

# THE TRAIN AVENUE GREENWAY PLAN

CLEVELAND, OHIO



# TABLE OF CONTENTS

## INTRODUCTION, P. I-II

Table of Contents  
Acknowledgements

## SECTION 1 EXECUTIVE SUMMARY, P. 1-3

Project Location  
Project Goals  
Project Phases and Meetings  
Design & Masterplan  
Implementation

## SECTION 2 INVENTORY & ANALYSIS, P. 5-37

Project Background  
The Towpath Trail  
Cleveland Bikeway Masterplan  
Cuyahoga County Greenspace Plan  
Demographics & Data  
Project Process And Organization  
Photographic Inventory  
Typical Corridor Conditions  
Businesses & Industry  
Zoning  
2020 Development Plan  
Public Properties  
Existing Green Spaces  
Vacant & Underutilized Land  
Parcel Ownership  
Dumping & Graffiti Observations  
Youth Perceptions Of Train Avenue  
Road Conditions Inventory  
Traffic Counts  
5 & 10 Minute Walk Analysis  
10 Minute Bike Analysis  
Historical Analysis  
    The Evolution Of Train Ave  
    Historic Walworth Run  
    Walworth Valley & Today  
    Walworth Run Cso  
    Historical Building Analysis  
Summary

## SECTION 3 GREENWAY ALTERNATIVES, P. 39-53

Roadway Analysis  
Trail Alternatives  
    Bike Lanes On The Road  
    Bike Trail Next To Rail  
    Beside The Road All-Purpose Trail  
Greening & Regeneration  
Examining Daylighting  
Green Infrastructure Alternatives  
    Streetside Bioswales  
    Naturalized Bioswales  
    Vacant Lot Raingardens  
Other Greenway Enhancements  
Summary

## SECTION 4 PRELIMINARY GREENWAY PLAN, P. 55-59

Overall Greenway Connections  
Typical Section  
Trail & Neighborhood Connections  
Greenway Enhancements  
Detailed Plans & Before/After Images  
    West Side  
    Central Section  
    East Side  
Green Infrastructure  
    4 Basic Prototypes  
    Watershed Wide Raingardens

## SECTION 5 FINAL GREENWAY PLAN, P. 61-75

Train Avenue Greenway Plan  
    Concept & Design Elements  
    Overall Masterplan  
Detailed Trail & Connections Plans  
    West Side  
    East Side  
Detailed Plans, Sections & Before/After  
    Intersection Of Train & Willey  
    Between I-90 & Fulton Street Bridges  
    Trailhead  
Trail Enhancements  
    Signage  
    Greening  
Trail Materials  
Green Infrastructure: Watershed Wide Raingarden Planning Study  
    Calculations & Diagrams  
    4 Basic Prototypes  
    Soils Evaluation

## SECTION 6 IMPLEMENTATION STRATEGY, P. 77-80

Overall Greenway Plan  
Phasing the Greenway Plan  
Grant Funding  
Forming Partnerships

## SECTION 7 APPENDICES, P. 81-86

Appendix A: Conceptual Cost Estimates  
Appendix B: Watershed Wide Raingarden Study Calculations Details

## SECTION 8 REFERENCES, P. 87-89

Data Sources & References

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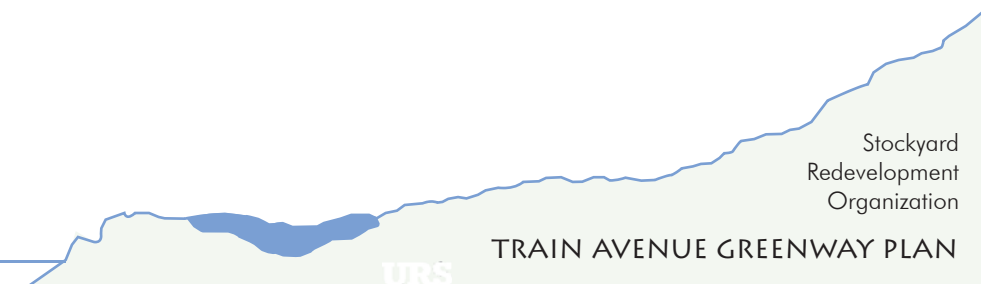
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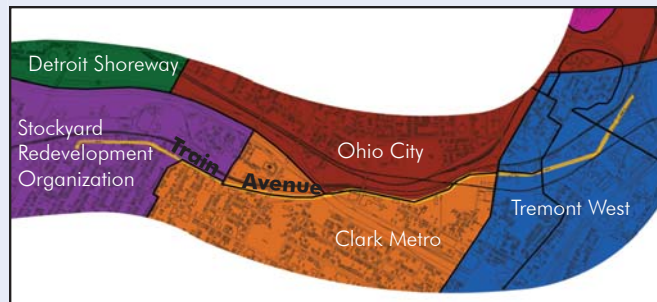
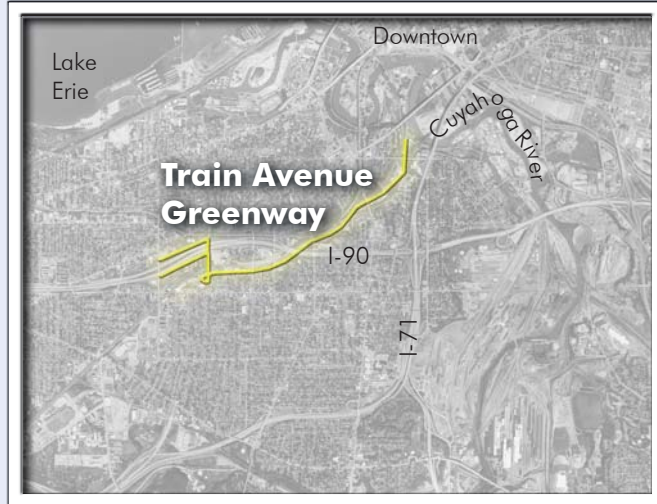
# SECTION 1: EXECUTIVE SUMMARY

- Project Location
- Project Goals
- Project Phases And Meetings
- Design & Masterplan
- Implementation



**PROJECT LOCATION**

The Train Avenue Greenway is a 2.5 mile long corridor on the Near West side of Cleveland, Ohio. The project study area stretches from the Clark Avenue-West 65th Street intersection eastward along Train Avenue to the vicinity of its intersection with Scranton Road and University Avenue. The boundaries include the peripheral areas of the adjoining five urban neighborhoods: Stockyards, Clark-Metro, Detroit Shoreway, Ohio City and Tremont.



**PROJECT GOALS**

- Develop plans for an aesthetically pleasing “greenway” environment
- Help reestablish Train Avenue as a major community asset
- Promote alternatives to the automobile by providing a route for pedestrians and bicyclists
- Develop improved access to adjoining neighborhoods and community assets
- Create a regional recreational amenity centered on a multi-purpose trail plan that will link into the City of Cleveland’s Bikeway Master Plan.

# EXECUTIVE SUMMARY

**PROJECT PHASING**

The Train Avenue Greenway Plan was funded in part by NOACA Transportation for Livable Communities (TLCI) grant. NOACA’s TLCI grant breaks the planning process into four phases.

**PHASE 1: INVENTORY AND ANALYSIS**

The Inventory and Analysis Phase contained four main meetings. The Project Kickoff meeting disclosed the project goals and objectives, roles and responsibilities, the project schedule and approaches to public presentations, including a bus tour of the project area. Over the next few months, URS collected existing data as pertaining to Train Avenue and compiled the information into an AutoCAD basemap. The Advisory and Steering Committee Meetings were held to discuss this existing data and offer suggestions and other resources to obtain any further information. A historic analysis and photographic inventory were presented as well as discussion of overall opportunities and constraints to the project. A Public Meeting displayed this information and gained excitement about the Greenway within the surrounding communities.

**PHASE 2: GREENWAY ALTERNATIVES**

The Greenway Alternatives Phase presented a series of alternatives for the Advisory and Steering Committees to discuss. Alternatives were broken down into five main categories: Roadway, Trail, Greening, Green Infrastructure, and Other Greenway Enhancements. The Advisory and Steering Committees provided feedback to weigh the benefits and limitations of each concept. A matrix of pros and cons was compiled for each of the five main categories. In the Public Meeting, the Greenway Alternatives and matrixes were presented in a powerpoint, and then the public was divided into rotating stations to discuss these alternatives in a more intimate setting. A summary of feedback received during all meetings was prepared and analyzed to move the design into the next phase.

The Public was presented with 3 trail alternatives: Bike Lanes on the Road, Bike Trail Next to Rail and Beside the Road All-Purpose Trail. A unanimous vote at the Public Meeting chose the Beside the Road All-Purpose Trail.

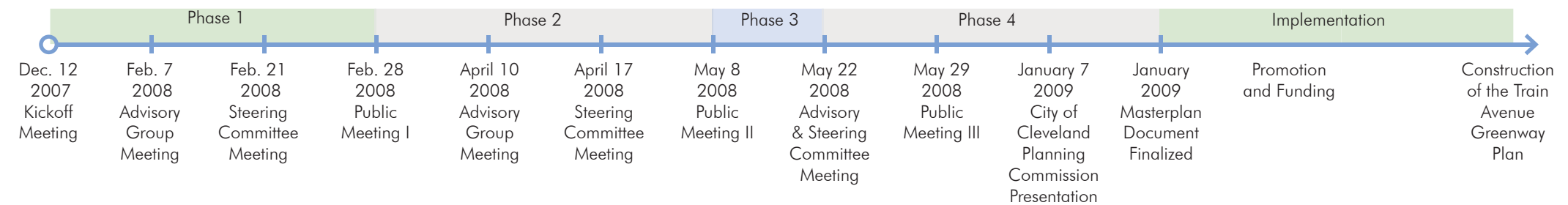
**PHASE 3: PRELIMINARY GREENWAY PLAN**

The Preliminary Greenway Plan Phase was a draft version of the Train Avenue Greenway Plan. This preliminary plan reflects the input received by the previous two phases and compiles the five main categories into one overall plan. The Advisory and Steering Committees analyzed and discussed the preliminary plan and the benefits and limitations the plan presents.

**PHASE 4: FINAL GREENWAY PLAN**

The Final Greenway Plan Phase presents the Train Avenue Greenway Plan as a reflection of the discussions involved with phases one through three. A Public Meeting presented the final plan and offered an opportunity for other suggestions or concerns. Funding sources and cost estimating were discussed in this phase. The final stages in phase four are a presentation to the City of Cleveland Planning Commission and the organization of this document.

These 4 phases will complete Steps 1-4 of the Ohio Department of Transportation Project Development Process.



**THE TRAIN AVENUE GREENWAY PLAN DESIGN**

The Train Avenue Greenway Plan is centered on maximizing the corridor’s potential as a roadway to accommodate traffic and as a greenway connection to link the five surrounding urban neighborhoods with pedestrian circulation and cultural and environmental amenities.

The Train Avenue Greenway Plan identifies feasible trail linkages to the Towpath Trail and the Cleveland Bikeway Masterplan as well as the surrounding neighborhoods. A historical survey identifies industrial heritage interpretation opportunities. Green Infrastructure opportunities were identified to add a dimension of environmental benefits, both locally and regionally.

In recent years, the surrounding neighborhoods have experienced millions of dollars in new residential and commercial investment. These new investments have exposed vacant and underutilized land either in or directly adjacent to the corridor. The Train Avenue Greenway Plan is designed to transform Train Avenue into a public amenity and spark growth in the surrounding areas.

**IMPLEMENTATION**

**FUNDING SOURCES IDENTIFIED**

- Clean Ohio Trails Fund & Conservation Fund
- Community Development Block Grants
- Land & Water Conservation Fund
- Natureworks
- ODH Community Obesity Prevention Program
- ODNR Recreational Trail Program
- Safe Routes to School
- Transportation Enhancement Program
- Coastal Management Assistance Grant and NOACA Transportation for Livable Communities Initiative Grant for further feasibility studies
- Public & Private Partnerships such as with the Northeast Ohio Regional Sewer District and the City of Cleveland

**ESTIMATED COSTS**

A Phasing Plan divided the Greenway Plan into 6 phases. Cost estimates for each phase including both Engineering & Construction projected to the year 2011 are:

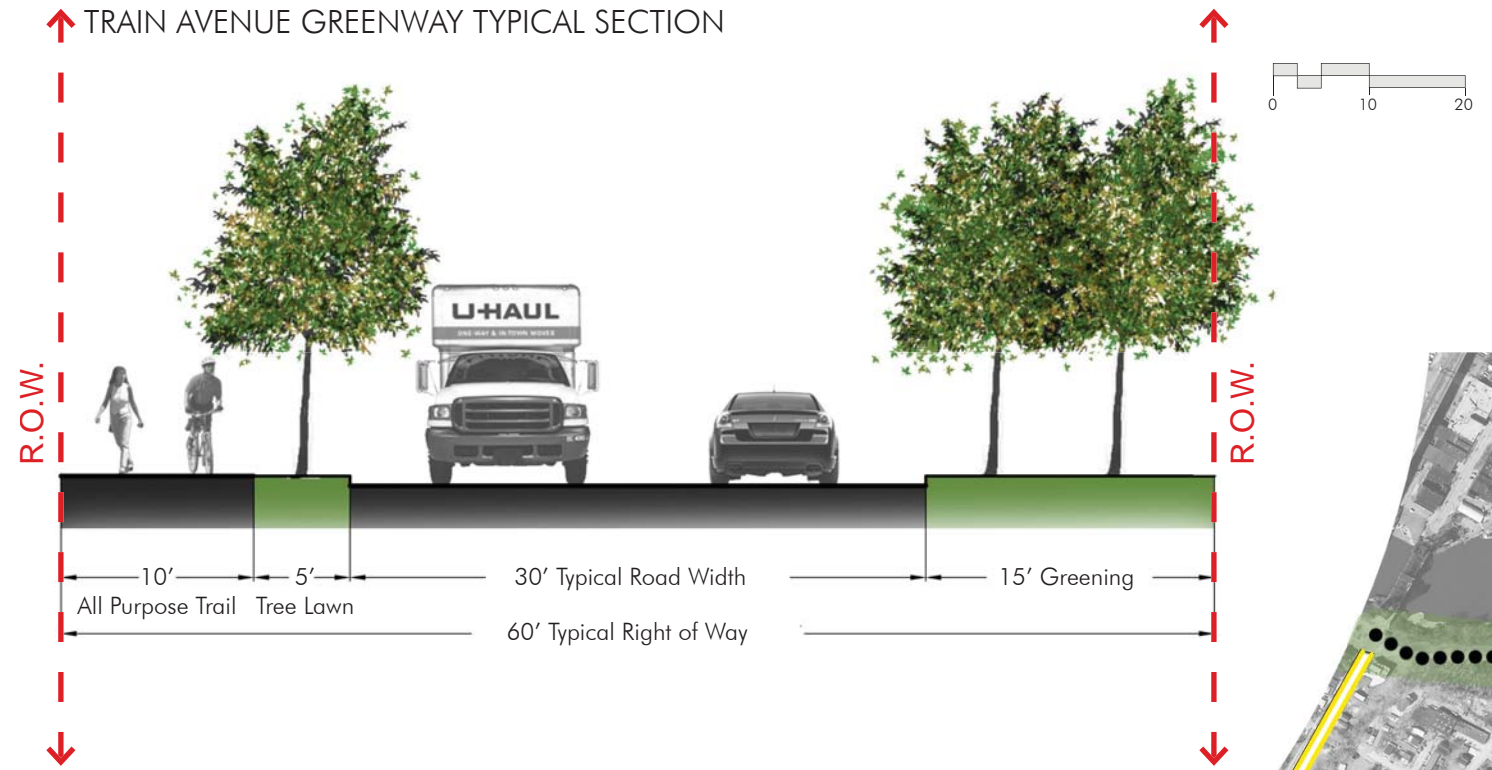
- Phase 1: Trailhead Land Acquisition = \$102,672
- Phase 2: Train Avenue All-Purpose Trail = \$1,989,270
- Phase 3: Trailhead = \$109,814
- Phase 4: Walworth Avenue Connector = \$268,212
- Phase 5: Connector Bike Lanes = \$20,460
- Phase 6: West 65th Street Connector = \$927,842



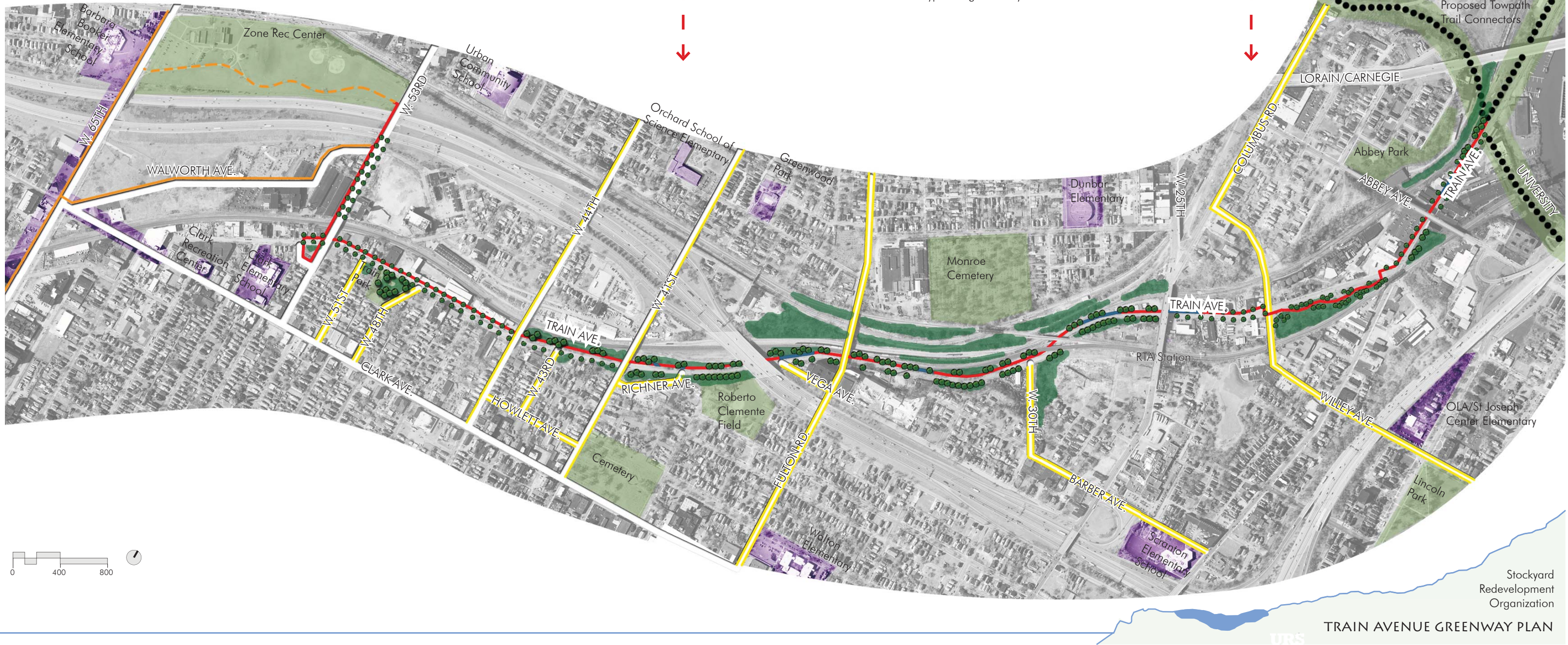
### TRAIN AVENUE GREENWAY SIMULATION IMAGES



### ↑ TRAIN AVENUE GREENWAY TYPICAL SECTION



### TRAIN AVENUE GREENWAY MASTERPLAN











# SECTION 2: INVENTORY AND ANALYSIS

- Project Background
- The Towpath Trail
- Cleveland Bikeway Masterplan
- Cuyahoga County Greenspace Plan
- Demographics & Data
- Project Process And Organization
- Photographic Inventory
- Typical Corridor Conditions
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- Parcel Ownership
- Dumping & Graffiti Observations
- Youth Perceptions Of Train Avenue
- Road Conditions Inventory
- Traffic Counts
- 5 & 10 Minute Walk Analysis
- 10 Minute Bike Analysis
- Historical Analysis
  - The Evolution Of Train Ave
  - Historic Walworth Run
  - Walworth Valley & Today
  - Walworth Run Cso
  - Historical Building Analysis
- Summary



# PROJECT BACKGROUND

## WHAT IS TRAIN AVENUE?

Train Avenue is a 2.5 mile long corridor on the Near West side of Cleveland, Ohio. The project study area stretches from the Clark Avenue – West 65th Street intersection eastward along Train Avenue to the vicinity of its intersection with Scranton Road and University Avenue. The boundaries include the peripheral areas of the adjoining five urban neighborhoods: Stockyards, Clark-Metro, Detroit-Shoreway, Ohio City and Tremont.

Train Avenue lies directly above the former Walworth Run, a tributary of the Cuyahoga River which was culverted as a combined sewer in 1903. Since then, Train Avenue served as a cross-town connector for industrial truck traffic and commuter traffic linking the Stockyards neighborhood on the west with Downtown Cleveland and the flats to the east.

In recent years, Train Avenue has a negative perception from the surrounding communities as a dumping ground, crime spot, and an industrial graveyard.

## WHAT IS THE TRAIN AVENUE GREENWAY PLAN?

The Train Avenue Greenway Plan is centered on maximizing the corridor’s potential as a roadway to accommodate traffic and as a greenway connection to link the five surrounding urban neighborhoods with pedestrian circulation and cultural and environmental amenities.

The Train Avenue Greenway Plan identifies feasible trail linkages to the Towpath Trail and Cleveland Bike Trail System as well as the surrounding neighborhoods. A historical survey identifies industrial heritage interpretation opportunities. Green Infrastructure opportunities were identified to add a dimension of environmental benefits, both locally and regionally.

In recent years, the surrounding neighborhoods have experienced millions of dollars in new residential and commercial investment. Resulting in the new investments is vacant and underutilized land either in or directly adjacent to the corridor. The Train Avenue Greenway Plan is intended to transform Train Avenue into a public amenity and spark growth in the surrounding areas.

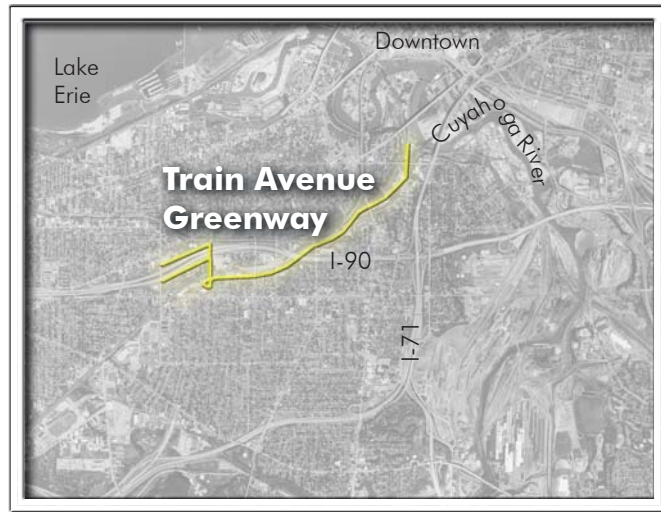


TRAIN AVENUE GREENWAY LOCATION

The Train Avenue Greenway is located in Cleveland Ohio in the Northeast industrial region of the state bordering Lake Erie.



The Train Avenue Greenway is in the Near-West side of Cleveland, directly across the river from downtown.

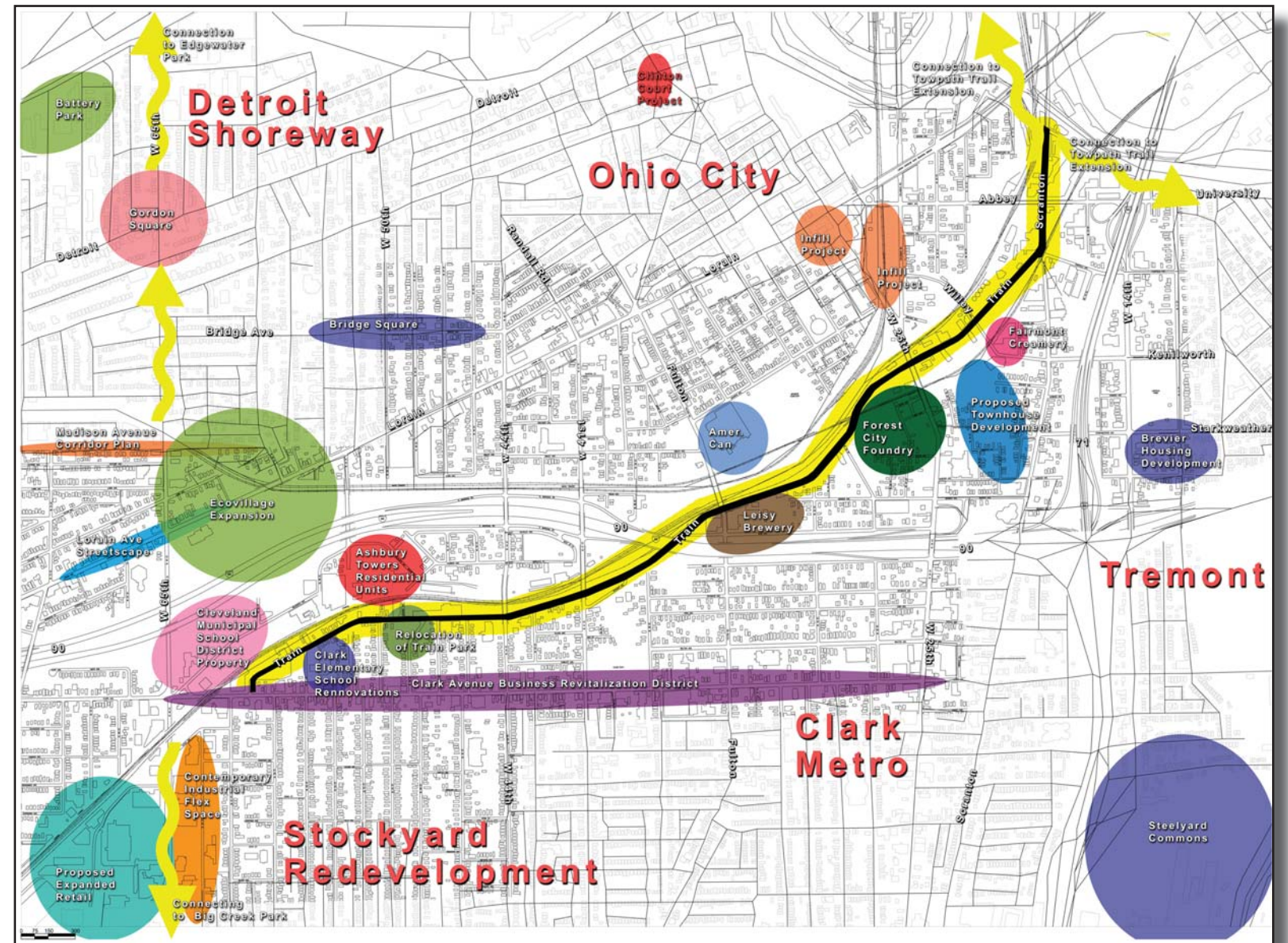
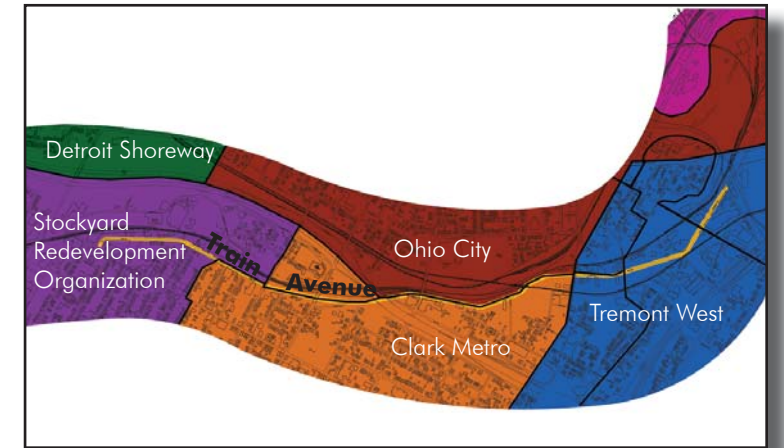


The Train Avenue Greenway is 1 mile from Lake Erie, divided by I-90 and railroad tracks, and has great views and easy access to downtown.

## COMMUNITY DEVELOPMENT CORPORATIONS

The Train Avenue Greenway weaves through five CDCs. The Greenway acts a stitch to these communities, creating a neighborhood amenity and linking key public destination points within each CDC. The CDCs involved are:

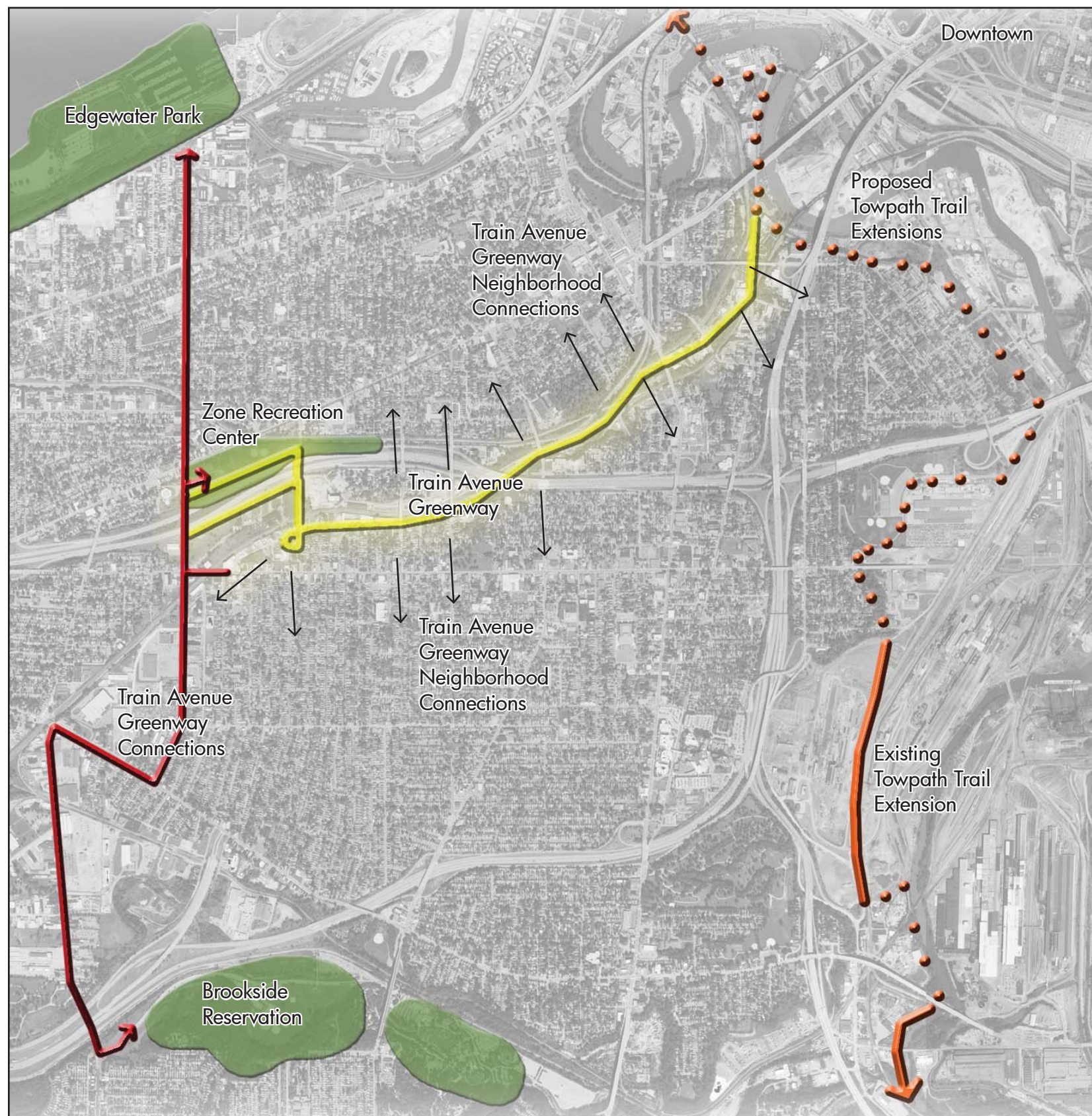
- Stockyard Redevelopment Organization
- Clark Metro Development Corporation
- Tremont West Development Corporation
- Ohio City Near West Development Corporation
- Detroit Shoreway Development Corporation



## PLANNED GROWTH AND DEVELOPMENT

Each of the neighboring CDCs has invested millions of dollars in residential and commercial developments in the past decade. Even more neighborhood improvements are in the development and planning stages. The above map displays how the Train Avenue Greenway will link these proposed development plans and help spark new plans of growth in the surrounding communities.





NEIGHBORHOOD AND REGIONAL LINKAGES

The Train Avenue Greenway will not only link immediate neighborhoods but it will act as a connector to Edgewater Park, Brookside Reservation, Zone Recreation Center, The Towpath Trail and Downtown Cleveland.



THE TOWPATH TRAIL



EDGEWATER PARK AND DOWNTOWN



MICHAEL ZONE RECREATION CENTER



BROOKSIDE RESERVATION

TRAIN AVENUE AS A DESTINATION

The Train Avenue Greenway will act as a recreational destination for those living in the surrounding neighborhoods. A recreational trail will provide a park-like public space to play, exercise, and experience the historic corridor and all that it offers. Bike riding, jogging, walking, rollerblading, skateboarding, dog walking and other recreational uses are encouraged within the greenway. The Train Avenue Greenway will be a public amenity for the communities and those visiting. As a destination, the Train Avenue Greenway is intended to be both safe and playfully inviting.

TRAIN AVENUE AS A PASSAGE

The Train Avenue Greenway is also meant to be experienced as a passage to get from one destination to another. The Train Avenue Greenway can be used as a transportation link, creating safer, easier access to downtown for both vehicles and bicyclists. The Greenway is an important link in a larger network, both conceptually and physically linking Edgewater Park, Zone Recreation Center, Brookside Park, and the Towpath Trail. As a passage, the Train Avenue Greenway is intended to increase safety and the aesthetic experience while passing through.



### WHAT IS THE TOWPATH TRAIL?

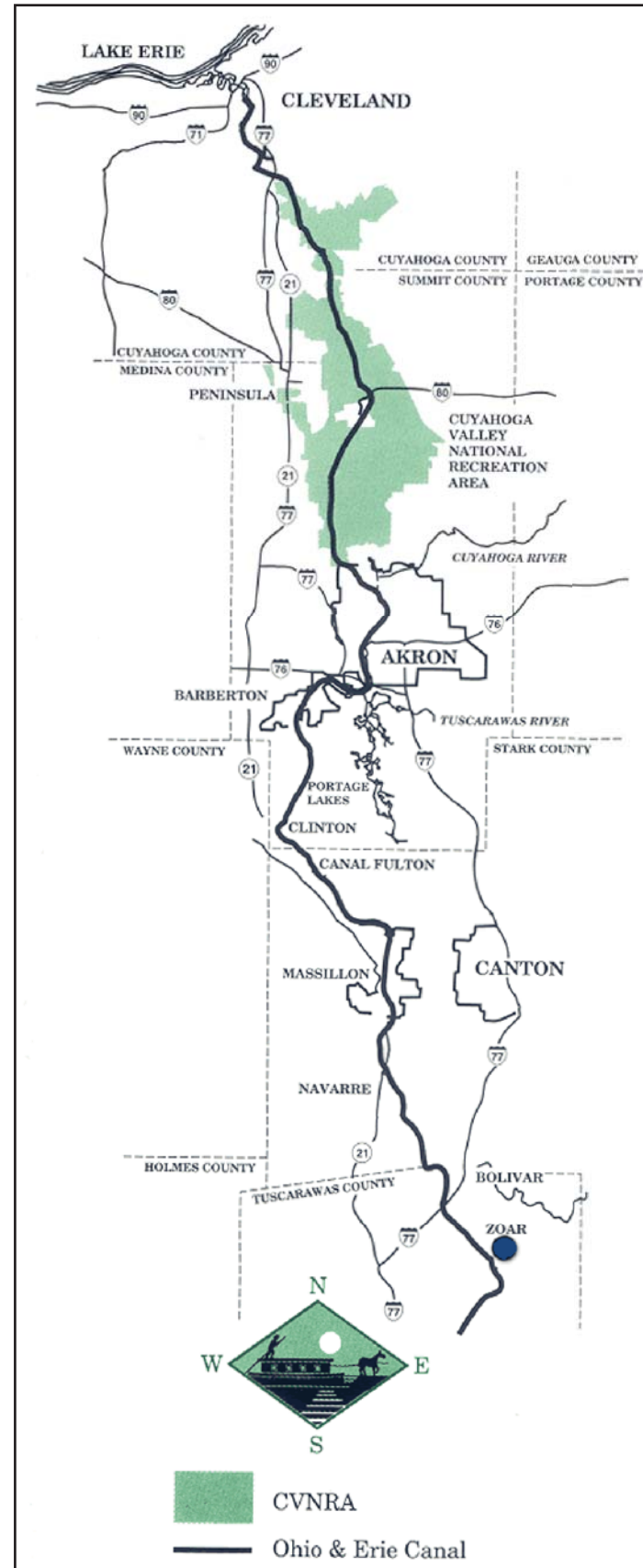
The Towpath Trail was constructed 175 years ago as part of the historic Ohio and Erie Canal. Back then it was a narrow dirt path for animals pulling the canal boats. When the canal shut down after the flood of 1913, the Towpath Trail remained. In 1974 the Cuyahoga Valley National Recreation Area (now Cuyahoga Valley National Park) reclaimed a 20 mile segment of the Towpath as an all-purpose trail. This segment has over 1.7 million users per year and sparked a campaign to extend the Towpath Trail over 100 miles, extending all the way up to the mouth of the canal in downtown Cleveland.

### THE TOWPATH TRAIL AND THE TRAIN AVENUE GREENWAY

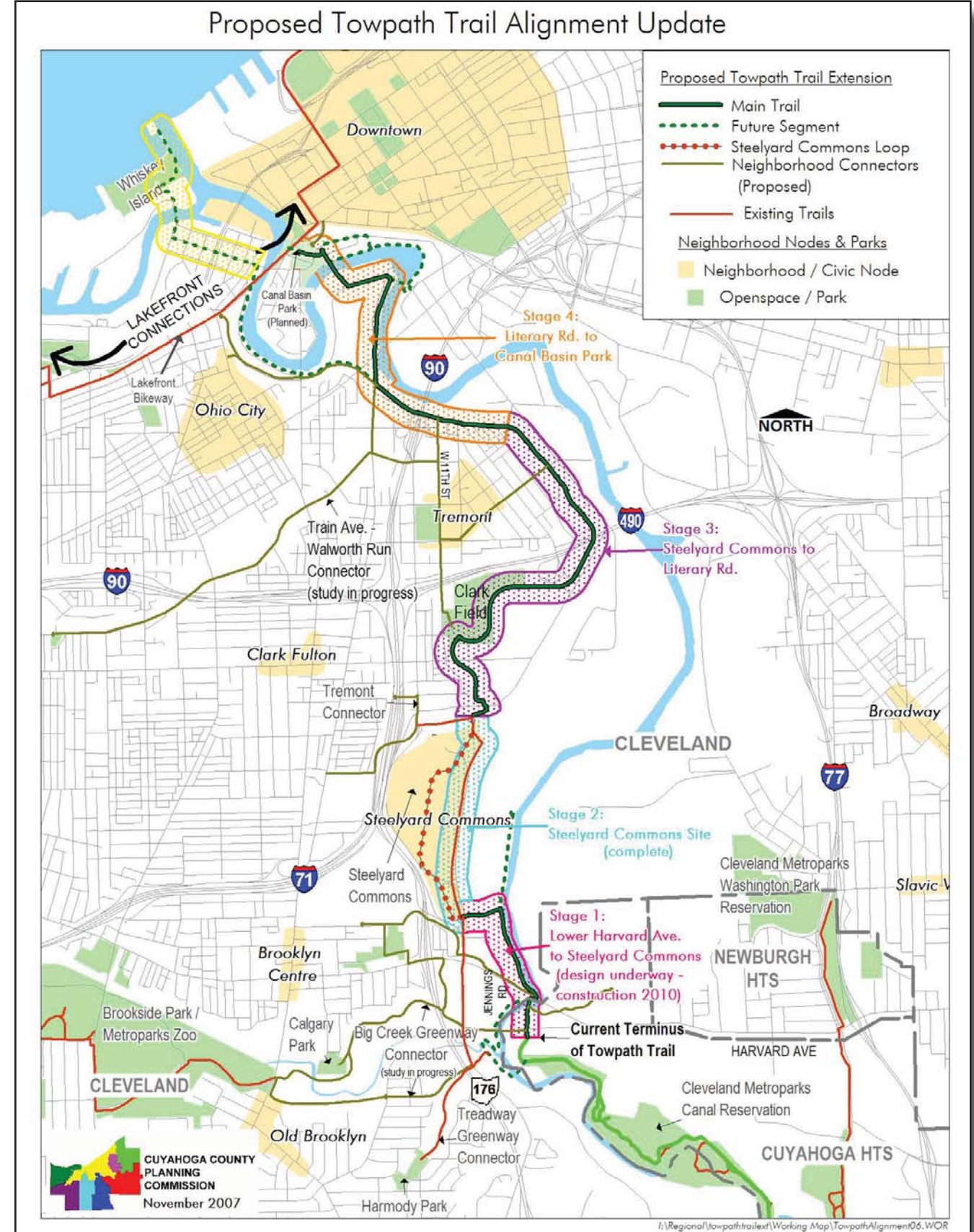
The Train Avenue Greenway will be a neighborhood connector to the Towpath Trail. An important link to connect the neighborhoods in the Near West to the Towpath, the Train Avenue Greenway will extend as a link of this regional historic chain. The Train Avenue Greenway will be a part of a trail network that has over 2 million users per year.

Trail users will be linked to a variety of destinations including downtown, the Flats, Whiskey Island, University Circle, Edgewater Park, the Zoo, Mill Creek Falls, Steelyard Commons, the Canal Reservation & the Cuyahoga Valley National Recreation Area.

## THE TOWPATH TRAIL



This map shows the extent of the Ohio & Erie Canal, stretching from Tuscarawas to Cuyahoga Counties. Over 100 miles of Towpath Trail are planned with more than 70 miles built today.



The Proposed Towpath Trail Alignment Plan includes this Train Avenue study as a neighborhood connector to link the Towpath to the communities in the Near-West.



# THE CLEVELAND BIKEWAY MASTER PLAN

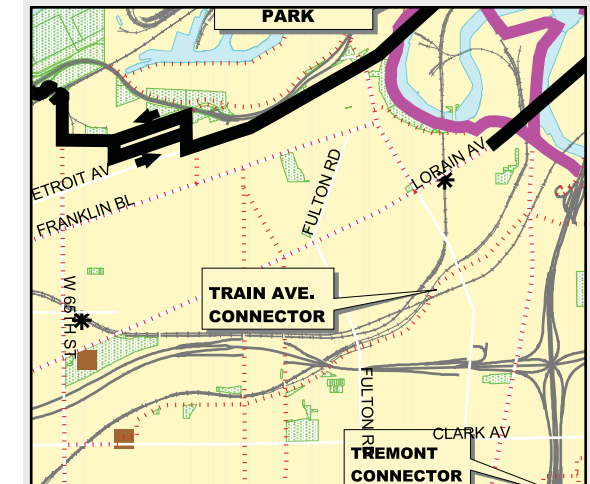
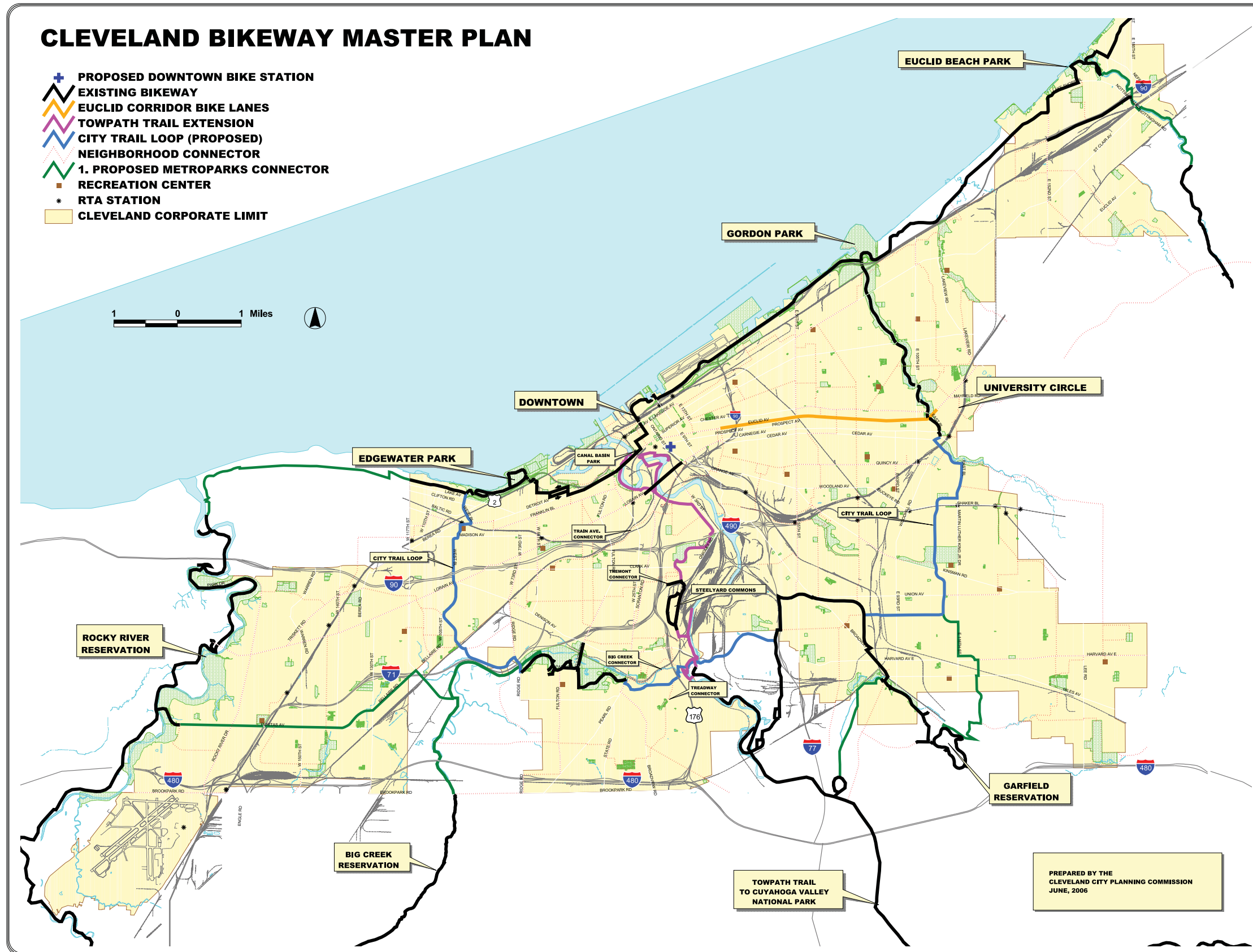
## CLEVELAND BIKEWAY MASTERPLAN

The Cleveland Bikeway Masterplan displays an over 180 mile network of shared roadways, bike lanes and all-purpose trails stretching all over Cleveland. The City of Cleveland Planning Commission states the major goals of the bikeway network:

- Increase bike ridership
- Connect neighborhoods to the lakefront and Cuyahoga Valley
- Link parks and open space
- Build a better transportation system
- Increase awareness of bicycle safety
- Improve the health of Clevelanders
- Improve air quality and the environment of Cleveland

## THE CLEVELAND BIKEWAY MASTERPLAN AND THE TRAIN AVENUE GREENWAY

The Train Avenue Greenway is called out on the Cleveland Bikeway Masterplan as a connector trail. By linking into this larger network, the Train Avenue Greenway has a larger connective goal.





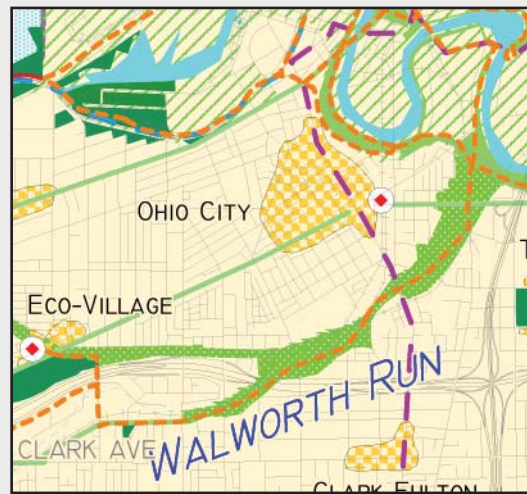
# THE CUYAHOGA COUNTY GREENSPACE PLAN

## CUYAHOGA COUNTY GREENSPACE PLAN

As stated by the Cuyahoga County Planning Commission, the Cuyahoga County Greenspace Plan is intended to promote a broad comprehensive vision for greenspace protection and restoration within Cuyahoga County. Basic elements of the plan include the creation of a system of natural corridors, a countywide trail system, the preservation of scenic views and the protection and restoration of critical natural areas.

## CUYAHOGA COUNTY GREENSPACE PLAN AND THE TRAIN AVENUE GREENWAY

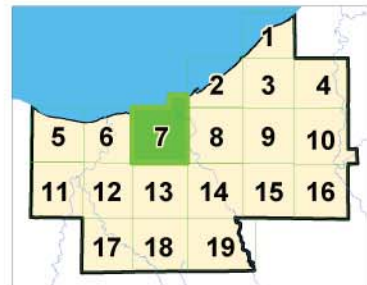
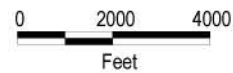
The map to the right displays a section of the Cuyahoga County Greenspace Plan which includes the proposed Train Avenue Greenway (Walworth Run) as part of the future of greenspace in Cuyahoga County. By being a part of the Greenspace Plan, the Train Avenue Greenway is linking into a network of communities dedicated to sharing their natural resources and creating greenspaces for their neighborhoods.



