtown Columbus. The boundaries of the site extend from 32<sup>nd</sup> Avenue east to 15<sup>th</sup> Avenue and from 23<sup>rd</sup> Street (U.S. Highway 30 [US 30]) south to 6<sup>th</sup> Street. The site includes the City's southern municipal well field, bounded roughly by 32<sup>nd</sup> and 27<sup>th</sup> Avenues and 13<sup>th</sup> and 8<sup>th</sup> Streets. EPA has installed a system of monitoring

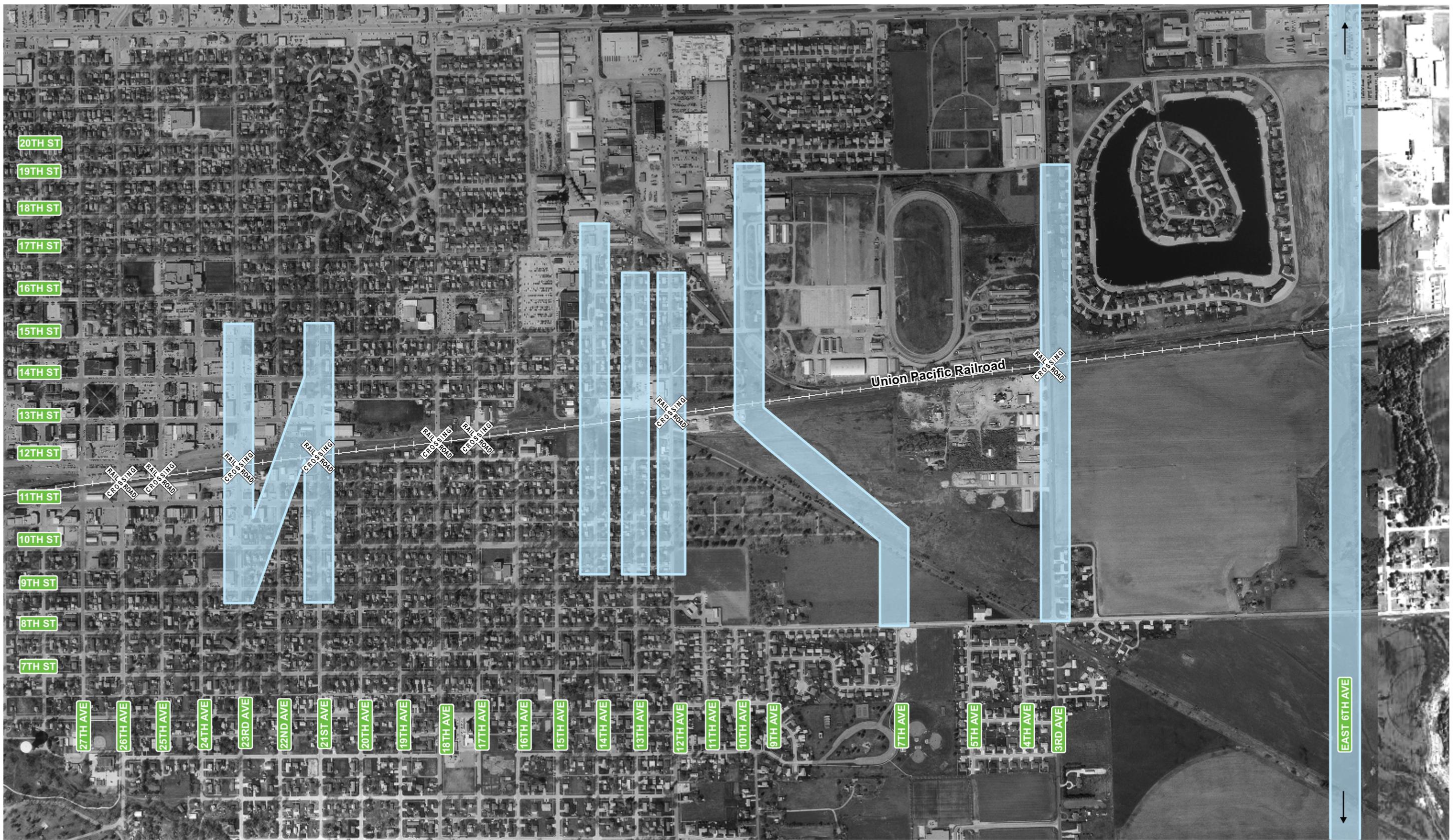
wells, injection wells, an air sparge/soil vapor extraction system,<sup>8</sup> and a groundwater extraction and treatment system.<sup>9</sup> Cleanup is anticipated to last another 10 to 15 years, followed by long-term monitoring and maintenance of the site for an additional 30 years or more (EPA, April 10, 2009).

- Former Deyke Oil Site – The Nebraska Department of Environmental Quality (NDEQ) is managing the cleanup of a leaking aboveground storage tank at the former Deyke Oil site (this site also includes the former Pollard Oil area). Monitoring wells and a soil vapor extraction system have been installed to clean up the contamination. Five of the monitoring wells are located adjacent to 18<sup>th</sup> Avenue. Remediation is ongoing; a completion date has not been estimated, but remediation is not anticipated to be completed in the near future (Kennedy/Jenks Consultants, October 26, 2010).
- Minnegasco, Inc. (Former Manufactured Gas Plant) – EPA is overseeing the cleanup of a former manufactured gas plant at 1169 22<sup>nd</sup> Avenue. A system of monitoring wells has been installed to determine the extent of contamination. The Final Removal Site Evaluation and Baseline Risk Assessment identified elevated levels of petroleum-related contamination at the site (EPA, May 3, 2007). Investigation of the site is ongoing.
- East 29<sup>th</sup> Avenue Viaduct – Platte County has studied potential locations for a viaduct over the UPRR mainline east of the City and has recommended further evaluation of a viaduct at East 29<sup>th</sup> Avenue.

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<sup>8</sup> In air sparging, air is injected into the ground below a contaminated area, forming bubbles that rise and carry trapped and dissolved contaminants. Soil vapor extraction is a process that physically separates contaminants from soil in a vapor form by exerting a vacuum through the soil formation; this process removes volatile organic compounds from soil beneath the ground surface (EPA, Argonne National Laboratory, and USACE, 2009).

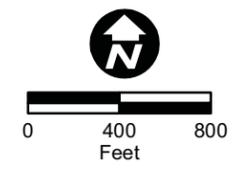
<sup>9</sup> The groundwater extraction and treatment system consists of four extraction wells and one city well that are used to extract water, treat it, and provide treated water to the Columbus public water supply system (EPA, February 3, 2009).