## CUYAHOGA COUNTY GREENSPACE PLAN

### LEGEND

- EXISTING PARKS & PROTECTED AREAS
- GREENSPACE CORRIDORS**
  - ▨ RIVER, LAKEFRONT & CONSERVATION AREAS
  - ▨ OTHER GREENSPACE CORRIDORS
  - ▨ OUTSIDE CUYAHOGA COUNTY
- GREENED CONNECTORS**
  - EXISTING BOULEVARDS
  - POTENTIAL GREENED CONNECTOR
  - LAKE ERIE CIRCLE TOUR ROUTE
  - CANALWAY OHIO SCENIC BYWAY
- ACTIVITY NODES**
  - CIVIC/RETAIL
  - COLLEGE
  - RAPID STATION
- TRAILS**
  - EXISTING MULTI-PURPOSE
  - POTENTIAL TRAILS
- CUYAHOGA VALLEY SCENIC RAILWAY**
  - EXISTING
  - PROPOSED



CUYAHOGA COUNTY PLANNING COMMISSION, 2002





# DEMOGRAPHICS AND DATA

## POPULATION

The Train Avenue Study Area is experiencing a population decline that runs parallel to that of Cuyahoga County, but is less than half of the population decline within the city of Cleveland. The population decline is from a decrease in manufacturing jobs regionally and dying industries. Because of this population decline, the Train Avenue Study Area must follow the regional trend of focusing on quality of life issues and creating public amenities for both the stationary population to enjoy, and to attract more people to the Area.

In this Area, there is a large percentage of children which is over 4% higher than the city of Cleveland. Concentrated within this area are a large number of families that have children, and there are 8 schools less than a mile from the Greenway.

The Train Avenue Greenway will help to spark development and bring people back to the Area, while creating a public amenity for those living in the surrounding neighborhoods, including the large percentage of families and children within the Area.

## HOUSEHOLDS/HOUSING

This area, as well as the city of Cleveland has been hit hard by the foreclosure crisis that is spreading across the country. In 2006 alone there were 7,504 vacant housing units and with no end in sight of the foreclosure crisis, even more vacant homes are projected in the future.

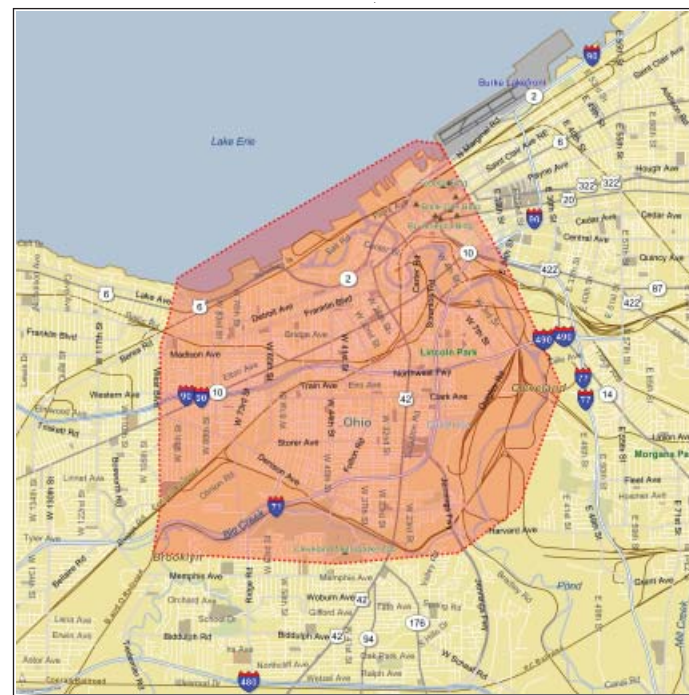
Despite of the high percentage of vacancies in the Area, housing units are still growing in numbers. Over the last 15 years there has been an increase in development within the Train Avenue Study Area, showing that these are neighborhoods that people are willing to invest in. With 5 active CDCs, there is growth in this area, as compared to negative growth within Cleveland.

## INCOME

About 1 in 4 families are below the poverty level in the Area which is well higher than the 1 in 10 families within Cuyahoga County. The Train Avenue Greenway will be an accessible public amenity servicing all income levels in both recreation on the Greenway itself and linking to other public properties.

## TRANSPORTATION

About 1 in 4 households do not have any vehicles available to them and must find other ways to get around. The Train Avenue Greenway will create a transportation network, linking into the Towpath Trail, the City of Cleveland Bikeway Masterplan and creating easier and safer access to downtown. With over 8,000 households that have no vehicles and roughly 2.5 people per household, the Train Avenue Greenway could be potentially serving 20,000 people for transportation use alone.



### TRAIN AVENUE STUDY AREA

This map shows the Train Avenue Study Area used in the demographics and data. The red area represents those user groups within a 10 minute bike ride from the Train Avenue Greenway.

POPULATION									
GEOGRAPHIC AREA	CENSUS 1990	CENSUS 2000	2006 FORECAST	PERCENT GROWTH		TOTAL FAMILIES	TOTAL CHILDREN	% CHILDREN	% MINORITIES
				1990 - 2000	2000 - 2006				
TRAIN AVE STUDY AREA	94,009	91,698	86,188	-2.46%	-6.01%	19,849	29,789	32.49%	35.90%
CLEVELAND	505,616	478,403	406,427	-5.38%	-15.05%	111,998	149,596	28.50%	58.50%
CUYAHOGA COUNTY	1,412,140	1,393,978	1,314,241	-1.29%	-5.72%	356,221	381,563	27.40%	32.60%
OHIO	10,847,115	11,353,140	11,478,006	4.67%	1.10%		3,215,955	28.30%	15.00%
USA	248,709,873	281,421,906	299,398,485	13.15%	6.39%		80,473,265	28.60%	24.90%

\* TRAIN AVENUE STUDY AREA POPULATION FOR 2006 FORECAST IS ESTIMATED USING ESRI 2008 DATA  
 \*\* TOTAL CHILDREN ESTIMATED USING POPULATION DATA FOR 19 YEARS AND YOUNGER

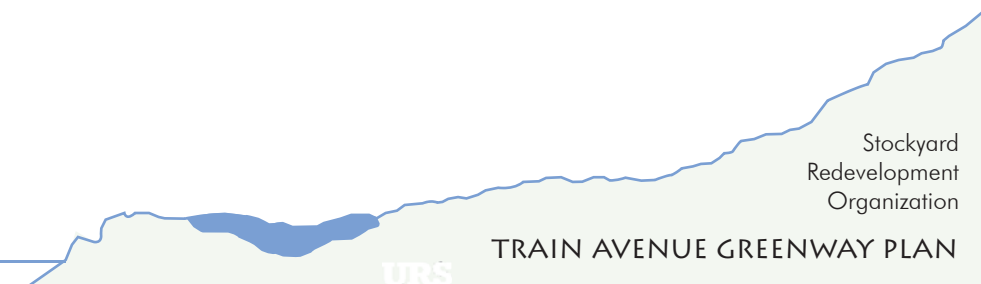
HOUSEHOLDS / HOUSING										
GEOGRAPHIC AREA	TOTAL HOUSEHOLDS			TOTAL HOUSING UNITS			TOTAL VACANT		% VACANT	
	CENSUS 1990	CENSUS 2000	% GROWTH 1990-2000	CENSUS 2000	FORECAST FOR 2006	% GROWTH 2000-2006	CENSUS 2000	FORECAST FOR 2006	CENSUS 2000	FORECAST FOR 2006
TRAIN AVE STUDY AREA	35,231	34,383	-2.41%	39,592	40,358	1.93%	5,209	7,504	13.20%	18.60%
CLEVELAND	199,617	190,638	-4.50%	215,856	213,915	-0.90%	25,218	45,520	11.68%	21.28%
CUYAHOGA COUNTY	563,303	571,457	1.45%	616,903	621,066	0.67%	45,446	82,457	7.37%	13.28%
OHIO				4,783,051	5,045,356	5.48%	337,278	545,850	7.05%	10.82%
USA				115,904,641	126,311,823	8.98%	10,424,540	14,694,421	8.99%	11.63%

\* TRAIN AVENUE STUDY AREA FORECAST FOR 2006 IS ESTIMATED USING ESRI 2008 DATA

INCOME			
GEOGRAPHIC AREA	MEDIAN HOUSEHOLD INCOME	TOTAL FAMILIES BELOW POVERTY LEVEL	% FAMILIES BELOW POVERTY LEVEL
	CENSUS 2000	CENSUS 2000	CENSUS 2000
TRAIN AVE STUDY AREA	24,898	5,460	27.40%
CLEVELAND	25,928	25,825	22.90%
CUYAHOGA COUNTY	39,168	36,535	10.30%
OHIO	40,956	235,026	7.80%
USA	41,994	6,620,945	9.20%

\* TRAIN AVENUE STUDY AREA POVERTY LEVEL IS FAMILIES BELOW \$15,000

TRANSPORTATION USERS				
GEOGRAPHIC AREA	TOTAL WORKERS 16+ THAT WALK TO WORK	% WORKERS 16+ THAT WALK TO WORK	TOTAL HOUSEHOLDS THAT HAVE NO VEHICLES AVAILABLE	% HOUSEHOLDS THAT HAVE NO VEHICLES AVAILABLE
	CENSUS 2000	CENSUS 2000	CENSUS 2000	CENSUS 2000
TRAIN AVE STUDY AREA	1,759	5.40%	8,846	25.70%
CLEVELAND	7,080	4.00%	46,841	24.60%
CUYAHOGA COUNTY	15,661	2.50%	78,005	13.70%
OHIO	125,882	2.40%	380,179	8.60%
USA	3,758,982	2.90%	10,861,067	10.30%





TRAIN AVENUE GREENWAY DESIGN TEAM

The Train Avenue Greenway Design Team consists of four main parties: URS, the Advisory Group, the Steering Committee and the Public. All four parties worked together to develop the Greenway Plan, with Stockyard Redevelopment Organization overseeing the process.



URS

The consultant for the Greenway Plan consisting of landscape architects, planners, designers, and a historian. URS works directly with Stockyard Redevelopment Organization, the Advisory Group, the Steering Committee and the Public to gather information and ideas and approve the Greenway design.

ADVISORY GROUP

The advisory group includes representatives from each of the five neighboring CDCs including Stockyard Redevelopment Organization, representatives from the City of Cleveland Planning Commission, a spokesperson for the Towpath Trail, and a representative from NOACA.

STEERING COMMITTEE

The Steering Committee consists of any businesses or organizations that will in some way be affected by the Train Avenue Greenway Plan. This committee involves business owners along Train Avenue, advisors for transportation and park issues, public officials, as well as every member of the Advisory Group

PUBLIC

Public meetings are open to anyone who has an interest in the Train Avenue Greenway Plan. The public meetings are meant to share information, gather ideas and investigate the opinions and concerns of community members. Public concerns and ideas were brought to the attention of the Advisory Group and Steering Committee, with the design altered to reflect these concerns.

# PROJECT PROCESS AND ORGANIZATION

## TRANSPORTATION FOR LIVABLE COMMUNITIES PHASING

NOACA's TLCI grant breaks the planning process into four phases.

### PHASE 1: INVENTORY AND ANALYSIS

The Inventory and Analysis Phase contained four main meetings. The Project Kickoff meeting disclosed the project goals and objectives, roles and responsibilities, the project schedule and approaches to public presentations, including a bus tour of the project area. Over the next few months, URS collected existing data as pertaining to Train Avenue and compiled the information into an AutoCAD basemap. The Advisory and Steering Committee Meetings were held to discuss this existing data and offer suggestions and other resources to obtain any further information. A historic analysis and photographic inventory were presented as well as discussion of overall opportunities and constraints to the project. A Public Meeting displayed this information and gained excitement about the Greenway within the community.

### PHASE 2: GREENWAY ALTERNATIVES

The Greenway Alternatives Phase presented a series of alternatives for the Advisory and Steering Committees to discuss. Alternatives were broken down into five main categories: Roadway, Trail, Greening, Green Infrastructure, and Other Greenway Enhancements. The Advisory and Steering Committees provided feedback to weigh the benefits and limitations of each concept. A matrix of pros and cons was compiled for each of the five main categories. In the Public Meeting, the Greenway Alternatives and matrixes were presented in a powerpoint, and then the public was divided into rotating stations to discuss these alternatives in a more intimate setting. A summary of feedback received during all meetings was prepared and analyzed to move the design into the next phase.

### PHASE 3: PRELIMINARY GREENWAY PLAN

The Preliminary Greenway Plan Phase was a draft version of the Train Avenue Greenway Plan. This preliminary plan reflects the input received by the previous two phases and compiles the five main categories into one overall plan. The Advisory and Steering Committees analyzed and discussed the preliminary plan and the benefits and limitations the plan presents.

### PHASE 4: FINAL GREENWAY PLAN

The Final Greenway Plan Phase presents the Train Avenue Greenway Plan as a reflection of the discussions involved with phases one through three. A Public Meeting presented the final plan and offered an opportunity for other suggestions or concerns. Funding and cost estimating were discussed in this phase. The final stages in phase four are a presentation to the City of Cleveland Planning Commission and the organization of this document.

These four phases are intended to complete Steps 1-4 of the Ohio Department of Transportation Project Development Process, as displayed to the right:

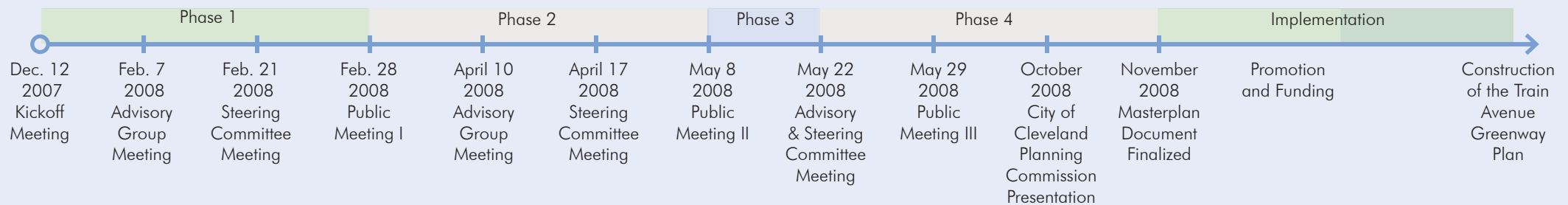
## PUBLIC MEETINGS

An important part of the Train Avenue Greenway Plan was the Public Meetings. Three Public Meetings were held at the end of Phases 1, 2 and 4.

These public meetings not only presented the various stages of the Greenway Plan to educate the public on what is happening in their community, but they also were held to receive public input. Concerns, suggestions and compliments were exchanged between the Advisory Group, Steering Committee, URS, and the public, creating healthy constructive dialogues that helped influence the Greenway design.

These three public meetings were:

- February 28, 2008
- May 8, 2008
- May 29, 2008





**PROJECT GOALS**

- Develop plans for an aesthetically pleasing “greenway” environment
- Help reestablish Train Avenue as a major community asset
- Promote alternatives to the automobile by providing a route for pedestrians and bicyclists
- Develop improved access to adjoining neighborhoods and community assets
- Create a regional recreational amenity centered on a multi-purpose trail plan that will link into the City of Cleveland’s Bikeway Master Plan.

**PLANNING DRIVERS**

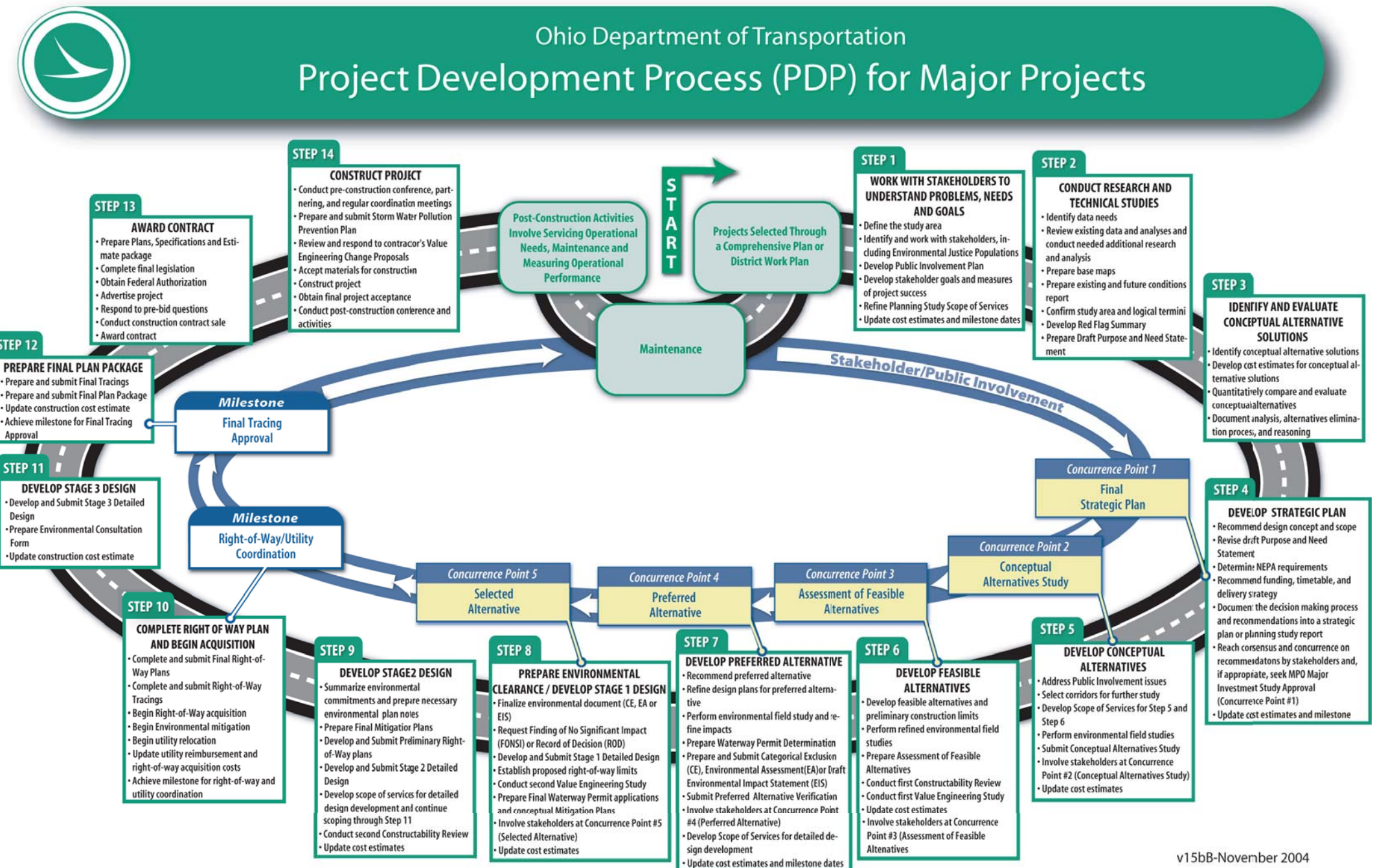
- Increase bike use
- Desire for more walkable communities
- Population decline
- Property vacancies
- Reduction of combined sewer overflows (CSO)
- Water quality improvement, Green Infrastructure

**TRAIN AVENUE GREENWAY BENEFITS**

- Change the negative perceptions of Train Avenue
- Promote alternative transportation and healthy communities
- Increase safety and awareness of Train Avenue
- A transportation, recreation, community, and environmental link to the region

**BENEFITS AND USES OF THIS DOCUMENT**

- For use as a document for potential funding of the Train Avenue Greenway
- To be utilized by CDC’s and communities for information on Train Avenue and its resources, documentation of the Greenway process and inspiration on future projects of a similar nature
- As a clearly organized documentation of the depth of a TLCI grant
- For CDCs to use as part of their own planning strategies
- To display how these 5 CDCs have worked together to enhance the near-west side of Cleveland in its function, aesthetics, environment, and neighborhood spirit



The Train Avenue Greenway Plan will complete steps 1-4 of the Ohio Department of Transportation Project Development Process.





# PHOTOGRAPHIC INVENTORY

The Train Avenue Greenway is dissected by a series of bridges. There are a total of 10 bridges within the viewshed of the Greenway. These bridges are part of the character of the area and present both opportunities to enhance that character and space constraints within the right-of-way.

The below photographic inventory documents the path travelling to each of these bridges.

## SECTION 2: INVENTORY & ANALYSIS

The Inventory and Analysis section of this document corresponds with Phase 1 of the NOACA TLCI Grant.

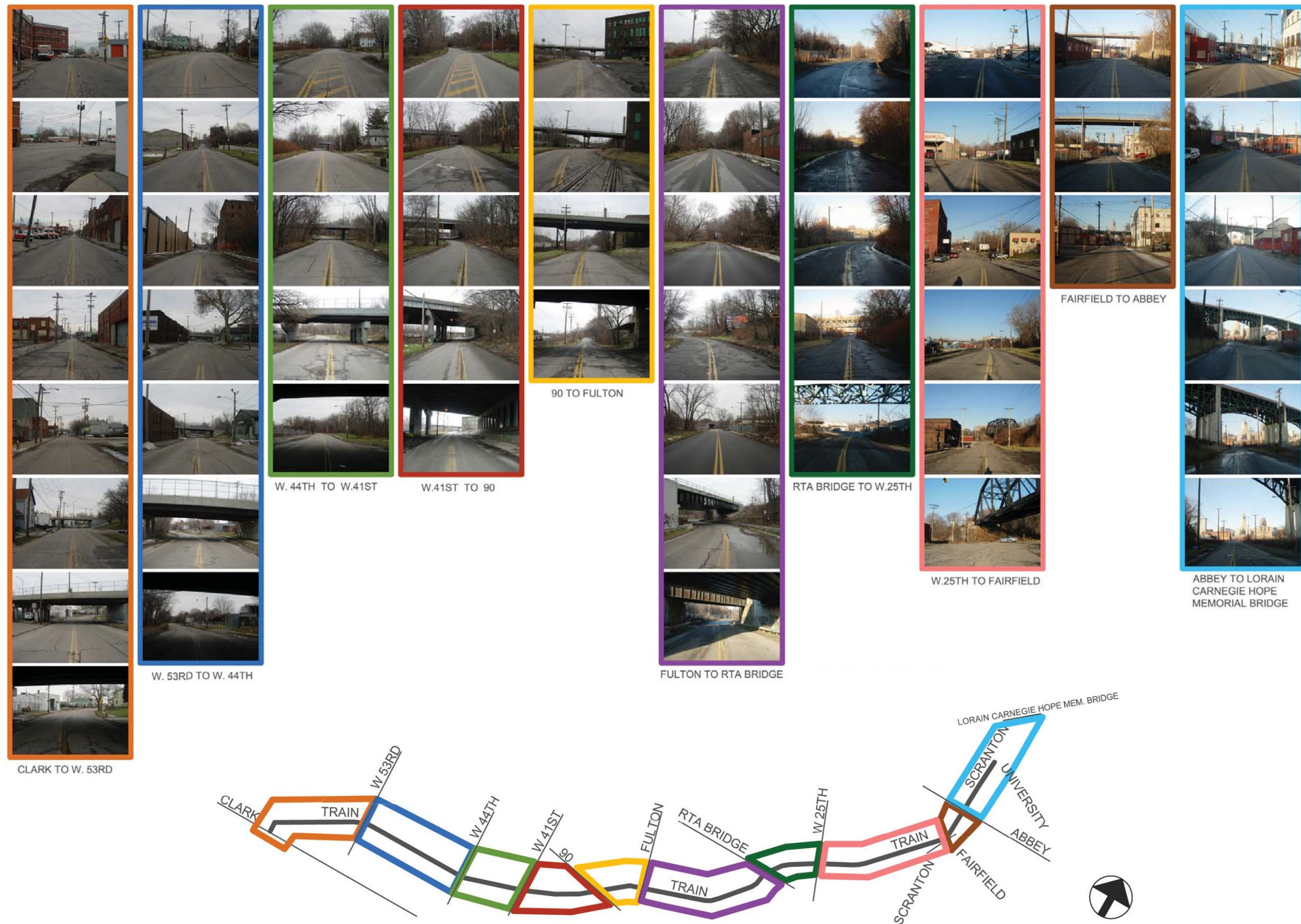
Inventory and Analysis has 3 parts:

1. Gathering of all the existing data pertaining to the Train Avenue Greenway
2. Compiling the data and analyzing the relationships between the layers of data
3. Identifying opportunities and constraints that will help to guide the design

Data came from a wide variety of sources. URS site visits with photographic documentation, an Ohio Utilities Protection Service (OUPS) request, GIS shape files from Cuyahoga County, and the many resources that the Advisory & Steering Committees provided all helped to contribute to the Inventory & Analysis.

The data obtained from these resources was then compiled into an AutoCAD base map. This AutoCAD base map contains layers stacked on top of each other with data attached to each layer. Layers can be turned on and off to discover relationships between data. Photographs convey the data in 3D perspective and complement the base map.

The following pages document the Inventory & Analysis process and convey the information used to develop the Train Avenue Greenway Plan.



CLARK TO W. 53RD

W. 53RD TO W. 44TH

W. 44TH TO W.41ST

W.41ST TO 90

90 TO FULTON

FULTON TO RTA BRIDGE

RTA BRIDGE TO W.25TH

W.25TH TO FAIRFIELD

FAIRFIELD TO ABBEY

ABBEY TO LORAIN CARNEGIE HOPE MEMORIAL BRIDGE





# TYPICAL CORRIDOR CONDITIONS

Train Avenue is about 2.5 miles long with about 0.75 miles each in the West and East Ends and 1 mile of the corridor in the Central Area.

There are 6 typical corridor conditions along the Train Avenue study area:



WEST END

**BUSINESSES AND SIDEWALKS ON BOTH SIDES**  
This segment of the Greenway contains noticeable space constraints within the right-of-way.



**RESIDENTIAL & SIDEWALKS ON BOTH SIDES**  
A small segment on the west side is a residential corridor. Only about 9% of the corridor is residential, with a total of 27 houses bordering Train Avenue.



CENTRAL AREA

**GREEN SPACE ON BOTH SIDES, NO SIDEWALKS**  
The majority of the central area contains green space on both sides of the road with no buildings or sidewalks. About 43% of the whole corridor is green/open space with the longest stretch of green corridor 1.02 miles in the central area.



EAST END

**BUSINESSES ON BOTH SIDES, NO SIDEWALKS**  
This segment of the Greenway contains businesses on both sides of the road, but little to no sidewalks. About 47% of the corridor does not contain any sidewalks



**ONE SIDE INDUSTRY, ONE SIDE GREEN SPACE**  
With an industrial complex on one side and an open segment of land on the other side, this segment has sidewalks on the industry side of the street but not the green side. About 48% of the corridor is industrial/businesses.



**BUSINESSES AND SIDEWALKS ON BOTH SIDES**  
This segment of the Greenway contains sidewalks and businesses on both sides of the road, with tree lawns in between the sidewalks and road in places. 31% of the entire corridor contains sidewalks on both sides.

# TRAIN AVE. BUSINESSES & INDUSTRY

About 48% of the corridor consists of businesses and industry. Some of these industries are no longer in operation, while others are thriving in the corridor. The proximity and easy access to downtown makes Train Avenue a popular passageway for trucks. In general, the businesses are clustered at the east and west ends of Train, with a few sprinkled within the central area.



## CORRIDOR QUANTITIES

Length of corridor = 2.5 miles

% of corridor residential = 9%  
% of corridor industrial = 48%  
% of corridor green/open = 43%

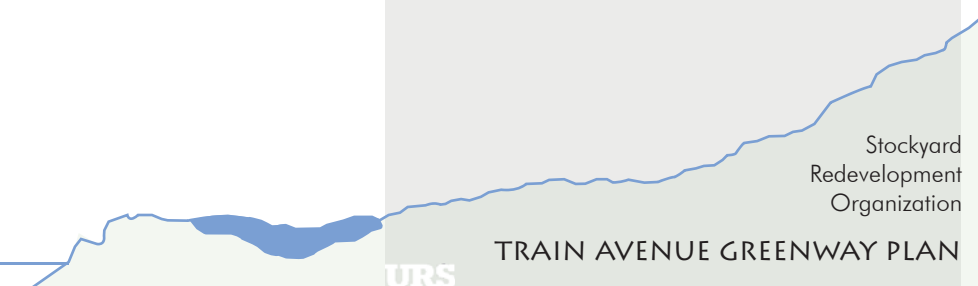
No. of intersections within Train = 14  
No. of left hand turn lanes within Train = 4

% of corridor with sidewalks on 2 sides = 31%  
% of corridor with sidewalks on 1 side = 22%  
% of corridor with sidewalks on no sides = 47%  
% of corridor with on street parking = 0%  
% of corridor with gravel shoulder or off street parking = 10%

% of corridor with buildings on 2 sides = 38%  
% of corridor with sparse or no buildings = 62%

Longest stretch of corridor with sparse or no buildings on either side = 0.87 miles

Longest stretch on north side of corridor with sparse or no buildings = 1.02 miles



Stockyard  
Redevelopment  
Organization

TRAIN AVENUE GREENWAY PLAN

URS



# ZONING PLAN

## ZONING PLAN FOR THE TRAIN AVENUE GREENWAY STUDY AREA

The majority of Train Avenue is zoned as General Industry, reflecting the area's history of being a brewery and factory district. The industrial zoning runs along the valley of the former Walworth Run, and the raw industrial flavor is found in the character of the corridor even today.

Several sections on the east side of Train Avenue are zoned as 2 Family, reflecting the few sections of residential development along the corridor.









# PUBLIC PROPERTIES

## PUBLIC PROPERTIES ALONG TRAIN AVENUE GREENWAY STUDY AREA

Within the Train Avenue Greenway study area there are 8 schools and 9 parks, cemeteries and recreation centers. These public amenities provide an opportunity for linkages to and from the Train Avenue Greenway, creating opportunities for access to the surrounding neighborhoods.

The Towpath Trail Extensions provide the opportunity to connect the Train Avenue Greenway to an even larger recreation and transportation network, stretching to downtown and communities all over Cleveland.

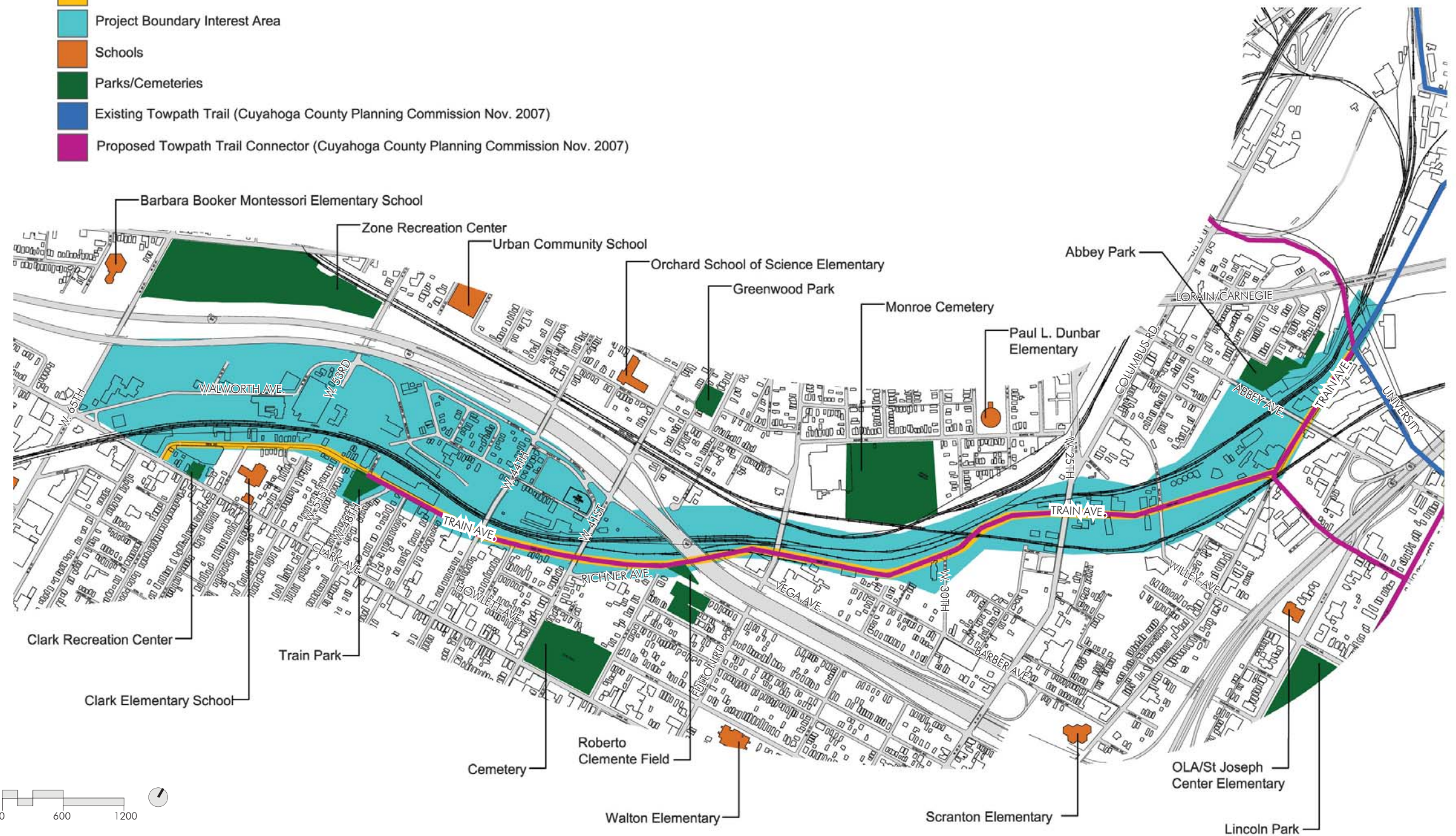
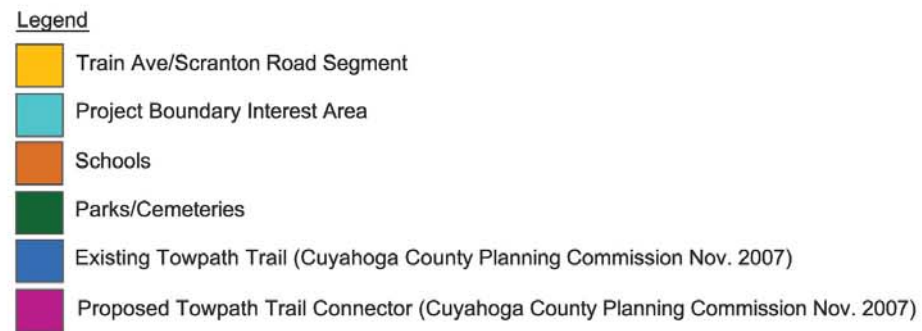
The user demographics of the Train Avenue Greenway will largely depend upon these public properties and the connections the Train Avenue Greenway can make to the neighborhoods supporting them.



**TRAIN PARK**  
Train Park is the only park directly adjacent to Train Avenue. A total of 9 parks, cemeteries and recreation centers lie within the study area.



**CLARK ELEMENTARY SCHOOL**  
Clark Elementary School is the only school directly adjacent to Train Avenue. There are a total of 8 schools within the project study area.





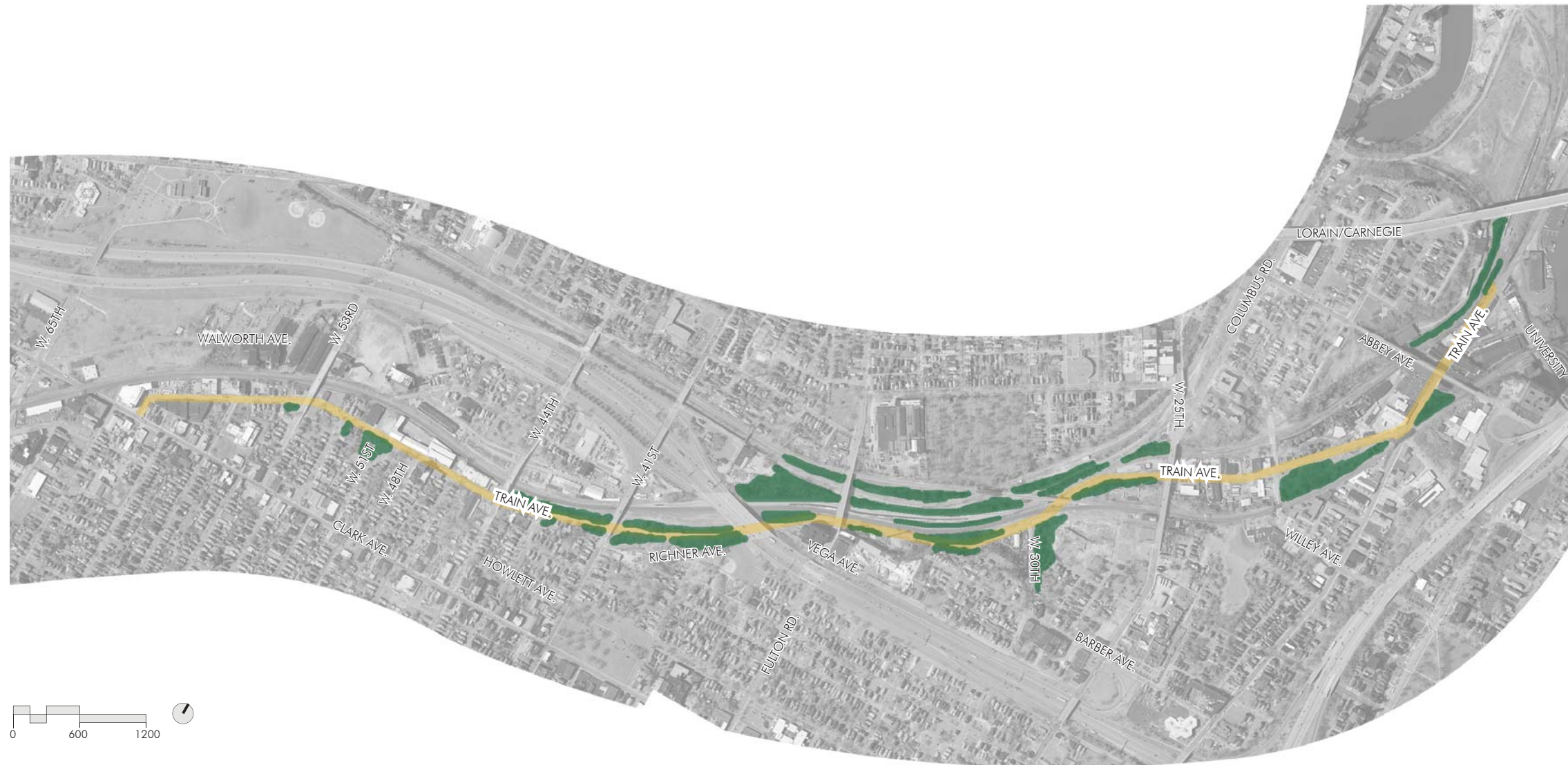
# EXISTING GREEN SPACES

## EXISTING GREEN SPACES WITHIN VISUAL PROXIMITY OF TRAIN AVENUE

The Existing Green Spaces plan shows the existing parks, open space and vegetated areas within the visual proximity of Train Avenue.

There is a surprising amount of greenery within the corridor, especially for an urban and industrial area. Pockets of open land along Train Avenue provide greening and regeneration potentials. The mature trees and vegetation of the area provides the opportunity for enhancement. Some areas are in need of replacement because of the high concentration of invasive species and weedy vegetation in this area.

The green segment in the central area is about one mile long, providing the most attractive scenery for greening and regeneration.



**EXISTING OPEN GREEN SPACE**  
There are several pockets of non-developed open land along Train Avenue that have greening/regeneration potentials.



**EXISTING GREENERY**  
While Train Avenue has a lot of greenery, the plant material contains a high concentration of invasive species and weedy vegetation.



# VACANT & UNDERUTILIZED LAND






## VACANT & UNDERUTILIZED LAND DIRECTLY ADJACENT TO TRAIN AVENUE

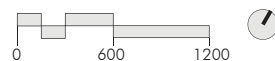
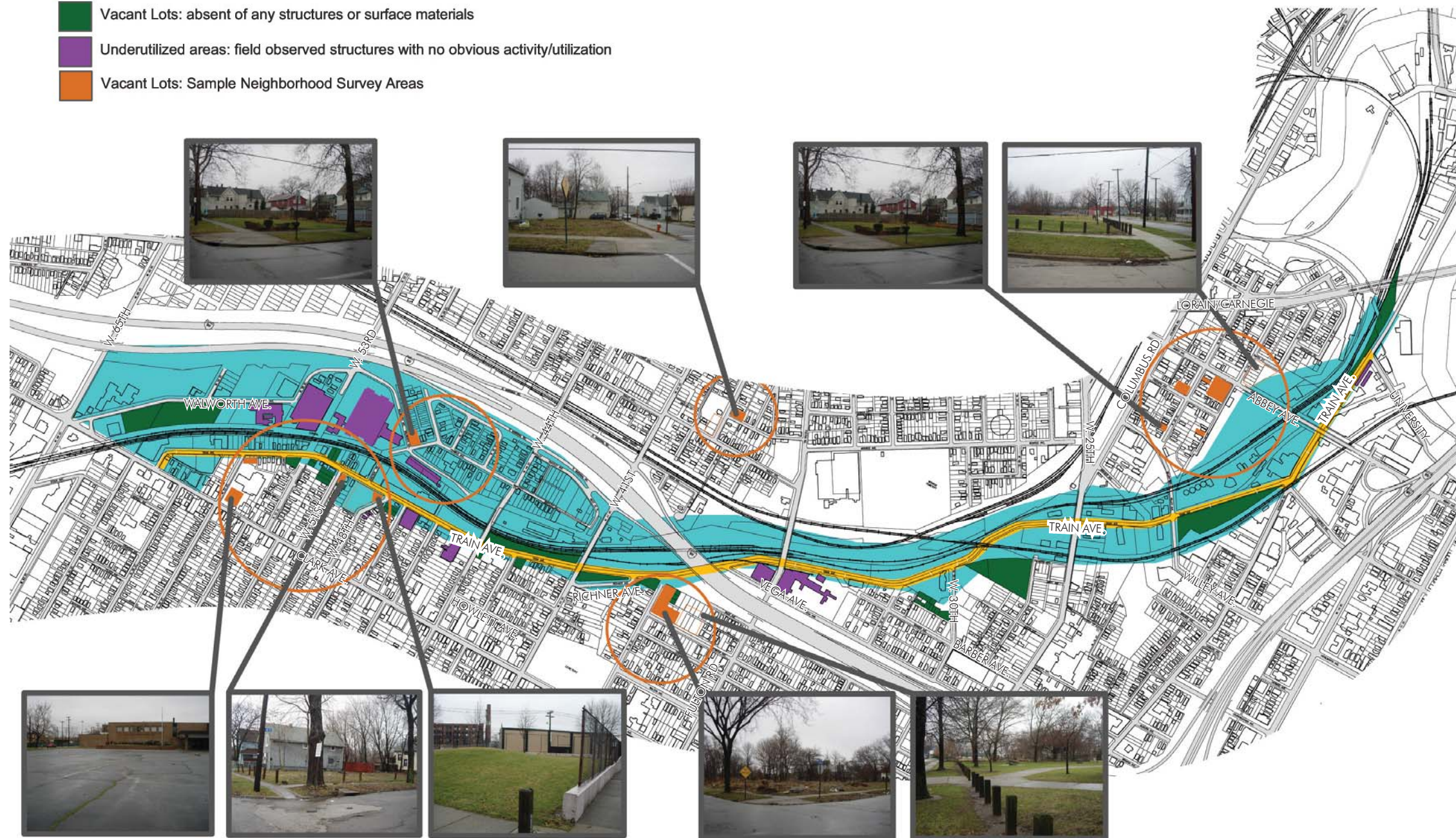
The Vacant and Underutilized Land map displays vacant lots and underutilized areas along Train Avenue. Vacant lots are defined as parcels absent of any structures or surface materials, as observed from the 2005 aerial. Underutilized areas are field observed structures with no obvious activity or utilization. Underutilized areas reflect foreclosures or dormant businesses and industries.

## VACANT & UNDERUTILIZED LAND IN SAMPLE NEIGHBORHOOD SURVEY AREAS

To get an idea of the vacant and underutilized land in the surrounding neighborhoods, 8 Sample Neighborhoods were field observed to identify the vacant lots in these areas. Vacant lots were not difficult to find, appearing as many as 1 every block in some areas. These vacant lots clearly map out the foreclosure crisis and decrease property values in this area, however they could provide opportunities for development or greenspace to improve the neighborhoods in the future.

### Legend

-  Train Ave/Scranton Road Segment
-  Project Boundary Interest Area
-  Vacant Lots: absent of any structures or surface materials
-  Underutilized areas: field observed structures with no obvious activity/utilization
-  Vacant Lots: Sample Neighborhood Survey Areas





### CLEVELAND VACANT LOTS & FORECLOSURES

The Foreclosure Crisis has hit Cleveland hard in the past decade. In just the last 8 years, Cuyahoga County has recorded over 80,000 foreclosures, making it the most per capita in the country. In just the year 2006, the US Census Bureau projected over 45,520 vacant houses, or about 21% of all housing units. And the crisis does not stop with housing abandonment. These vacant housing units are opening their doors to vandals who strip the recently foreclosed houses of their fixtures, plumbing pipes, windows and wiring to sell at the local scrapyards. These stripped houses are no longer deemed livable and need to be demolished, leaving empty lots behind. Empty lots decrease property values of the houses that surround them, making these houses harder to sell and bringing down the livability of the neighborhood.

The neighborhoods surrounding Train Avenue are experiencing the affects of the foreclosure crisis cycle and vacant houses from today mixed with abandoned factories from the slump of the industrial era create unavoidable planning drivers for the Train Avenue Greenway Plan.

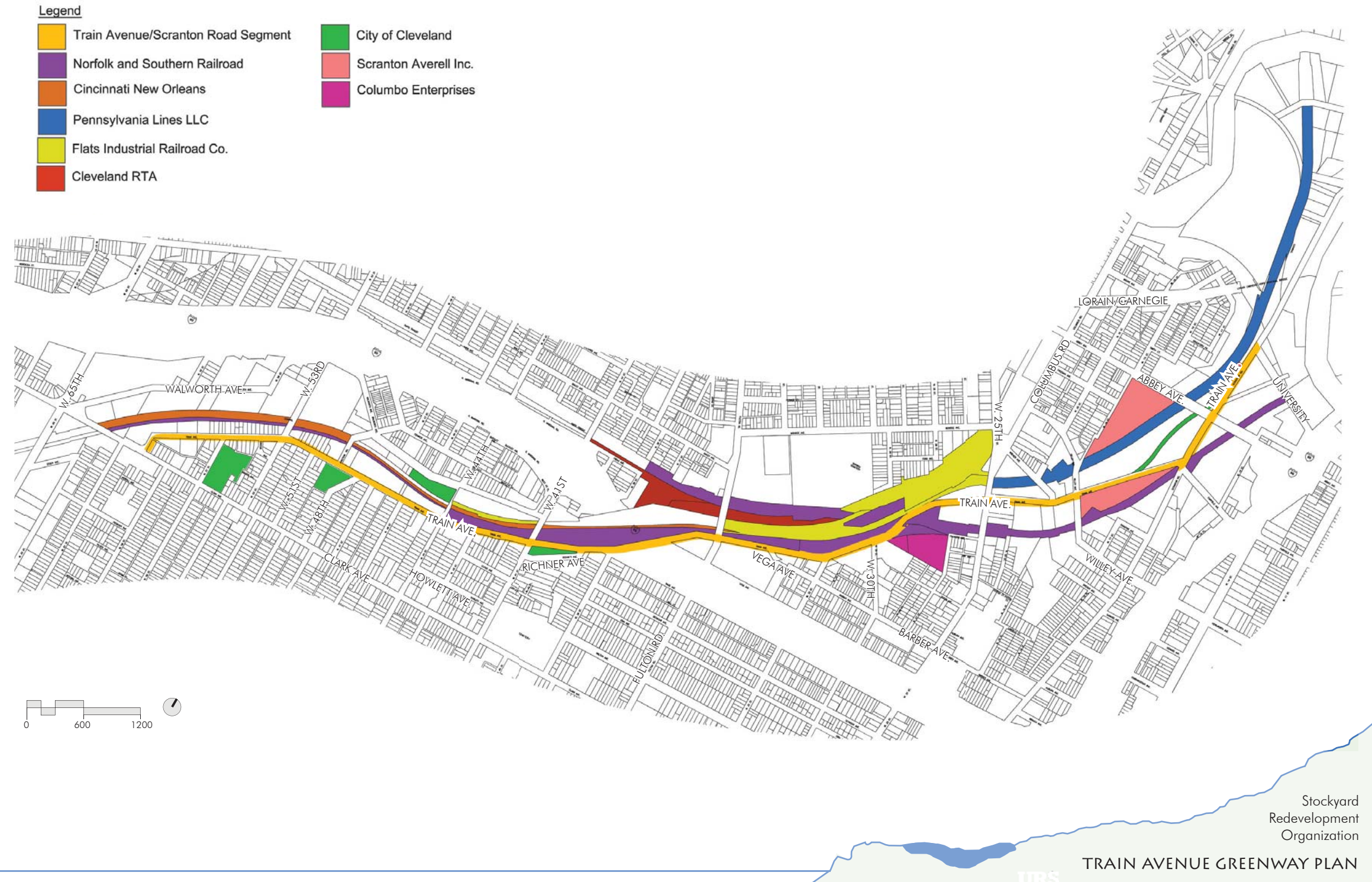


A series of vacant houses along Train Avenue. Windows are boarded up and thieves are pulling the siding off the houses.



All around Cleveland dying or weakened industries leave behind graveyards of underutilized or vacant buildings. This building along Train Avenue was at one point a thriving brewery.

## PARCEL OWNERSHIP



### PARCEL OWNERSHIP OF EXISTING GREEN SPACES WITHIN VISUAL PROXIMITY OF TRAIN AVENUE

The owners of the parcels that were part of the Existing Green Spaces map are identified on the Parcel Ownership map. By displaying the owners of these parcels, a realistic view of purchasing strategies that will help guide the design can be formulated.

The majority of the greenspaces identified in the Existing Green Spaces map are owned by railroad companies. Scranton Averell and Columbo Enterprises also own key greenspaces, as does the City of Cleveland.