**Legend**

- Existing At-Grade Crossings
- Grade-Separated Corridor Options

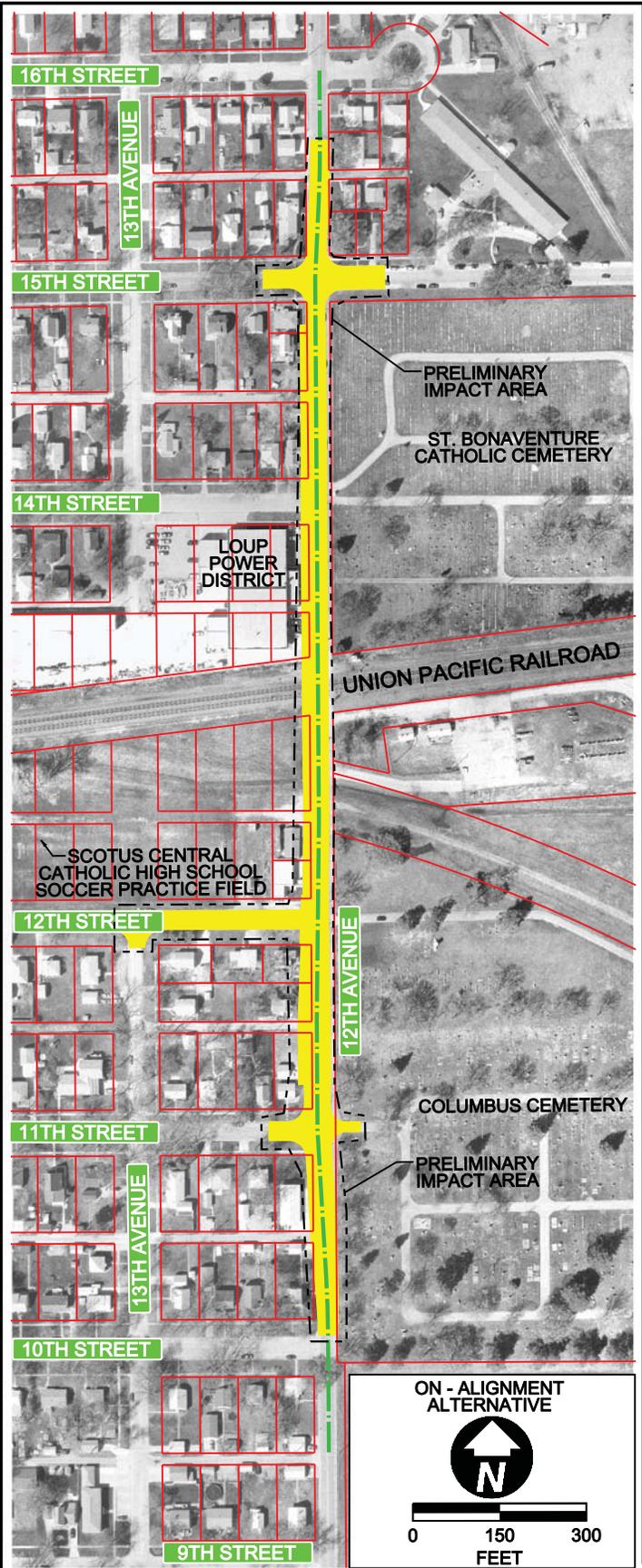
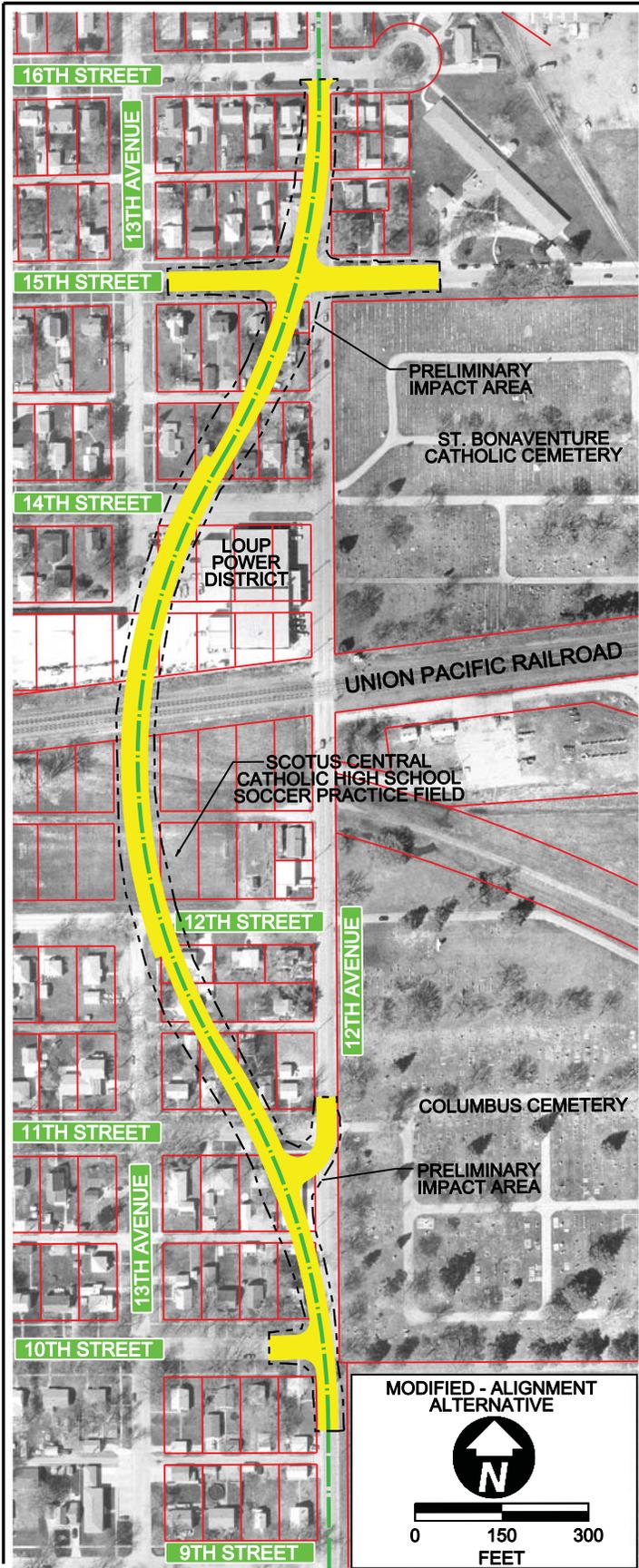
Aerial Photography - Western Air Maps, 2007



**Previously Considered Viaduct Corridors**

Columbus Viaducts  
Platte County, Nebraska  
Environmental Assessment

DATE	March 2011
FIGURE	2-1



## 12th Avenue Viaduct Alternatives Considered

Columbus Viaducts  
Platte County, Nebraska  
Environmental Assessment



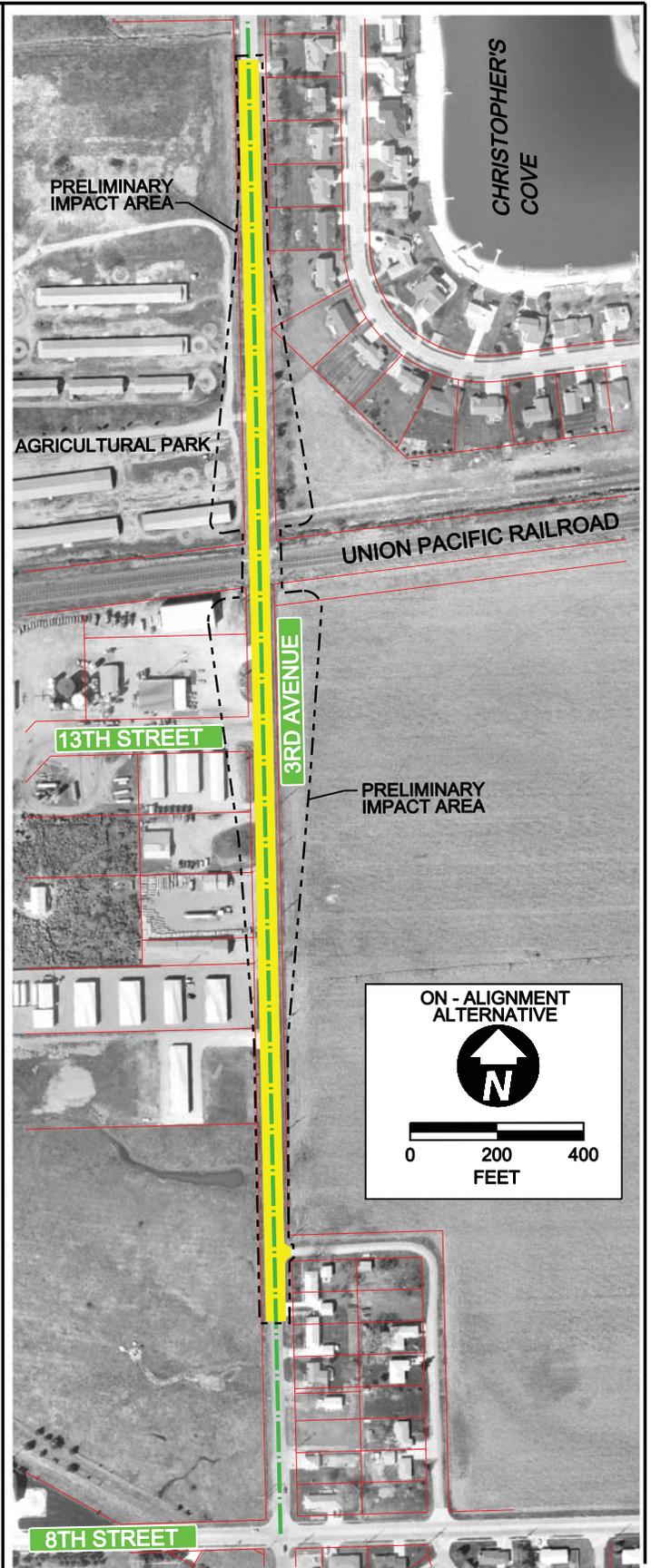
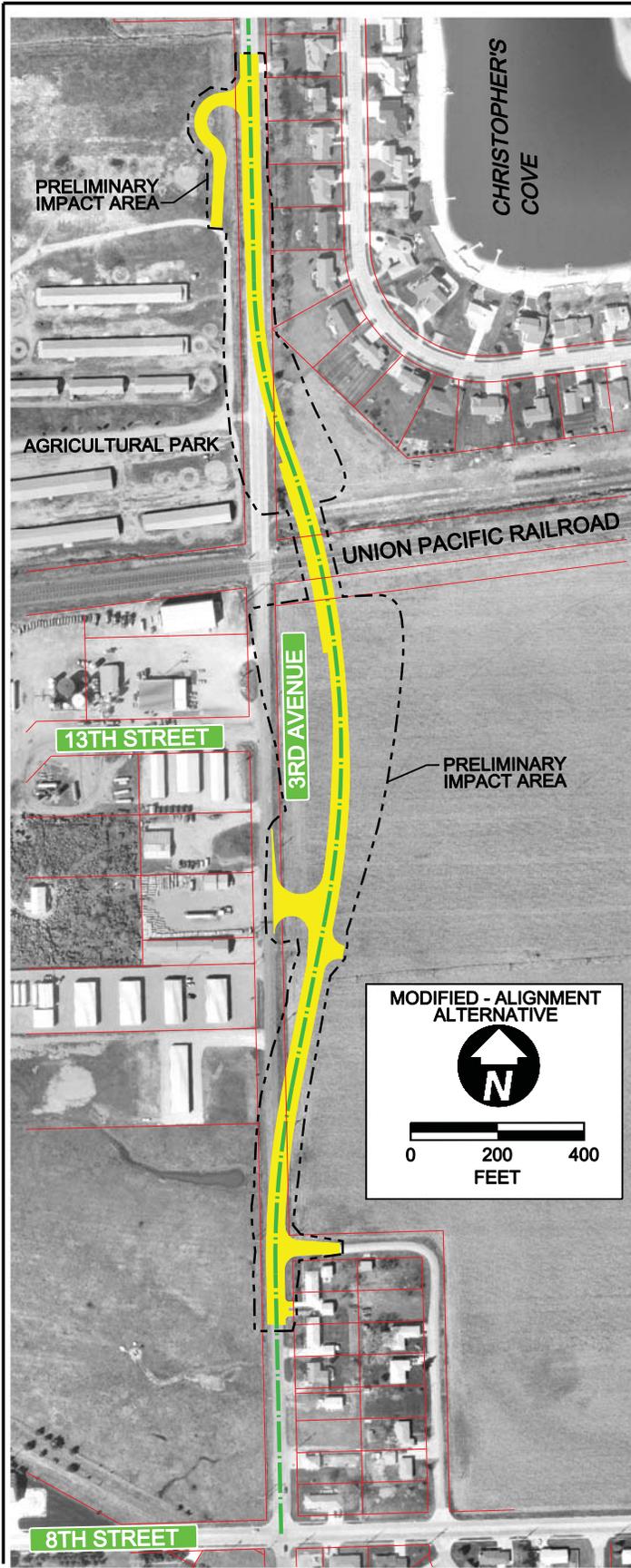
City of Columbus