# DUMPING & GRAFFITI OBSERVATIONS

## DUMPING AND GRAFFITI OBSERVATIONS ALONG TRAIN AVENUE

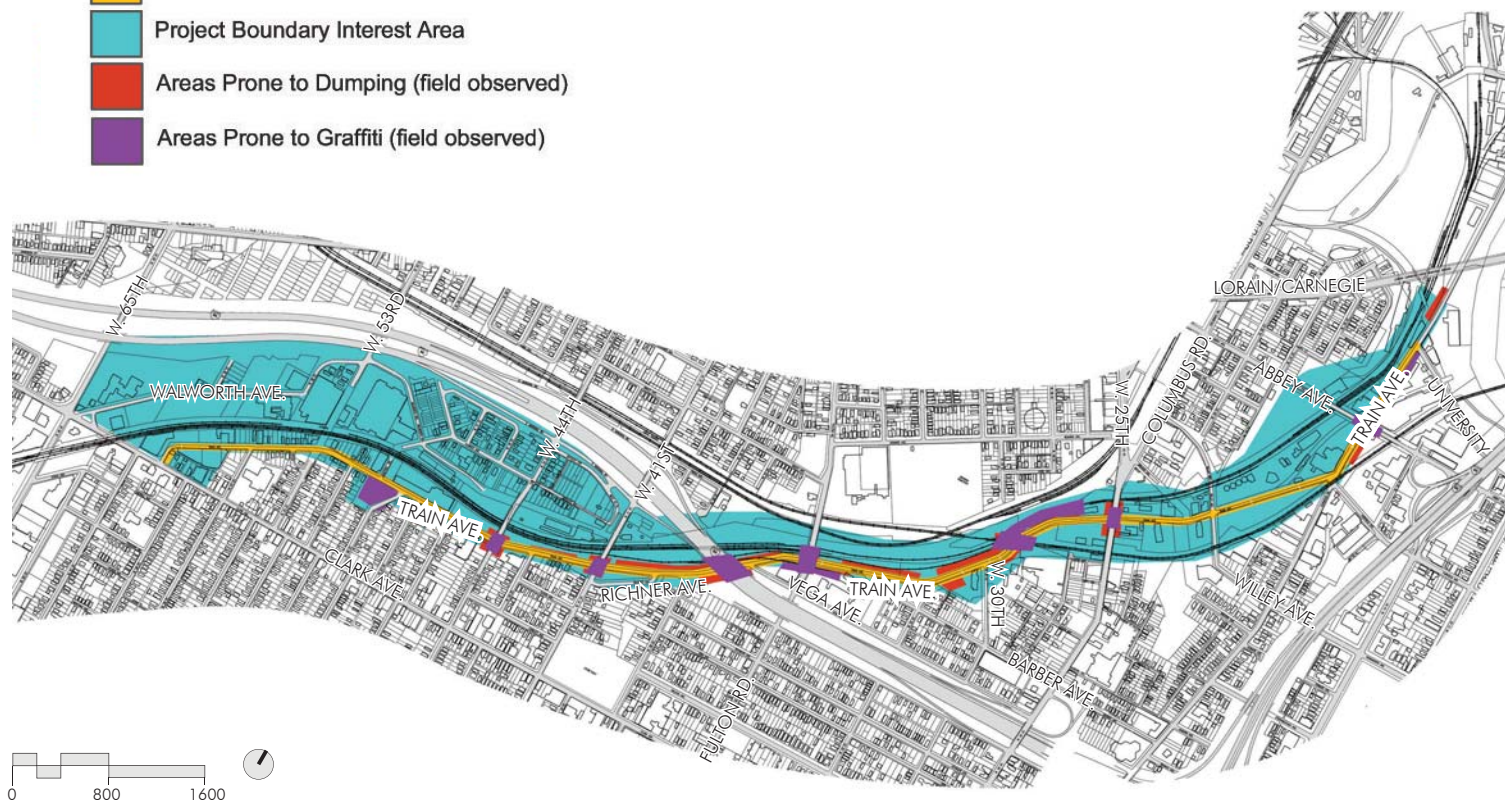
The Dumping & Graffiti Observations plan displays the areas most prone to dumping and graffiti. While all of Train Avenue contains evidence of dumping and graffiti, the Dumping & Graffiti Observations plan points out the key areas most susceptible.

The plan reveals that dumping mainly occurs under bridges, along hillsides, and within vegetated areas.

Graffiti mainly appears under bridges, on abandoned buildings, and along concrete walls.



- Legend**
- Train Ave/Scranton Road Segment
  - Project Boundary Interest Area
  - Areas Prone to Dumping (field observed)
  - Areas Prone to Graffiti (field observed)



The dumping and graffiti prone areas happen mostly in remote sections or underlit areas. These field observations point out that without an active roadway with pedestrians and proper lighting, an area could be perceived as welcoming for trash disposal, underground graffiti and transient persons.

With an active greenway, more pedestrians and vehicles will be present which will draw more attention to maintenance and lighting issues. With these efforts, the Train Avenue Greenway could potentially solve the dumping and graffiti problems over time.



## PERCEPTION OF TRAIN AVENUE THROUGHOUT THE YEARS

Documents as far back as the 1950's mention Train Avenue as notorious for being a dumping ground. Train Avenue has been described as a burial place for old tires, mattresses, couches and scrap lumber—and the object of periodic exposes in the press. The headline of one article in the Cleveland Press (1980) read, "Welcome to Cleveland's Trash Avenue." The problem persists down to today and constitutes one of the challenges of the Greenway plan.

## COMMUNITY REACTION: RIVER SWEEP 2008

River Sweep is Ohio Canal Corridor's annual, environmental awareness and clean-up initiative. The event partners multiple non-profit organizations with private companies to clean areas along the Cuyahoga River Valley and its tributaries. On May 10, 2008 nearly 1000 volunteers cleaned up 7 communities, including Train Avenue, removing 891 illegally dumped tires and more than 18 tons of trash. Cleaning up Train Avenue's streets is the first step to establishing community support and engaging the neighborhoods in the upcoming Greenway plan.



Volunteers removed over 100 tires and countless bags full of trash and debris from Train Avenue.



Volunteers in action at River Sweep May 10 2008. "great neighbors make great neighborhoods!"



# YOUTH PERCEPTIONS OF TRAIN AVENUE



"This picture is of graffiti on a bridge and graffiti affects the environment."  
~ Jose, Scranton Elementary School



"Fix the sidewalk and clean it up. Also, take out the graffiti."  
~ Wibel, Clark Elementary School

## NEAR WEST PHOTOVOICE PROJECT

The Near West Photovoice project was an opportunity for youth at 3 Cleveland elementary schools situated along the Train Avenue Greenway to express their views using photographs and words on ways to improve the biking and walking environment in the area surrounding their schools, including proposed connections to the Greenway.

The project was led by Rainbow Babies & Children's Hospital's Injury Prevention Center and Safe Kids Greater Cleveland as part of a larger Safe Routes to School planning process funded by the Ohio Department of Transportation with additional assistance from the Cuyahoga County Coroner's office. Students were instructed by a professional photographer from the Coroner's office on the basics of photo composition, aesthetics and the ethics of photojournalism before participating in an observational field trip in the neighborhood led by Rainbow Injury Prevention Center staff. Classroom activities also included lessons on pedestrian safety and a mapping and visioning exercise to get kids thinking about their routes to and from school and ways to effectively document their experience.

Each student was asked to take a picture highlighting a positive aspect of their walk, a hazard or negative aspect and a space that could be transformed into something else. Over 200 students in grades 6-8 at Clark, Scranton and Paul E. Dunbar schools participated taking over 1,000 photos in the surrounding Near West Side neighborhoods. Besides taking photographs, students investigated crash sites of actual reported child pedestrian and bike injuries to make observations regarding possible hazards and recommendations for improvements.

The three day lesson concluded with group projects and individual essays using the photos, their words and other materials. A selection of these student photos will be included in an international photo exhibit as part of a collaboration among Safe Kids Worldwide partners in 6 countries (China, Philippines, India, South Korea, Brazil and Canada). The photo gallery event will be held locally as part of Tremont Art Walk to allow for additional public comment on creating safer routes to school.

"They should grow some more plants around that area so it could look nicer and they should put up more stop signs."  
~ Orlando, Scranton Elementary School



"I chose this photo so that everyone can see that there is not a stop sign or traffic light."  
~ Neryliz, Scranton Elementary School



"I chose this photo because the mayor has to see this and change it to a clean place"  
~ Luis, Scranton Elementary School



"This picture was taken on Train Ave. They need to take out or cut all of the branches because it is taking all of the sidewalk that nobody could walk on."  
~ Daiyanaira, Scranton Elementary School



## YOUTH PERCEPTIONS OF TRAIN AVENUE

Sometimes adults forget that Youth are well aware of their surroundings.

The area in which a child grows up reflects how they view the rest of the world as an adult. The surrounding community plays a big part in the development of a child and if there is a negative perception, the neighborhood can be distracting, disheartening, and unwelcoming. On the flipside, if a child has a positive perception, the neighborhood can bring thoughts of pride and hope, inviting the child to explore the neighborhood.

The Photovoice project was intended to draw out these perspectives of Train Avenue from youth and families living in the Train Avenue Greenway corridor. Both negative and positive perceptions were documented in essays and photos.

The Photovoice project helped identify opportunities for safe biking, bikeway connections the youth and families would like for their neighborhoods, and neighborhood improvements for the safety and quality of life along the corridor.



# ROAD & TRAFFIC INVENTORY

## ROAD CONDITIONS ALONG TRAIN AVENUE

The Road Conditions Inventory map displays URS staff field observations of the pavement conditions along Train Avenue. Pavement condition definitions were taken from the Ohio Department of Transportation.

“Very Good” pavement is stable, contains no cracking, patching or deformation and has excellent riding qualities. “Very Good” pavement does not need maintenance attention.

“Fair” pavement is generally stable, though minor structural weaknesses may be present. Riding qualities are good, although pavement may contain distress characteristics such as deformation with rutting depths up to 3/4”, noticeable thermal cracks or longitudinal cracks appearing in wheel paths. “Fair” pavement could benefit from maintenance attention.

“Poor” pavement shows areas of instability, with marked evidence of structural deficiency. Riding qualities can range from acceptable to poor and there are distress characteristics such as rut depths greater than 3/4” or alligator cracking that requires patching. “Poor” pavement is in need of immediate maintenance attention.

About 38% of Train Avenue is field observed as having “Poor” pavement conditions.

About 92% of Train Avenue is field observed as having “Poor” or “Fair” pavement conditions.

## DAILY TRAFFIC COUNTS ALONG TRAIN AVENUE AND INTERSECTING STREETS

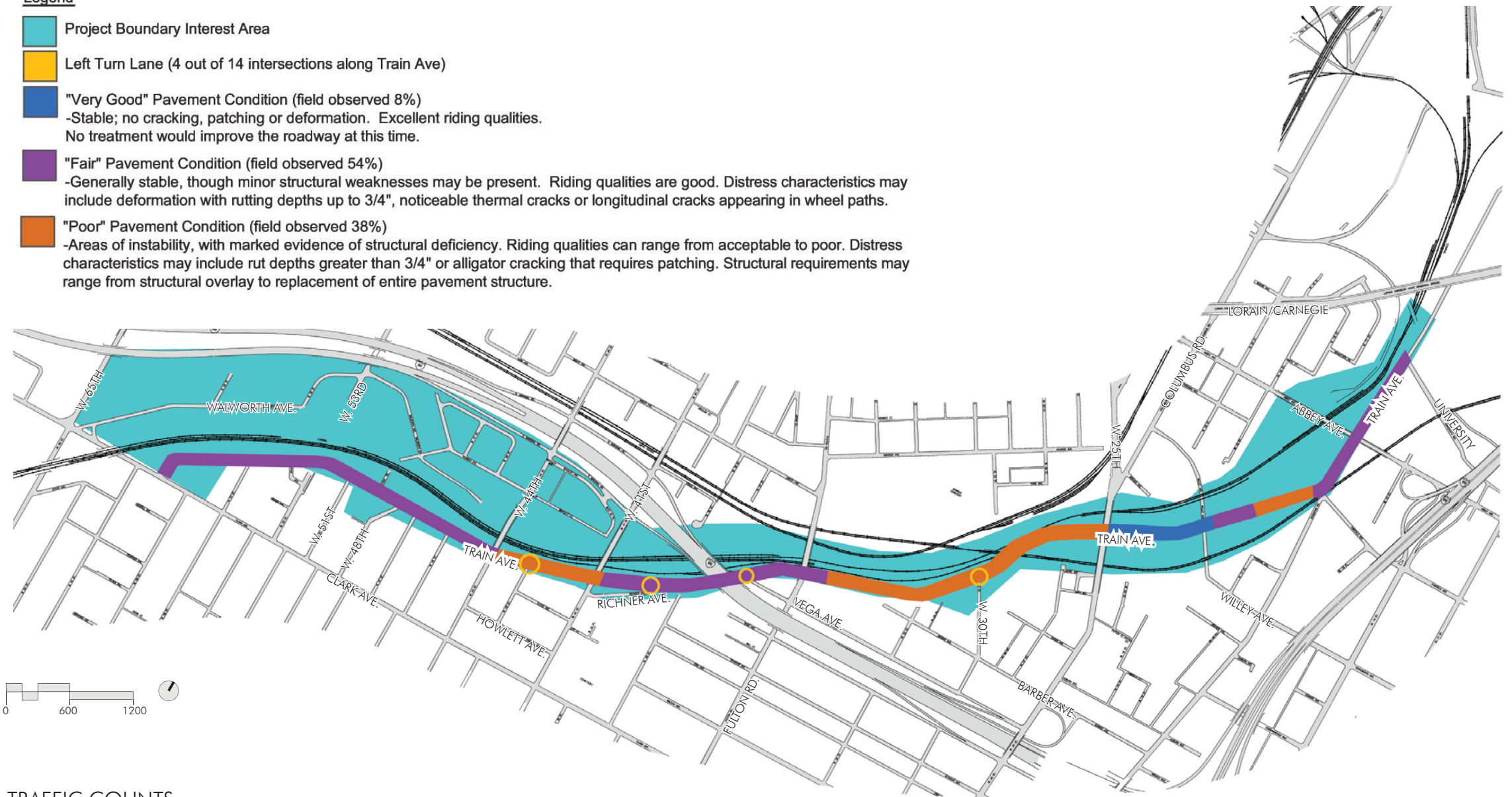
The Traffic Counts Map was created from daily traffic data from the NOACA website. The traffic counts displayed in the map are the most recent counts collected on that street; the years that data was collected range from 1989 to 2003. The numbers are the average daily traffic of 24 hours, both directions and seasonally adjusted.

The map points out that Train Avenue is not nearly as heavily travelled as any of the intersecting streets, steeping as low as 900 cars in some areas. The low traffic counts could be because of the poor road conditions, safety issues, poorly lit streets, the mostly industrial use or a number of other factors.

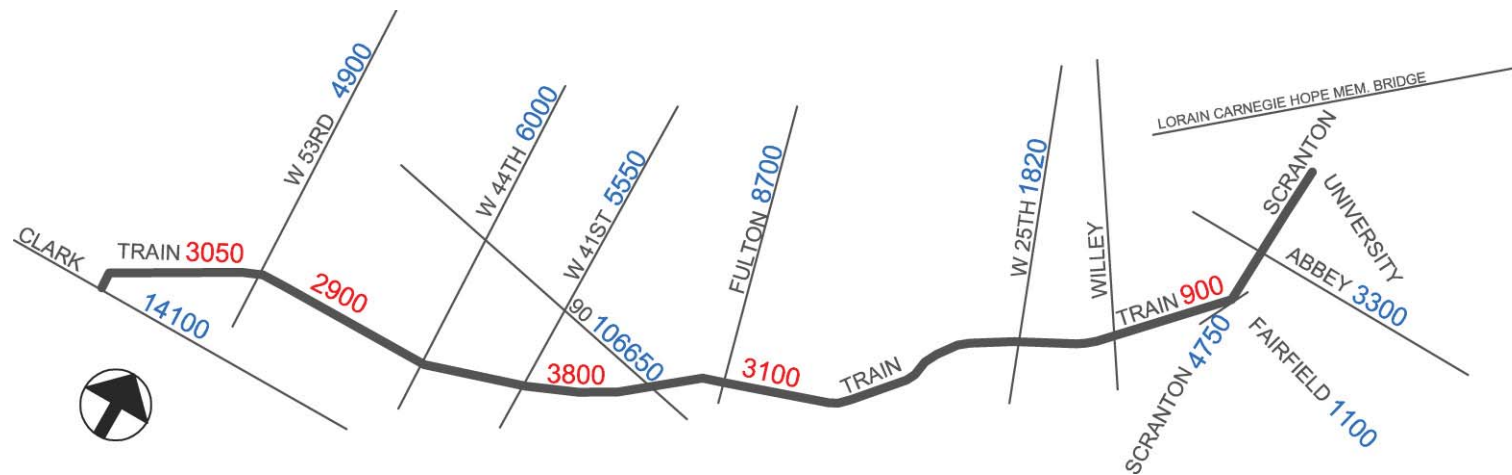
## ROAD CONDITIONS INVENTORY

### Legend

- Project Boundary Interest Area
- Left Turn Lane (4 out of 14 intersections along Train Ave)
- “Very Good” Pavement Condition (field observed 8%)  
-Stable; no cracking, patching or deformation. Excellent riding qualities. No treatment would improve the roadway at this time.
- “Fair” Pavement Condition (field observed 54%)  
-Generally stable, though minor structural weaknesses may be present. Riding qualities are good. Distress characteristics may include deformation with rutting depths up to 3/4”, noticeable thermal cracks or longitudinal cracks appearing in wheel paths.
- “Poor” Pavement Condition (field observed 38%)  
-Areas of instability, with marked evidence of structural deficiency. Riding qualities can range from acceptable to poor. Distress characteristics may include rut depths greater than 3/4” or alligator cracking that requires patching. Structural requirements may range from structural overlay to replacement of entire pavement structure.



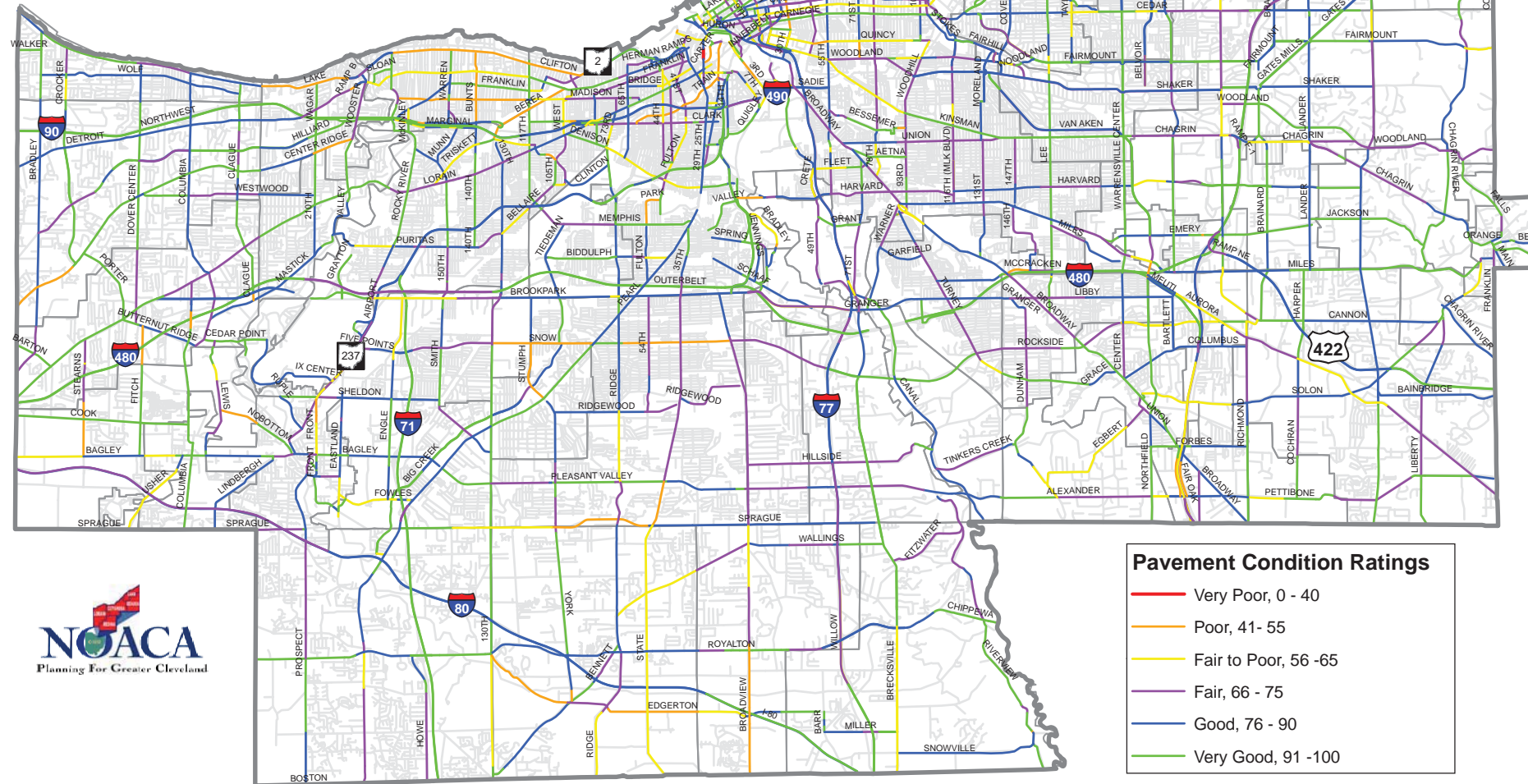
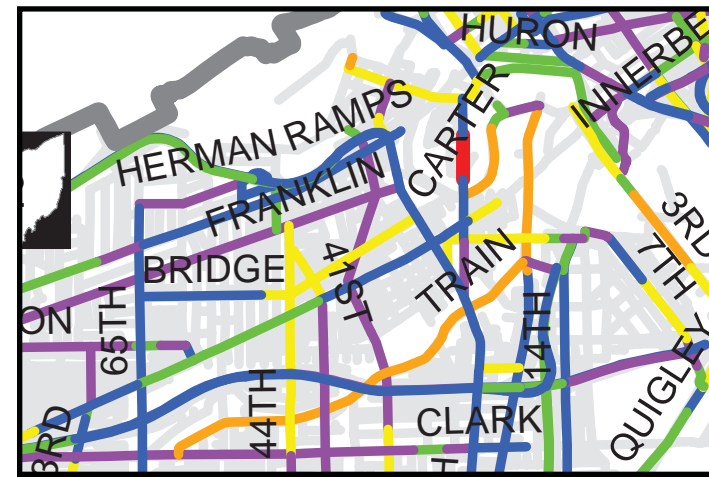
## TRAFFIC COUNTS





# 2006 Cuyahoga County Pavement Condition Ratings (PCRs)

## TRAIN AVENUE PAVEMENT CONDITIONS

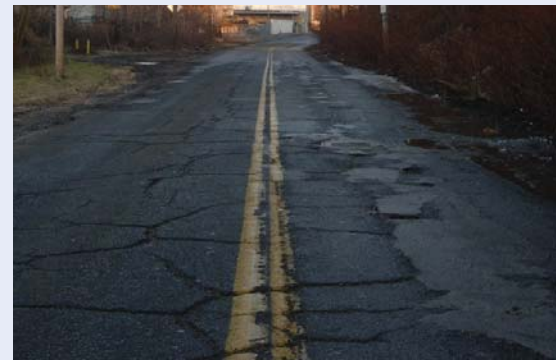


**Pavement Condition Ratings**

- Very Poor, 0 - 40
- Poor, 41- 55
- Fair to Poor, 56 -65
- Fair, 66 - 75
- Good, 76 - 90
- Very Good, 91 -100



2006 CUYAHOGA COUNTY PAVEMENT CONDITIONS RATINGS  
This map is from the Northeast Ohio Areawide Coordinating Agency website and shows pavement conditions ratings for all over Cleveland. A blow up of Train Avenue is in the top left.



**POOR PAVEMENT CONDITIONS**  
Upon field observation of Train Avenue, about 38% had poor pavement conditions with cracks, ruts, and possible structural degradation. The poor road conditions cause swerving and frequent braking of vehicles utilizing Train Avenue. The poor pavement conditions could be causing the low traffic counts along Train Avenue.



**DRAINAGE AFFECTING QUALITY**  
Poorly drained streets not only affect commuters travelling to downtown (above image) but they also affect access to businesses along Train Avenue (below image)



# 5 & 10 MINUTE WALK ANALYSIS

## THE SURROUNDING NEIGHBORHOODS WITHIN A 5 OR 10 MINUTE WALK OF TRAIN AVENUE

The 5 & 10 Minute Walk Analysis map shows all the neighborhoods that will be able to access the Train Avenue Greenway within both 5 minutes and 10 minutes. These neighborhoods would have easy access to the Greenway and would have the opportunity to use it as a neighborhood amenity on a regular basis. Notice that, because of the bridges and railroad tracks, the communities on the north side of Train Avenue are more than a 10 minute walk. These neighborhoods become priorities for examining connector and linkage opportunities.

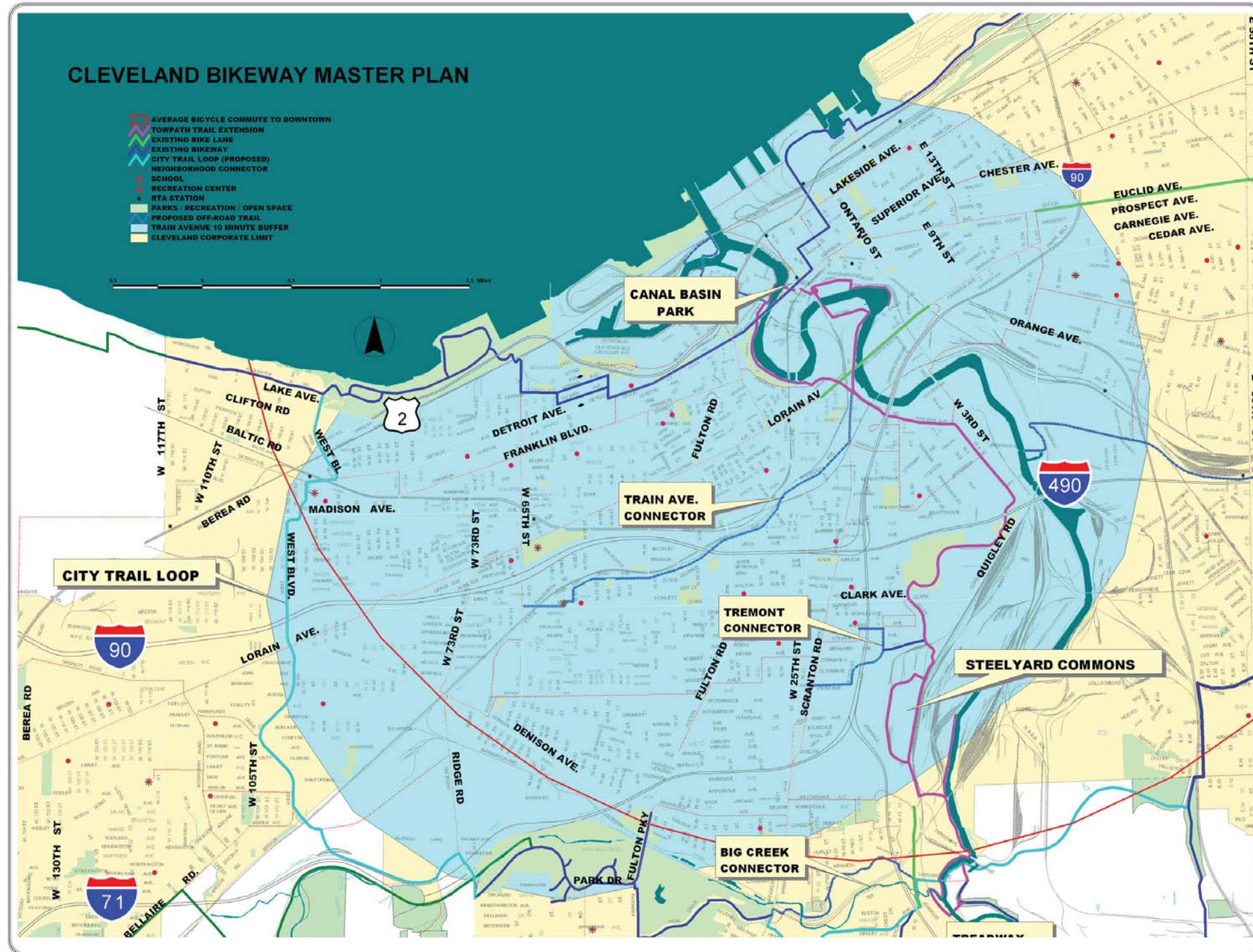
### Legend

- Train Ave/Scranton Road Segment
- 5 Min Walk along roads to Train Ave (800')
- Areas within 5 minute walk from Train Ave
- 10 Min Walk along roads to Train Ave (1600')
- Areas within 10 minute walk from Train Ave





# 10 MINUTE BIKE ANALYSIS



THE SURROUNDING NEIGHBORHOODS WITHIN A 10 MINUTE BIKE OF TRAIN AVENUE

The 10 Minute Bike Analysis map provided by the City of Cleveland Planning Commission shows all the neighborhoods that are within a 10 minute bike ride of the Train Avenue Greenway Plan. The speed used to calculate the distance is 10 mph. The map shows the large amount of neighborhoods that would benefit from the Train Avenue Greenway. A 10 minute bike ride is a comfortable distance for both recreational use and as a transportation corridor to access downtown, Edgewater Park, the West Side Market, Steelyard Commons, and other frequently used destinations.



# HISTORICAL ANALYSIS

## TRAIN AVENUE THROUGH TIME

What's in a name?

The derivation of the name "Train Avenue" is obvious. But what about Walworth? John Walworth (1765-1812) was one of the most prominent settlers of Ohio's Western Reserve. He moved from Fairport to Cleveland in 1806, when he was appointed Inspector of Revenue for the Port of Cuyahoga and Postmaster of Cleveland. His name is perpetuated in Walworth Avenue and Walworth Run, where he had a farm, according to Cleveland historian William Ganson Rose. His papers and those of his son Ashbel (1790-1844) are at the Western Reserve Historical Society.

Walworth Run, a tributary of the Cuyahoga, has been a cradle of industry since the mid-nineteenth century, when the stream supplied power via mill ponds to several mills near today's Fulton Road. These are unspecified on the maps, but they were probably grist or flouring mills.

The coming of the railroad in 1851 sealed the valley's fate. The Cleveland, Columbus & Cincinnati Railroad (later the Cleveland, Cincinnati, Chicago & St. Louis, or the "Big Four" of the New York Central) soon built livestock pens on Scranton Road, opposite Fairfield, and slaughter- and meat-packing houses sprang up along Walworth Run. Cooperages, foundries, machine shops, and a bolt and nut works (Lamson & Sessions) followed.

A landslide on November 12, 1881, wiped out the Scranton Road stock yards, which relocated to Gordon (West 65th) Street, where it became one of the largest livestock markets between Chicago and the Atlantic seaboard.

Over time, five breweries operated in or near Walworth Run: Pilsner, Standard, Union, Star, and Isaac Leisy. Joseph & Feiss Company, an important garment manufacturer, built an extensive plant on 53rd Street, at the upper end of the valley, while the Ferry Cap & Set Screw Company built and successively enlarged its plant on Scranton Road, contributing to Cleveland's prominence as a center of the fastener industry.

Meanwhile, modest workers' cottages sprang up along upper Train Avenue and on every cross street, bringing mill workers within walking distance of their jobs. These immigrant laborers included Irish, Slovaks, Czechs, Italians, and other groups, each with its distinctive Roman Catholic parish church and school.

With industrialization, Walworth Run changed from a country brook to "a filthy watercourse carrying refuse from numerous slaughter houses, breweries, and other industrial plants." It was deemed a "menace to the health of the community."

Between 1897 and 1903, the Walworth Sewer was built at a cost of \$850,000, completely obliterating the natural channel of the stream. The construction of this great brick-lined conduit, which runs beneath today's Train Avenue, was extensively documented in the Transactions of the American Society of Civil Engineers.

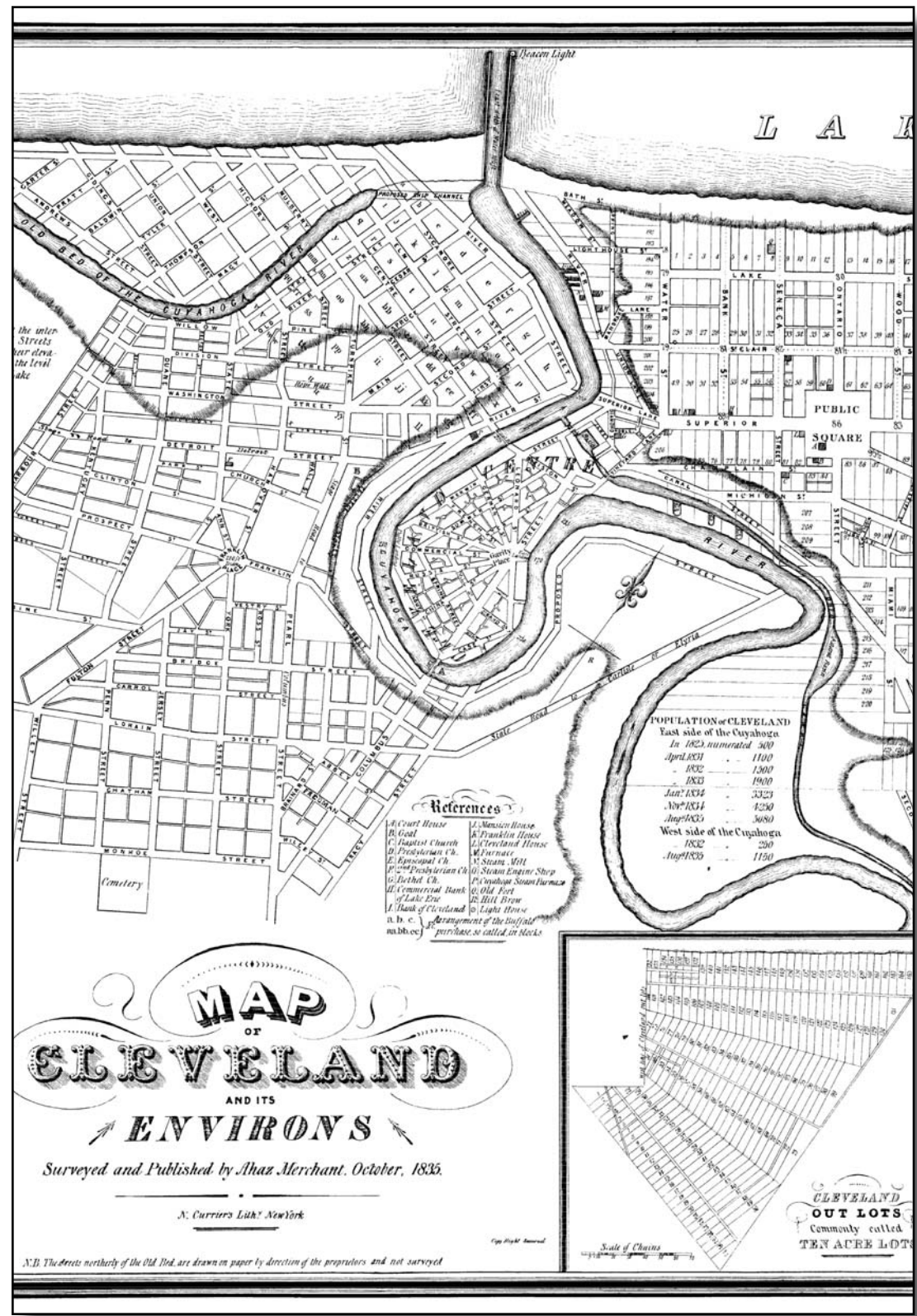
It should be noted that, until the 1920s, Train Avenue ran only as far as West 41st Street. The remainder of the roadway—then called Walworth Avenue—remained unimproved. A 1926 newspaper article described it as "reminiscent of an old trail of the covered wagon in frontier days ... a misplaced cowpath in an area teeming with industrial life ..." The article announced the city's plan to construct and pave a road that would provide an important new traffic artery leading (via Scranton and Eagle roads) to downtown Cleveland. Today's Train Avenue was the result.

After World War II, the area's demographics changed with the arrival of significant numbers of Appalachians and Puerto Ricans seeking work in area industries.

Train Avenue by then had become a notorious dumping ground—the burial place for old tires, mattresses, couches, and scrap lumber—and the object of periodic exposes in the press. The headline of one article in the Cleveland Press (1980) read, "Welcome to Cleveland's Trash Avenue." The problem persists down to our own day and constitutes one of the challenges of the Greenway project.

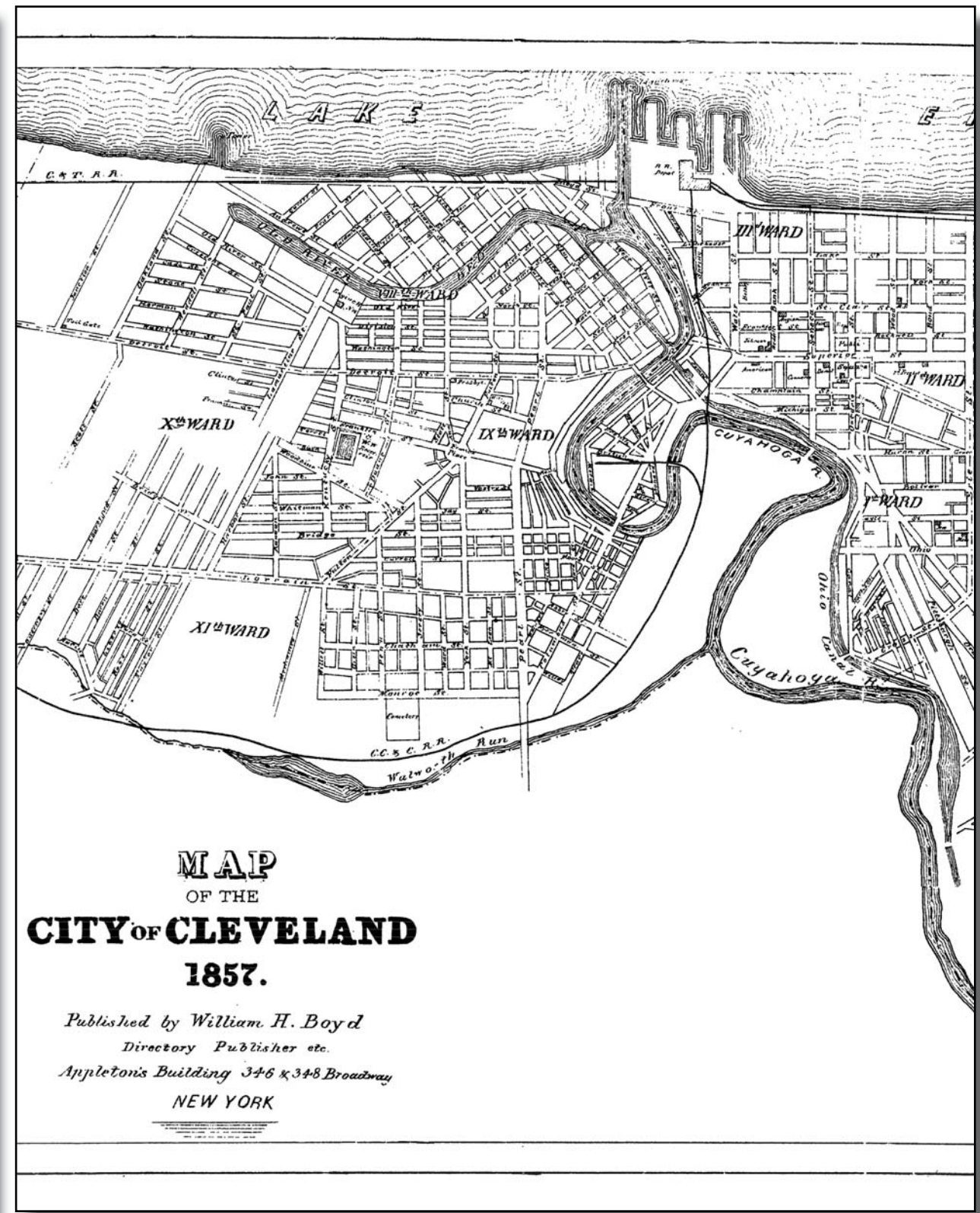


### 1800's - 1840's THE CANAL



1835, surveyed and published by Ahaz Merchant

### 1840's - 1860's THE RAILROAD

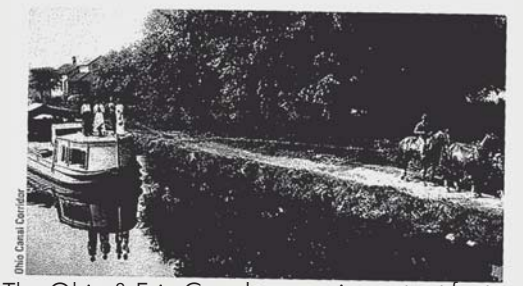


1857, published by William H. Boyd

### THE EVOLUTION OF TODAY'S TRAIN AVE

**1800's-1840's: THE CANAL**  
The Ohio and Erie Canal, completed in 1832, stretched from Cleveland to Portsmouth, Ohio and was one of the major factors in molding what Cleveland is today. The Canal opened up access to Lake Erie, creating a water highway, and sparking an explosion of industry all over Cleveland.

The map to the left, from 1835, shows the Canal on the east side of the Cuyahoga River and the development that was built around it.



The Ohio & Erie Canal was an important factor in molding Cleveland in what it is today.

**1840's-1860's: THE RAILROAD**  
With the incoming industry from the Canal, Cleveland was able to expand its industrial zone across the river. In 1851, a new transportation network was created to transport goods and expand the Near-West side industry- the railroad.

The map to the right, from 1857, shows how the railroad ran along Walworth Run, pushing development closer to the tributary.



The railroad opened up new industrial opportunities along Walworth Run and the Near-West side.

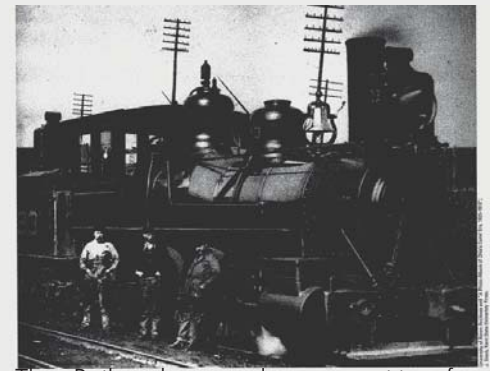


THE EVOLUTION OF TODAY'S TRAIN AVE

1860's-1880's:THE INDUSTRY

The coming of the railroad created an explosion of industry on the Near West Side. The Cleveland, Columbus & Cincinnati Railroad (later the Cleveland, Cincinnati, Chicago & St. Louis, or the "Big Four" of the New York Central) built livestock pens on Scranton Road, opposite Fairfield, and slaughter- and meat-packing houses sprang up along Walworth Run. Cooperages, foundries, machine shops, and a bolt and nut works soon (Lamson & Sessions) followed.

The map to the left, from 1884, shows how the railroad sparked development along Walworth Run, including the construction of Train Road, which will later become today's Train Avenue.



The Railroad created opportunities for industry along Walworth Run with Train Road built alongside the train tracks.

1880's-1900's: THE CULVERT

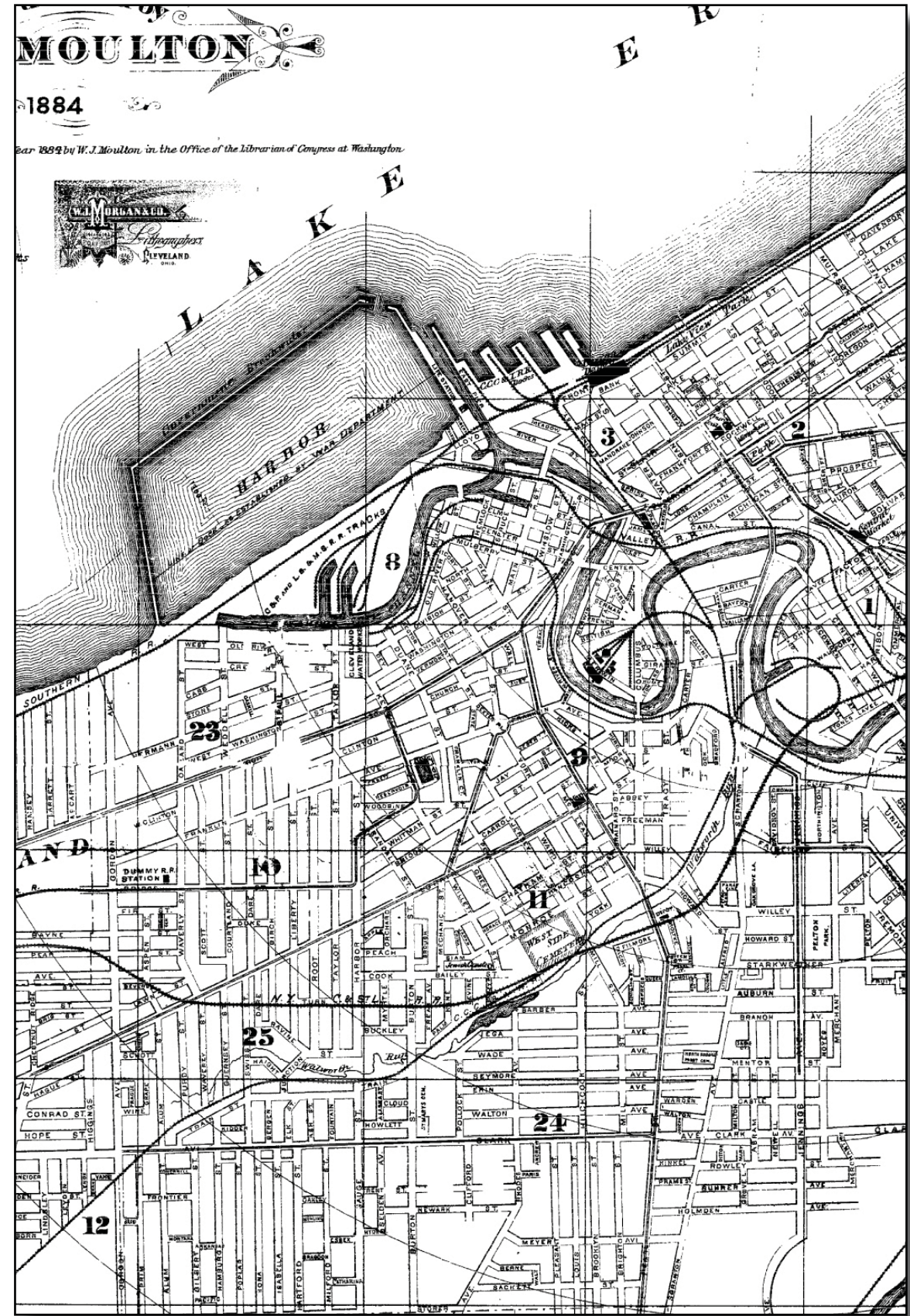
With the onset of slaughterhouses combined with a landslide in 1881, Walworth Run was deemed a "menace to the health of the community." The construction of the Walworth sewer started in 1897 and was completed in 1903. Walworth Run was culverted in a combined sewer overflow and the natural waterway disappeared forever.

The map to the right, from 1898, shows Walworth Run culverted to create Train Road and Walworth Avenue.

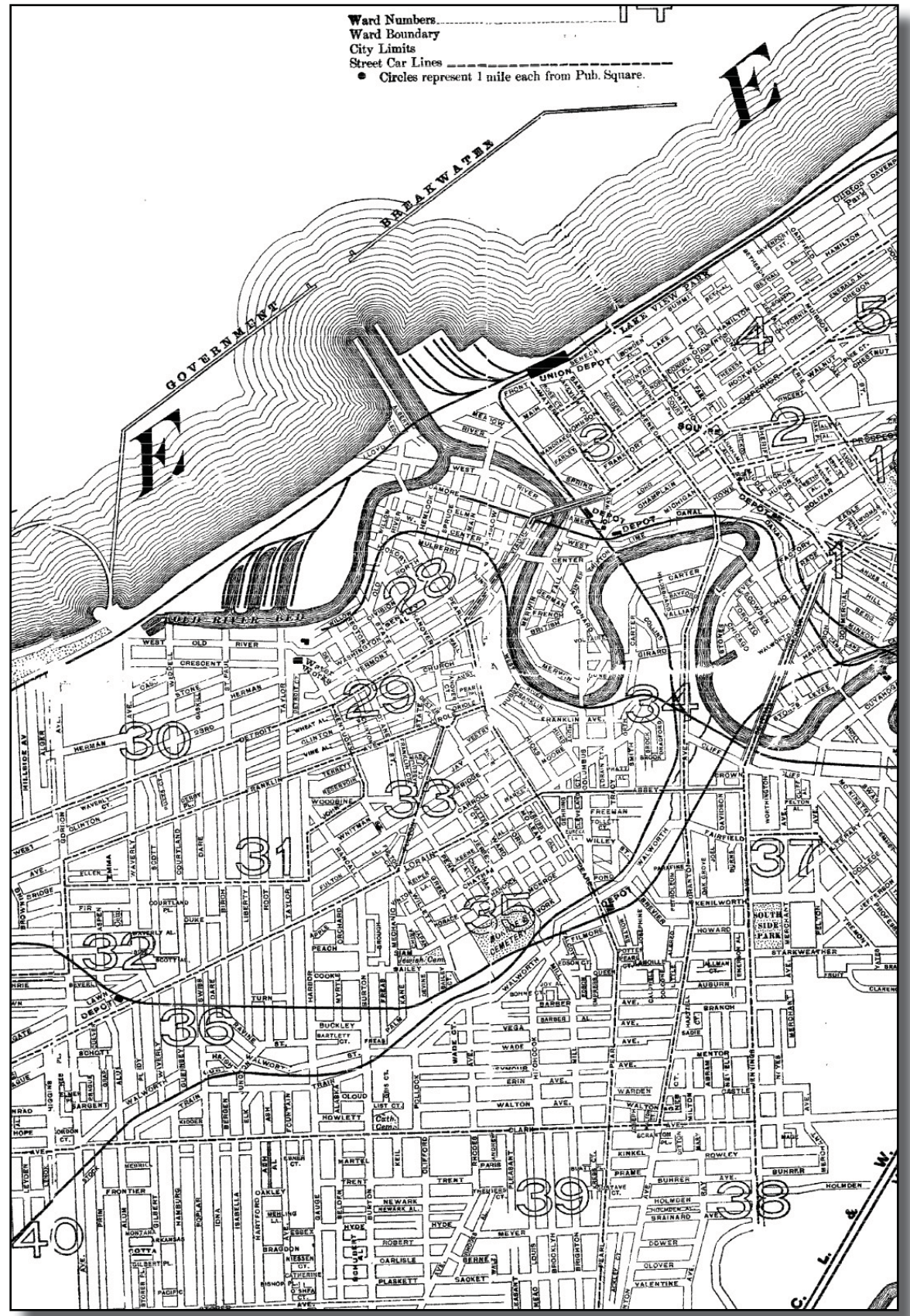


Walworth Run was culverted in a combined sewer overflow.

1860's - 1880's THE INDUSTRY



1880's - 1900's THE CULVERT





# 1900's - TODAY DEVELOPMENT EXPLOSION



## TODAY'S RAILROAD REMNANTS



## THE EVOLUTION OF TODAY'S TRAIN AVE

### 1900's-TODAY: DEVELOPMENT EXPLOSION

Cleveland was booming from industry and heavy manufacturing until the 1960's when industries began to slump, and residents sought new housing in the suburbs. Today's Train Avenue still holds the character of the Walworth Valley, leaving behind a graveyard of factory buildings and railroad remains.

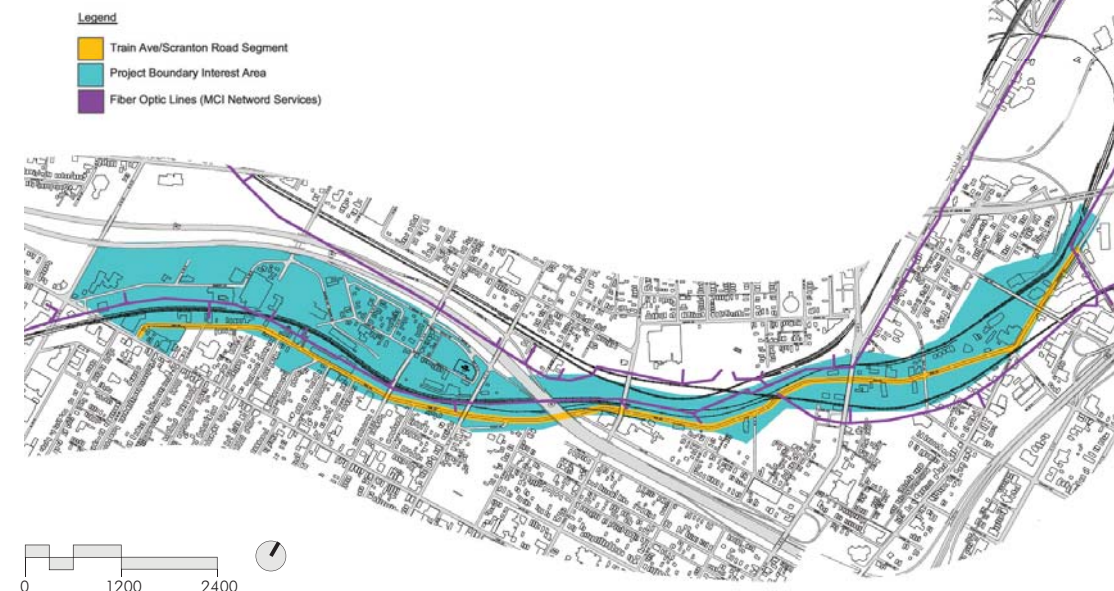
### TODAY'S RAILROAD REMNANTS

Most of the railroad lines along Train Avenue are active, however segments have been abandoned, leaving behind skeletons and memories of what the industry was a hundred years ago. The railroad lines play an important part as both the character of the Train Avenue Greenway and a safety consideration for pedestrians and trail-goers.

### FIBER OPTIC UTILITY LINES

The Fiber Optic Utility Lines map shows the fiber optic lines that run within the Train Avenue Greenway study area. These fiber optic utilities typically run along the existing railroad lines and contain high bandwidth data. The original railroad from the 1850's plays an interesting juxtaposition with the high speed internet, cable, telephone, and other higher bandwidth data running alongside.

## FIBER OPTIC UTILITY LINES





# HISTORIC WALWORTH RUN

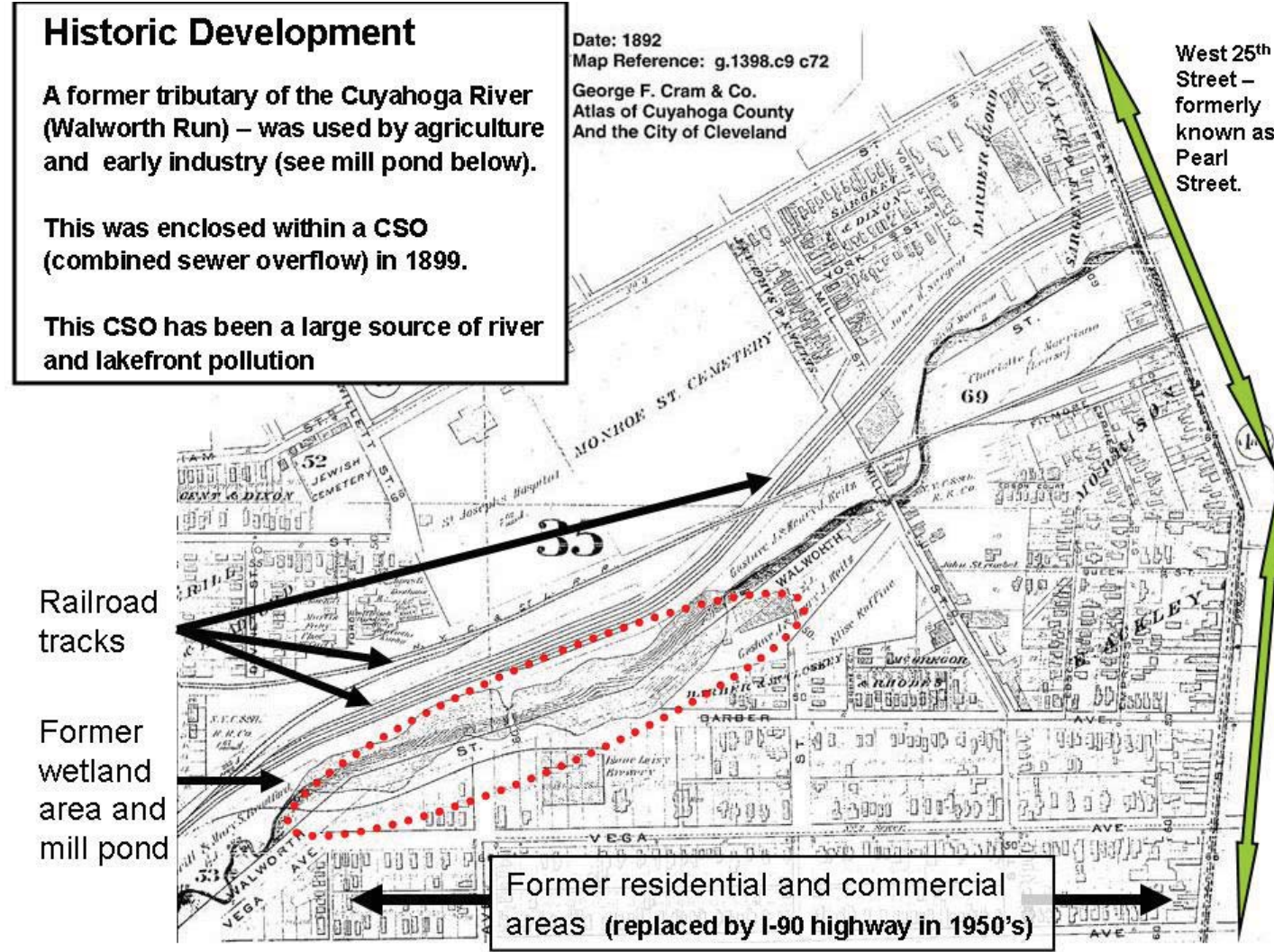
## HISTORIC WALWORTH RUN

### HISTORIC WALWORTH RUN

Walworth Run was a tributary of the Cuyahoga River, running from east to west and providing both a natural amenity for residents and function for the agriculture and early industries. From the American Society of Civil Engineers (ASCE) document "Transactions Paper No. 1011" written in 1905, the significance of Walworth Run is highlighted. "It is so important a feature in the topography of the city that it forms the boundary between what is locally known as the 'West Side' and the 'South Side' portions of the city."

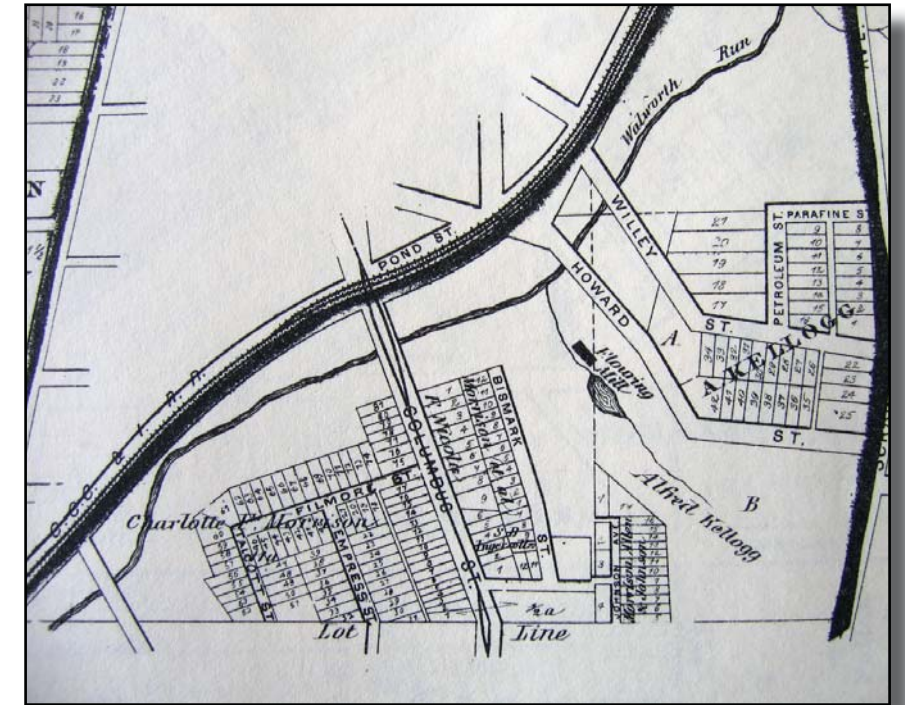
### HISTORIC MILL POND

Walworth Run has been a cradle of industry since the mid-nineteenth century, when the stream supplied power via mill ponds to several mills near today's Fulton Road. These mill ponds were most likely for grist or flouring mills.

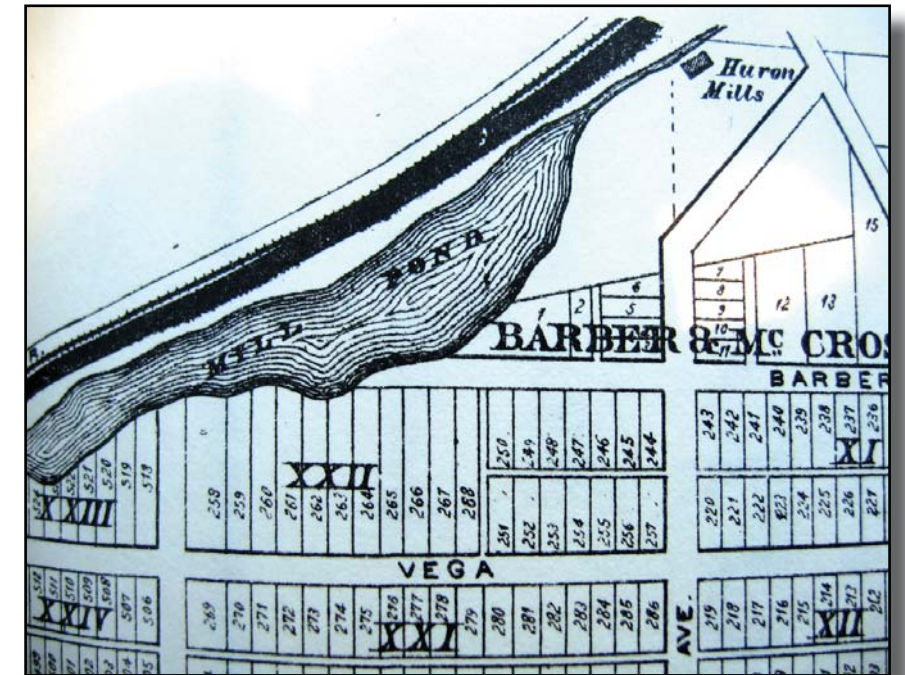


Excerpted from the City of Cleveland - West 25th Street Corridor Strategic Land Use Plan, Foundry Hill

## HISTORIC WALWORTH RUN TRIBUTARY



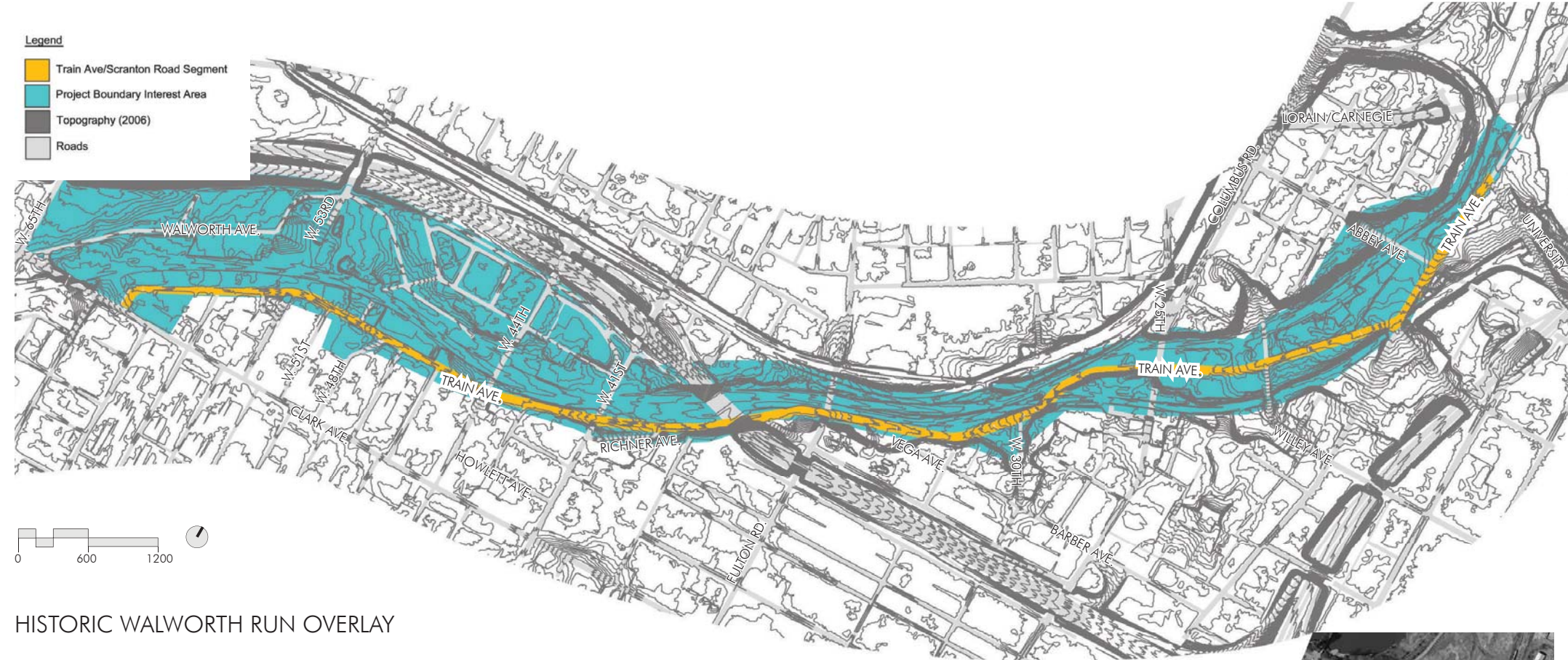
## HISTORIC MILL POND



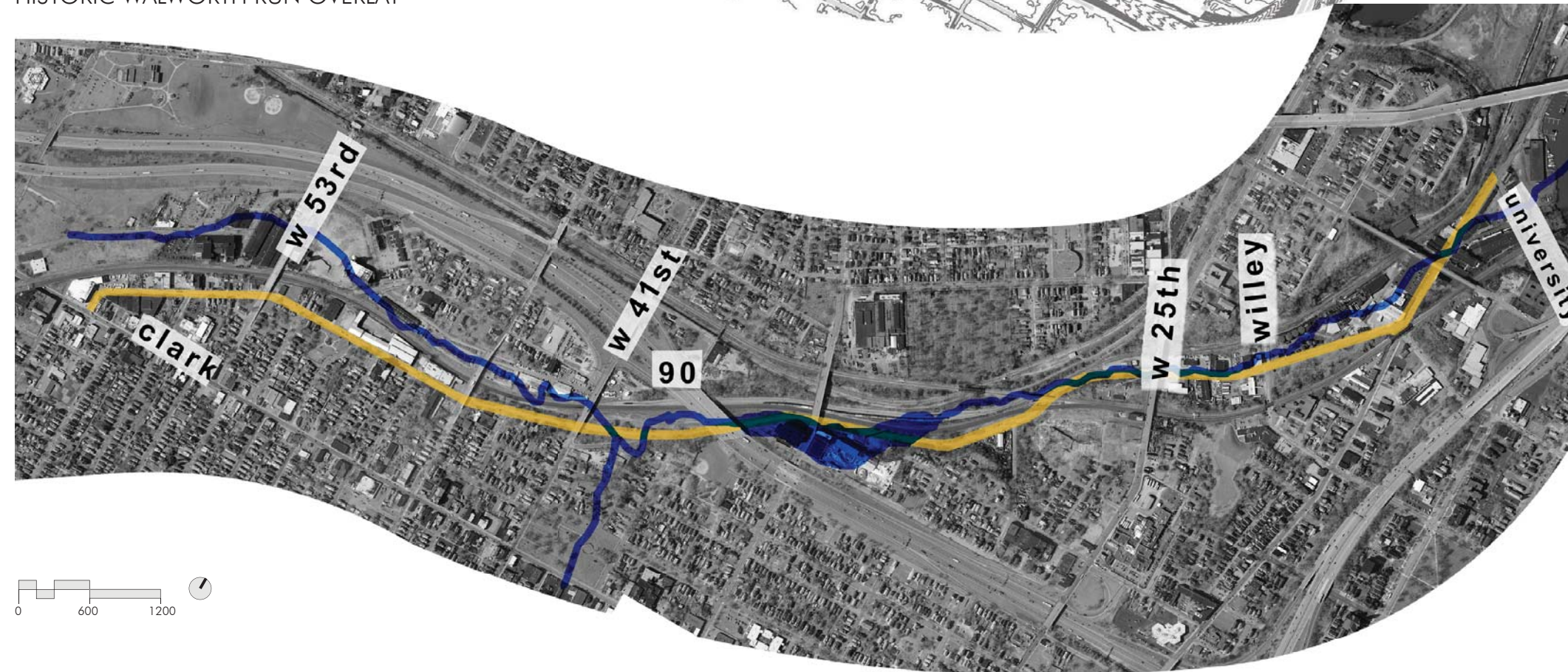


# THE WALWORTH VALLEY AND TRAIN AVENUE TODAY

## TOPOGRAPHY OF THE WALWORTH VALLEY



## HISTORIC WALWORTH RUN OVERLAY



TODAY'S TOPOGRAPHY AROUND TRAIN AVENUE AS A PART OF THE WALWORTH RUN VALLEY

The Train Avenue Greenway lies within the Walworth Run Valley, as shown on the Topography & the Walworth Run Valley map. The surrounding topography separates Train Avenue from the surrounding neighborhoods both physically and psychologically.

The topography makes Train Avenue feel remote and isolated from the rest of the communities. The remoteness poses constraints in becoming a popular spot for trash collection and graffiti artists.

The topography also creates opportunities by being reminiscent of the historic Walworth Run and playing a large part in the character of the area. As quoted from a community member's reaction to the current Train Avenue: "Train Avenue has a peaceful, park like feel to it, reminiscent of a country road".

## HISTORIC WALWORTH RUN OVERLAY

The Historic Walworth Run Overlay map shows Walworth Run before 1897 when it was culverted overlaid onto today's Train Avenue. The historic stream weaves back and forth along today's Train Avenue, with the mill pond directly in the heart of the greenest part of the road.

This historic stream presents opportunities for historical interpretation in the Train Avenue Greenway design.



THE HISTORIC WALWORTH RUN AND IT'S INFLUENCES ON TRAIN AVENUE AND THE WALWORTH CSO

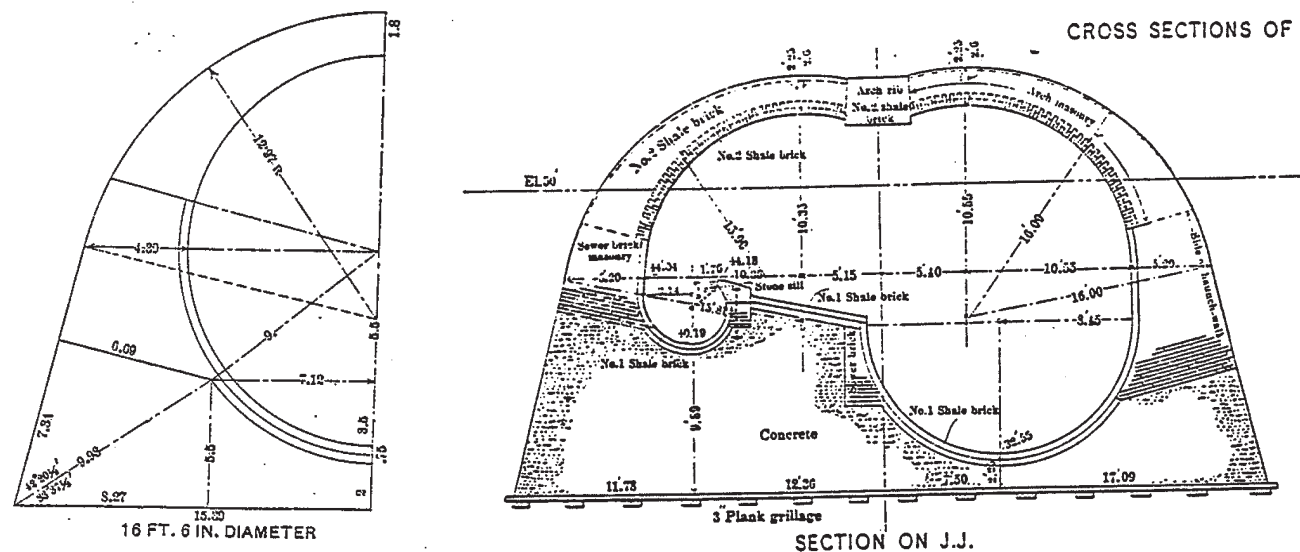
The American Society of Civil Engineers has extensively documented the design and construction for the Walworth CSO in a 412 page document "Transactions Paper No. 1011" presented in 1905. This document states:

"...for more than 20 years the stream had been foul, and a menace to the health of the community..."

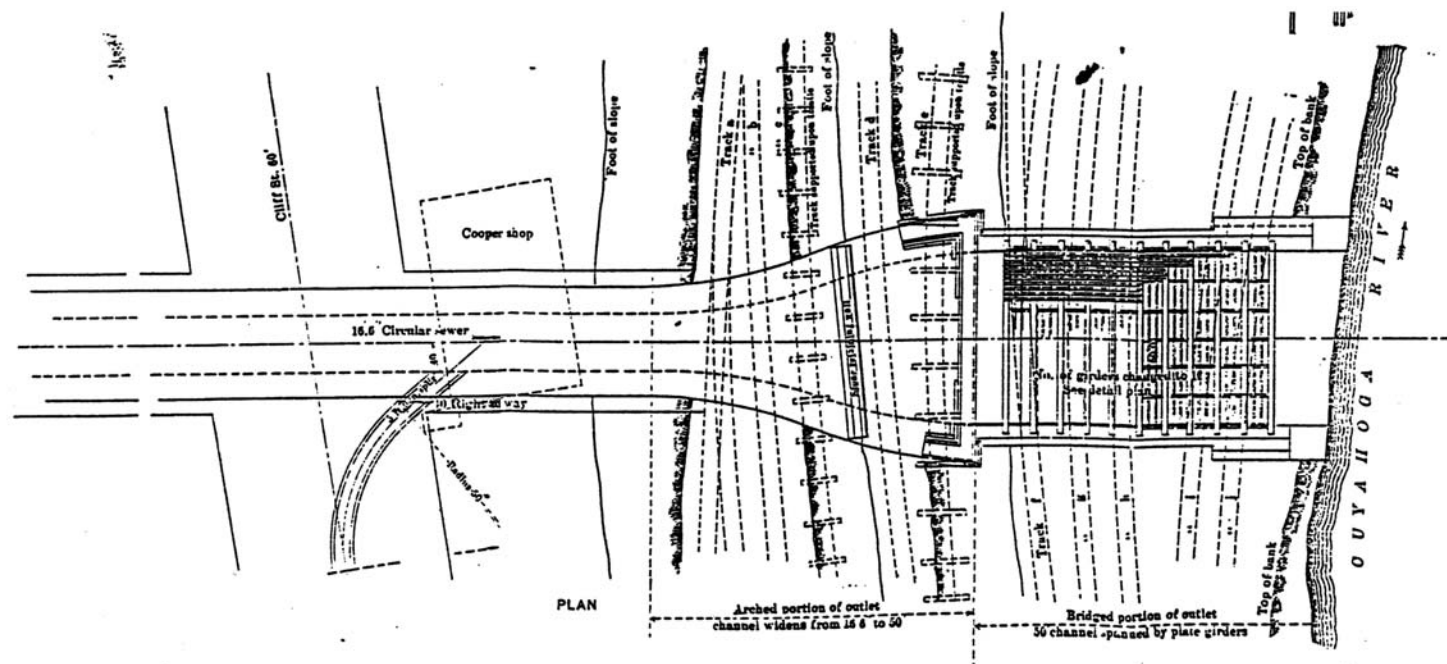
"In the development of the city the stream had gradually changed from a country brook to a filthy watercourse carrying refuse from numerous slaughter houses, breweries and other industrial plants."

Because of these health hazards the Walworth CSO had to be constructed.

HISTORIC WALWORTH RUN CSO



Extensive mathematics and engineering went into the design of the Walworth CSO. The pipe, made of hand laid brick and concrete is on average 16.5 feet in diameter and contains 2 sections- the upper section for sewage and the lower for stormwater. In heavy rains the fluids in these two sections will mix.



One of the design challenges of the CSO was transitioning the outlet from a 16.5 foot diameter pipe to a 50 foot wide channel spilling out into the Cuyahoga River.

STORM OF AUGUST 4th, 1888, IN SIXTH AVENUE SEWER. FROM 221 ACRES, 90% IMPERVIOUS ROOFS AND PAVEMENTS. TIME OF CONCENTRATION, 25 MINUTES.

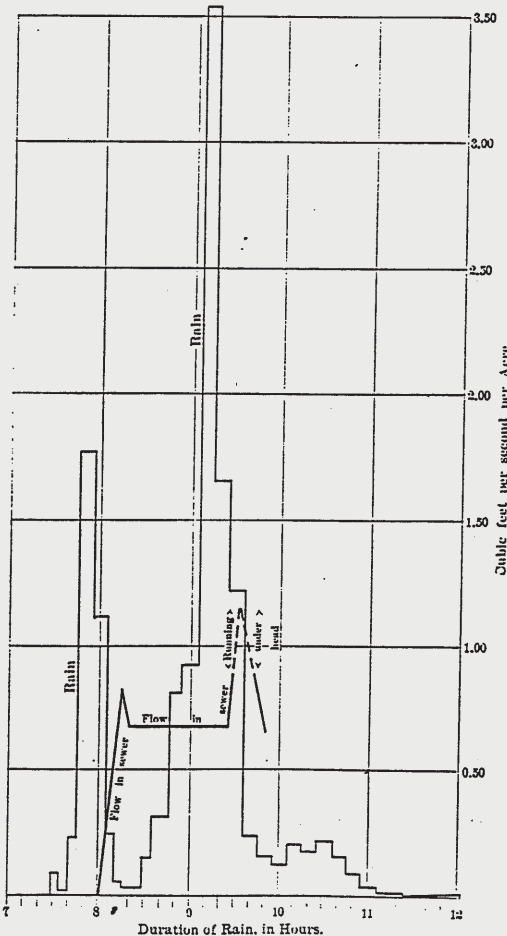
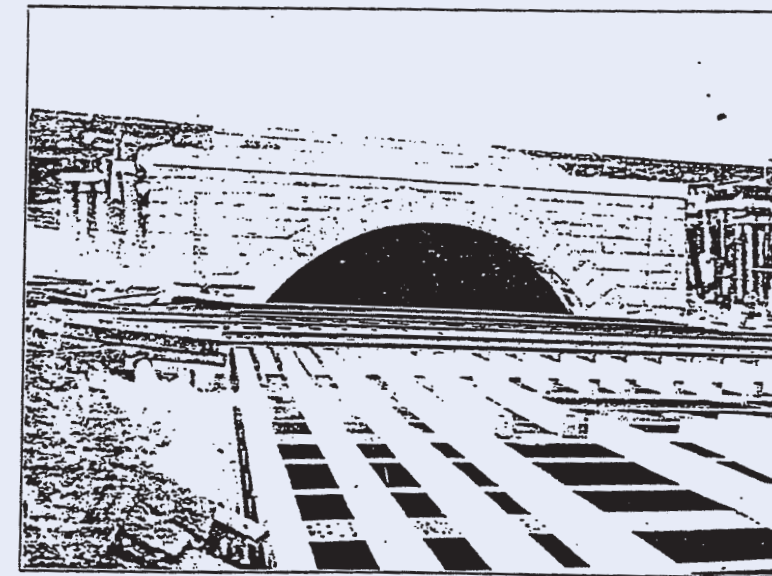


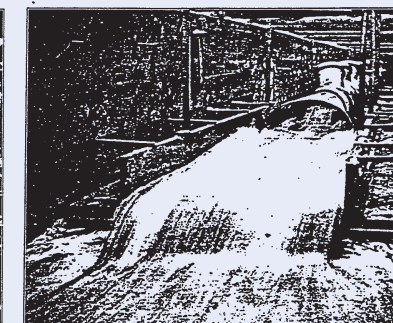
FIG. 15.



The Walworth CSO drains approximately 3000 acres.

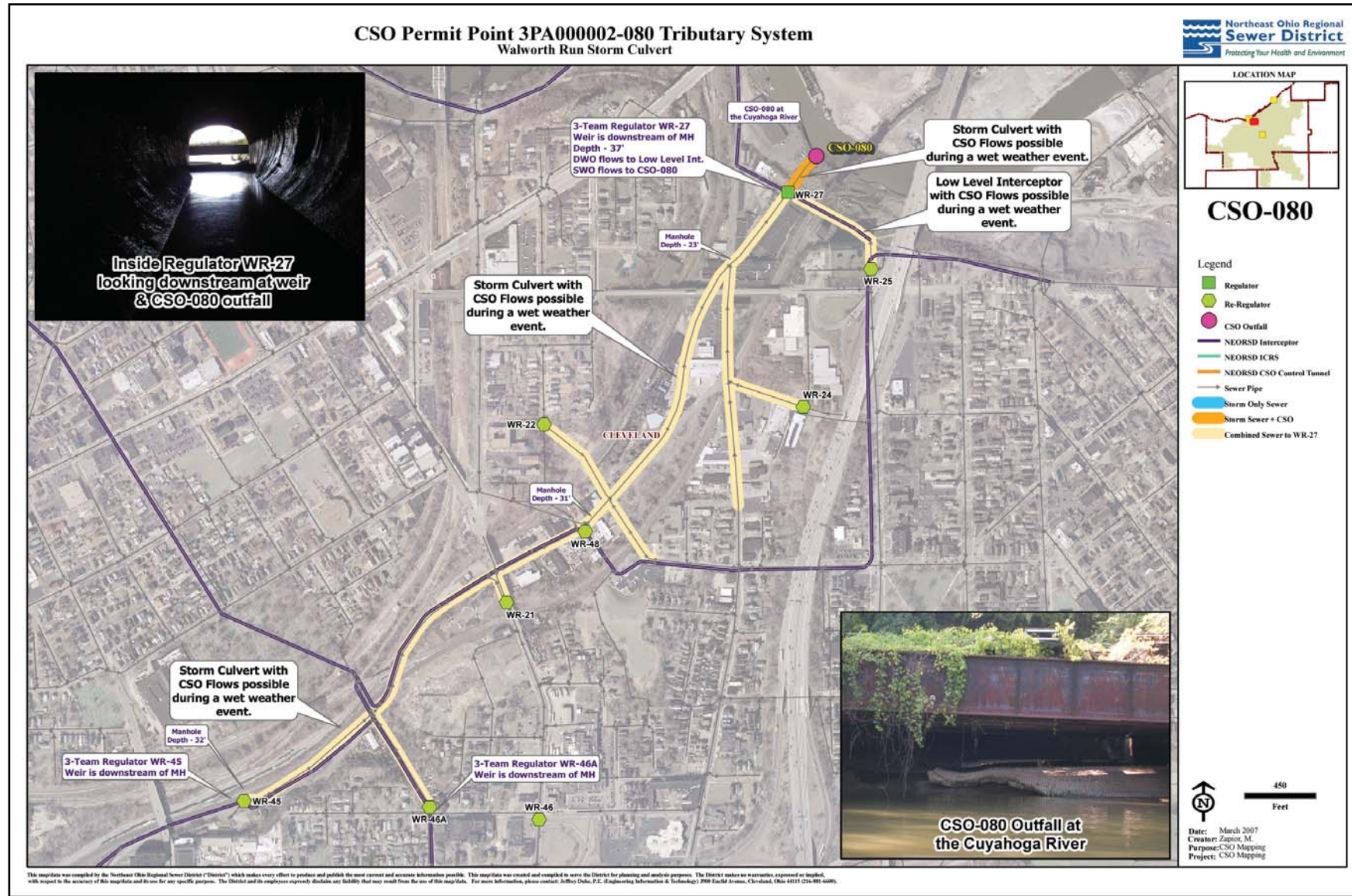


Construction of the Walworth CSO was from 1897 to 1903.



The CSO was built at a cost of \$850,000





## WALWORTH RUN CSO

### COMBINED SEWER OVERFLOW ISSUES IN THE WALWORTH RUN NEIGHBORHOOD

The cost of complying with Federal mandates to reduce Combined Sewer Overflows, and improve water quality in the Cuyahoga River and Lake Erie represents several billion dollars. The Walworth Run CSO is the largest Combined Sewer Overflow (CSO) on Cleveland's west side, discharging 320 million gallons of raw sewage per year and accounting for 77% of all the untreated discharge for the Westerly Sewage Treatment Plant. Flowing directly into the Cuyahoga River, this sewage discharge occurs 43 times a year – approximately once every 9 days. The North East Ohio Sewer District (NEORSB) recently recommended the creation of a Storage Tunnel estimated at \$106 million dollars to relieve this excessive discharge.

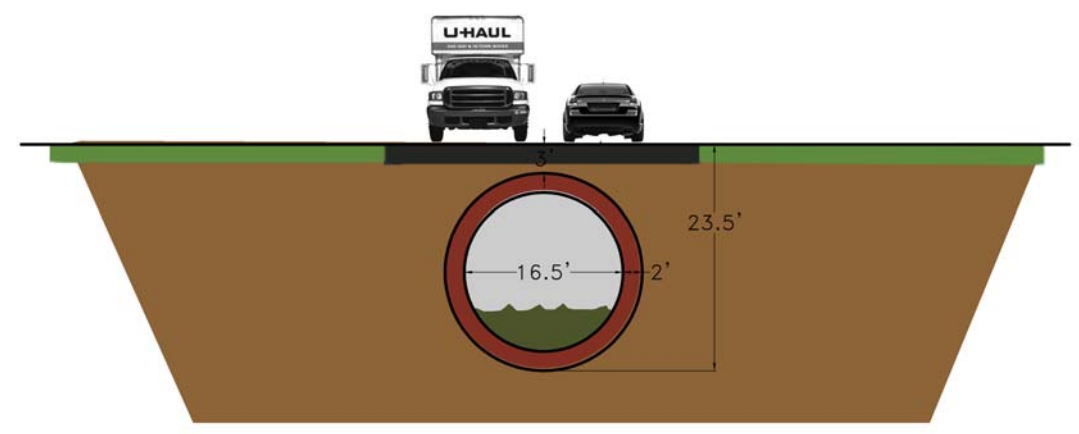
### UTILITY LINES FOR TRAIN AVENUE GREENWAY STUDY AREA: WATER, SEWER & COMBINED SEWER OVERFLOW LINES

The Water, Sewer & CSO Utility Lines map shows these underground utilities in the Train Avenue Greenway study area. Water and sewer lines typically run along the streets in the surrounding neighborhoods while the Combined Sewer Overflow (CSO), a pipe that contains both sewer and water lines, lies directly underneath Train Avenue. The former Walworth Run is culverted into this CSO.

## WATER, SEWER, AND COMBINED SEWER OVERFLOW UTILITY LINES



## SECTION OF EXISTING CSO UNDERNEATH TRAIN AVENUE



## SECTION OF EXISTING CSO UNDERNEATH TRAIN AVENUE

The section on the bottom right shows the 16.5' diameter Combined Sewer Overflow that lies directly underneath Train Avenue. This massive structure creates both opportunities and constraints for the Train Avenue Greenway Plan.



## HISTORICAL BUILDING ANALYSIS

There are four previously recorded buildings from the Ohio Historic Inventory. From west to east, these are:

- **Standard Brewing Co. Bottling Works** – 5801 Train Ave. (1908)

- **Gustav Schaefer Wagon Co.** (which had an earlier incarnation as the Union Brewing Co.) – a multi-story red brick building on Train Ave. between W. 46th & W. 47th (ca. 1885)

- And, straddling Fulton Rd., two multistory buildings that once housed the **Isaac Leisy Brewing Co.** – at 3400 Vega & 2400 Fulton (both late 19th century)

In addition to these, resources that are 50 years old or older were identified. The other structures identified to date are:

- Two additions to **Standard Brewing** – one 2-story building of 1916, one 1-story building of the 1930s.

- **Apex Paper Box Company** – 5601 Walworth, a red brick factory formerly occupied by the Russ Manufacturing Company (inc. 1901), a mfr. of soda fountains, carbonators, beer pumps, and luncheonette equipment.

- Two **Joseph & Feiss' Clothcraft Clothes** factory buildings from 1920 – one two-story building with tower, one 4-story building with tower, water tower, and stack.

- The **Fairmont Creamery Company** – 2310-36 W. 17th – a multistory red brick plant built in 1930. Fairmont was mfr. And wholesale dealer in butter, eggs, cheese, and poultry.

- **Bestway Industries, Inc.** – 4411 Train Ave. – a metal-clad factory with monitor roof. Producer of specialty slitting machinery, as well as drilling and exploration equipment.

- **Byrne Sign Supply** – 1880 Train Ave. (formerly 1831 Willey Ave.), formerly home of Standard Paint & Lead Works, Inc.

- **Werner G. Smith, Inc.** – 1730 Train Ave., two corbelled brick buildings – processing synthetic, vegetable & fish oils since 1950. Formerly home of the Barrett Company, tar & tar paper manufacturers.

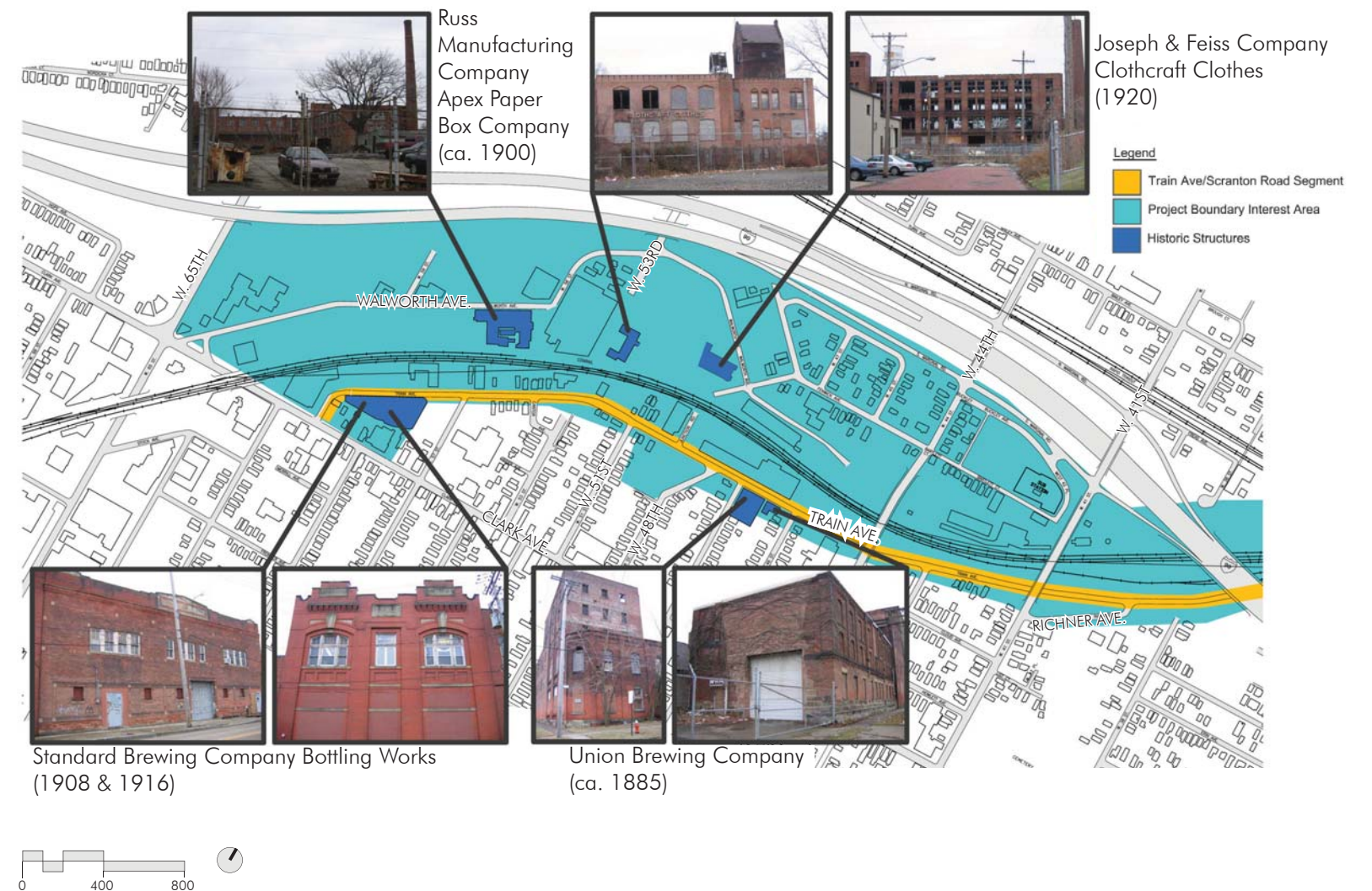
- The **Nickel Plate (now CSX) Railroad Trestle**, a camelback truss dating from ca. 1900.

- **Ferry Cap & Set Screw Company** – 2151 Scranton Rd., previously inventoried by the Historic American Engineering Record, a multi-story brick mill complex built and continuously enlarged between 1907 and 1919. It is the last company left in an area that was once an important center of the fastener industry.

## HISTORICAL BUILDING ANALYSIS

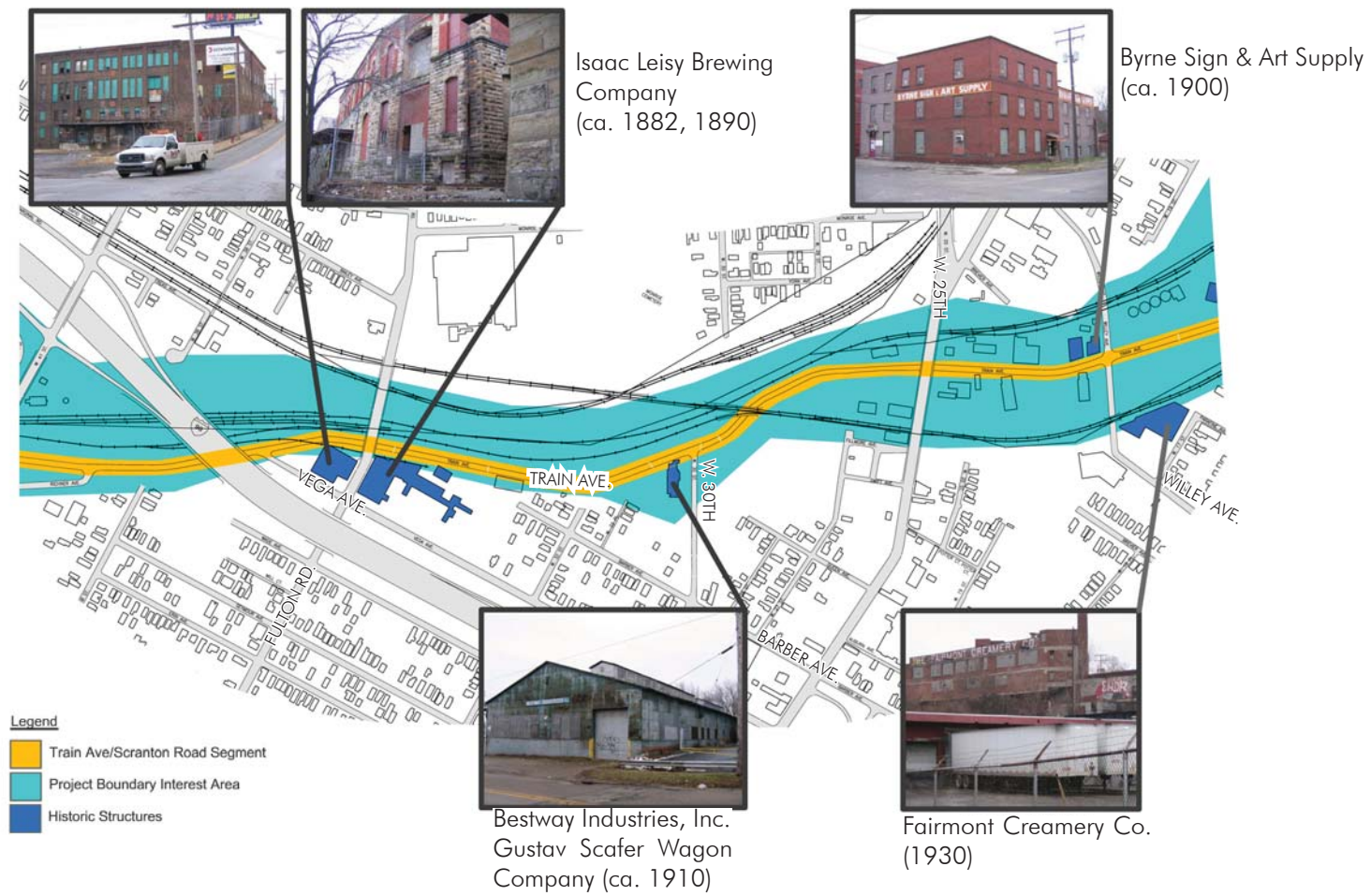
The Historical Building Analysis maps identify the historic resources within the Train Avenue Greenway corridor. The structures identified on the maps are the results of both URS field surveys and a search of records of the Cleveland Landmarks Commission for buildings previously recorded by the Ohio Historic Inventory.

## HISTORICAL BUILDING ANALYSIS: WEST SIDE





HISTORICAL BUILDING ANALYSIS: CENTRAL AREA



HISTORICAL BUILDING ANALYSIS: EAST SIDE





## SUMMARY OF OPPORTUNITIES & CONSTRAINTS

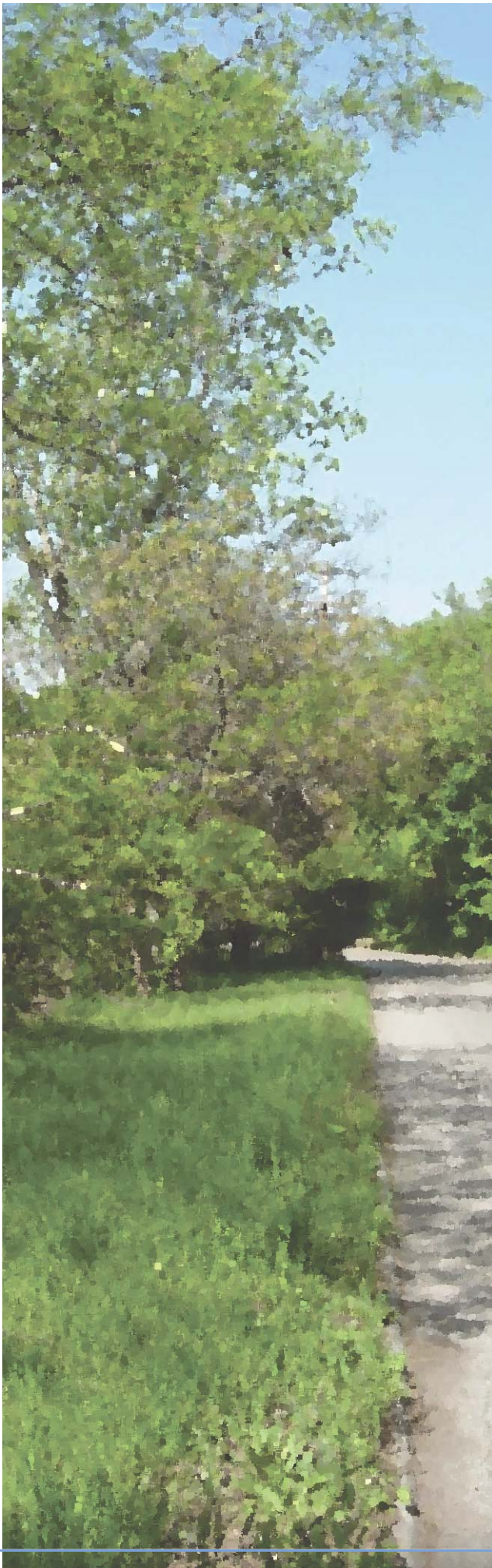
### ISSUES AND DESIGN CHALLENGES

- Space constraints of bridges, buildings and narrow right-of-ways
- Coordination with businesses, industries, and their truck traffic along Train Avenue
- Vacant and underutilized land
- Illegal dumping and graffiti creating a negative image
- Current road pavement conditions as a menace to drivers, creating low traffic counts
- Linkage constraints across a highway and railroad tracks
- Topographic challenges with drainage and secluded atmosphere
- A 16.5' CSO underneath the road

### OPPORTUNITIES AND DESIGN POSSIBILITIES

- Opportunities to link public properties in local neighborhoods as well as regional linkages
- Part of several networks: the Towpath Trail, Cleveland Bikeway Masterplan and the Cuyahoga County Greenspace Plan
- Bridges, historic buildings and existing greenery are opportunities to enhance the character of the industrial valley
- A greenway to spark the development of vacant and underutilized land and development of greenspaces to improve the neighborhoods
- Neighborhoods to the north are priorities for examining connector trails and linkages
- Historical interpretation opportunities for buildings, historic Walworth Run and mill pond





# SECTION 3: GREENWAY ALTERNATIVES

- Roadway Analysis
- Trail Alternatives
  - Bike Lanes On The Road
  - Bike Trail Next To Rail
  - Beside The Road All-Purpose Trail
- Greening & Regeneration
- Examining Daylighting
- Green Infrastructure Alternatives
  - Streetside Bioswales
  - Naturalized Bioswales
  - Vacant Lot Raingardens
- Other Greenway Enhancements
- Summary



# ROADWAY RECOMMENDATIONS & RIGHT-OF-WAY ANALYSIS

## SECTION 3: GREENWAY ALTERNATIVES

The Greenway Alternatives section of this document corresponds with Phase 2 of the NOACA TLCI Grant.