DATE

March 2011

FIGURE

2-2



### 3rd Avenue Viaduct Alternatives Considered

Columbus Viaducts  
Platte County, Nebraska  
Environmental Assessment



City of Columbus

DATE

March 2011

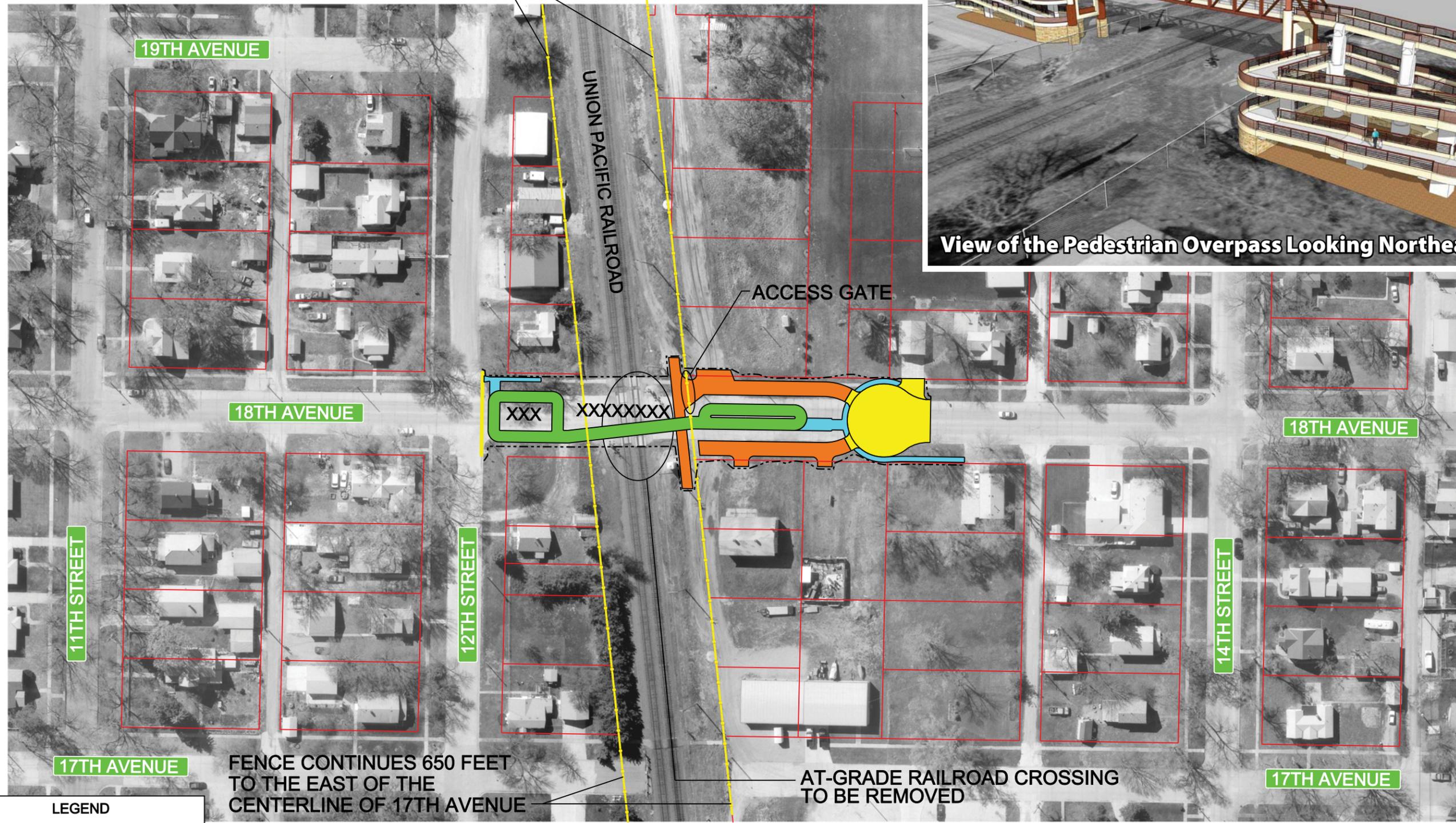
FIGURE

2-3

FENCE CONTINUES 750 FEET TO THE WEST OF THE CENTERLINE OF 19TH AVENUE

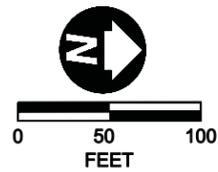


View of the Pedestrian Overpass Looking Northeast



**LEGEND**

- PROPOSED CONCRETE PAVEMENT
- PROPOSED PEDESTRIAN OVERPASS
- PROPOSED GRAVEL SURFACING
- PROPOSED SIDEWALK
- XXXXX PAVEMENT OR CROSSING TO BE REMOVED
- PRELIMINARY IMPACT AREA
- PROPOSED CHAIN LINK FENCE
- PROPERTY LINES



Sources:  
Aerial Photography - Western Air Maps, 2007  
Property Lines - Platte County Assessors Database, March 2009

**PRELIMINARY PLAN**  
NOT FINAL - SUBJECT TO CHANGE



**18th Avenue  
Pedestrian Overpass  
Preliminary Design**  
Columbus Viaducts  
Platte County, Nebraska  
Environmental Assessment

DATE	March 2011
FIGURE	2-4

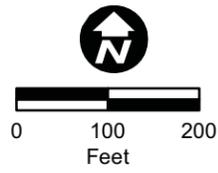
Z:\Projects\City\_of\_Columbus\65822\_Columbus\_Viaducts\map\_docs\mxd\EA\_Figures\18th\_Ave\_Fencing.mxd(jan11)\jcm



**Legend**

- 18th Ave Viaduct Concept
- x - Fencing
- Study Corridor

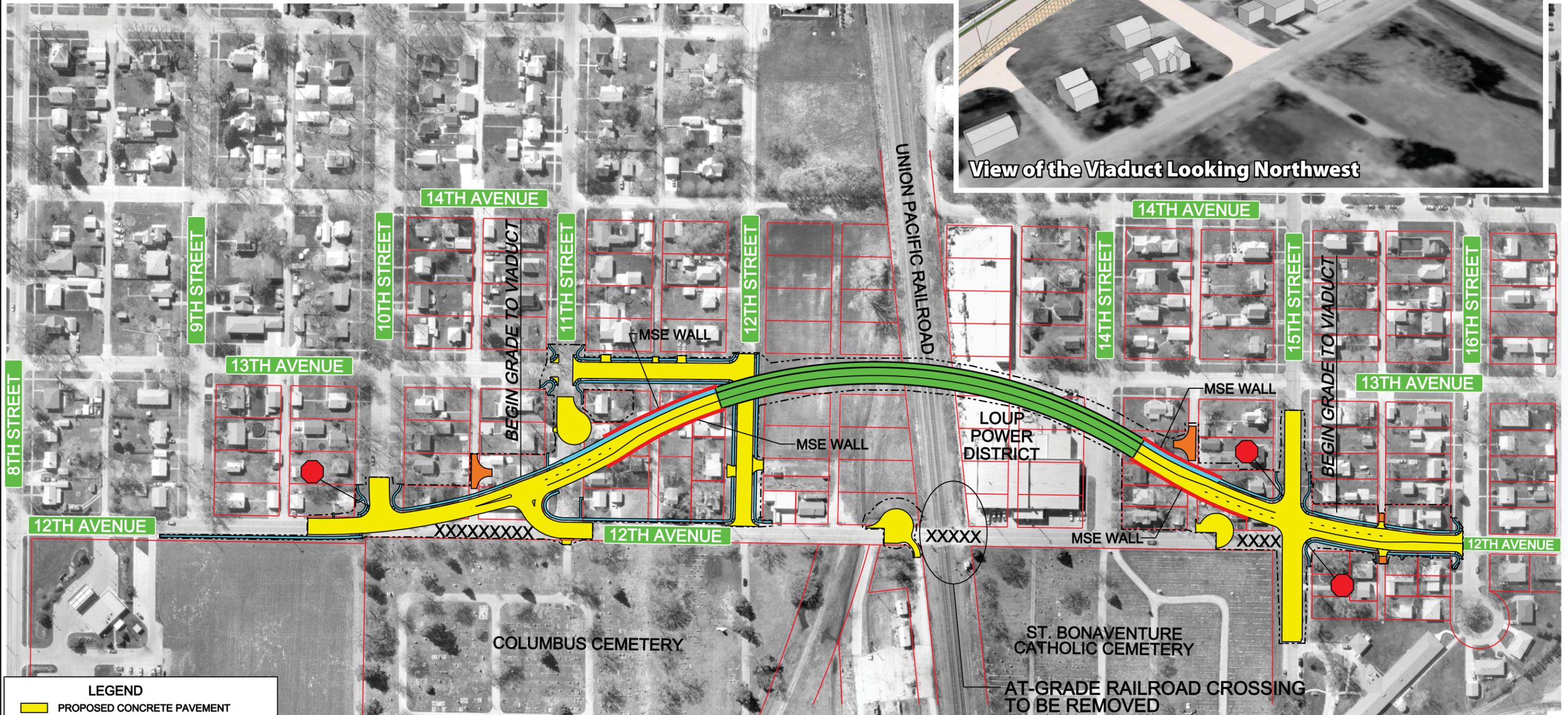
Aerial Photography - Western Air Maps, 2007