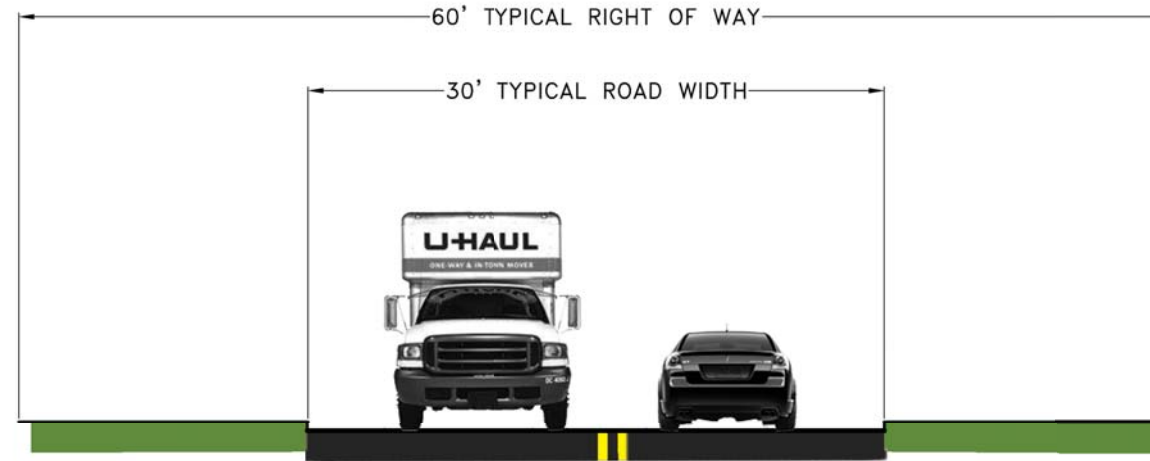
The Greenway Alternatives Phase presented a series of alternatives for the Advisory and Steering Committees to discuss. Greenway Alternatives is organized into five main sections:

- Roadway Recommendations
- Trail Alternatives
- Greening & Regeneration
- Green Infrastructure Alternatives
- Other Greenway Enhancements

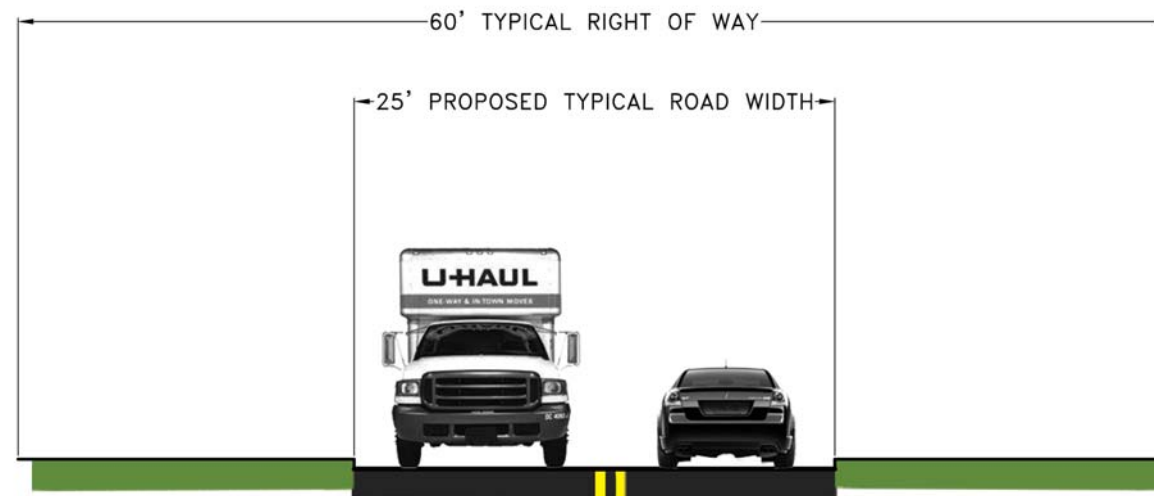
The Advisory and Steering Committees provided feedback to weigh the benefits and limitations of each concept. A matrix of pros and cons was compiled for each of the main categories. In the Public Meeting, the Greenway Alternatives and matrixes were presented in a powerpoint, and then the public was divided into rotating stations to discuss these alternatives in a more intimate setting. A summary of feedback received during all meetings was prepared and analyzed to move the design into the next phase.

The following pages are intended to document the Greenway Alternatives process and discuss the options that will grow into the Preliminary Plan.

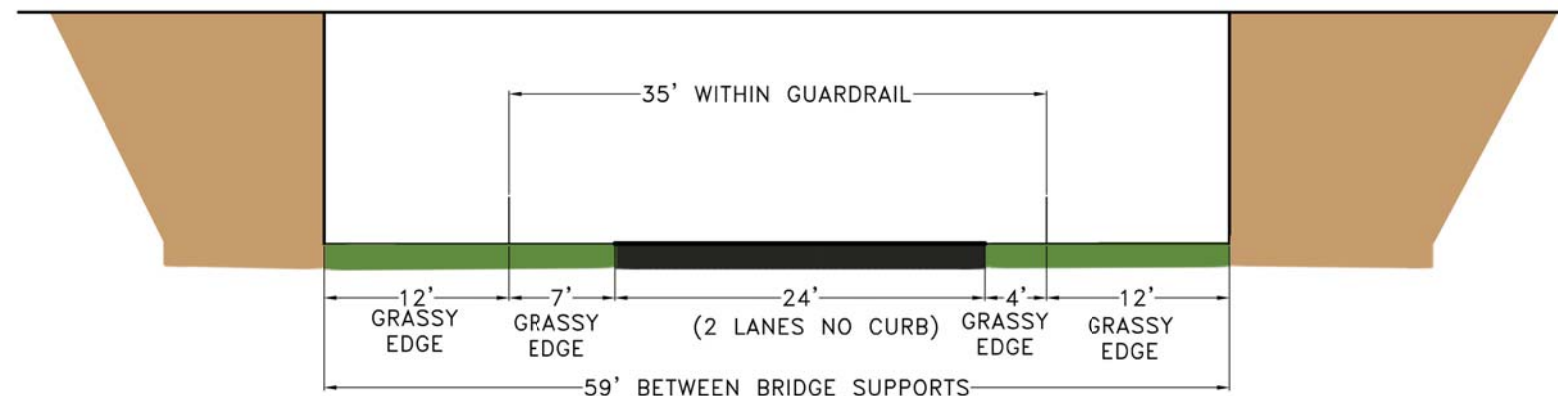
TYPICAL SECTION OF EXISTING ROADWAY



TYPICAL SECTION OF PREFERRED ROADWAY



TYPICAL SECTION OF MOST CONSTRAINING BRIDGE



## ROADWAY RECOMMENDATIONS

The existing typical road width is 30 feet. Understanding that the trail, road, greenery and enhancements would all need to fit into the 60 foot right-of-way, the Advisory and Steering Committees posed the question of decreasing the width of the road. According to ODOT a commercial/industrial collector street such as Train Avenue would only need a typical road width of 25 feet (see top left chart).

A further analysis of the existing left hand turning lanes suggests that they could also be removed to allow more space for the Greenway elements. Train Avenue has an average daily traffic volume of 3,000 vehicles per day. This would typically amount to 300 vehicles in a peak hour or approximately 2 vehicles in each direction per minute. According to the "2-Lane Left Turn Lane Warrant" chart from the State Highway Access Management Manual, it would appear that Train Avenue is not close to warranting the left turn lane, and the existing left turn lanes could be removed.

The preferred roadway recommendations are to decrease the width of the road and remove any left hand turn lanes. However, after further discussion with the City of Cleveland Division of Engineering & Construction, the roadway repairs for Train Avenue are planned to date to be mill & fill surface repairs. Mill & fill would not allow for any variance from the existing conditions. Therefore, the road width and turning lanes will remain the same.

## RIGHT-OF-WAY ANALYSIS

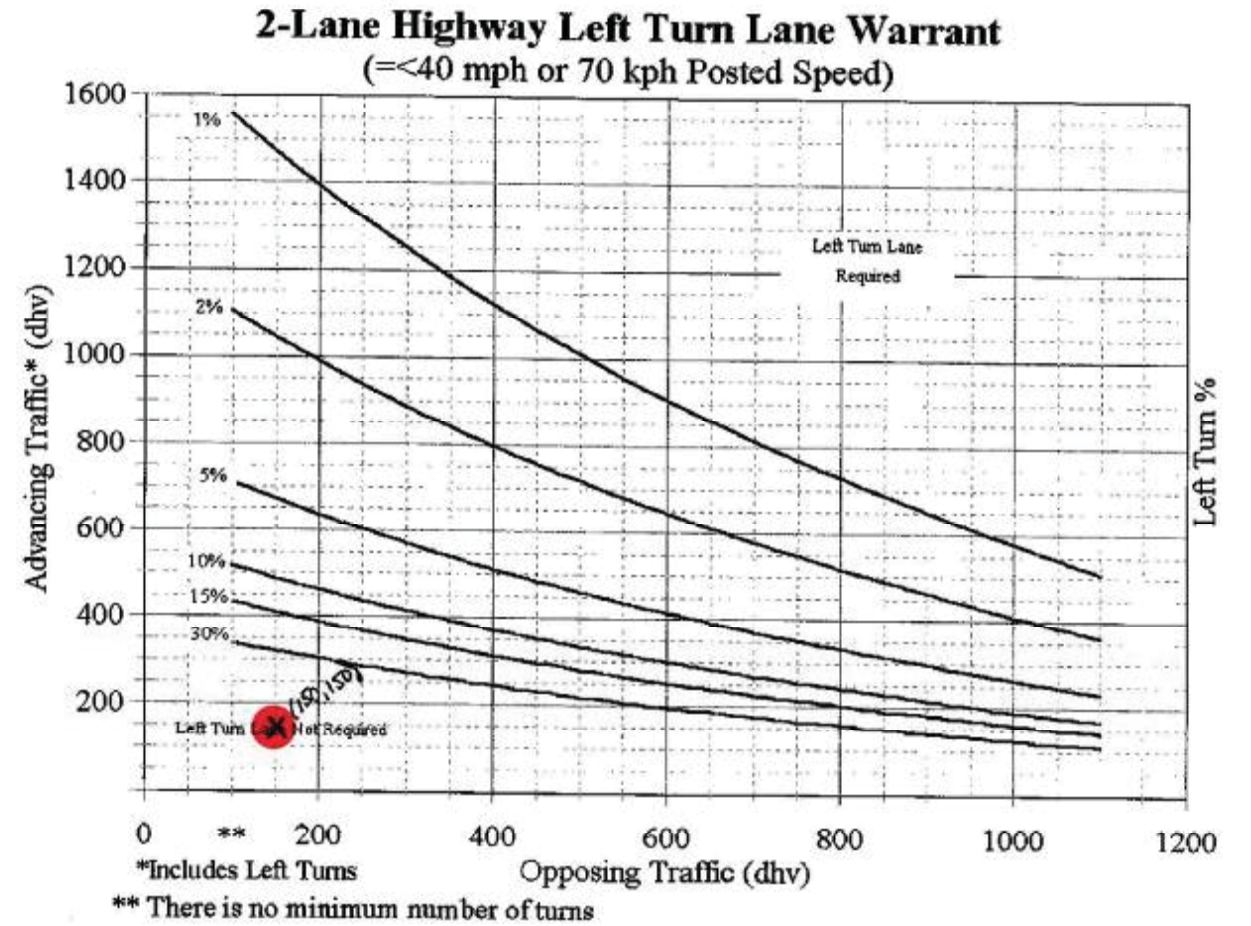
The right-of-way is typically about 60 feet. A Right-of-Way Analysis was prepared to determine if there would be any spatial challenges for the Greenway in some of the tighter spots, especially the bridges. Field measurements revealed that there is plenty of room for a road and trail at the tightest of bridges.



<b>URBAN ROADWAY CRITERIA LANE &amp; SHOULDER WIDTHS <sup>(A)</sup></b>	<b>301-4E</b>
	REFERENCE SECTIONS 301.1.2, 301.2.2, 301.2.3 & 304.2.2

Functional Classification	Locale	Lane Width (ft.)		Minimum Curbed Shoulder Width (ft.) (G)	
		Min.	Pref'd	w/o Parking Lane	with Parking Lane (F)
Interstate, Other Freeways and Expressways	All	12	12	12 Rt. Paved (I) 4 Med. Paved (D)	
Arterial Streets	50 mph or more	12	12	10 Each Side Paved (E) (H)	
	Less than 50 mph	12 (B)	12	1-2 Paved	10-12 Paved
Collector Streets	Commercial / Industrial	11	12	1-2 Paved	9-10 Paved
	Residential	11	12	1-2 Paved	7-10 Paved
Local Streets	Commercial / Industrial	11	12	1-2 Paved	9 Paved
	Residential	10 (C)	11	1-2 Paved	7 Paved

Chart from the Ohio Department of Transportation



Ohio Department of Transportation  
State Highway Access Management Manual

Issued December 2001  
Version 3-12-03 Page 40

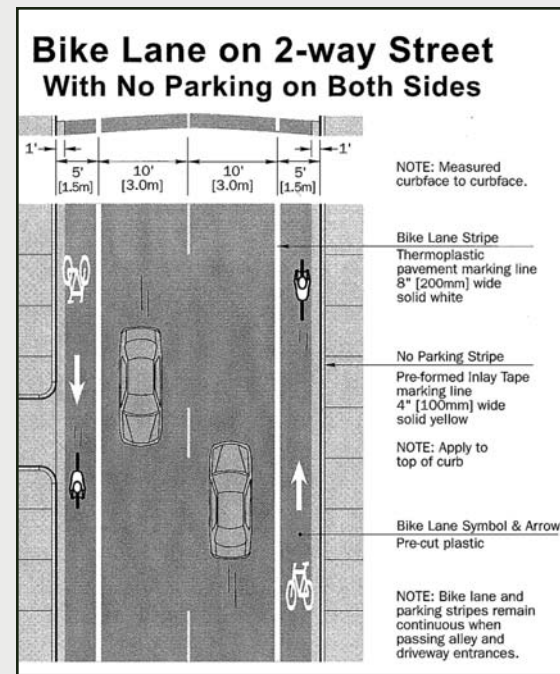
Excerpted from the State Highway Access Management Manual



BIKE LANES ON THE ROAD

The first of the trail alternatives, Bike Lanes on the Road examined placing the trail within the existing pavement along Train Avenue. The measurements for the typical sections were taken from the City of Cleveland Bike Lane Standards, adopted from Chicago's Bike Lane Design Manual.

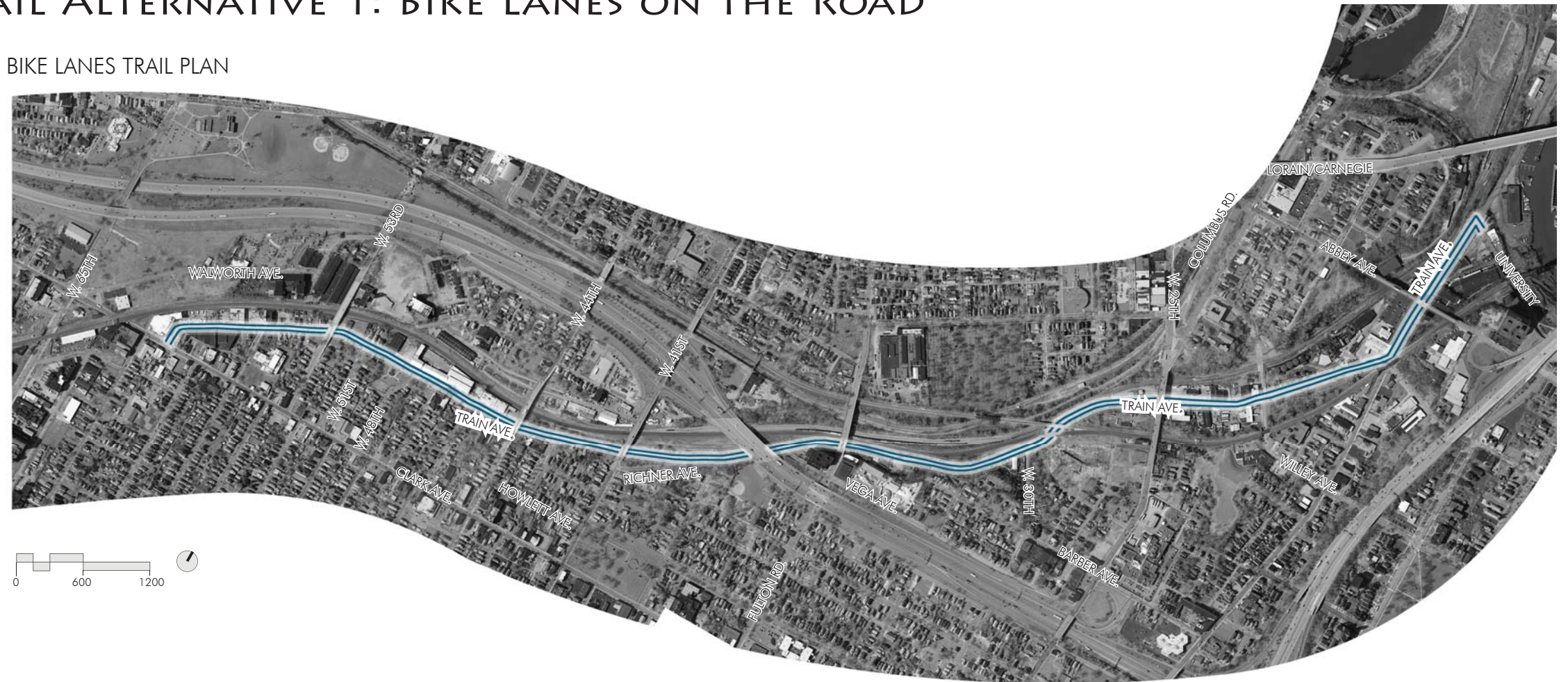
The existing road would be retrofitted to accommodate bike lanes as shown in the below graphic:



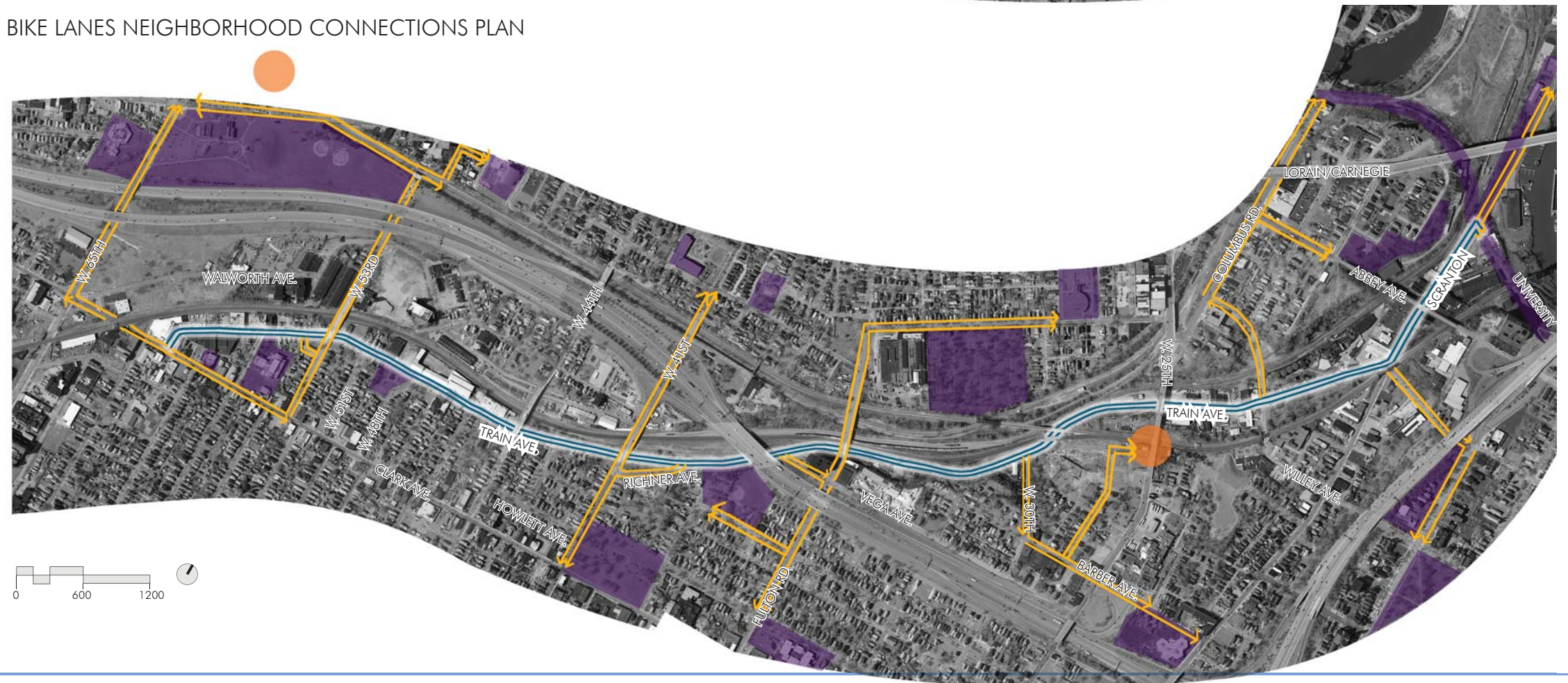
As displayed on the Bike Lanes Neighborhood Connections map, the Bike Lanes provide many opportunities for linkages to the surrounding neighborhoods. The sections taken from the east, central and west ends of Train Avenue represent the typical Greenway conditions if the Bike Lanes on the Road alternative were to be used.

TRAIL ALTERNATIVE 1: BIKE LANES ON THE ROAD

BIKE LANES TRAIL PLAN

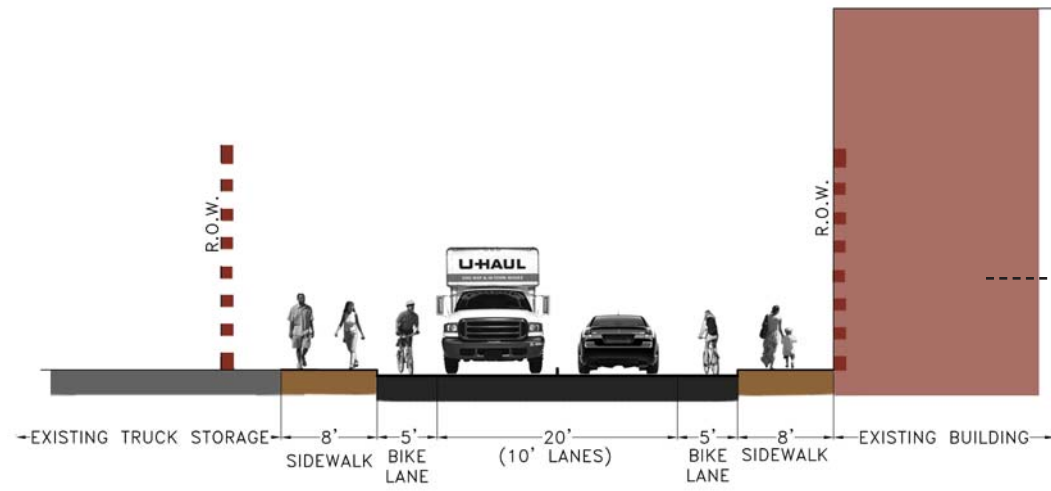


BIKE LANES NEIGHBORHOOD CONNECTIONS PLAN

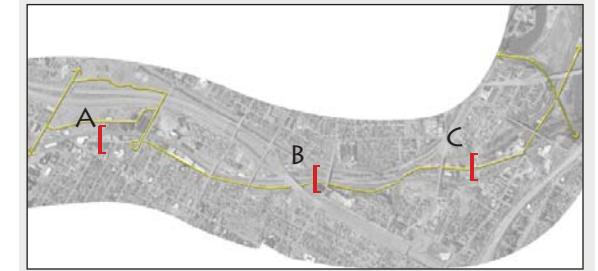




BIKE LANES SECTION A: WEST END



Existing view facing east from section A



BIKE LANES PROS & CONS

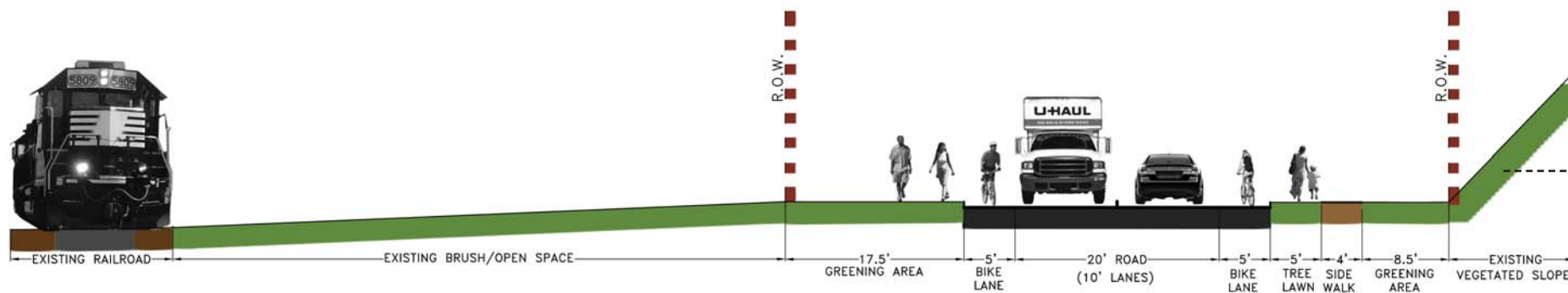
PROS:

- Numerous linkage opportunities
- Ideal for people who bike for transportation
- Visible, well travelled path feels safe
- Positive enhancement of Train Avenue as a corridor
- Would be maintained, snow plowed when the road would be

CONS:

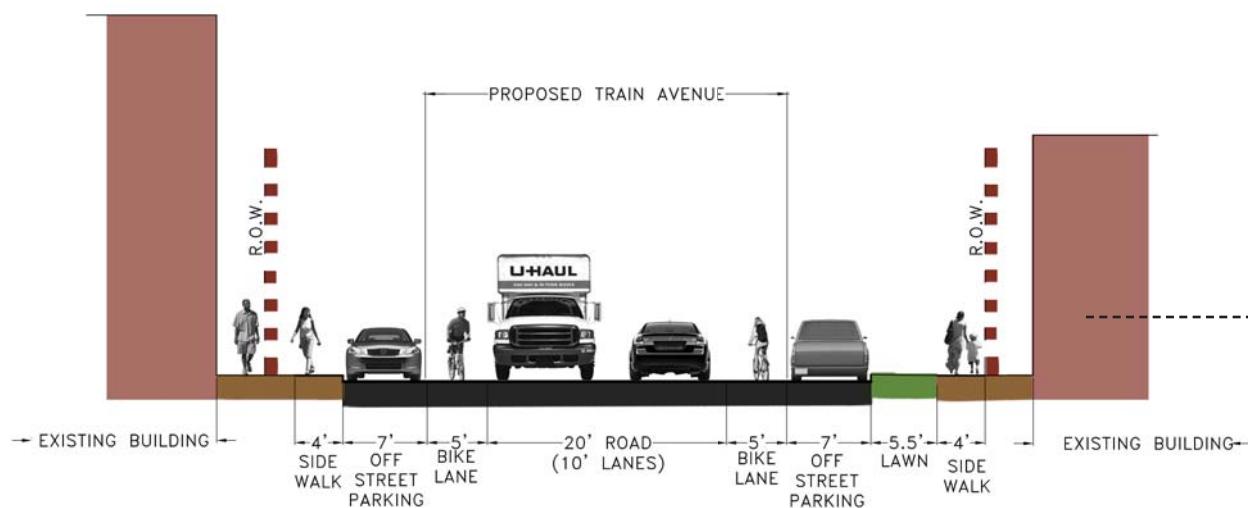
- Would have to add a sidewalk to service pedestrians
- Safety from vehicles would be an issue
- Might collect loose gravel on the edge of bike lanes

BIKE LANES SECTION B: CENTRAL AREA



Existing view facing east from section B

BIKE LANES SECTION C: EAST END



Existing view facing east from section C



Bike lanes are painted lanes on the existing road



The second trail alternative, Bike Trail Next to Rail examined a completely off road option, placing the trail along the existing access road next to the rail lines parallel to Train Avenue. The feasibility of a trail next to an active rail line was researched in the document "Rails-with-Trails Lessons Learned", supported by the U.S. Department of Transportation, FHWA, FTA, NHTSA, FTA. This document states that there are currently 65 existing trail next to active rail lines across 30 states including Ohio, as shown in Figure 1.1. These trails have varying distances between the rail and trail, even as close as 2 feet, as shown in Figure 5.7. Surprisingly, about 28% of the Rails with Trails do not have a buffer between the trail and rail, as shown in Figure 5.14



FIGURE 1.1 Map of existing rails-with-trails

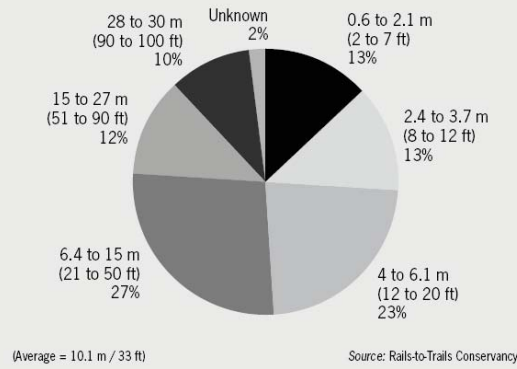
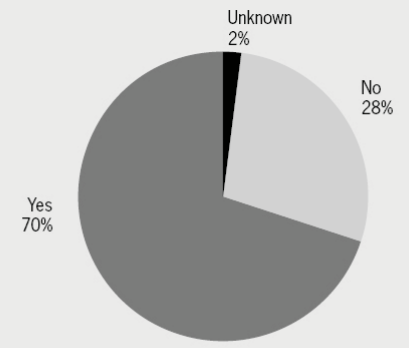


FIGURE 5.7 Distance between edge of trail and track centerline, by percentage of trails

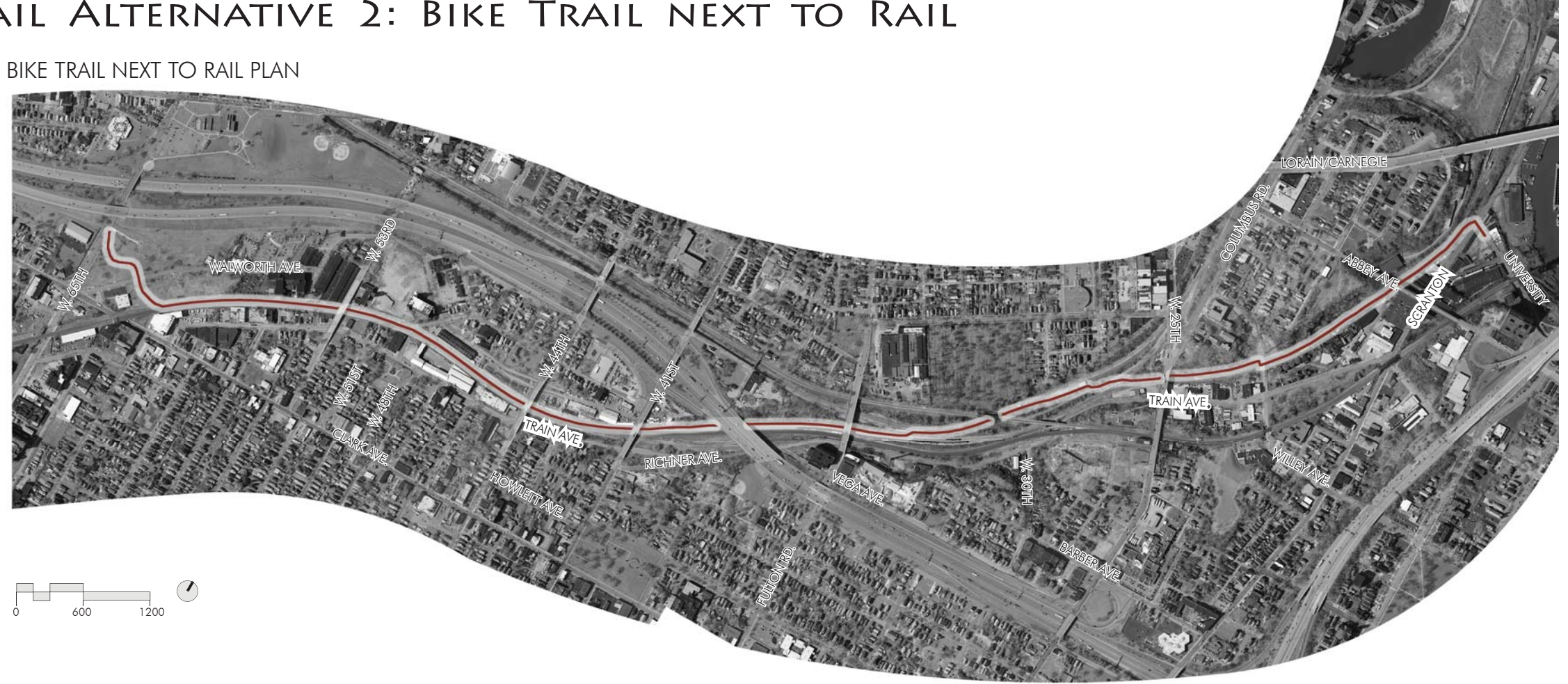


NOTE: A "Yes" response does not necessarily indicate the presence of a full barrier. It includes some partial barriers and one instance of where a barrier is planned to be removed. Source: Rails-to-Trails Conservancy

FIGURE 5.14 Percentage of existing RWTs with barrier

# TRAIL ALTERNATIVE 2: BIKE TRAIL NEXT TO RAIL

BIKE TRAIL NEXT TO RAIL PLAN

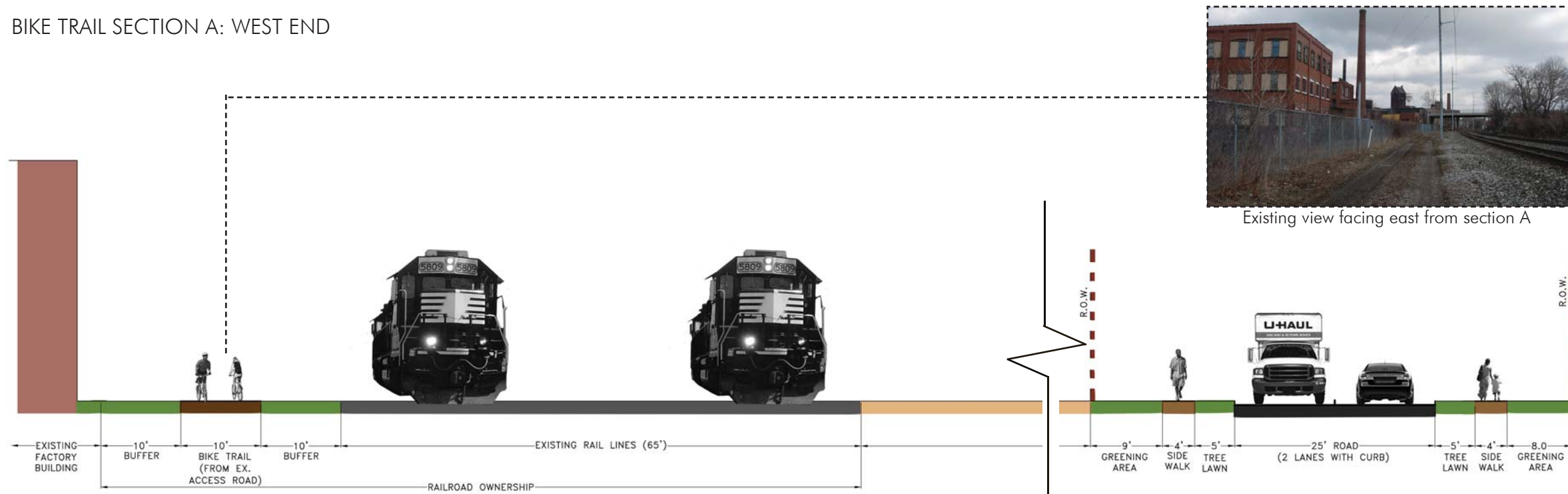


BIKE TRAIL NEXT TO RAIL CONNECTIONS PLAN

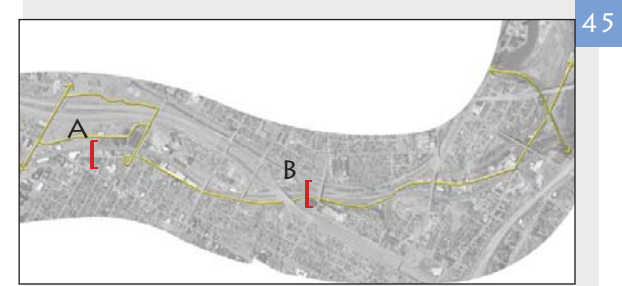
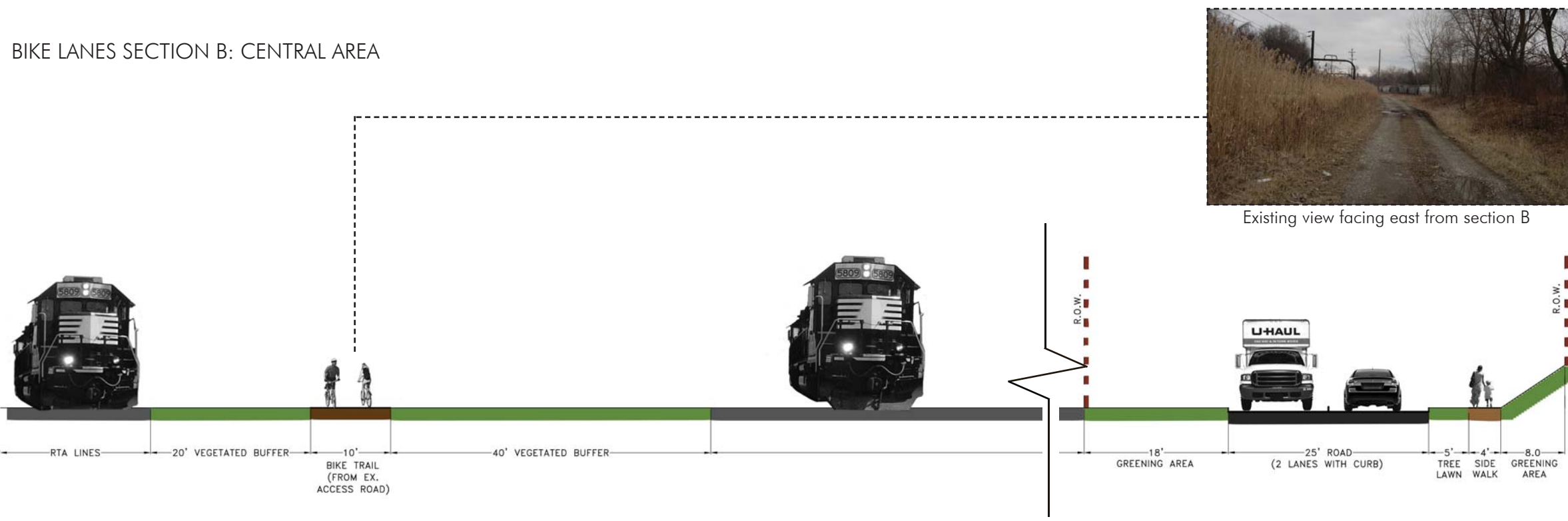




BIKE TRAIL SECTION A: WEST END



BIKE LANES SECTION B: CENTRAL AREA



BIKE TRAIL PROS & CONS

- PROS:
- Ideal for people who bike or walk for recreation or direct downtown access
  - Safe from vehicular traffic
  - Peaceful, park-like recreational experience
  - Rails-With-Trail programs prove 65 rai-side trails successful
  - Interesting industrial vs. green aesthetics
- CONS:
- Limited linkage opportunities
  - Not ideal for people biking to destinations in the middle section of Train Avenue
  - Trains pose a threat to those who leave the path
  - Doesn't enhance the vehicular experience or solve Train Avenue issues
  - Difficulty getting railroad support/access



Example of a fence barrier between trail & rail



Example of no barrier between rail & trail  
Great Allegheny Passage, PA & MD



Example of vegetation barrier between trail & rail  
LaCrosse River State Trail, WI



### BESIDE THE ROAD ALL-PURPOSE TRAIL

The third trail alternative, Beside the Road All-Purpose Trail examined an all-purpose trail directly next to Train Avenue, replacing the sidewalks in some areas. A buffer of varying widths would keep the trail separated from vehicles. A similar all-purpose trail within an industrial neighborhood in Cleveland was examined as a precedent.

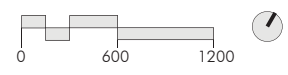
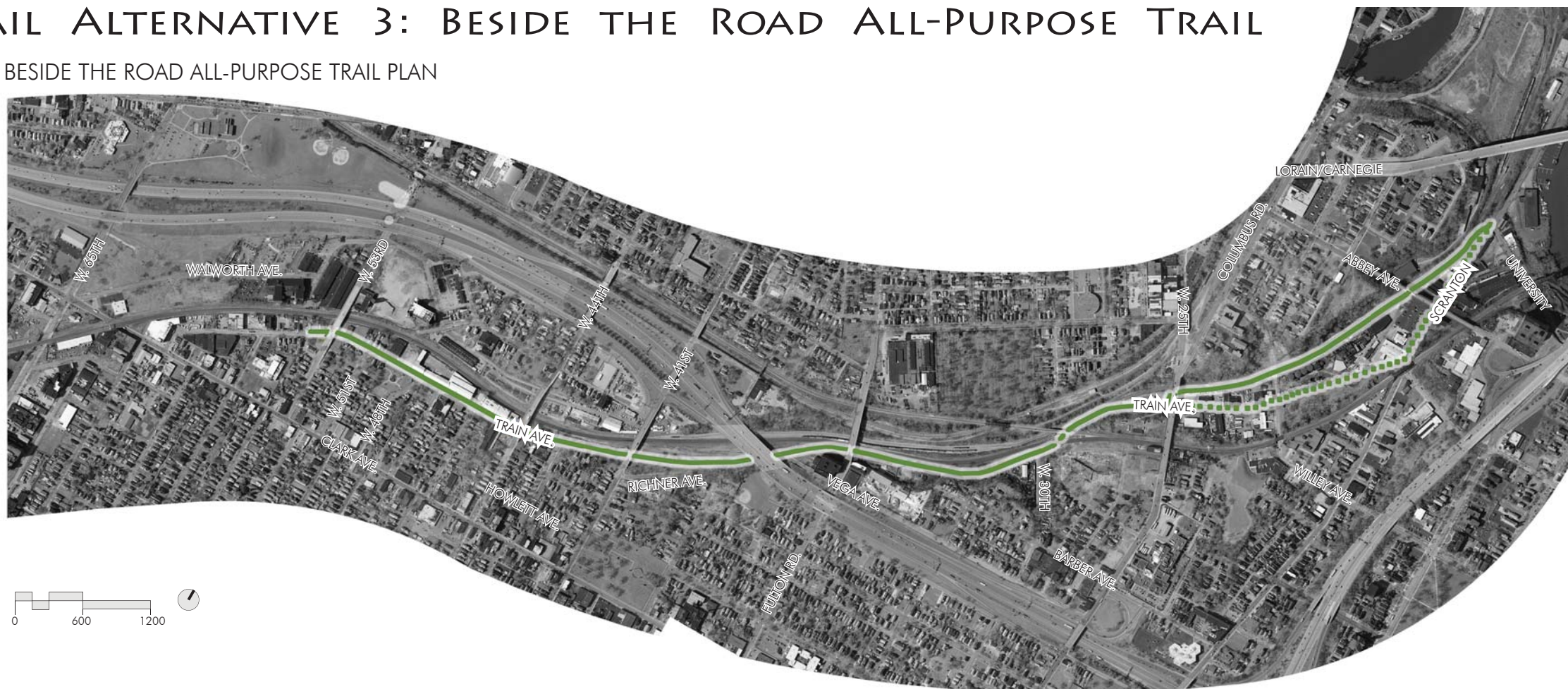
As displayed on the All-Purpose Trail Neighborhood Connections map, the all-purpose trail provides many opportunities for linkages to the surrounding neighborhoods. The trail would be 10' wide as displayed in the sections.

ALL-PURPOSE TRAIL PRECEDENT: EAST 49TH STREET, CLEVELAND OH

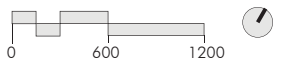


## TRAIL ALTERNATIVE 3: BESIDE THE ROAD ALL-PURPOSE TRAIL

BESIDE THE ROAD ALL-PURPOSE TRAIL PLAN

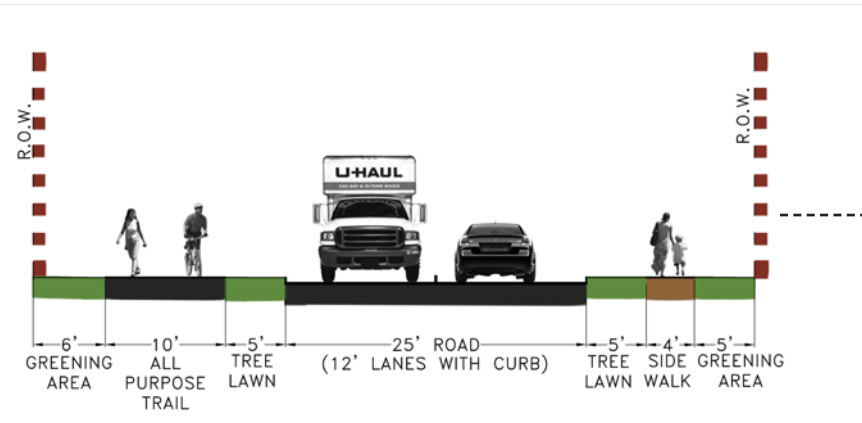


ALL-PURPOSE TRAIL NEIGHBORHOOD CONNECTIONS PLAN



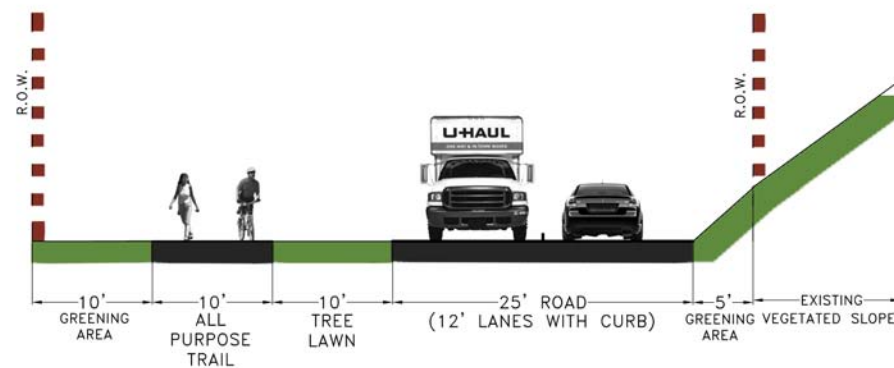


BIKE LANES SECTION A: WEST END



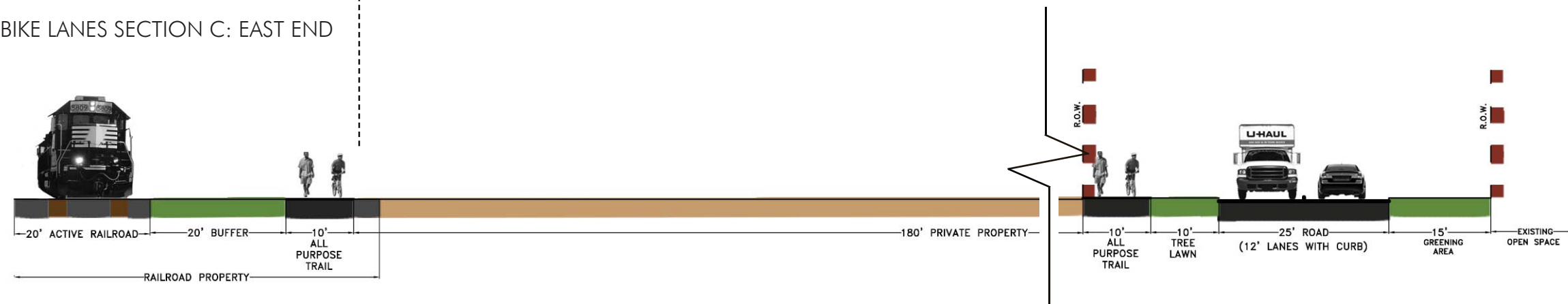
Existing view facing east from section A

BIKE LANES SECTION B: CENTRAL AREA

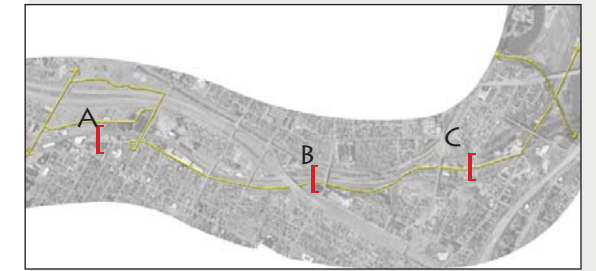


Existing view facing east from section B

BIKE LANES SECTION C: EAST END



Existing view facing east from section C



ALL-PURPOSE TRAIL PROS & CONS

- PROS:
- Numerous linkage opportunities
  - Ideal for people who bike for recreation, good for transportation
  - Visible, well travelled path feels safe
  - Enhanced vehicular, pedestrian, and bicyclist experiences
  - Positive enhancement of Train Avenue as a corridor
  - Buffer from street gives "greenway" experience

- CONS:
- Still need to be cautious about safety from vehicles in tighter areas
  - Who will maintain issue



# GREENING & REGENERATION

## GREENING & REGENERATION

Greening & Regeneration examines how to enhance the existing greenery and create a Greening and Regeneration Design Strategy for Train Avenue. Three different types of Greening conditions were examined:

- Street trees
- Tree groupings
- Reforestation and regeneration

These three design types were applied to create the Proposed Greening & Regeneration Plan.

### WHY GREENING?

- Roadside beautification
- Enhanced vehicular, bicyclist and pedestrian experiences
- Desired “country road” feel
- Sense of place
- Increased property values
- Traffic calming
- Environmental & air quality benefits

### GREENING PROS & CONS

#### PROS:

- Enhanced pedestrian, bicyclist, and vehicular experiences
- Tree canopies create a sense of place, neighborhood identity
- Numerous environmental and air quality benefits
- Streetscape could improve property values, commercial desirability

#### CONS:

- Large trees could possibly give area a more “creepy” feel, too much enclosure for a valley
- May not have adequate room for street trees in some areas
- Some maintenance needed, especially with power lines

## EXISTING GREENERY



Train Park is the only existing public greenspace along Train Avenue.



The central section of Train Avenue has mature trees and roadside vegetation.



A few open spaces lie along Train Avenue and have regeneration and reforestation opportunities.



A large percentage of the existing greenery is invasive species and weedy vegetation that may need to be removed.

## GREENING PRECEDENT

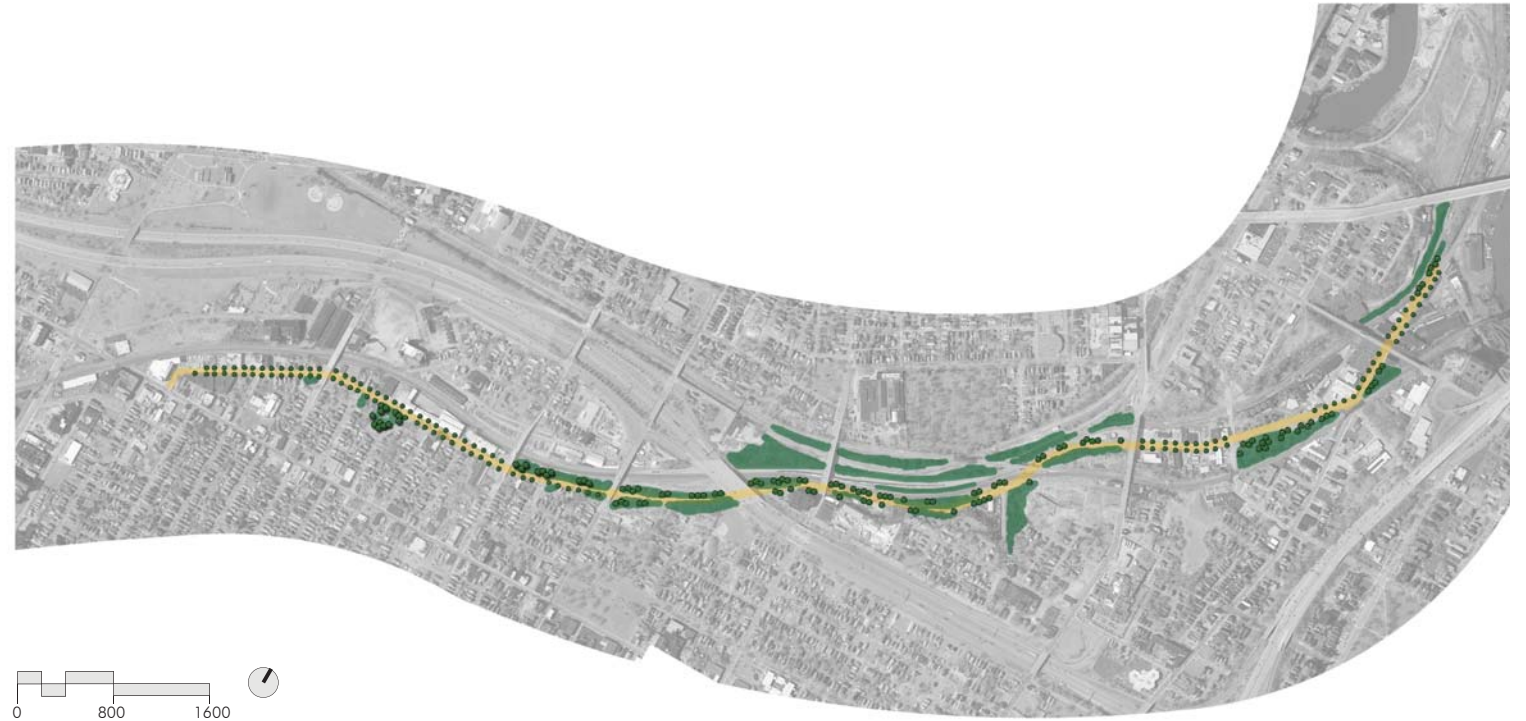


Martin Luther King Boulevard, Cleveland OH



Images from Walk & Roll Cleveland Festival, taken within MLK Blvd.

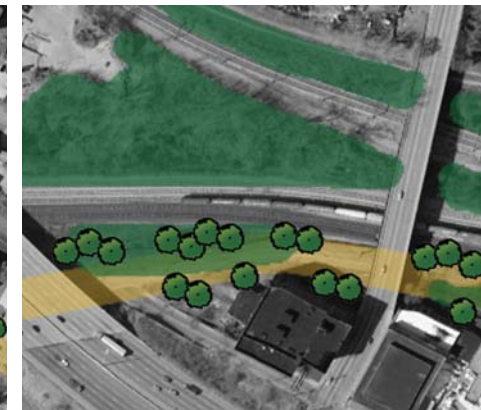
## PROPOSED GREENING AND REGENERATION PLAN



## GREENING AND REGENERATION DESIGN STRATEGY



Greening Type 1: Street trees



Greening Type 2: Tree groupings to enhance existing greenery



Greening Type 3: Reforestation & regeneration of open spaces/vacant parcels



## CALCULATED BENEFITS OF GREENING

### AIR QUALITY

- 400 mature trees absorb 19,200 lbs CO<sub>2</sub> a year; Each person in the U.S. generates approx 4,600 lbs of CO<sub>2</sub> each year; 400 mature trees = approx. 4 people's CO<sub>2</sub> use each year
- 408 trees absorb enough CO<sub>2</sub> over 1 year equal to the amount produced by driving a car 52,000 miles
- Over a 50 year lifetime 400 trees generate \$12.5 million worth of oxygen, provide \$24.8 million worth of air pollution control, recycle \$15 million worth of water, and control \$12.5 million worth of soil erosion.
- Particulates are small particles emitted in smoke from burning fuel; There is up to a 60% reduction in street level particulates with trees

### STORMWATER BENEFITS

- For every 5% of tree cover added to a community, stormwater runoff is reduced by approx. 2%
- In a 1" rainstorm over 12 hours, the interception of rain by the canopy of the urban forest in Salt Lake City reduced surface runoff by about 11.3 million gallons, or 17%.

### COOLING BENEFITS

- Help to cool cities by reducing heat sinks (6-19 degrees warmer than their surroundings)
- The evaporation from 400 large trees can produce the cooling effect of 4000 room size air conditioners operating 24 hours/day

### EXTENDED LIFE OF PAVED SURFACES

- A slurry seal on a road costs approx. \$50,000 per linear mile
- The slurry seal can be deferred from every 10 years to every 20-25 years for older streets with extensive tree canopy cover.

### REAL ESTATE VALUES

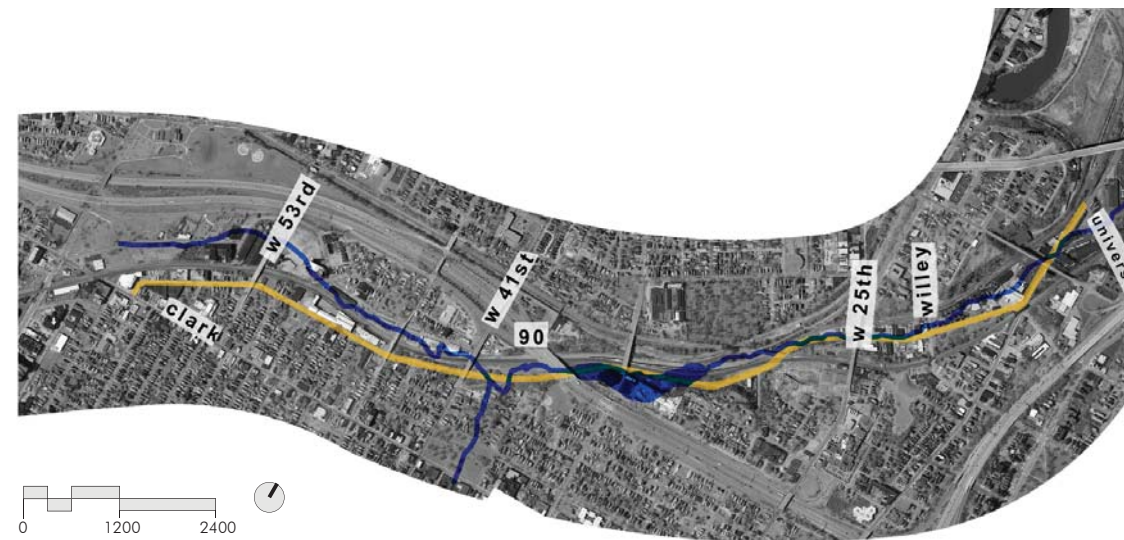
- Property values increase 5-15% when compared to properties without trees
- US Dept of Energy study reports that trees reduce noise pollution by absorbing 50% of urban noise

*McAliney, Mike. Arguments for Land Conservation: Documentation and Information Sources for Land Resources Protection*  
 Nowak, David J., "Benefits of Community Trees"  
 USDA Forest Service Pamphlet #R1-92-100  
 Coder, Dr. Kim D., "Identified Benefits of Community Trees and Forests"  
 American Forests, "How Trees Fight Climate Change", 1999  
 USDA Forest Service Pamphlet #FS-363)  
 Tree Guidelines for San Joaquin Valley Communities, March 1999. Published by the USDA Forest Service's Western Center for Urban Forest Research & Education.

## HISTORIC MAP

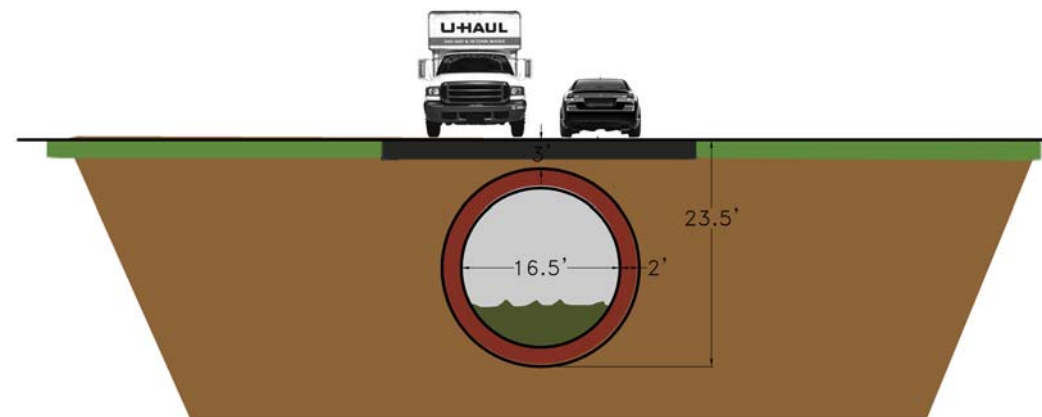


## TRAIN AVENUE & WALWORTH CSO REPLACED WALWORTH RUN

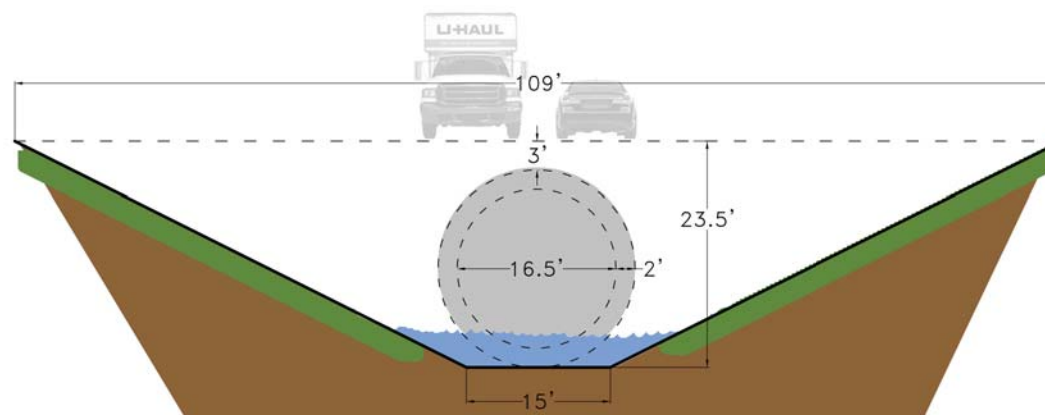


Walworth Run is currently culverted all along Train Avenue in this combined sewer outfall.

## EXISTING CSO TYPICAL SECTION



## DAYLIGHTING TYPICAL SECTION



## WHAT IS DAYLIGHTING?

The term "daylighting" describes the process of intentionally restoring to the open air some or all of the flow of a previously culverted stream. This feasibility study would look to restore Walworth Run close to its natural state.

## DAYLIGHTING BENEFITS

Daylighting of a waterway has many benefits to the environment and the community:

- Reducing runoff to the Walworth CSO
- A public amenity for the neighborhood
- Increased property values
- An aesthetic & recreational attraction for trail goers
- A natural system attracting wildlife & creating habitats
- Historic & cultural significance

## DAYLIGHTING FEASIBILITY

While Daylighting can be a good decision recreationally, aesthetically and environmentally, Daylighting of a CSO in particular presents several issues:

- Not enough space along Train Avenue to support space needed for daylighting
- Cost of removing CSO structure, maneuvering connector pipes, stream installation
- Health and safety problems of opening up a sewer- to both man and wildlife

URS concluded that daylighting of Walworth Run is not feasible.

## DAYLIGHTING ALTERNATIVE: GREEN INFRASTRUCTURE

Since Daylighting is not feasible, an alternative was examined. This alternative is Green Infrastructure.

Green Infrastructure can reduce runoff going down to the CSO and Train Avenue which in turn will reduce water running on and over Road/Trail, lengthening the lifespan of each. Green Infrastructure elements, like Daylighting, will also be seen as an amenity to the neighborhood and trail/road travelers.



# GREEN INFRASTRUCTURE ALTERNATIVES

Green Infrastructure Alternatives were examined as an alternative to Daylighting, as requested by the Advisory Committee. Three types of Green Infrastructure were examined:

- Streetside Bioswales
- Naturalized Bioswales
- Vacant Lot Raingardens

## WHAT IS GREEN INFRASTRUCTURE?

Green “stormwater management practices that utilize soils and vegetation to capture, cleanse and reuse stormwater runoff to maintain or restore natural hydrology”  
~ US EPA

Green Infrastructure is using plants as tools in engineering.

## EXAMPLES OF GREEN INFRASTRUCTURE

- Bioswales
- Raingardens
- Stormwater Wetlands
- Stream Restoration
- Green Roofs

## GREEN INFRASTRUCTURE PROS & CONS

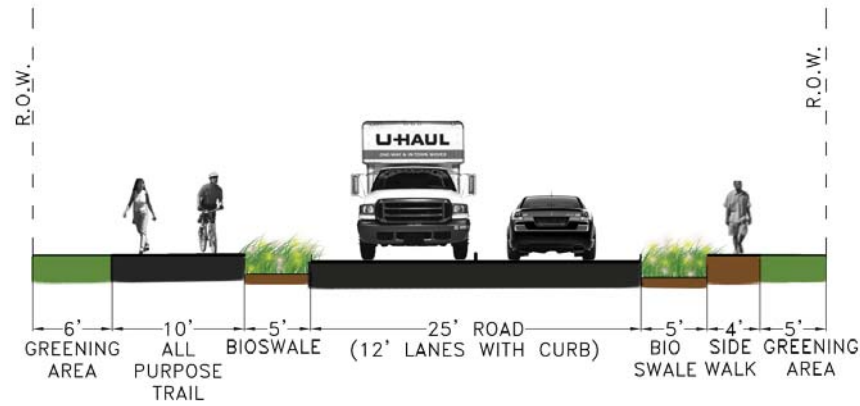
### PROS:

- Neighborhood beautification
- Replacing vacant lots, increased property values
- Enhanced pedestrian, bicyclist, and vehicular experiences
- Placemaking, neighborhood identity
- Reduces runoff to Walworth CSO, eliminating amount of times sewage empties into the Cuyahoga River
- Creates habitat in an urban setting
- Increases the life of the road & trail
- Low maintenance
- Cost effective solution to CSO problems
- Historic & cultural significance
- Helps to solve flooding issues
- Public education for schools and neighborhoods

### CONS:

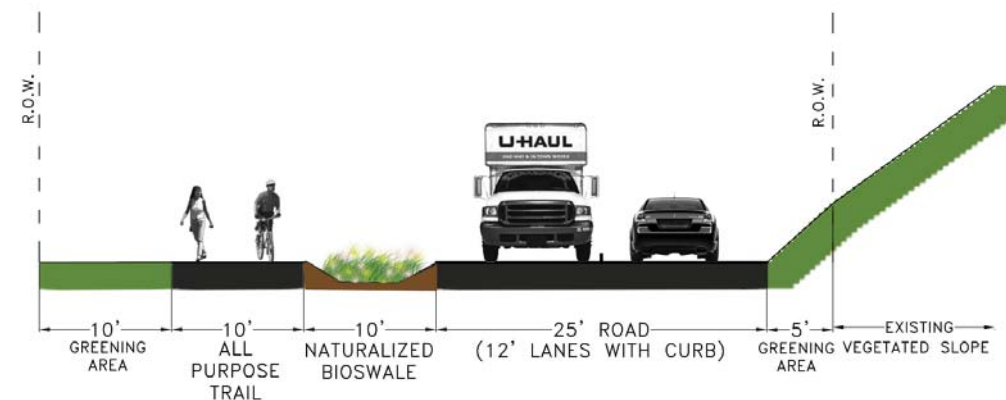
- Who will maintain?
- Public access risks destruction of raingardens/bioswales
- Upfront cost
- Need cultural acceptance of “natural” landscaping

## OPTION 1: STREETSIDE BIOSWALES



Streetside bioswales, like these found in Portland, are contained with concrete and integrated into the streetscape

## OPTION 2: NATURALIZED BIOSWALES



Naturalized bioswales are not contained in concrete and act as a vegetated buffer.

## OPTION 3: VACANT LOT RAINGARDENS

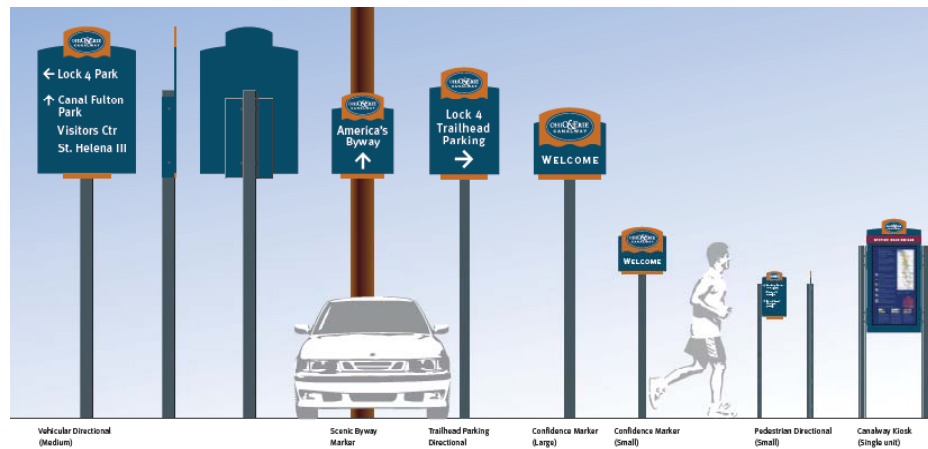


By inserting raingardens into vacant lots, runoff can be stopped before entering the CSO.

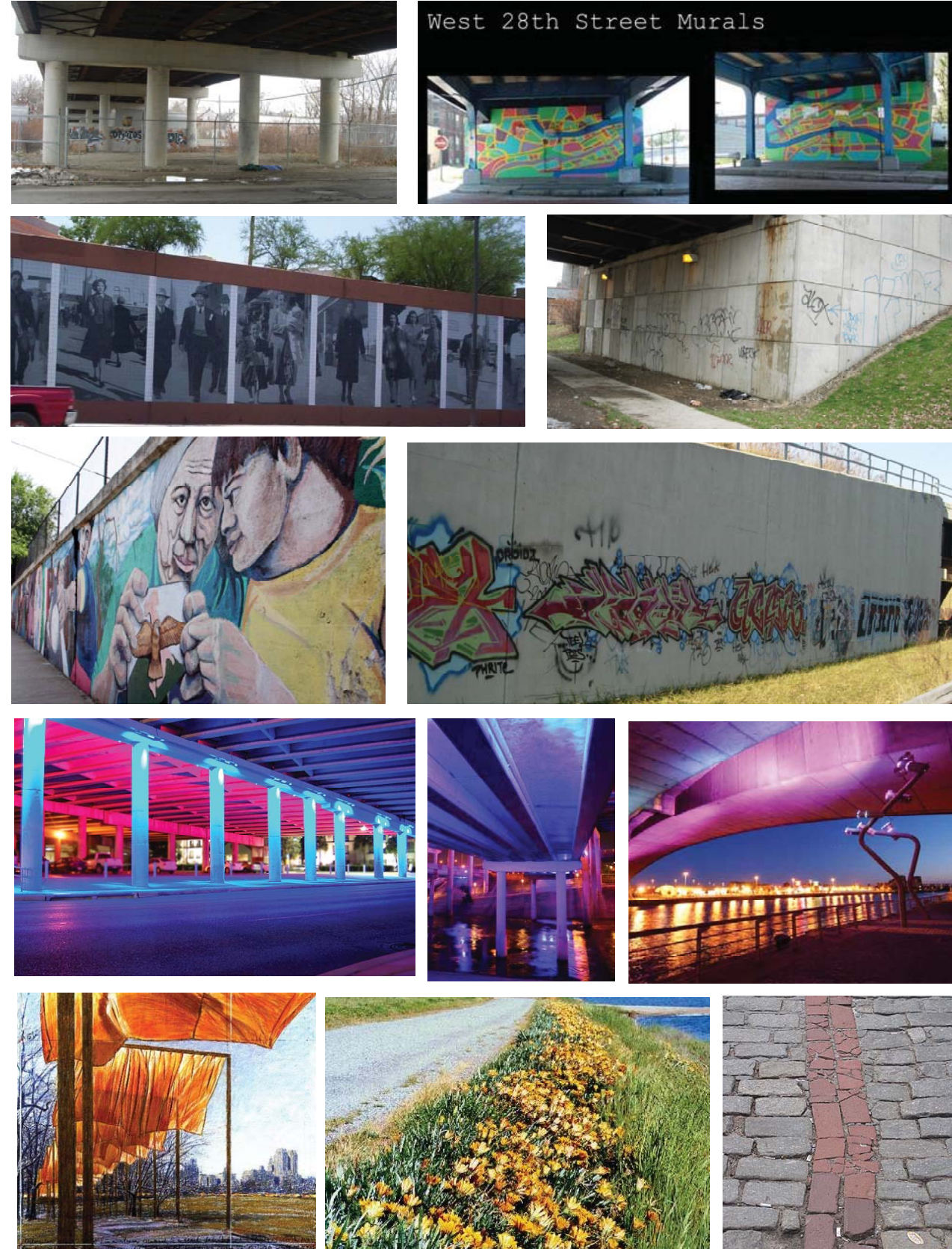


# OPTIONS FOR OTHER GREENWAY ENHANCEMENTS

## HISTORICAL INTERPRETATION



## ART AND CULTURE



## OTHER GREENWAY ENHANCEMENTS

To make the Train Avenue Greenway more than a typical trail and road plan, Other Greenway Enhancements were examined. There are 2 categories of Other Greenway Enhancements:

- Historical Interpretation Ideas
- Art and Culture Ideas

## HISTORICAL INTERPRETATION IDEAS

As shown in the Inventory and Analysis section of this document, Train Avenue has a rich history displayed in the historical buildings along the corridor. The Advisory and Steering Committees, as well as the public had an interest in calling out these historic structures to embrace Train Avenue's past. Different signage ideas were examined to highlight the buildings. Signage would be designed along the proposed trail.

## ART AND CULTURE IDEAS

The Inventory and Analysis section also describes the many bridges that help form the character of Train Avenue. These bridges are currently covered in graffiti and create an attraction for dumping. The Art and Culture Ideas would highlight the bridges in a positive manner. Possibilities of murals and lighting art were examined to call out these bridges. Sculpture and landscaping were also investigated to highlight the historic Walworth Run.

## GREENWAY ENHANCEMENTS PROS & CONS

- PROS:
- Contributes to placemaking, identity
  - Historical focus brings educational opportunities
  - Community pride
  - Helps to solve graffiti and dumping problems
  - Highlights the positives of Train Avenue
- CONS:
- Added cost
  - Would need community support
  - Opens the door for vandalism



# SUMMARY OF PROS & CONS FOR GREENWAY ALTERNATIVES

ROADWAY ALTERNATIVES

## EXISTING 30' ROAD WIDTH

### PROS:

- roadway repairs are proposed to be mill & fill, so ODOT typically wouldn't remove existing pavement
- trail would be able to be built regardless of the road repair status
- plenty of space for truck traffic

### CONS:

- less space for trail, greening and other greenway enhancements
- more impervious surfaces
- smaller buffers between pedestrians and vehicles
- wide roads encourage roadside parking and pull off spots

## COMPACTED 25' ROAD WIDTH

### PROS:

- more space for trail, greening and other greenway enhancements
- less impervious surfaces
- more green adds environmental, community and aesthetic benefits
- larger buffers between pedestrians and vehicles makes safer environment
- compacted road eliminates ease of roadside parking and pull off spots

### CONS:

- roadway repairs would be mill & fill, so ODOT typically wouldn't remove 5' of pavement
- trail construction would depend upon status of road repairs

TRAIL ALTERNATIVES

## OPTION 1: BIKE LANES

### PROS:

- numerous linkage opportunities
- ideal for people who bike for transportation
- visible, well travelled path feels safe
- positive enhancement of Train Avenue as a corridor
- would be maintained, snow plowed when the road would be

### CONS:

- would have to add a sidewalk to service pedestrians
- safety from vehicles would be an issue
- might collect loose gravel on the edge of bike lanes

## OPTION 2: BIKE TRAIL NEXT TO RAIL

### PROS:

- ideal for people who bike or walk for recreation or direct downtown access
- safe from vehicular traffic
- peaceful, park-like recreational experience
- Rails-With-Trail programs prove 65 rai-side trails successful
- interesting industrial vs. green aesthetics

### CONS:

- limited linkage opportunities
- not ideal for people biking to destinations in the middle section of Train Avenue
- trains pose a threat to those who leave the path
- doesn't enhance the vehicular experience or solve Train Avenue issues
- difficulty getting railroad support/access
- limited access creates security issues

## OPTION 3: ALL-PURPOSE TRAIL

### PROS:

- numerous linkage opportunities
- ideal for people who bike for recreation, good for transportation
- visible, well travelled path feels safe
- enhanced vehicular, pedestrian, and bicyclist experiences
- positive enhancement of Train Avenue as a corridor
- buffer from street gives "greenway" experience

### CONS:

- still need to be cautious about safety from vehicles in tighter areas
- who will maintain issue

★ pro X con

## Summary

	On Road Bike Lanes	Bike Trail Next to Rail	Beside Road All-Purpose Trail
Linkages	★	X	★
Security (crime)	★	X	★
Safety (vehicles)	X	★	★
Pedestrian experience	X	★	★
Vehicular experience	★	X	★
Transportation bicycling	★	X	★
Recreation bicycling	X	★	★
Difficulty in implementing	★	X	★
Maintenance issues	X	X	X
Train Ave as Corridor	★	X	★
Enhancing west end	★	X	X
Cost			

GREENING

### PROS:

- enhanced pedestrian, bicyclist, and vehicular experiences
- tree canopies create a sense of place, neighborhood identity
- numerous environmental and air quality benefits
- streetscape could improve property values, commercial desirability

### CONS:

- large trees could possibly give area a more "creepy" feel, too much enclosure for a valley
- may not have adequate room for street trees in some areas
- some maintenance needed, especially with power lines

GREEN INFRASTRUCTURE

### PROS:

- Neighborhood beautification
- replacing vacant lots, increased property values
- Enhanced pedestrian, bicyclist, and vehicular experiences
- Placemaking, neighborhood identity
- Reduces runoff to Walworth CSO, eliminating amount of times sewage empties into the Cuyahoga River
- Creates habitat in an urban setting
- increases the life of the road & trail
- low maintenance
- cost effective solution to CSO problems
- historic & cultural significance
- helps to solve flooding issues
- public education for schools and neighborhoods

### CONS:

- who will maintain?
- public access risks destruction of raingardens/bioswales
- upfront cost
- need cultural acceptance of "natural" landscaping

GREENWAY ENHANCEMENTS

### PROS:

- contributes to placemaking, identity
- historical focus brings educational opportunities
- community pride
- helps to solve graffiti and dumping problems
- highlights the positives of Train Avenue

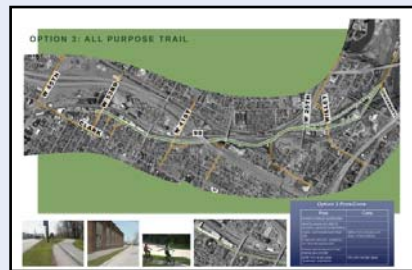
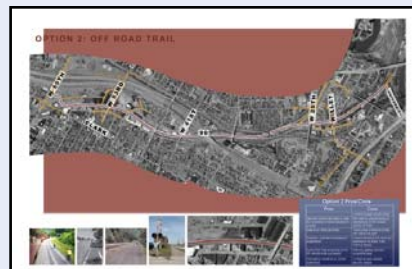
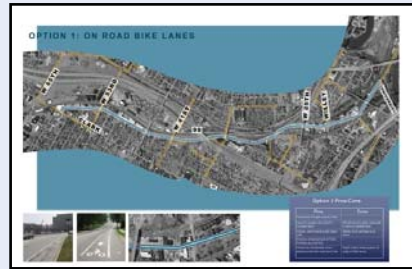
### CONS:

- added cost
- would need community support
- opens the door for vandalism



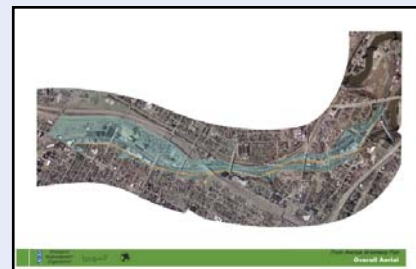
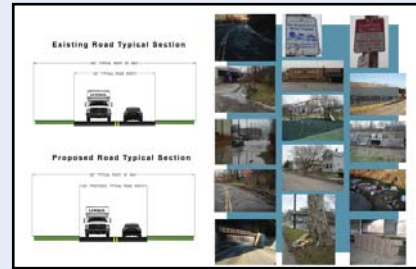
# PUBLIC MEETING 'TRAIN STATIONS' AND PUBLIC CONCLUSIONS

## TRAIL PLANNING - TRAIL ALTERNATIVES & CONNECTIONS TO THE LAKEFRONT & BIG CREEK



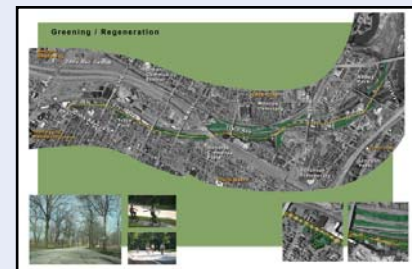
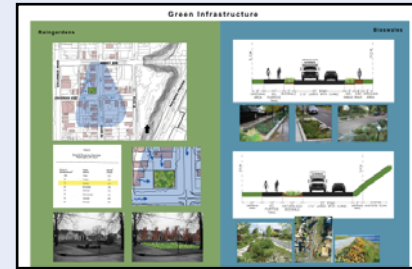
**CONCLUSION**  
The Public had an unanimous vote in favor of Option 3: the All-Purpose Trail next to the road.

## INFRASTRUCTURE- TRAFFIC PLANNING & SAFETY



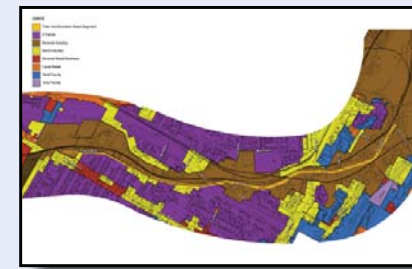
**CONCLUSION**  
The Public was concerned about issues of maintenance and safety as well as had suggestions of signage and crosswalks.

## GREENSPACE DEVELOPMENT- GREENING/REGENERATION & GREEN INFRASTRUCTURE



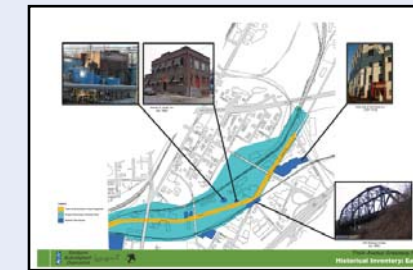
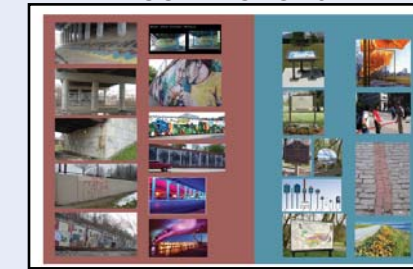
**CONCLUSION**  
The Public had an interest in learning more about Green Infrastructure and had unanimous support for greening & regeneration.  
  
The Public suggested investigating naturalized bioswales, permeable paving and raingardens.

## FUTURE LAND USE- MANUFACTURING, COMMERCIAL & RESIDENTIAL OPPORTUNITIES



**CONCLUSION**  
There was interest in preserving and redeveloping the historical buildings and looking at the corridor's sense of history as a major thematic element to attract new residents, businesses & trail users.

## GREENWAY ENHANCEMENTS – PUBLIC ART, WAYFINDING, HISTORIC HERITAGE & NEIGHBORHOOD CONNECTIONS



**CONCLUSION**  
The public was in support of signage and highlighting the history of the area. The public was intrigued with the idea of a "ghost" footprint to represent the mill pond & Walworth Run.









# SECTION 4: PRELIMINARY GREENWAY PLAN

- Overall Greenway Connections
- Typical Section
- Trail & Neighborhood Connections
- Greenway Enhancements
- Detailed Plans & Before/After Images
  - West Side
  - Central Section
  - East Side
- Green Infrastructure
  - 4 Basic Prototypes
  - Watershed Wide Raingardens



# PRELIMINARY GREENWAY PLAN

## RESULTS FROM GREENWAY ALTERNATIVES PHASE

At the Public Meeting in the previous phase, the Greenway Alternatives phase, the Public voiced several suggestions:

- A unanimous vote for the Beside the Road All-Purpose Trail option
- Interest in signage for both safety and wayfinding
- Support for Greening/Regeneration along Train
- More explanation and exploration of Green Infrastructure
- Interest in History as a major thematic element
- Interest in an artistic way to highlight the former Walworth Run and the Historic buildings of the corridor

These suggestions from the Public Meeting were incorporated into the Preliminary Greenway Plan.

## SECTION 4: PRELIMINARY GREENWAY PLAN

The Preliminary Greenway Plan section of this document corresponds with Phase 3 of the NOACA TICI Grant.

The Preliminary Greenway Plan is the organization of the preferred Greenway Alternatives suggested at the Phase 2 Advisory Group, Steering Committee and Public meetings into one comprehensive plan.

The Preliminary Greenway Plan contains the following:

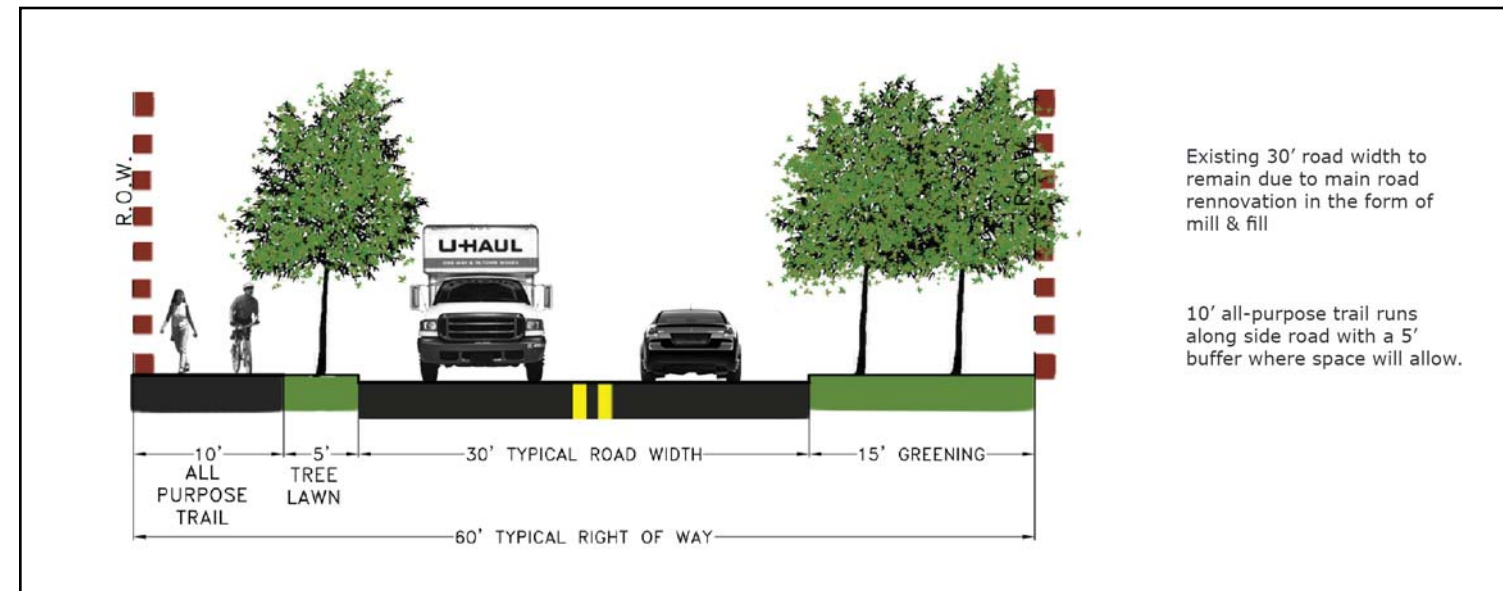
- Overall Greenway Connections
- Typical Section of Proposed Greenway
- Roadside All-Purpose Trail and Immediate Neighborhood Connections Plan
- Greenway Enhancements Plan
- Detailed Plans of the West Side, Central Section, and East Side
- Before and After Images of the West Side, Central Section and East Side
- Green Infrastructure Watershed Wide Study

The following pages are intended to document the Preliminary Greenway Plan process by sharing the images presented to the Advisory and Steering Committees. The images brought up discussions about modifications necessary to move into the Final Greenway Plan.