**18th Avenue Pedestrian Overpass  
Fencing**  
Columbus Viaducts  
Platte County, Nebraska  
Environmental Assessment



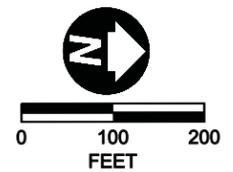
DATE	March 2011
FIGURE	2-5



View of the Viaduct Looking Northwest

**LEGEND**

- PROPOSED CONCRETE PAVEMENT
- PROPOSED VIADUCT
- PROPOSED GRAVEL SURFACING
- PROPOSED SIDEWALK
- PROPOSED MSE WALL
- XXXXX PAVEMENT OR CROSSING TO BE REMOVED
- PRELIMINARY IMPACT AREA
- PROPERTY LINES
- STOP SIGN



Sources:  
 Aerial Photography - Western Air Maps, 2007  
 Property Lines - Platte County Assessors Database, March 2009

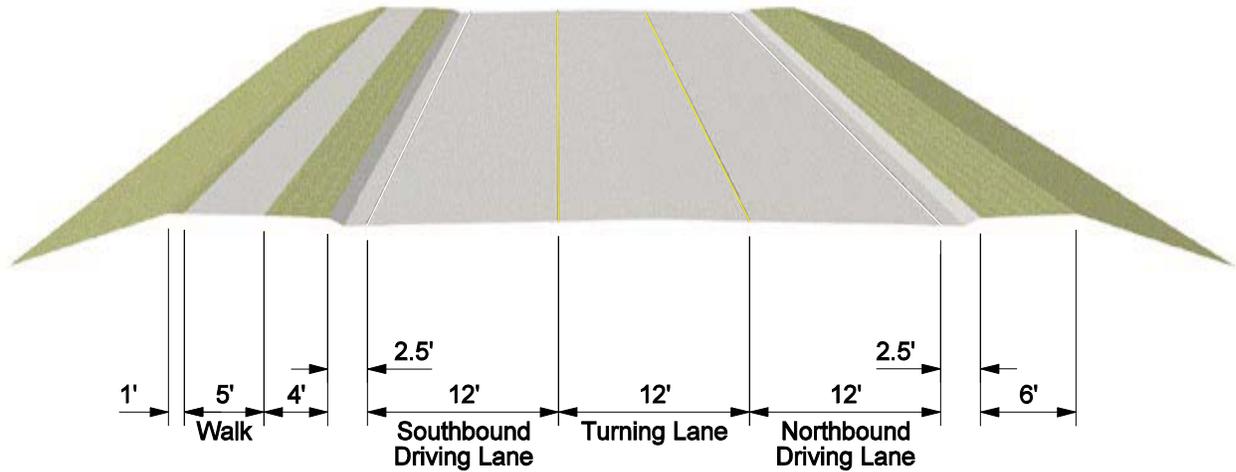
**PRELIMINARY PLAN**  
 NOT FINAL - SUBJECT TO CHANGE



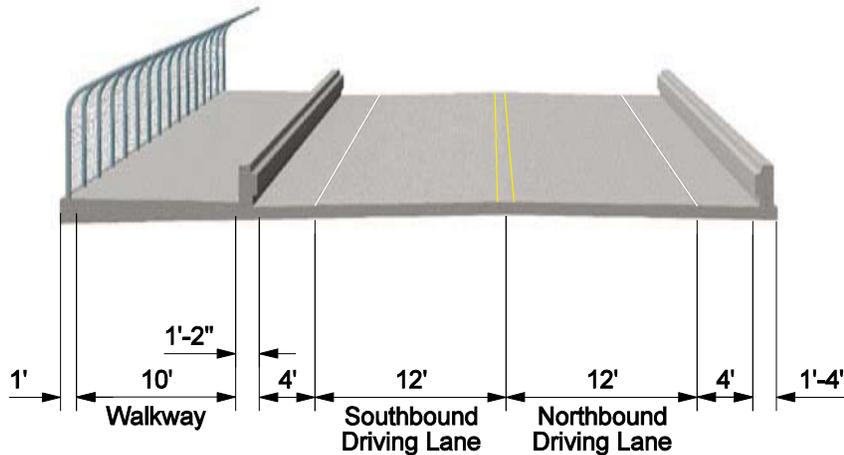
**12th Avenue Viaduct Preliminary Design**  
 Columbus Viaducts  
 Platte County, Nebraska  
 Environmental Assessment

City of Columbus

DATE	March 2011
FIGURE	2-6



**Roadway Cross Section**



**Viaduct Cross Section**

**Note:**  
 A chain link fence on the eastern barrier rail would be constructed only on the portion of the bridge across the railroad right-of-way.



**Typical Cross Section  
 of 12th Avenue  
 Viaduct and Roadway**

Columbus Viaducts  
 Platte County, Nebraska  
 Environmental Assessment



City of Columbus

DATE

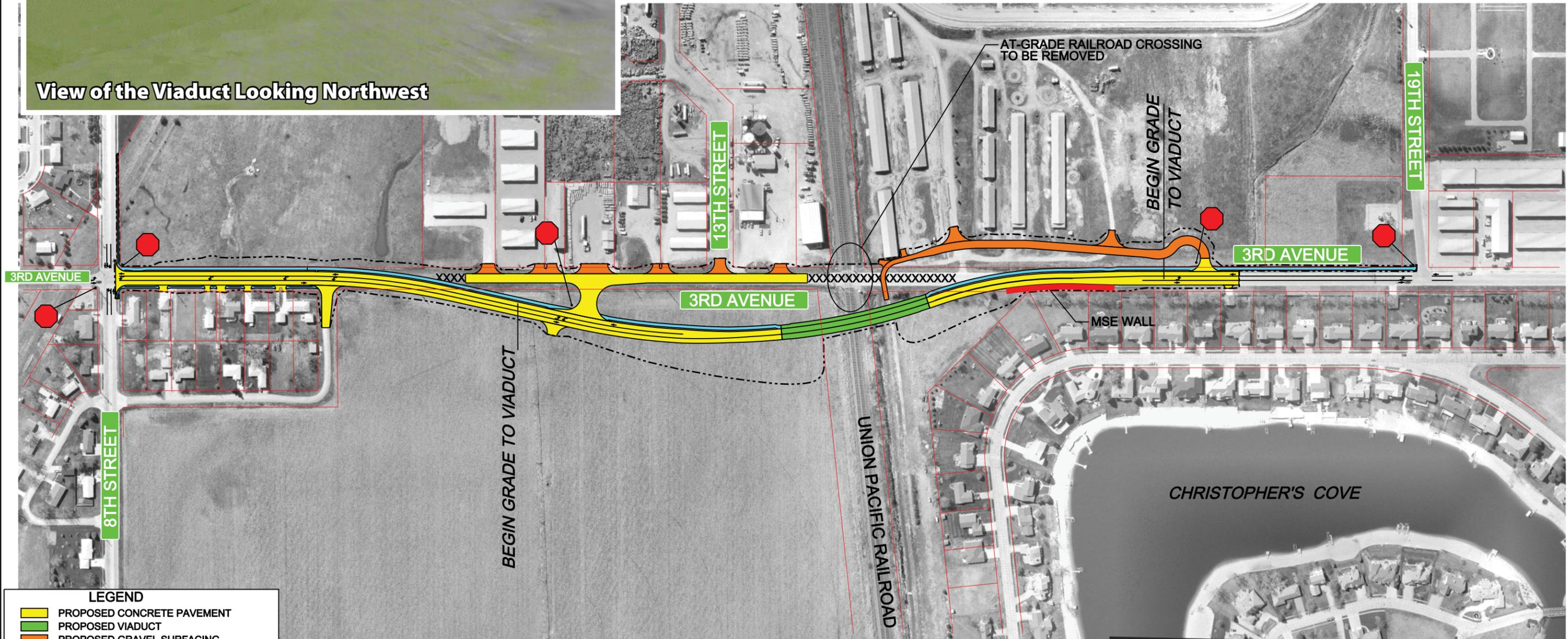
March 2011

FIGURE

2-7

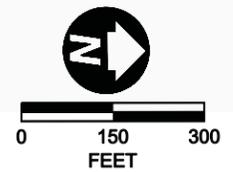


**View of the Viaduct Looking Northwest**



**LEGEND**

- PROPOSED CONCRETE PAVEMENT
- PROPOSED VIADUCT
- PROPOSED GRAVEL SURFACING
- PROPOSED SIDEWALK
- PROPOSED MSE WALL
- XXXXX PAVEMENT OR CROSSING TO BE REMOVED
- - - PRELIMINARY IMPACT AREA
- PROPERTY LINES
- STOP SIGN
- TRAFFIC SIGNAL



Sources:  
 Aerial Photography - Western Air Maps, 2007  
 Property Lines - Platte County Assessors Database, March 2009

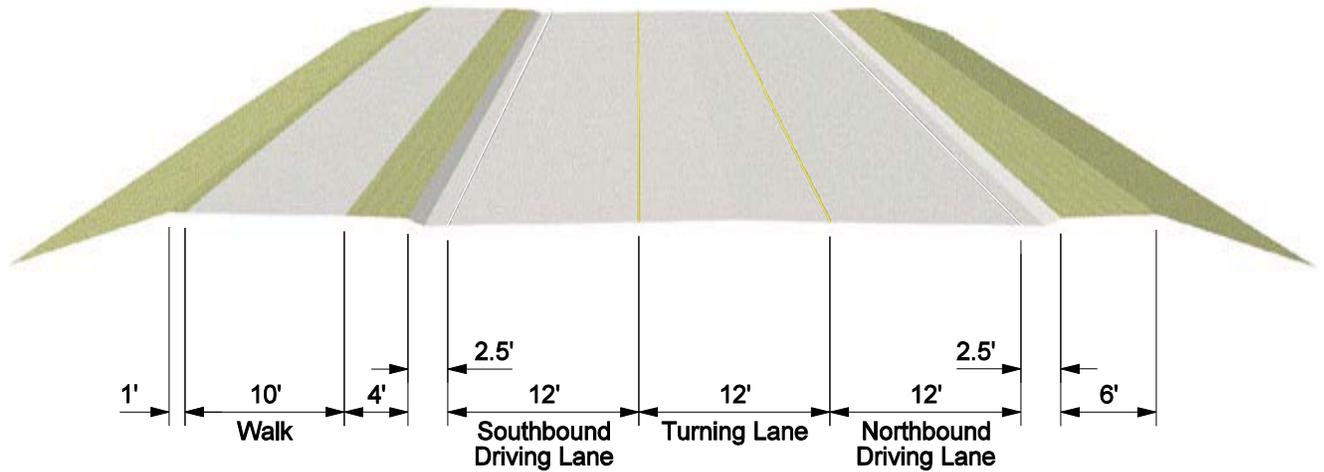
**PRELIMINARY PLAN**  
 NOT FINAL - SUBJECT TO CHANGE



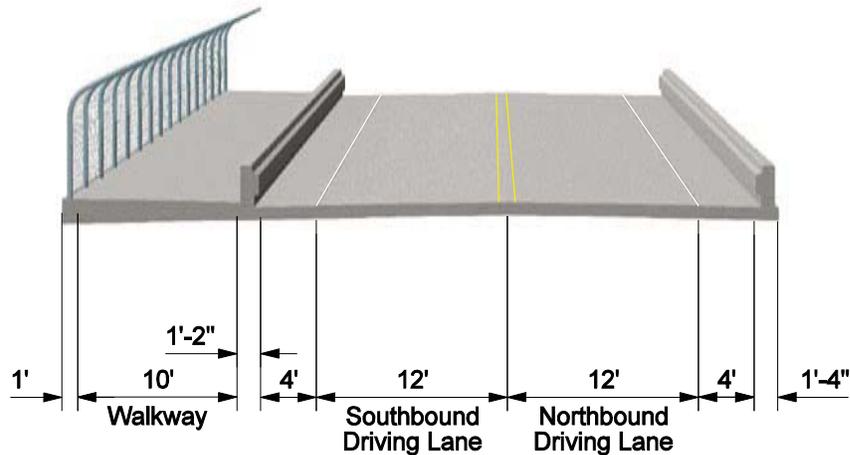
**3rd Avenue Viaduct Preliminary Design**  
 Columbus Viaducts  
 Platte County, Nebraska  
 Environmental Assessment