## OVERALL GREENWAY CONNECTIONS

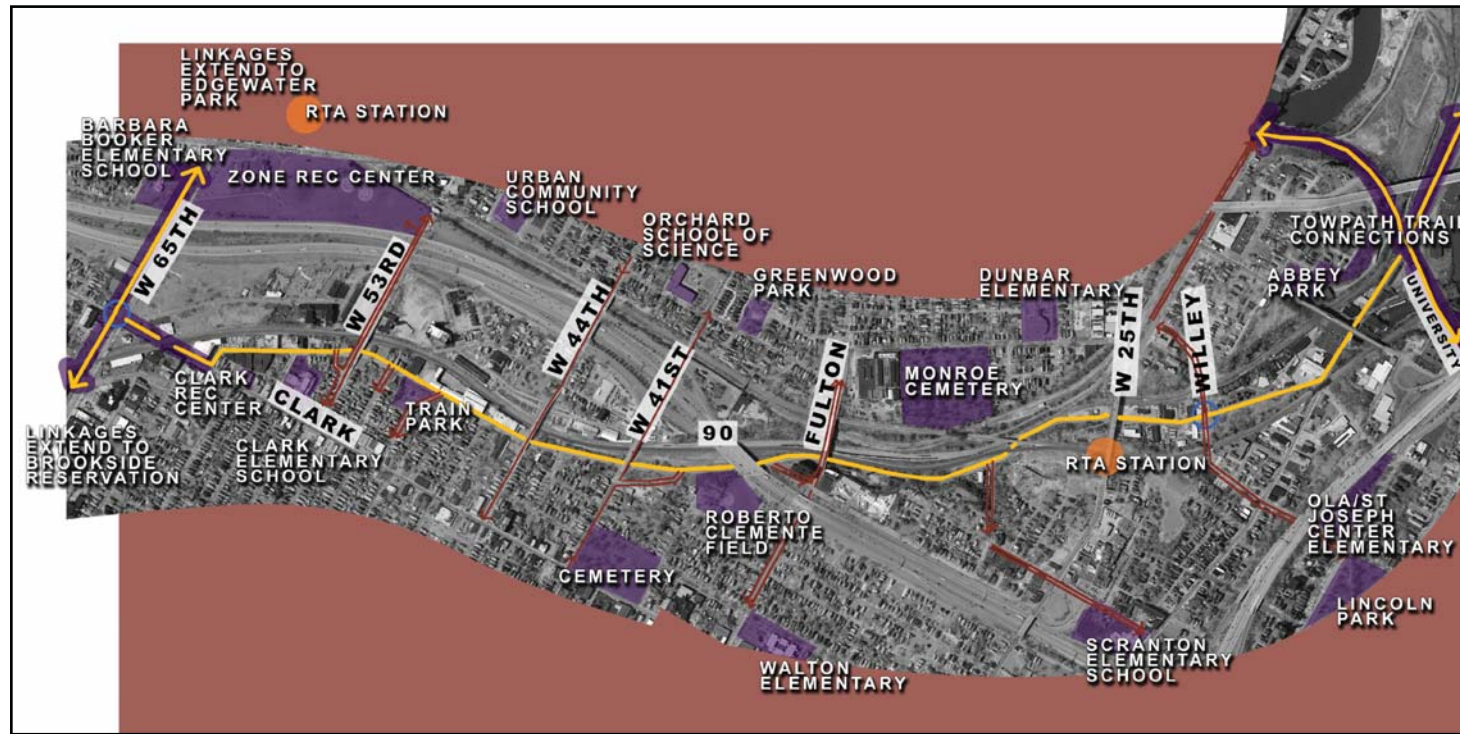


## TYPICAL SECTION OF PROPOSED GREENWAY

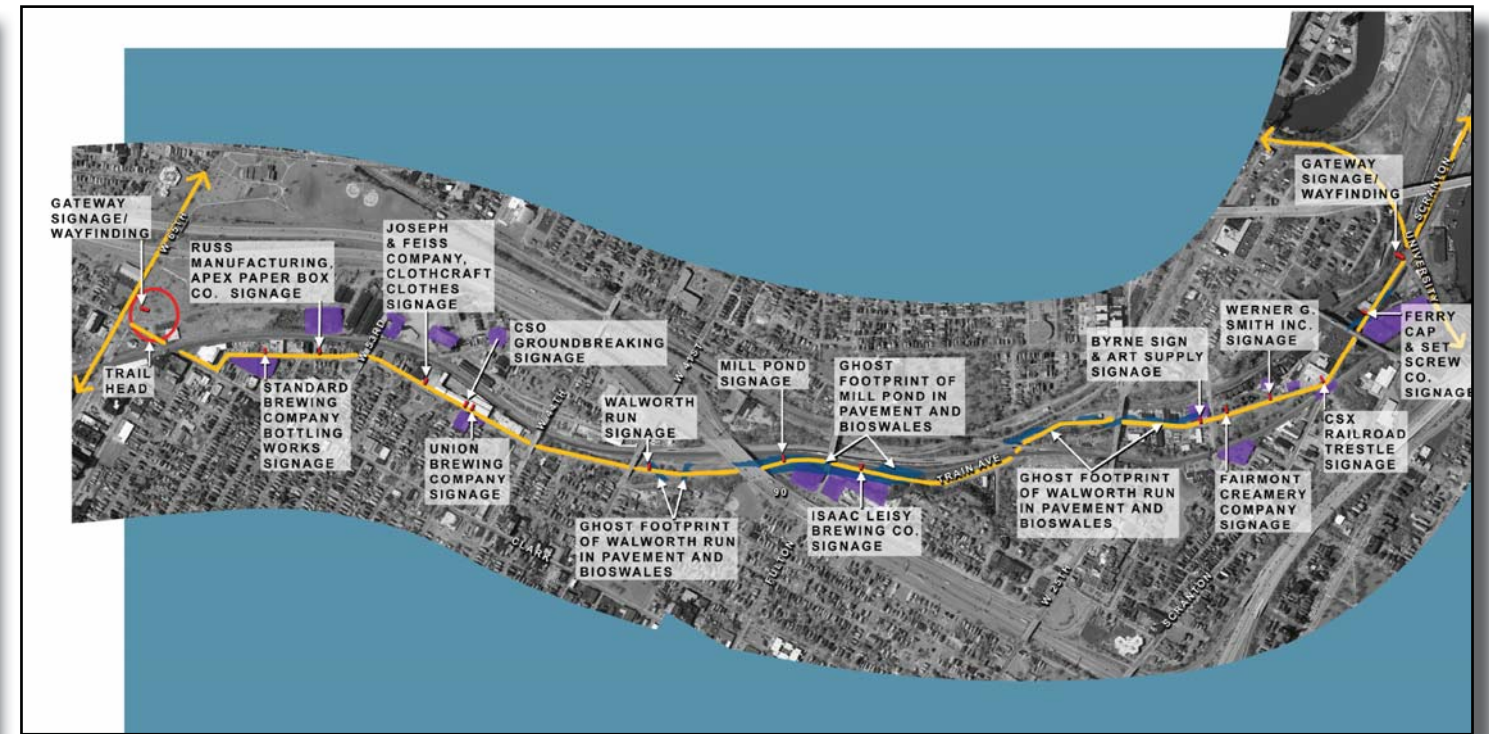




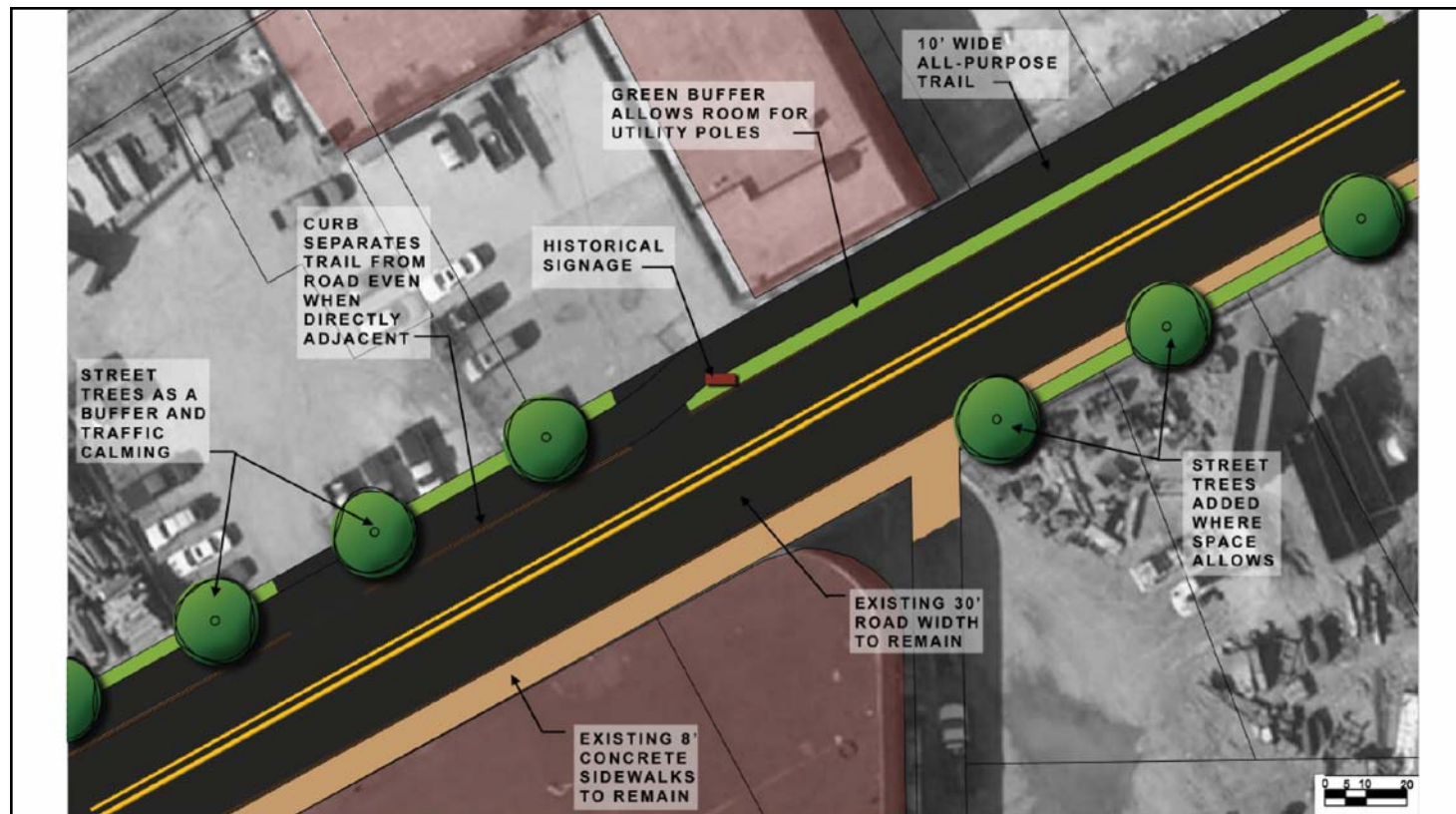
### ROADSIDE ALL-PURPOSE TRAIL AND IMMEDIATE NEIGHBORHOOD CONNECTIONS



### GREENWAY ENHANCEMENTS



### DETAILED PLAN OF WEST SIDE OF TRAIN AVENUE GREENWAY

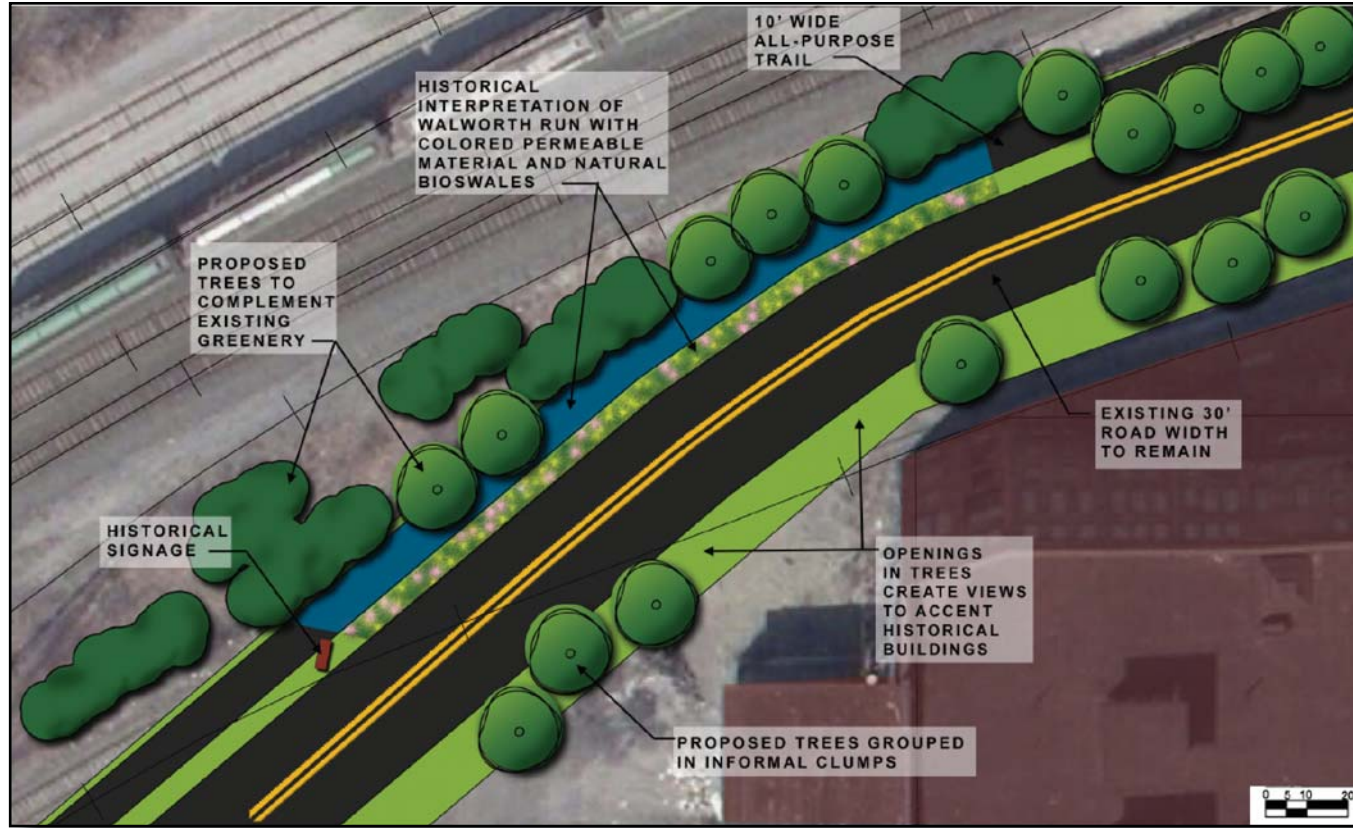


### BEFORE & AFTER WEST SIDE OF TRAIN AVENUE GREENWAY

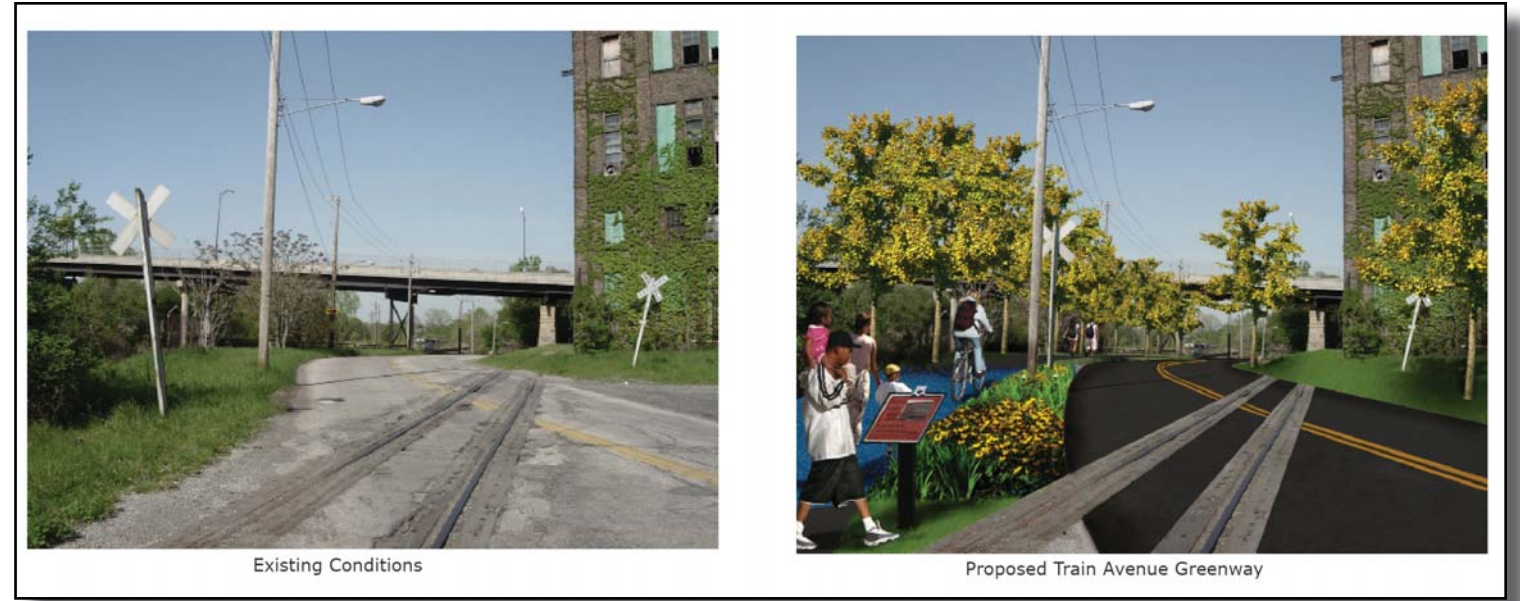




DETAILED PLAN OF CENTRAL SECTION OF TRAIN AVENUE GREENWAY



BEFORE & AFTER OF CENTRAL SECTION OF TRAIN AVENUE GREENWAY



DETAILED PLAN OF WILLEY/TRAIN INTERSECTION AT EAST SIDE OF GREENWAY

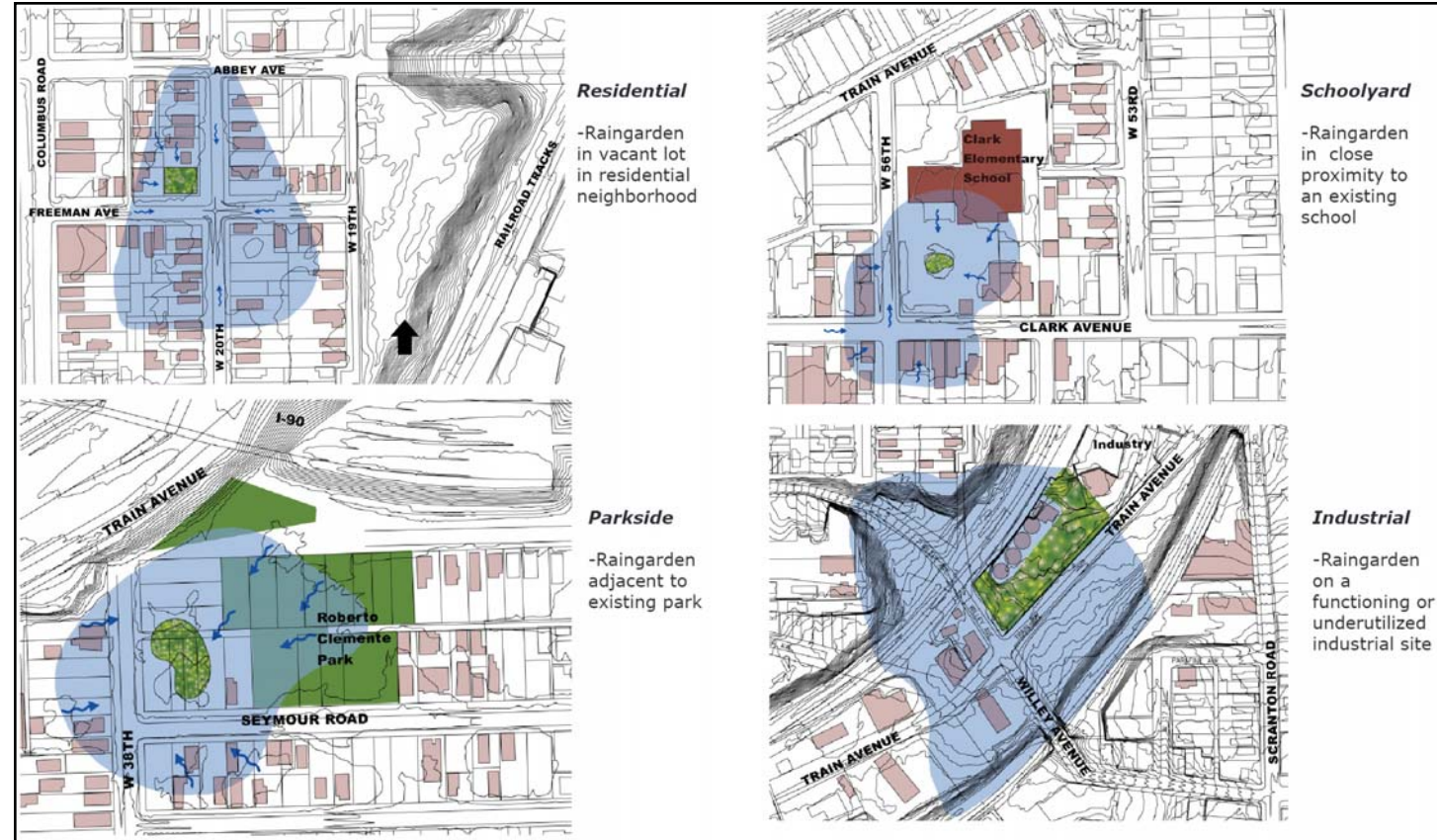


BEFORE & AFTER OF EAST SIDE OF TRAIN AVENUE GREENWAY

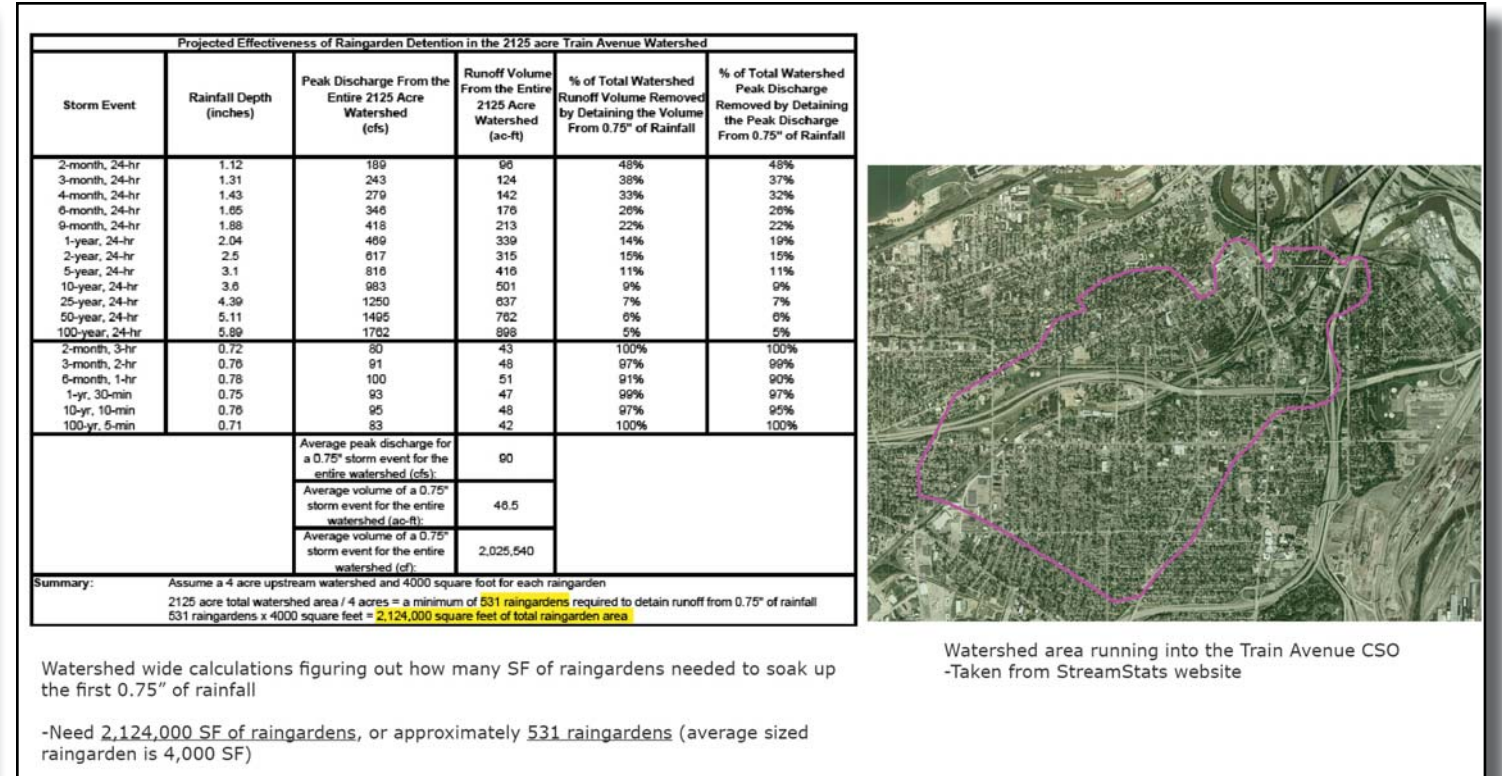




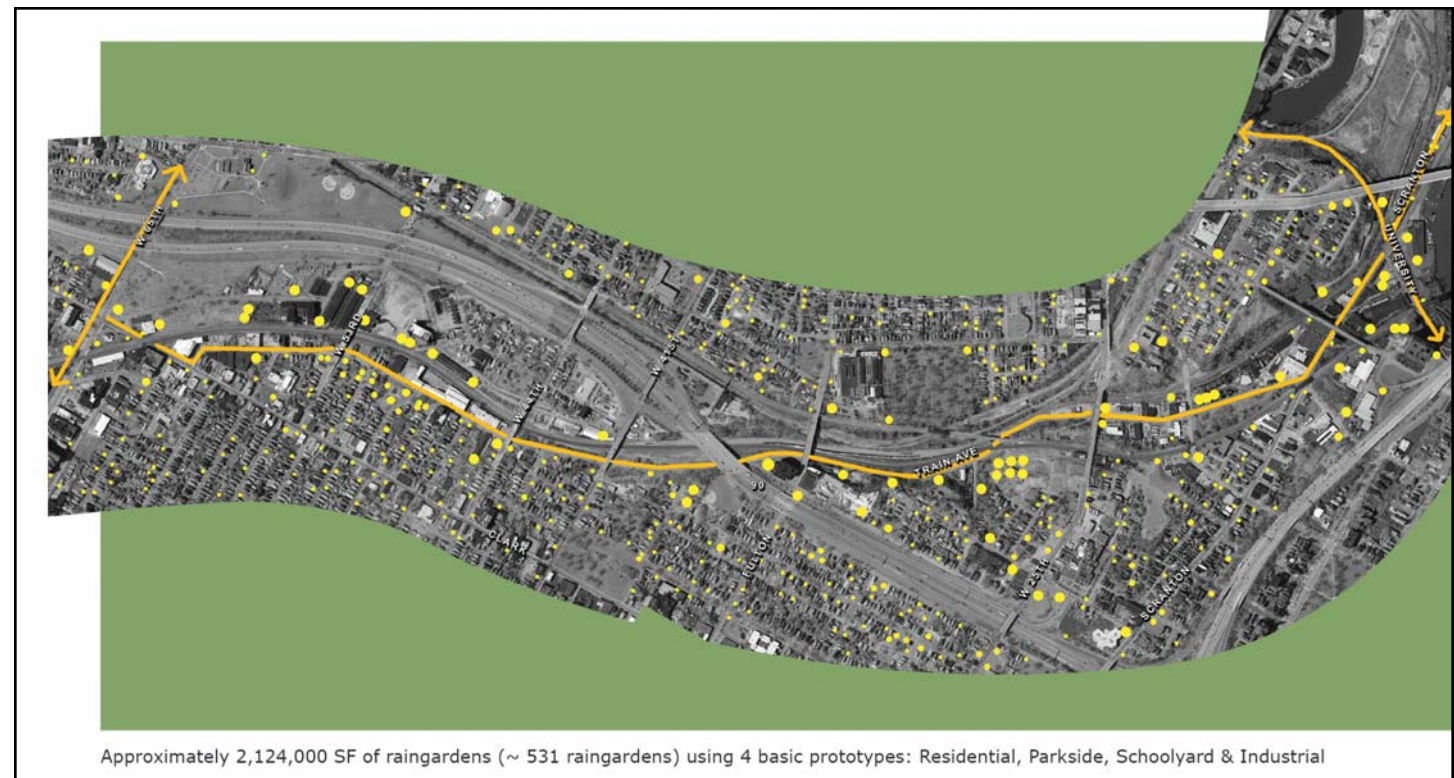
GREEN INFRASTRUCTURE STUDY: 4 BASIC PROTOTYPES



GREEN INFRASTRUCTURE STUDY: WATERSHED WIDE RAINGARDENS



GREEN INFRASTRUCTURE STUDY: WATERSHED WIDE RAINGARDENS



SUMMARY

The Preliminary Greenway Plan successfully compiled the elements of the Greenway Alternatives Plan and the suggestions of the Public into a Comprehensive Masterplan. The Roadside All-Purpose Trail was unanimously chosen by the public from three alternatives as the best option for bikeway circulation and neighborhood connections. Greenway enhancements add an extra layer of complexity and greening and green infrastructure add an environmental benefit.

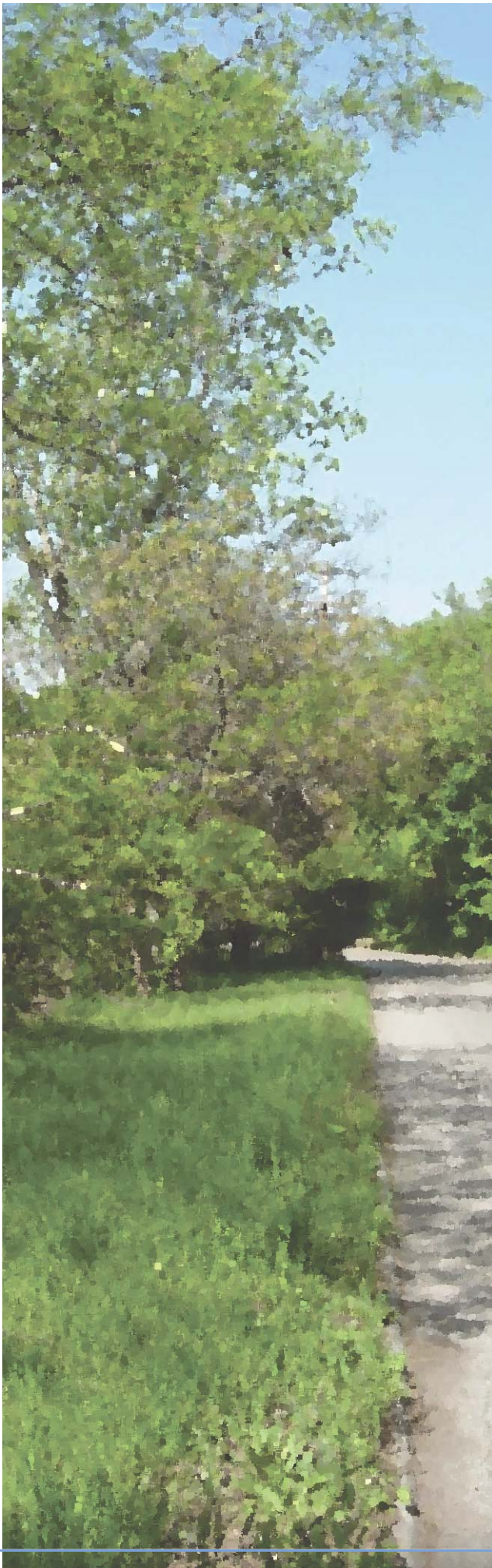
The design was carefully crafted to achieve the goals set by the Advisory Group and Steering Committees:

- Develop plans for an aesthetically pleasing "greenway" environment
- Help reestablish Train Avenue as a major community asset
- Promote alternatives to the automobile by providing a route for pedestrians and bicyclists
- Develop improved access to adjoining neighborhood and community assets
- Create a regional recreational amenity centered on a multi-purpose trail plan that will link into the City of Cleveland's Bikeway Master Plan









# PHASE 4: FINAL GREENWAY PLAN

- Train Avenue Greenway Plan
  - Concept & Design Elements
  - Overall Masterplan
- Detailed Trail & Connections Plans
  - West Side
  - East Side
- Detailed Plans, Sections & Before/After
  - Intersection Of Train & Willey
  - Between I-90 & Fulton Street Bridges
  - Trailhead
- Trail Enhancements
  - Signage
  - Greening
- Trail Materials
- Green Infrastructure: Watershed Wide Raingarden Planning Study
  - Calculations & Diagrams
  - 4 Basic Prototypes
  - Soils Evaluation



# FINAL GREENWAY PLAN

## THE TRAIN AVENUE GREENWAY PLAN CONCEPT

The Train Avenue Greenway Plan is centered on maximizing the corridor's potential as a roadway to accommodate traffic and as a greenway connection to link the five surrounding urban neighborhoods with pedestrian circulation and cultural and environmental amenities.

The Train Avenue Greenway is a trail and greenway network to be used by vehicles, bicyclists and pedestrians for transportation, recreation or cultural investigation.

The Train Avenue Greenway Plan identifies feasible trail linkages to the Towpath Trail and the Cleveland Bikeway Masterplan as well as the surrounding neighborhoods. A historical survey identifies industrial heritage interpretation opportunities. Green Infrastructure opportunities were identified to add a dimension of environmental benefits, both locally and regionally.

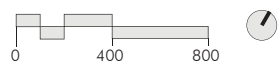
In recent years, the surrounding neighborhoods have experienced millions of dollars in new residential and commercial investment. Resulting in the new investments is vacant and underutilized land either in or directly adjacent to the corridor. The Train Avenue Greenway Plan is designed to transform Train Avenue into a public amenity and spark growth in the surrounding areas.

## THE TRAIN AVENUE GREENWAY PLAN DESIGN ELEMENTS

ROAD	TRAIL	GREENING	SIGNAGE	TRAIL MATERIALS
<ul style="list-style-type: none"> <li>• Street Crossings</li> <li>• Trailhead Parking Lot</li> </ul>	<ul style="list-style-type: none"> <li>• Train Avenue All-Purpose Trail</li> <li>• Connector All-Purpose Trails</li> <li>• Connector Bike Lanes</li> </ul>	<ul style="list-style-type: none"> <li>• Trees               <ul style="list-style-type: none"> <li>-street trees</li> <li>-tree groupings</li> <li>-reforestation</li> </ul> </li> <li>• Bioswales</li> <li>• Raingardens               <ul style="list-style-type: none"> <li>-parkside</li> <li>-schoolyard</li> <li>-industrial</li> <li>-vacant parcel</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Gateway and Wayfinding</li> <li>• Place Marker               <ul style="list-style-type: none"> <li>-historical</li> <li>-explanatory</li> </ul> </li> <li>• Mile Marker</li> </ul>	<ul style="list-style-type: none"> <li>• Traditional Asphalt</li> <li>• Colored Permeable Paving</li> <li>• Painted Lanes</li> </ul>



# TRAIN AVENUE GREENWAY MASTERPLAN





# TRAIN AVENUE GREENWAY DETAILED TRAIL & CONNECTIONS PLAN: WEST SIDE



## TRAIN AVENUE GREENWAY TRAILS

The Train Avenue Greenway Trail System consists of three parts:

- Train Avenue All-Purpose Trail
- Connector All-Purpose Trails
- Connector Bike Lanes

These three parts link together schools, parks, cemeteries, recreation centers and communities in a network of public places. The Train Avenue Greenway is a crucial link to achieve easier downtown access for bicyclists, as well as linking into the Towpath Trail and connecting the Near-West to the rest of Cleveland and beyond. The three parts of the Train Avenue Greenway work together to achieve these connections.

## TRAIN AVENUE ALL-PURPOSE TRAIL

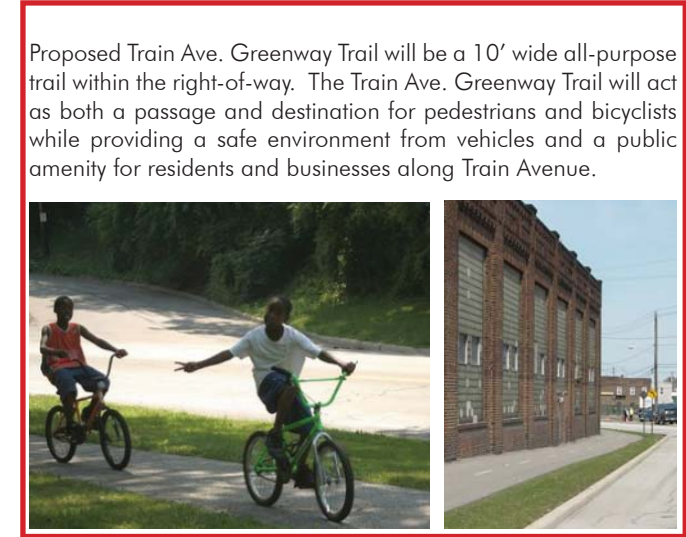
The Train Avenue All-Purpose Trail is a 10' wide asphalt trail separated from the road by a "green" buffer where space will allow. The Train Avenue All-Purpose Trail will replace existing sidewalks in areas that have them and will be a trail for both pedestrians and bicyclists.

The Train Avenue All-Purpose Trail stretches from the intersection of Cantor Street and Train Avenue eastward along Train Avenue to the vicinity of its intersection with Scranton Road and University Avenue. The Train Avenue All-Purpose Trail is on the north side of the street from Cantor Street to Willey, then jogs on the south side of the street from Willey to Scranton and continues down Scranton to University on the west side of the street.

There are five street crossings and one railroad crossing. These are:

- Crossing Train to Cantor
- Crossing railroad tracks between the I-90 and Fulton Road bridges
- Crossing Train to Willey
- Crossing Willey to Train
- Crossing Train to Scranton
- Crossing Scranton to University

These crossings will need appropriate vertical signage and pavement markings to alert vehicles, trains, and Train Avenue All-Purpose Trail users.



Proposed Train Ave. Greenway Trail will be a 10' wide all-purpose trail within the right-of-way. The Train Ave. Greenway Trail will act as both a passage and destination for pedestrians and bicyclists while providing a safe environment from vehicles and a public amenity for residents and businesses along Train Avenue.



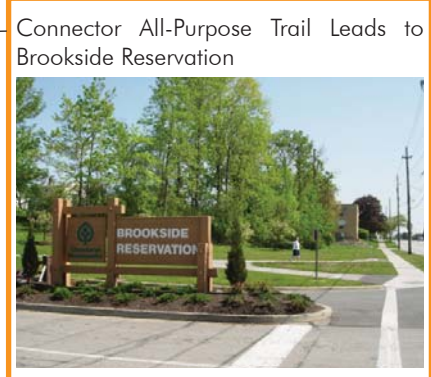
Bike lane connectors link Train Avenue All-Purpose Trail to the surrounding neighborhoods



Train Ave. All-Purpose Trail will connect to existing Zone Rec trail both East and West.



Train Ave. All-Purpose Trail crosses the road from North to South side of Walworth Ave. Appropriate crossing signage needed.



Connector All-Purpose Trail Leads to Brookside Reservation



Connector All-Purpose Trail Leads to Edgewater Park



Future Site of West Side Relief High School



# TRAIN AVENUE GREENWAY DETAILED TRAIL & CONNECTIONS PLAN: EAST SIDE



Train Avenue All-Purpose Trail changes color to represent Walworth Run and Mill Pond past presence.



Connector Bike Lanes link schools to greenway.



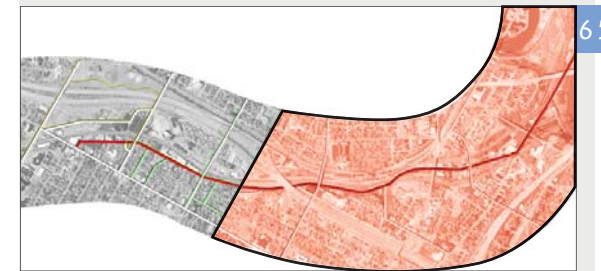
Train Ave. All-Purpose Trail jogs from the North side of Train Avenue to the South side, with two street crossings. Appropriate crossing signage needed.



Train Avenue All-Purpose Trail jogs from the North side of Train Avenue to the South side, with one street crossing.



Railroad tracks cross road and Train Avenue All-Purpose Trail. Appropriate crossing signage needed.



## CONNECTOR ALL-PURPOSE TRAILS

The Connector All-Purpose Trails are 8-10' wide asphalt trails that will replace existing sidewalks in areas that have them. The Connector All-Purpose Trails will be trails for both pedestrians and bicyclists and will join up with the Train Avenue All-Purpose Trail. The Connector All-Purpose Trails are the following:

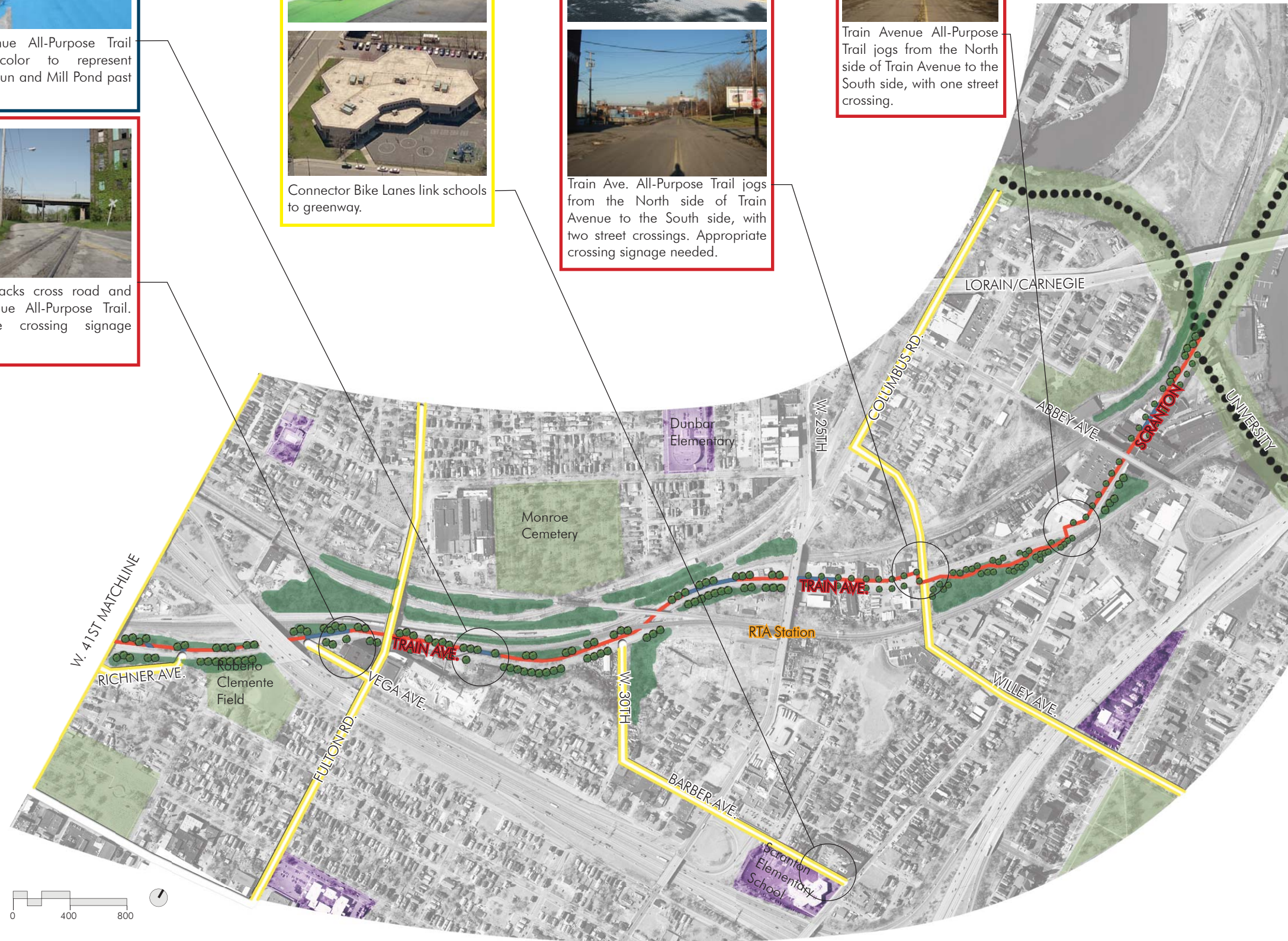
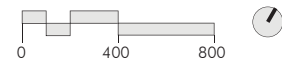
- Cantor north to W 53rd to Walworth Avenue to W 65th in both directions, terminating at Edgewater Park and Brookside Reservation and extending into the existing all-purpose trail at Zone Recreation Center
- Along Scranton past University to downtown (as per the Towpath Trail Proposed Connectors)
- The intersection of Scranton and University along University (as per the Towpath Trail Proposed Connectors)

## CONNECTOR BIKE LANES

The Connector Bike Lanes are 5' wide min. painted lanes on the existing pavement of the connector streets. The existing streets will need to be re-painted to support these lanes. The Connector Bike Lanes will be trails for bicyclists only. Pedestrians are to use the existing sidewalks in these areas. The Connector Bike Lanes will join up with the Train Avenue All-Purpose Trail. The Connector Bike Lanes are the following:

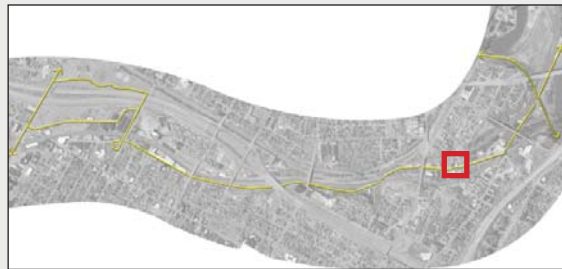
- W 51st Street, from Train to Clark
- W 48th Street, from Train to Clark
- W 43rd Street, from Train to Howlett
- Howlett Avenue, from W 44th to W 41st
- W 44th Street, from Clark to Trent
- W 41st Street, from Clark to Bailey
- Richner Avenue, from Train to W 41st
- Vega Avenue, from Train to Fulton
- Fulton Road, from Walton to Monroe
- W 30th Street, from Train to Barber
- Barber Avenue, from W 30th to Scranton
- Willey Avenue, from Columbus to W 14th
- Columbus Road, from Willey to Carter

Further studies will be needed to determine crossings, spatial constraints, necessary signage etc. of both the Connector All-Purpose Trails and Connector Bike Lanes.





# INTERSECTION OF TRAIN AND WILLEY DETAILS



## TRAIN AVENUE ALL-PURPOSE TRAIL

The Train Avenue All-Purpose Trail is a 10' wide asphalt trail separated from the road by a "green" buffer where space will allow. The Train Avenue All-Purpose Trail will replace existing sidewalks in areas that have them and will be a trail for both pedestrians and bicyclists. As shown in the detailed plan, section and images, the Train Avenue All-Purpose Trail is separated from the road to create a safer atmosphere for both pedestrians and vehicles.

## CROSSINGS

The detailed plan of the intersection of Train Avenue and Willey shows the typical conditions involved in a road crossing. Road crossings will need to be clearly designated in both vertical signage and markings on the pavement. Road crossing designations will need to be targeted at both vehicles and trail users.

## CONNECTOR BIKE LANES

The Connector Bike Lanes are 5' wide min. painted lanes on the existing pavement of the connector streets. The existing streets will need to be re-painted to support these lanes. The Connector Bike Lanes will be trails for bicyclists only. Pedestrians are to use the existing sidewalks in these areas. As shown in the detailed plan, Connector Bike Lanes join in to the Train Avenue All-Purpose Trail.

## STREET TREES

The Street Trees form a buffer between pedestrians and vehicles, while creating a vertical element for a more walkable environment. Street trees would be pedestrian scaled and evenly spaced.

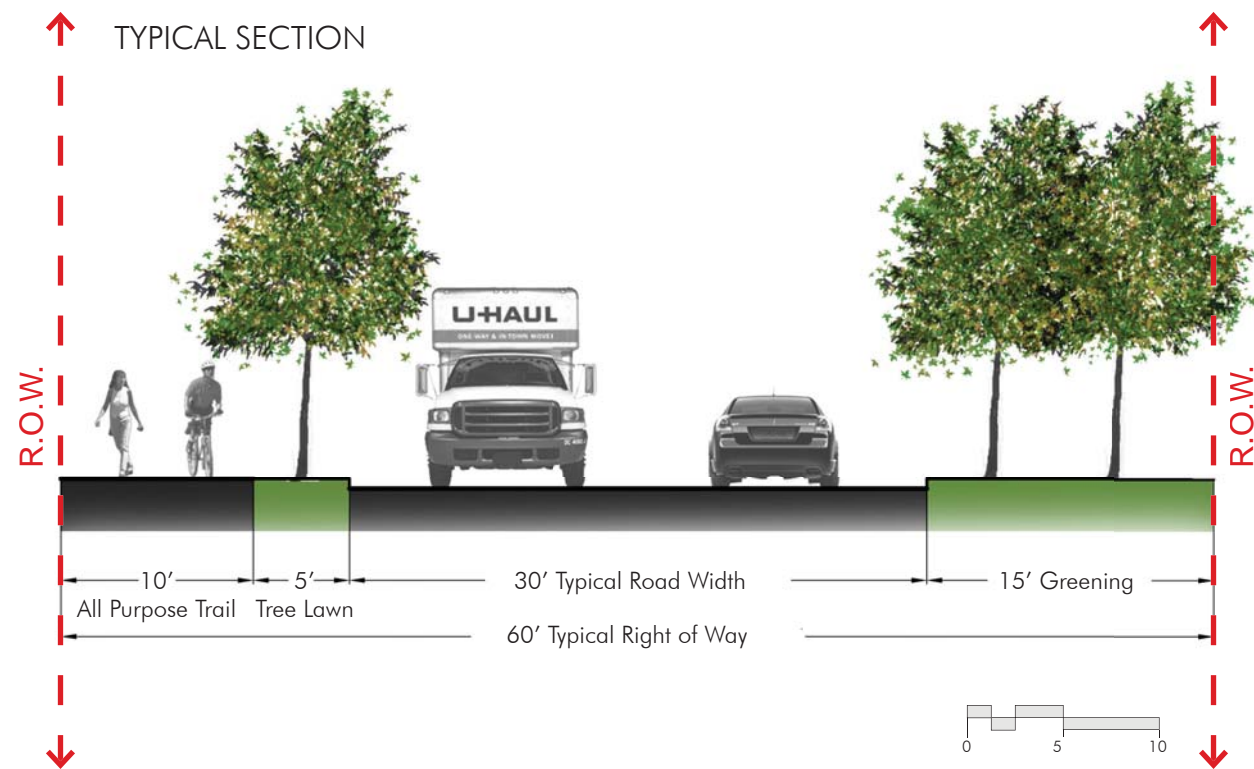
## POTENTIAL OUTLOOK



Before



After



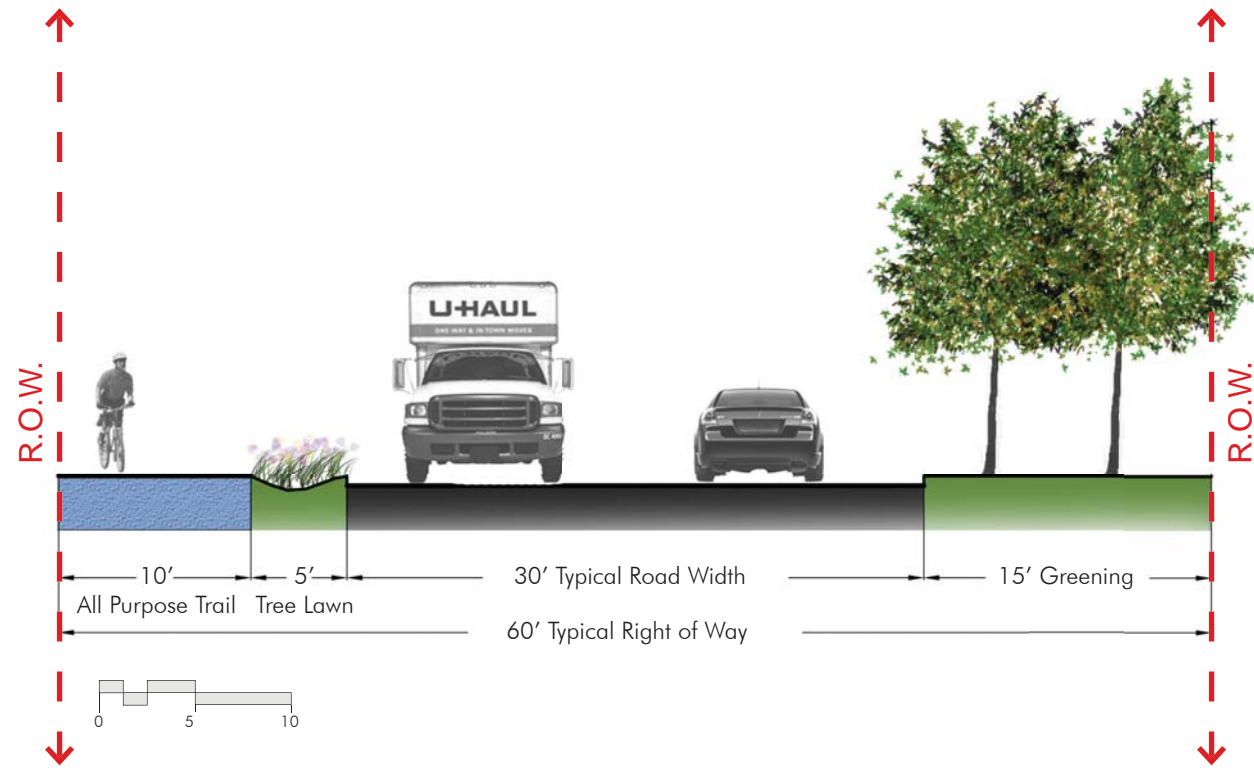
## DETAILED PLAN



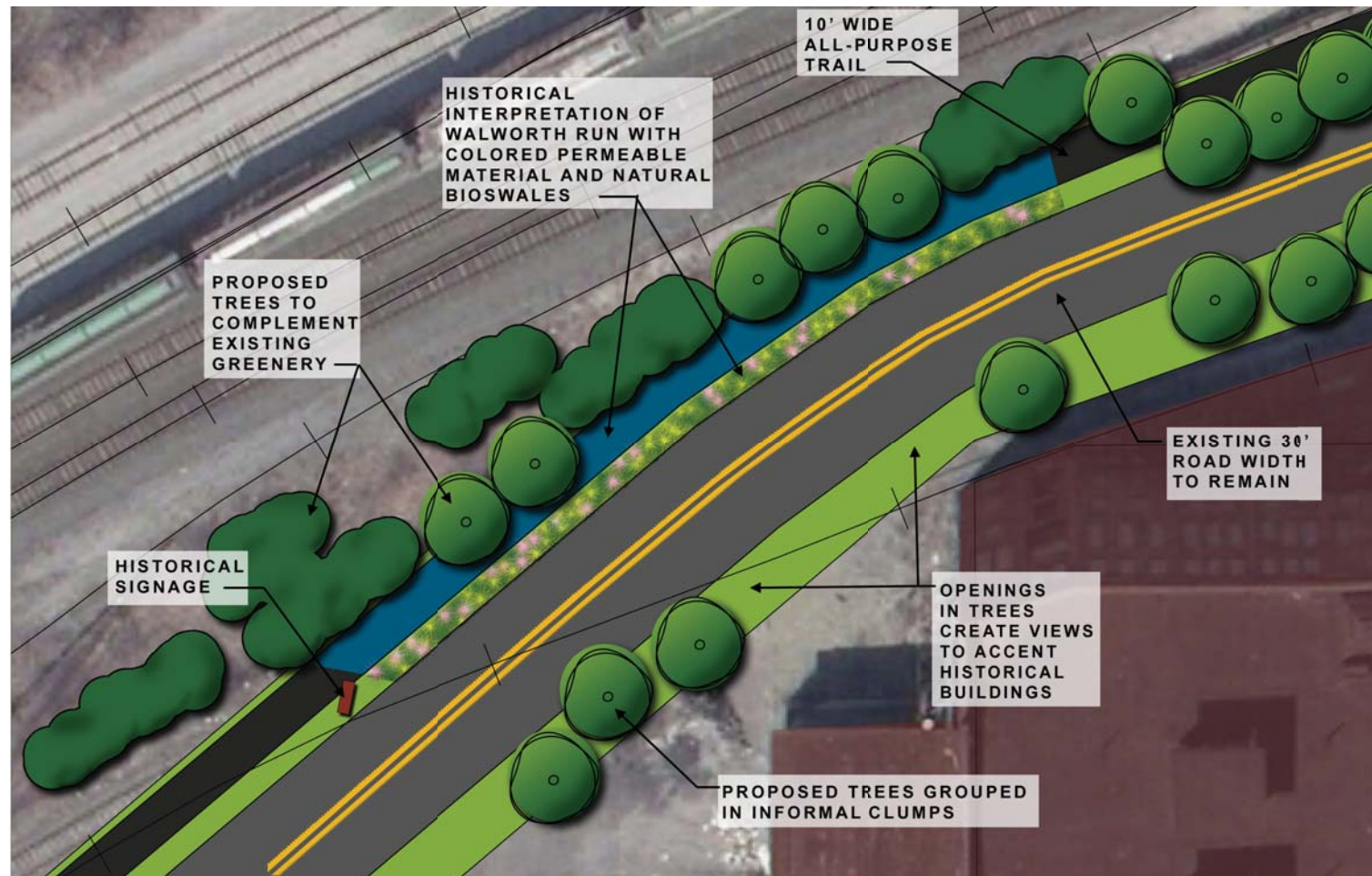


# BETWEEN I-90 & FULTON STREET BRIDGE DETAILS

## TYPICAL SECTION



## DETAILED PLAN



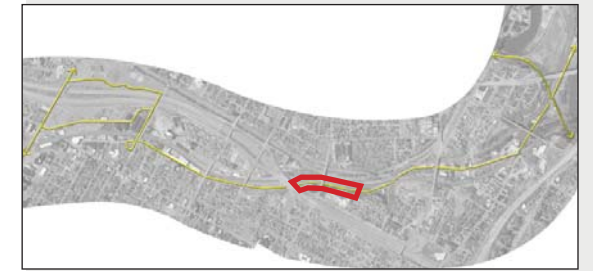
## POTENTIAL OUTLOOK



Before



After



### COLORED PERMEABLE PAVING

As part of the historical interpretation of Train Avenue, the Colored Permeable Paving represents the footprint of the former Walworth Run and the old Mill Pond. The Colored Permeable Paving happens when the Train Avenue All-Purpose Trail crosses over the ghost footprint of these historical waterways. The Colored Permeable Paving occurs for a total of 220 linear feet, in eight different spots.

### NATURALIZED BIOSWALES

The Naturalized Bioswales run alongside the Colored Permeable Paving and occur as part of the buffer between the road and Train Avenue All-Purpose Trail. The Naturalized Bioswales will not only act as a historical interpretation element, but they will also capture and cleanse stormwater runoff.

### EXPLANATORY AND HISTORICAL SIGNAGE

Explanatory Signage will occur adjacent to the Colored Permeable Paving and Naturalized Bioswales educating the public about the former Walworth Run and the function of bioswales. Historical Signage will occur next to the trail in visual proximity of the historical buildings and will educate the public on the cultural significance and previous owners of the buildings.