DATE	March 2011
FIGURE	2-8



**Roadway Cross Section**



**Viaduct Cross Section**

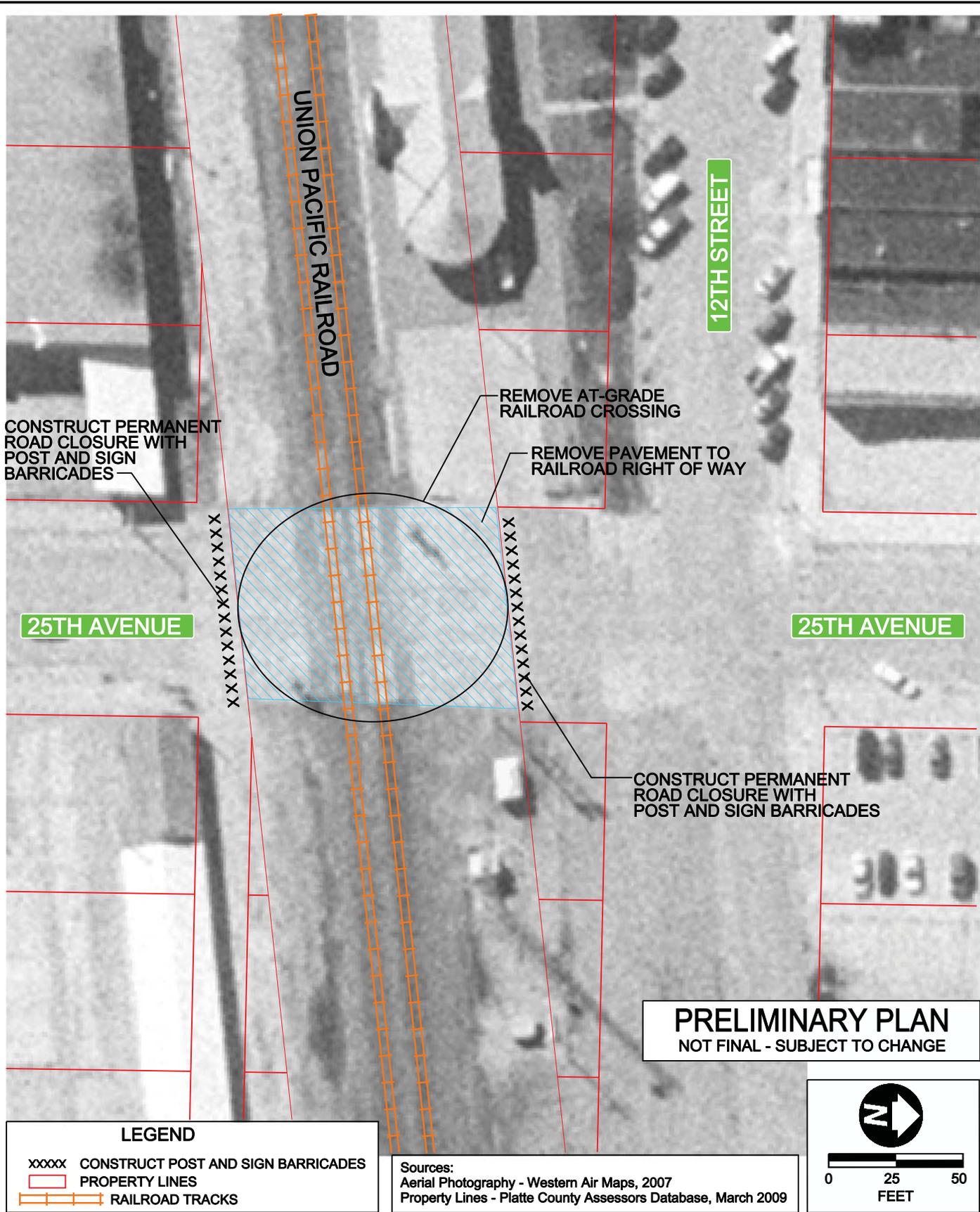
**Note:**  
 A chain link fence on the eastern barrier rail would be constructed only on the portion of the bridge across the railroad right-of-way.



**Typical Cross Section of 3rd Avenue Viaduct and Roadway**  
 Columbus Viaducts  
 Platte County, Nebraska  
 Environmental Assessment



DATE	March 2011
FIGURE	2-9



**LEGEND**

- xxxxx CONSTRUCT POST AND SIGN BARRICADES
- PROPERTY LINES
- RAILROAD TRACKS

Sources:  
 Aerial Photography - Western Air Maps, 2007  
 Property Lines - Platte County Assessors Database, March 2009

0 25 50  
 FEET

**PRELIMINARY PLAN**  
 NOT FINAL - SUBJECT TO CHANGE

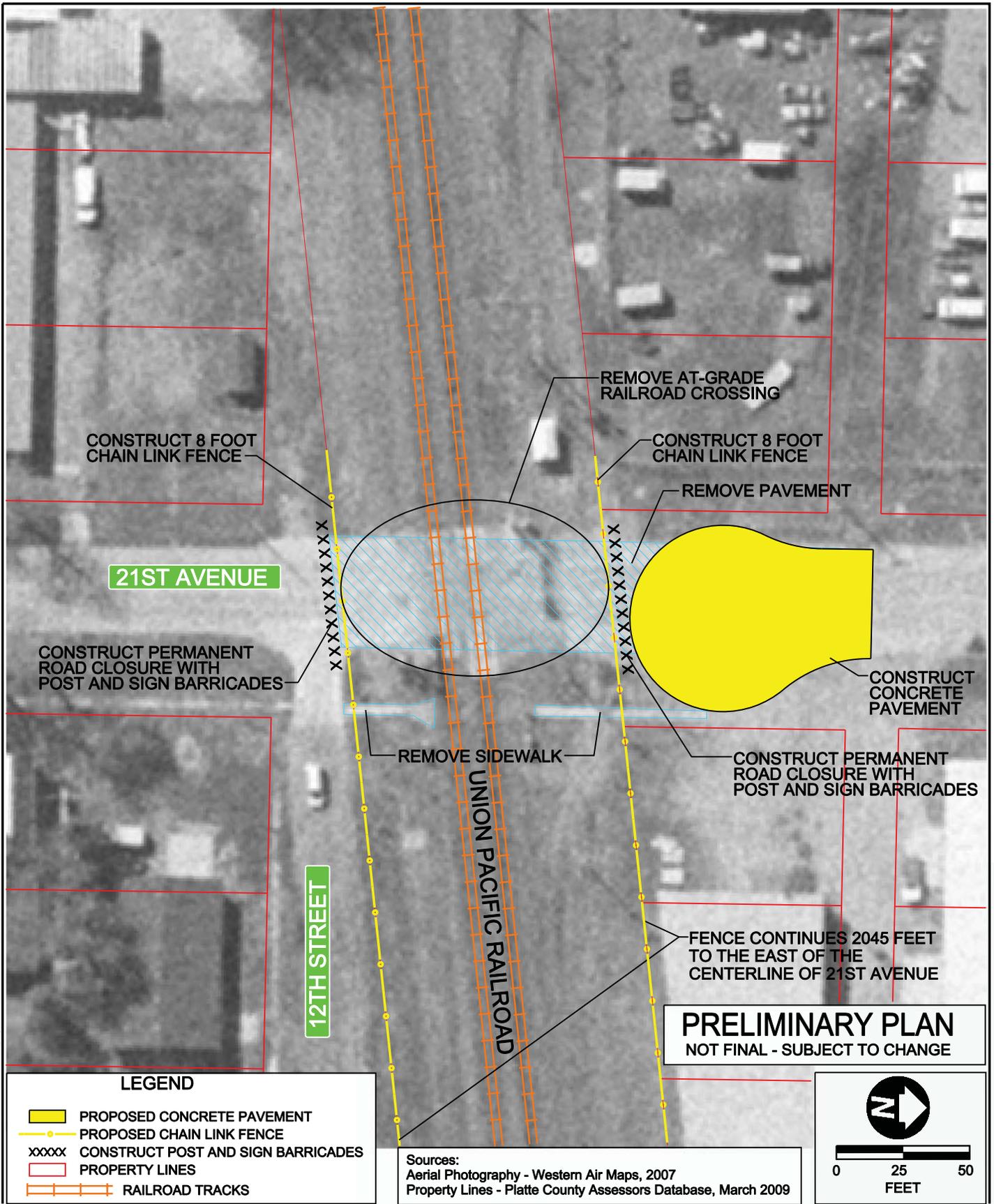


**25th Avenue  
 Crossing Closure  
 Preliminary Design**  
 Columbus Viaducts  
 Platte County, Nebraska  
 Environmental Assessment



DATE  
 March 2011

FIGURE  
 2-10



**LEGEND**

- PROPOSED CONCRETE PAVEMENT
- PROPOSED CHAIN LINK FENCE
- CONSTRUCT POST AND SIGN BARRICADES
- PROPERTY LINES
- RAILROAD TRACKS

Sources:  
 Aerial Photography - Western Air Maps, 2007  
 Property Lines - Platte County Assessors Database, March 2009

**PRELIMINARY PLAN**  
 NOT FINAL - SUBJECT TO CHANGE

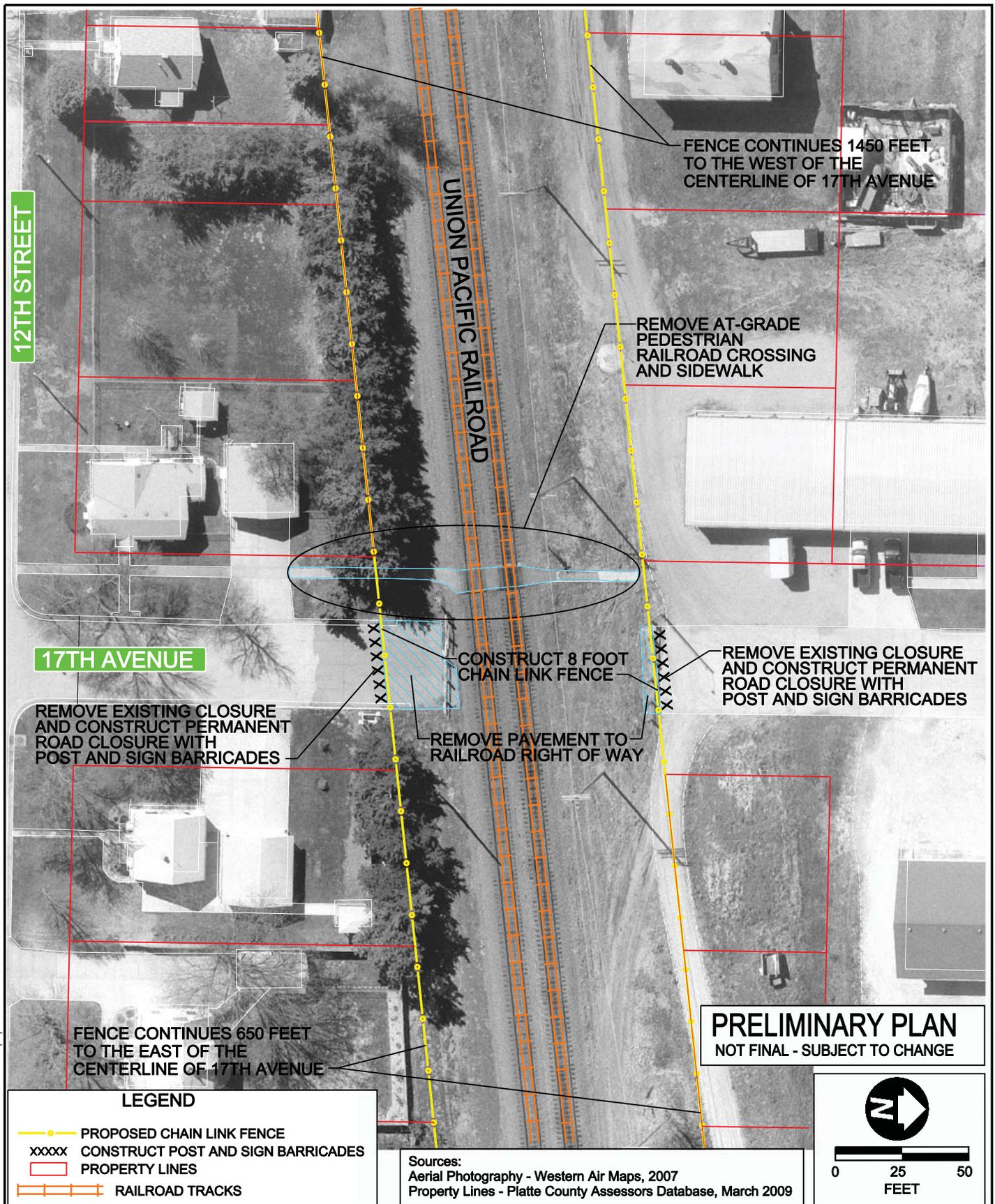

  




**21st Avenue Crossing Closure Preliminary Design**  
 Columbus Viaducts  
 Platte County, Nebraska  
 Environmental Assessment


  
 City of Columbus

DATE	March 2011
FIGURE	2-11



**LEGEND**

- PROPOSED CHAIN LINK FENCE
- CONSTRUCT POST AND SIGN BARRICADES
- PROPERTY LINES
- RAILROAD TRACKS

Sources:  
 Aerial Photography - Western Air Maps, 2007  
 Property Lines - Platte County Assessors Database, March 2009

0 25 50  
 FEET



**17th Avenue  
 Crossing Closure  
 Preliminary Design**  
 Columbus Viaducts  
 Platte County, Nebraska  
 Environmental Assessment



DATE	March 2011
FIGURE	2-12