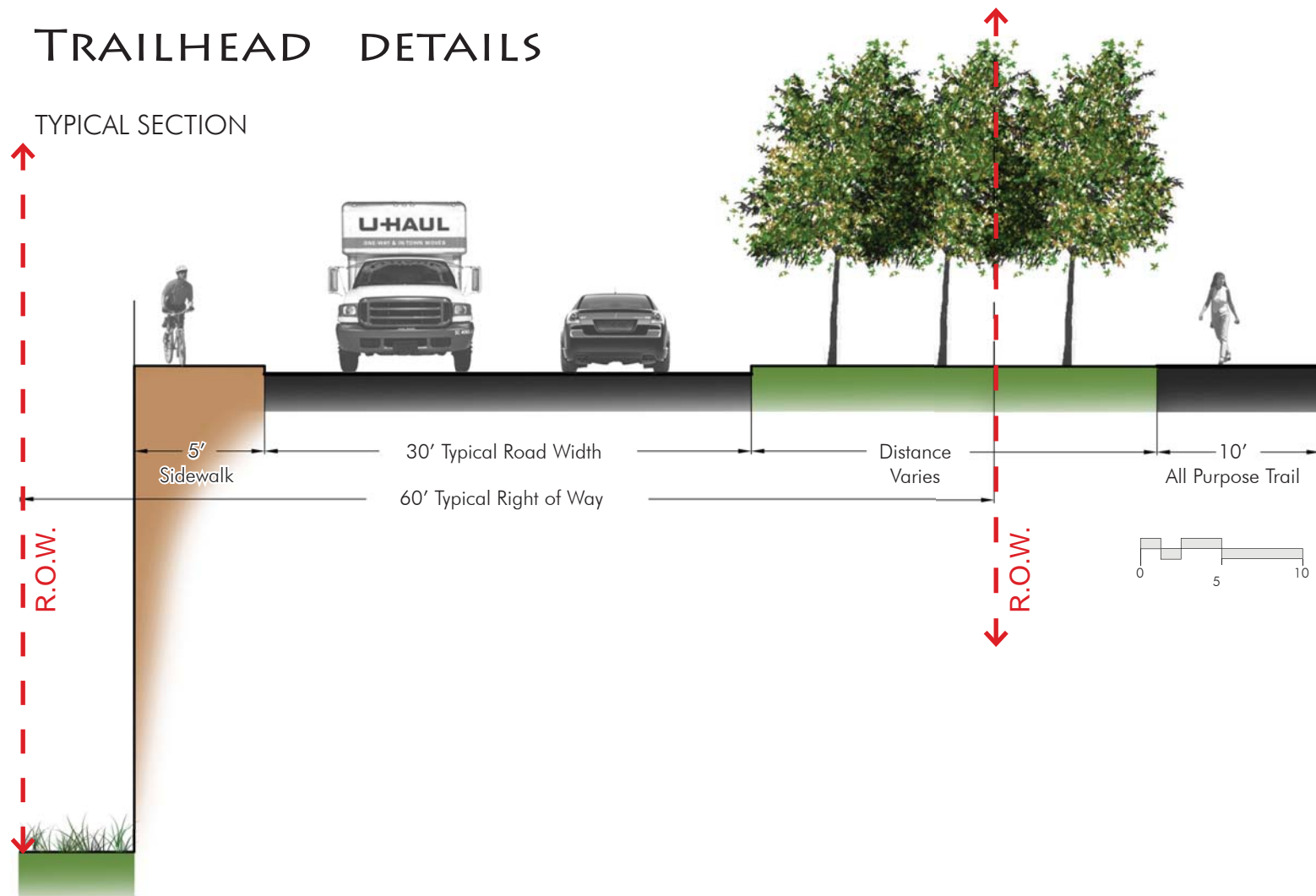
### TREE GROUPINGS

Trees will be added in Tree Groupings within the right-of-way to complement the existing greenery. Tree Groupings will be grouped to create views to accent the historical buildings.

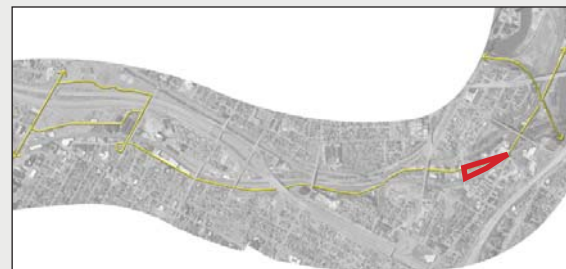


# TRAILHEAD DETAILS

TYPICAL SECTION



DETAILED PLAN



## DETAILED PLAN, SECTION AND PHOTOGRAPHIC MONTAGES: TRAILHEAD BETWEEN WILLEY AND SCRANTON

**MEANDERING TRAIN AVE ALL-PURPOSE TRAIL**  
 The Train Avenue All-Purpose Trail will meander through the trailhead to create a more interesting pedestrian and bicyclist experience. Tree Groupings will create visual “surprises” within the meandering trail, opening views to both the industrial landscape across the street and the greenery within the trailhead property.

**TRAILHEAD PARKING LOT**  
 The Trailhead will have a Parking Lot supporting about 6 parking spots for those who want to experience the Train Avenue Greenway Trail but are too far away to bike or walk to it.

**GATEWAY SIGNAGE AND WAYFINDING**  
 The Trailhead will also contain Gateway Signage and Wayfinding elements to help visitors navigate the Train Avenue Greenway Trail. Gateway Signage will welcome visitors to the Greenway, creating a placemaking element. Wayfinding signage will describe the Train Avenue Greenway network of trails, identifying the Train Avenue All-Purpose Trail, Connector All-Purpose Trails and Connector Bike Lanes. Wayfinding signage will also educate the public on the neighborhood and regional connections made by the Train Avenue Greenway.

**REFORESTATION**  
 The Trailhead is located on an existing open space, making it an opportunity for Urban Reforestation. Large trees will be added in naturalized clumps to open spaces, and existing greenery will be cleared of invasives and replaced with native trees.

## POTENTIAL OUTLOOK



Before



After



# TRAIL ENHANCEMENTS: SIGNAGE



- A: Gateway/Wayfinding
- B: Standard Brewing Company Bottling Works
- C: Russ Manufacturing Apex Paper Box Company
- D: Joseph & Feiss Company, Clothcraft Clothes
- E: CSO Groundbreaking
- F: Union Brewing Company
- G: Walworth Run
- H: Mill Pond
- I: Isaac Leisy Brewing Company
- J: Byrne Sign & Art Supply
- K: Fairmont Creamery Company
- L: Werner G. Smith Inc.
- M: CSX Railroad Trestle
- N: Ferry Cap and Set Screw Company
- O: Gateway/Wayfinding

## TRAIL SIGNAGE

**TYPE 1**  
Gateway and Wayfinding



**TYPE 2**  
Place Marker



**TYPE 3**  
Mile Marker

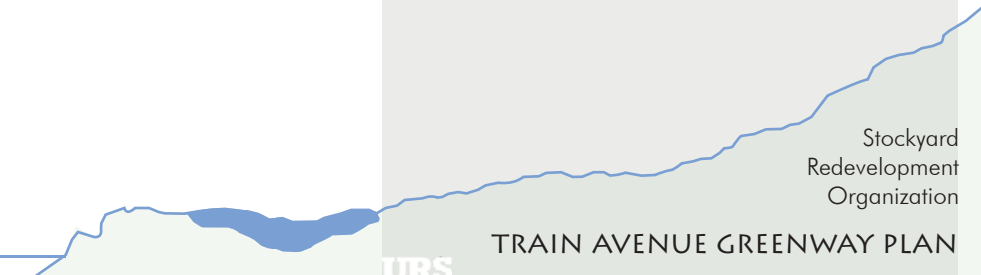


## TRAIL ENHANCEMENTS SIGNAGE

**TYPE 1**  
**GATEWAY AND WAYFINDING SIGNAGE**  
Gateway and Wayfinding Signage will be located on both ends of the Train Avenue Greenway Plan and will act as both welcome signage and directional signage to help visitors navigate through the Greenway. Gateway and Wayfinding Signage could be an overhead structure, a decorative marquis, a sculptural element, or traditional park signage.

**TYPE 2**  
**PLACE MARKER SIGNAGE**  
Place Marker Signage will be either historical or explanatory signs, calling out the historical buildings and waterways, as well as environmental and cultural public education. Place Marker Signage will also identify neighborhood and regional linkages and could be anything from kiosks, to posts, to traditional park signage

**TYPE 3**  
**MILE MARKERS**  
Mile Markers are the simplest form of signage on the Core All-Purpose Trail. They can be self standing or attached to a vertical element, such as a post or tree. There are many choices in materiality such as concrete, wood, or metal.





# TRAIL ENHANCEMENTS: GREENING

## TRAIL GREENING

Trail Greening adds an environmental, recreational and aesthetic flavor to the Train Avenue Greenway Plan. There are 3 main types of greenery alongside the Core All-Purpose Trail. These three types are bioswales, trees, and raingardens.

### TYPE 1 BIOSWALES

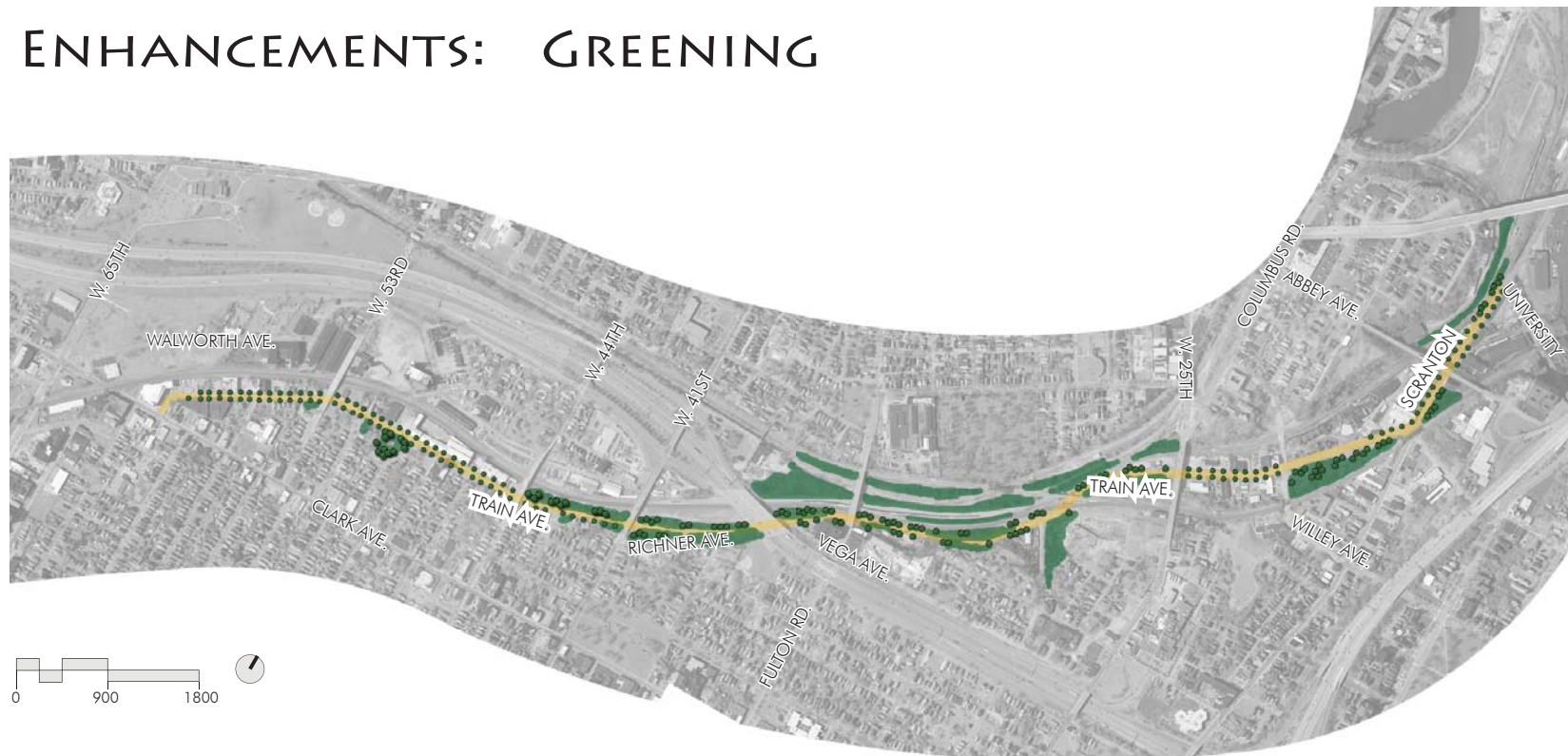
Bioswales would occur along the Core All-Purpose Trail next to the Colored Permeable Pavement, as part of the buffer between the road and trail. Bioswales act as both a historical interpretation element, and to capture and cleanse stormwater runoff.

### TYPE 2 TREES

Trees will be added to the Train Avenue Greenway Plan as street trees, tree groupings and to enhance existing greenery. Street trees will be at a pedestrian scale, while tree groupings will create a larger canopy. Enhancement trees will be of similar characteristics of the existing greenery and will replace invasives.

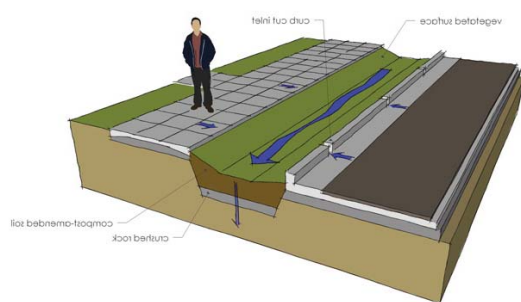
### TYPE 3 RAINGARDENS

Raingardens will occur in vacant parcels, next to schools, within or next to parks and in unused industrial lots. A few of these conditions occur directly adjacent to the Core All-Purpose Trail. See the last 4 pages in this section for information on raingardens on a watershed-wide level.



## TRAIL GREENING

TYPE 1  
Bioswales



TYPE 2  
Trees



TYPE 3  
Raingardens





# TRAIL MATERIALS



## TRAIL MATERIALS

### TYPE 1 - (YELLOW)

Train Avenue & Connector All-Purpose Trails  
Traditional Asphalt Pavement



### TYPE 2 - (BLUE)

Train Avenue All-Purpose Trail Segments  
Colored Permeable Pavement



### TYPE 3 - (GREEN)

Connector Bike Lanes  
Designated Lanes on Existing Road



## MATERIAL TYPE 1

### CORE & CONNECTOR ALL-PURPOSE TRAILS

The Core and Connector All-Purpose Trails will be traditional asphalt pavement with painted markings for pedestrians and bicyclists.

## MATERIAL TYPE 2

### CORE ALL-PURPOSE TRAIL SEGMENTS

Segments of the Core All-Purpose Trail will be colored permeable pavement, blue in color to reflect the historical waterways. The permeable pavement could be recycled glass, such as FilterPave manufactured by Geosystems, colored recycled tires, such as those made by Xtreme FlexiPave, or other colored permeable materials.

## MATERIAL TYPE 3

### CONNECTOR BIKE LANES

Connector Bike Lanes will be designated lanes on the existing street pavement. These designated lanes are intended to be painted lines with symbols, however if cost is not a constraint, the lanes could be pavers, colored asphalt or containing bollards as a barrier between road and bike lane.



# GREEN INFRASTRUCTURE: WATERSHED WIDE RAINGARDENS PLANNING STUDY

## GREEN INFRASTRUCTURE & CSO RELIEF

### WALWORTH CSO

The Walworth CSO is the largest Combined Sewer Overflow (CSO) on Cleveland's west side, discharging 320 million gallons of raw sewage per year and accounting for 77% of all the untreated discharge for the Westerly Sewage Treatment Plant. Flowing directly into the Cuyahoga River, this sewage discharge happens when there are increases of stormwater and occurs 43 times per year or approximately every 9 days. The North East Ohio Regional Sewer District (NEORS) recently recommended the creation of a Storage Tunnel estimated at \$106 million dollars to relieve this excessive discharge.

### GREEN INFRASTRUCTURE

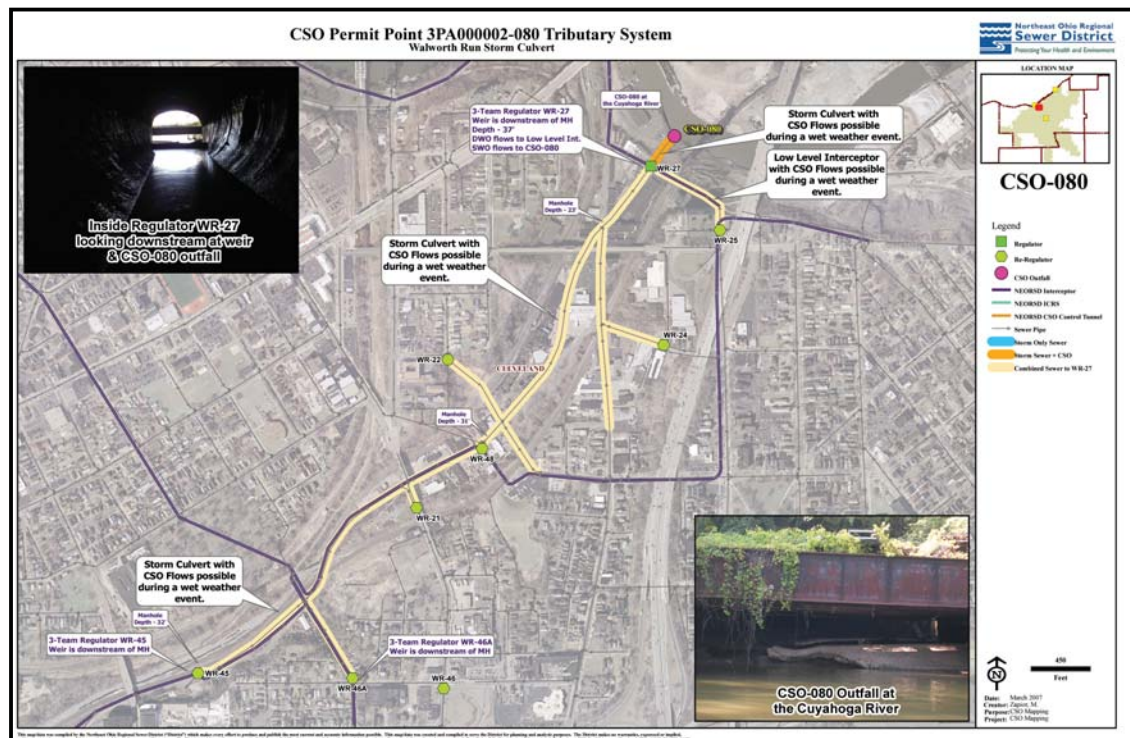
Green Infrastructure is the concept of using plants as tools in engineering. Green Infrastructure can help to solve the CSO discharge problem for the Walworth CSO. By using highly engineered bioretention areas, such as raingardens and bioswales, stormwater will be soaked up through the plants and soil before it even gets to the pipes. With less water in the pipes, less sewage will be dumping into the Cuyahoga.

### WATERSHED WIDE RAINGARDEN STUDY

The Watershed Wide Raingarden Study is a broad strokes planning study examining how many raingardens it would take to soak up the first 3/4" flush of rain across the entire Walworth Watershed. From this, preliminary CSO cost savings were calculated.

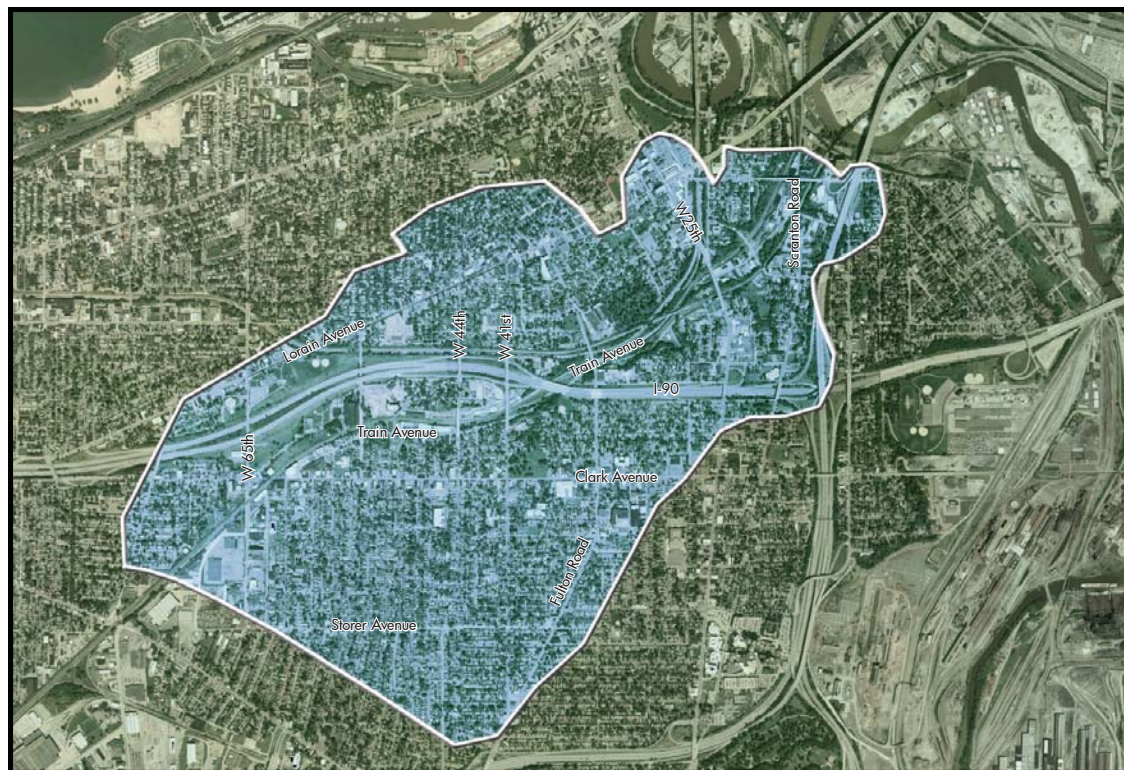
### WALWORTH CSO

The Walworth CSO runs underneath Train Avenue and accounts for 77% of all the untreated discharge for the Westerly Sewage Treatment Plant. Sewage from the CSO dumps into the Cuyahoga about every 9 days.



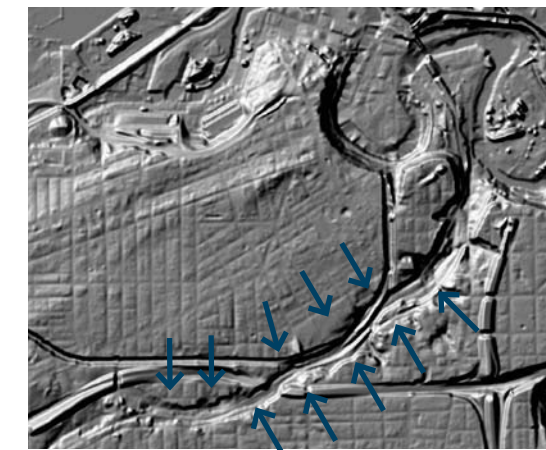
### WALWORTH RUN WATERSHED

The Walworth Watershed is approximately 2,125 acres. The Watershed Wide Raingarden Study projects how many raingardens will be needed to soak up the first 3/4" flush rainfall across the whole watershed.



### RUNOFF DRAINAGE

The neighborhoods surrounding the Train Avenue Greenway drain into the Walworth Valley and the Walworth CSO.



### EXISTING VACANT PARCEL



### RAINGARDEN SIMULATION





**RAINFALL FREQUENCY SPECTRUM CHART**

The Watershed Wide Raingarden Study looks at soaking up the first 3/4" flush of rainfall by use of raingardens. About 93% of all storm events have at least 3/4" of rain.

Rainfall Frequency Spectrum Cleveland Hopkins Airport Period of Record: 1/1/1957-12/31/2007		
Percent of All Storm Events	Regional Data (Return Interval, Duration)	24-hour Rainfall Amount (inches)
68.5%	-	0.24
87.2%	-	0.53
<b>92.7%</b>	<b>-</b>	<b>0.75</b>
97.1%	2-month, 24-hr	1.12
98.1%	3-month, 24-hr	1.31
98.5%	4-month, 24-hr	1.43
99.1%	6-month, 24-hr	1.65
99.4%	9-month, 24-hr	1.88
99.6%	1-year, 24-hr	2.04
99.9%	2-year, 24-hr	2.5
99.8%	5-year, 24-hr	3.1
99.96%	10-year, 24-hr	3.6
99.99%	25-year, 24-hr	4.39
None Occurred	50-year, 24-hr	5.11
None Occurred	100-year, 24-hr	5.89

**RAINGARDEN DETENTION CALCULATIONS DATABASE**

This chart reflects the results of an Excel database determining the number of raingardens needed to soak up the first 3/4" flush for a 24 hour rainfall event. A 2,125 acre watershed would need about 2,124,000 square feet of raingardens, or about 531 raingardens spread across the watershed.

Projected Effectiveness of Raingarden Detention in the 2125 acre Train Avenue Watershed					
Storm Event	Rainfall Depth (inches)	Peak Discharge From the Entire 2125 Acre Watershed (cfs)	Runoff Volume From the Entire 2125 Acre Watershed (ac-ft)	% of Total Watershed Runoff Volume Removed by Detaining the Volume From 0.75" of Rainfall	% of Total Watershed Peak Discharge Removed by Detaining the Peak Discharge From 0.75" of Rainfall
2-month, 24-hr	1.12	189	96	48%	48%
3-month, 24-hr	1.31	243	124	38%	37%
4-month, 24-hr	1.43	279	142	33%	32%
6-month, 24-hr	1.65	346	176	26%	26%
9-month, 24-hr	1.88	418	213	22%	22%
<b>1-year, 24-hr</b>	<b>2.04</b>	<b>469</b>	<b>339</b>	<b>14%</b>	<b>19%</b>
2-year, 24-hr	2.5	617	315	15%	15%
5-year, 24-hr	3.1	816	416	11%	11%
10-year, 24-hr	3.6	983	501	9%	9%
25-year, 24-hr	4.39	1250	637	7%	7%
50-year, 24-hr	5.11	1495	762	6%	6%
100-year, 24-hr	5.89	1762	898	5%	5%
2-month, 3-hr	0.72	80	43	100%	100%
3-month, 2-hr	0.76	91	48	97%	99%
6-month, 1-hr	0.78	100	51	91%	90%
1-yr, 30-min	0.75	93	47	99%	97%
10-yr, 10-min	0.76	95	48	97%	95%
100-yr, 5-min	0.71	83	42	100%	100%
		Average peak discharge for a 0.75" storm event for the entire watershed (cfs):	90		
		Average volume of a 0.75" storm event for the entire watershed (ac-ft):	46.5		
		Average volume of a 0.75" storm event for the entire watershed (cf):	2,025,540		
<b>Summary:</b> Assume a 4 acre upstream watershed and 4000 square foot for each raingarden					
2125 acre total watershed area / 4 acres = a minimum of <b>531 raingardens</b> required to detain runoff from 0.75" of rainfall					
531 raingardens x 4000 square feet = <b>2,124,000 square feet of total raingarden area</b>					

**531 RAINGARDENS**

This conceptual diagram gives an idea of what 531 raingardens looks like. Each green dot represents a potential raingarden.



**WATERSHED WIDE RAINGARDEN STUDY**

**CALCULATIONS**

To determine the number of raingardens needed to soak up the first 3/4" flush of rainfall (EPA's requirement for water quality standards), a series of data collection and calculations were necessary.

Rainfall data from the last 50 years was collected from Cleveland Hopkins Airport and created the Rainfall Frequency Spectrum chart (far left). This Spectrum chart says that about 93% of all storm events have at least 3/4" of rain. By plugging the watershed data into the Raingarden Detention Calculations database (near left), URS was able to determine that a 2,125 acre watershed would need about 2,124,000 square feet of raingardens. With the average size of a vacant lot raingarden as 4,000 square feet, that means that the Walworth watershed needs about 531 raingardens to soak up the first 3/4" flush of rainfall.

**COST SAVINGS**

Raingardens would create significant cost savings for CSO relief over time. Below are the following preliminary calculations:

- Total cost of 531 Raingardens over 20 years, including real estate costs, installation and maintenance is about \$48,000,000
- Total savings on a Conventional CSO over 20 years, including stormwater treatment costs and partial savings on new CSO expansions is about \$95,500,000
- Therefore, the estimated net savings on Raingardens over 20 years is about \$47,500,000.

More detailed calculations and cost savings can be found in the Appendix.



# GREEN INFRASTRUCTURE: 4 BASIC PROTOTYPES



## RAINGARDEN PROTOTYPES

With the Watershed Wide Raingarden Study, URS determined four basic prototypes of raingardens that would occur in different conditions within the watershed.

These prototypes are:

### PARKSIDE RAINGARDEN

Raingardens next to or within a park would be enhancing an existing public property, helping to solve drainage problems within the park and concentrating neighborhood amenities.

### SCHOOLYARD RAINGARDEN

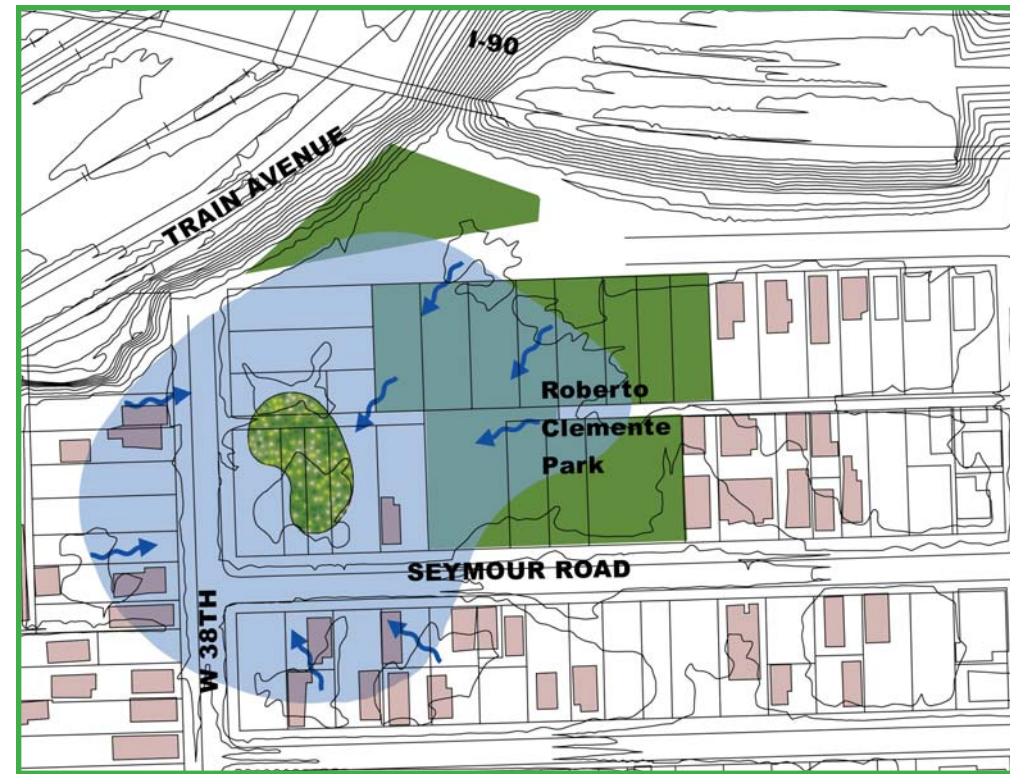
Raingardens on school property would be used as outdoor classrooms, to help educate children on environmental issues within science classes. Children would have the benefit of helping to plant and monitor the raingardens as part of a learning experience.

### INDUSTRIAL RAINGARDEN

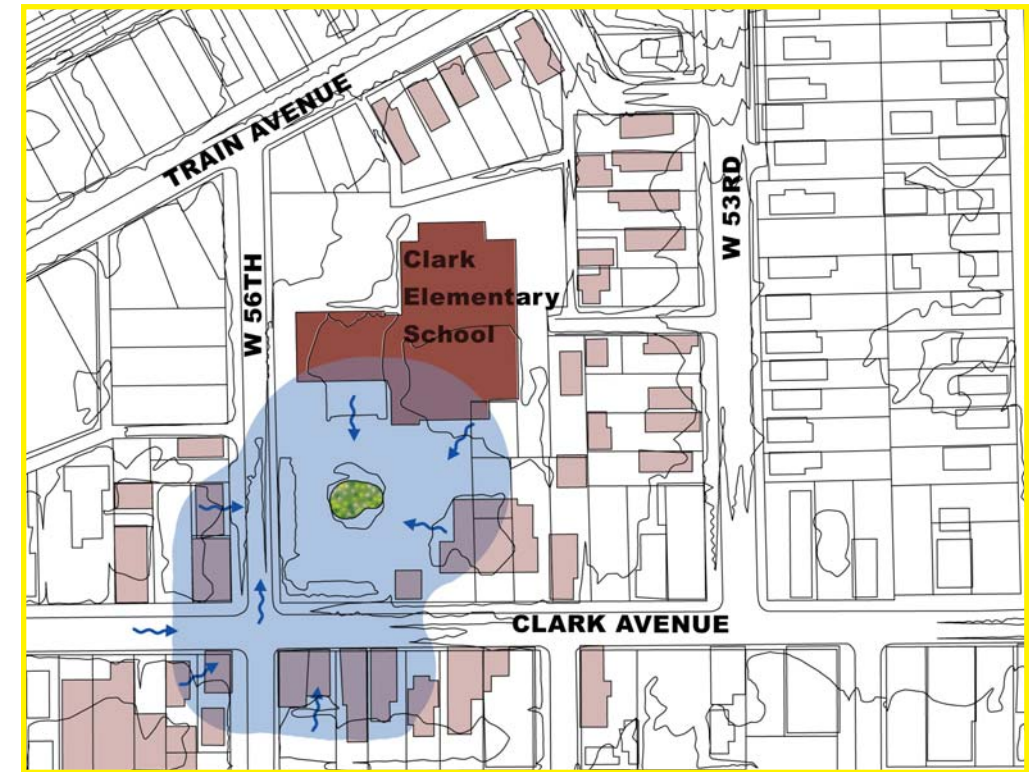
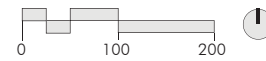
Raingardens on abandoned or partially used industrial sites would allow for larger stormwater collections while making use of otherwise underutilized land. Industrial land would need to be thoroughly tested for chemicals or other harmful substances and phytoremediation possibilities.

### VACANT PARCEL RAINGARDEN

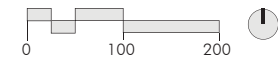
Raingardens on vacant parcels would help to beautify a neighborhood and utilize vacant land. These raingardens would help to solve neighborhood flooding problems while increasing property values and creating a neighborhood amenity.



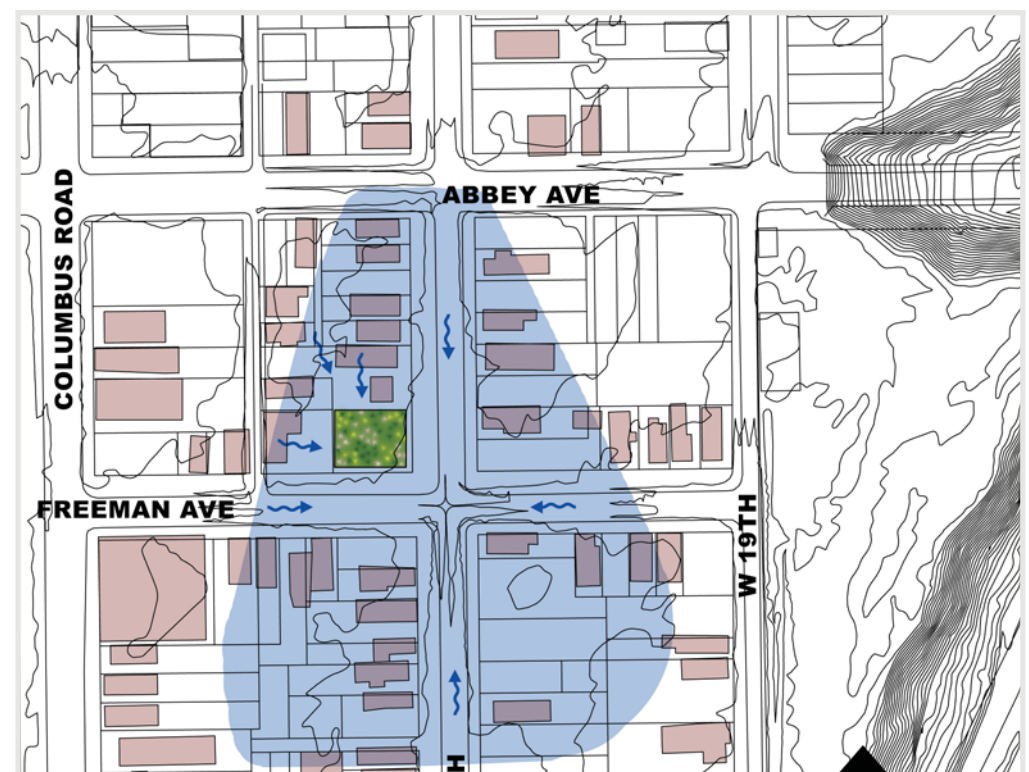
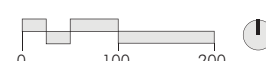
PARKSIDE RAINGARDEN



SCHOOLYARD RAINGARDEN



INDUSTRIAL RAINGARDEN



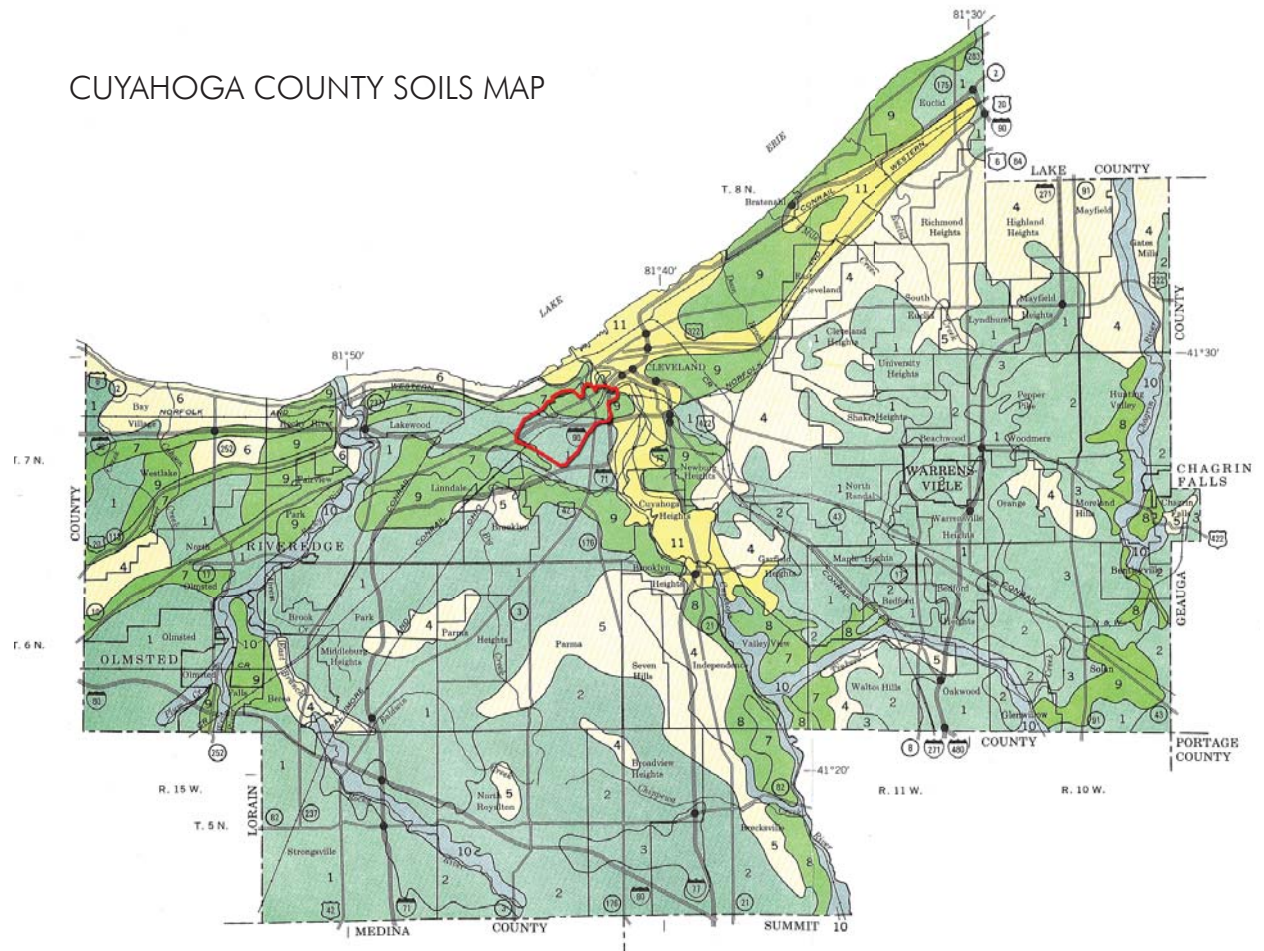
VACANT PARCEL RAINGARDEN



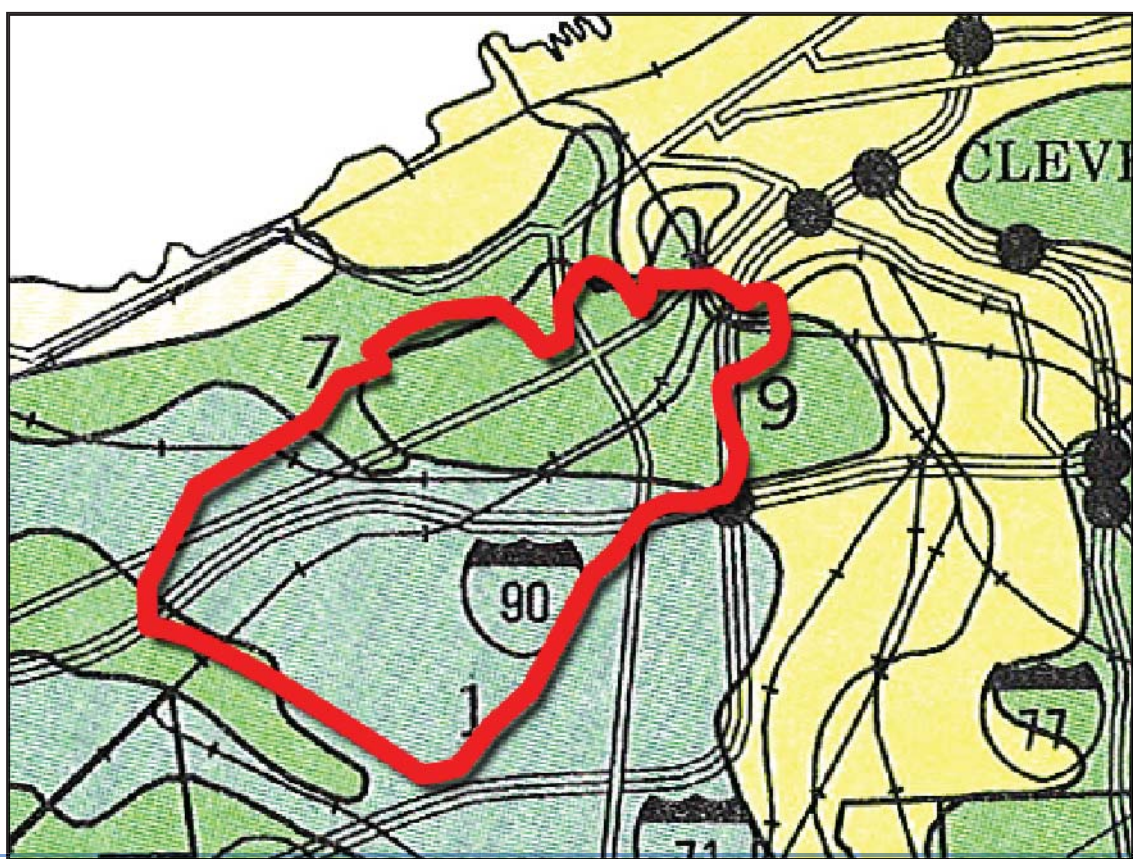


# GREEN INFRASTRUCTURE: SOILS EVALUATION

CUYAHOGA COUNTY SOILS MAP



WALWORTH RUN WATERSHED SOILS MAP



GOOD SOILS FOR  
RAINGARDENS  
WITHIN THE  
WALWORTH RUN  
WATERSHED

U. S. DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE  
OHIO DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF LANDS AND SOIL  
OHIO AGRICULTURAL RESEARCH AND DEVELOPMENT CENTE  
**GENERAL SOIL MAP**  
CUYAHOGA COUNTY, OHIO

## SOIL LEGEND

- DEEP SOILS ON UPLANDS AND THE HIGHER PARTS OF LAKE PLAINS**
- 1 Urban land-Mahoning association: Urban land and undulating, somewhat poorly drained soils that formed in silty and loamy glacial till; on uplands and lake plains
  - 2 Mahoning-Ellsworth association: Nearly level to very steep, somewhat poorly drained and moderately well drained soils that formed in silty and loamy glacial till; on uplands and lake plains
  - 3 Wadsworth-Rittman association: Nearly level to sloping, somewhat poorly drained and moderately well drained soils that formed in silty and loamy glacial till; on uplands
- MODERATELY DEEP SOILS ON UPLANDS AND LAKE PLAINS**
- 4 Urban land-Mitiwanga association: Urban land and moderately deep, nearly level and gently sloping, somewhat poorly drained soils that formed in loamy glacial till; on uplands and lake plains
  - 5 Breckville-Hornell association: Moderately deep, gently sloping to very steep, well drained and somewhat poorly drained soils that formed in silty and clayey glacial till and residuum from shale; on uplands
  - 6 Allis-Urban land association: Urban land and moderately deep, nearly level, poorly drained soils that formed in silty and clayey glacial till derived mainly from shale; on lake plains
- DEEP SOILS ON BEACH RIDGES, OUTWASH TERRACES, AND LAKE PLAINS**
- 7 Oshtemo-Urban land-Chili association: Urban land and nearly level to very steep, well drained soils that formed in stratified, loamy and sandy glacial outwash; on outwash terraces and beach ridges
  - 8 Geeburg-Mentor association: Steep and very steep, moderately well drained and well drained soils that formed in clayey and silty lacustrine sediments; on dissected parts of terraces
  - 9 Urban land-Elnora-Jimtown association: Urban land and nearly level, moderately well drained and somewhat poorly drained soils that formed in sandy, water-deposited materials and in loamy glacial outwash; on lake plains, terraces, and beach ridges
- DEEP SOILS ON FLOOD PLAINS AND LOW STREAM TERRACES**
- 10 Chagrin-Tioga-Euclid association: Nearly level, well drained and somewhat poorly drained soils that formed in loamy and sandy alluvium and in silty and loamy deposits; on flood plains and low stream terraces
- URBAN LAND**
- 11 Urban land: Nearly level and gently sloping areas that are predominantly covered by buildings, structures, concrete, asphalt, and other impervious surfaces

## SOILS EVALUATION

The Soils maps to the left display the projected soils types underneath the urban surface within Cuyahoga County and the Walworth Run Watershed. Type 7 and type 9 soils are good soils that would support healthy drainage of raingardens. These occur in the north of I-90 within the watershed. The less permeable soils that occur within this watershed would need more engineering and imported soils to support the raingardens.

## FURTHER STUDIES

The Watershed Wide Raingarden Study is a conceptual planning study supported by broad stroke calculations. Further detailed feasibility studies will be needed to more accurately calculate raingarden effectiveness and cost savings. These feasibility studies will need to examine:

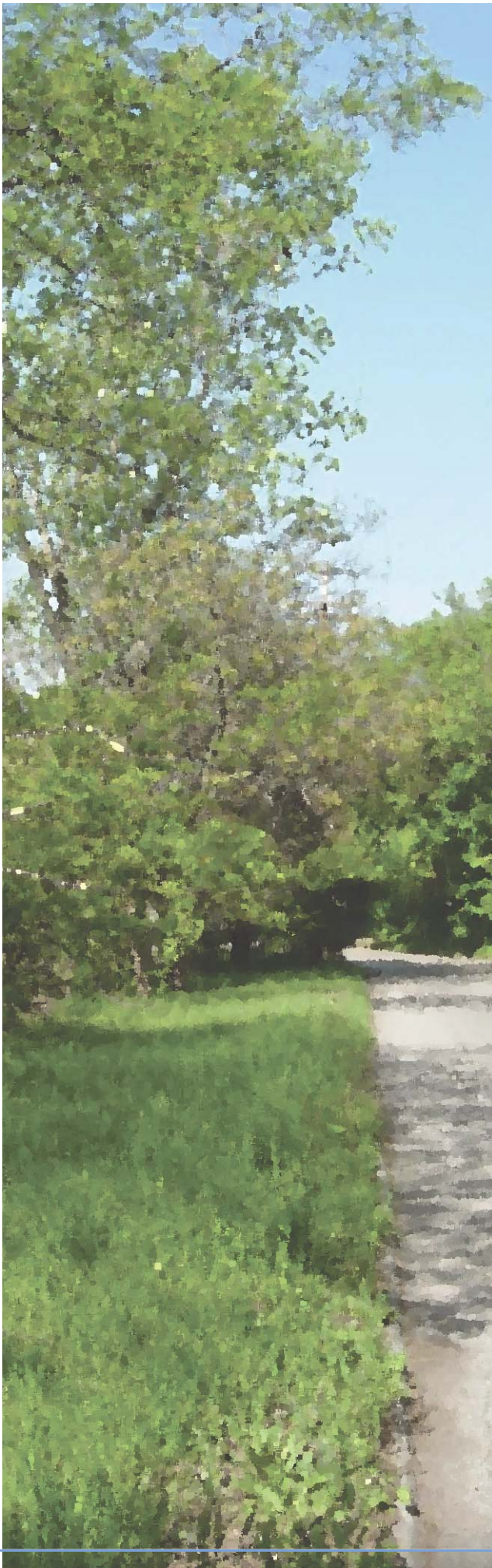
- Raingardens in site specific conditions (drainage, soils, slopes etc.)
- Availability of vacant lots and other prototypes
- Partnerships between NEORS and the City of Cleveland
- Other unforeseen factors

Compiled 1980









# SECTION 6: IMPLEMENTATION STRATEGY

- Overall Greenway Plan
- Phasing The Greenway Plan
- Grant Funding
- Forming Partnerships



# TRAIN AVENUE OVERALL GREENWAY PLAN

## IMPLEMENTATION STRATEGY

### PHASING THE GREENWAY PLAN

The Train Avenue Greenway Plan is broken into 6 main phases to create a more manageable budget for construction projects.

### GRANT FUNDING

These 6 phases can be funded by applying for local, state, or federal grants. Grant opportunities have been recommended for each phase.

### FORMING PARTNERSHIPS

Public and private partnerships will not only create funding opportunities, but they will also strengthen the invested interest in the Train Avenue community and open doors to neighborhood programs and subprojects.





# PHASING THE GREENWAY PLAN

## PHASE 1

### PHASE 1: TRAILHEAD LAND ACQUISITION

Phase 1 consists of purchasing parcel 004-25-007 on the east side of the Greenway for use as a trailhead.

Phase 1 Estimated Cost (2008): \$82,800  
Recommended Grant Funding: Land & Water Conservation Fund, Natureworks, Community Development Block Grant, Clean Ohio Conservation Fund

## PHASE 2

### PHASE 2: TRAIN AVENUE ALL-PURPOSE TRAIL

Phase 2 is the construction of the Train Avenue All-Purpose Trail, from the existing Zone Recreation Center trail along West 53rd, Train Avenue, and Scranton Road to the intersection of Scranton Road and University Avenue. Phase 2 includes all construction within the right-of-way.

Phase 2 Estimated Construction Costs (2008): \$1,394,250  
Phase 2 Estimated Engineering Costs (2008): \$210,000  
Phase 2 Estimated Total Cost (2008): \$1,604,250  
Recommended Grant Funding: Transportation Enhancement Program, ODNR Recreational Trails Program (RTP), The Clean Ohio Trails Fund, ODH Community Obesity Prevention Program, Safe Routes to School

## PHASE 3

### PHASE 3: TRAILHEAD

Phase 3 is the construction of the Trailhead, including a Trailhead parking lot and reforestation/regeneration of the open space parcel 004-25-007.

Phase 3 Estimated Construction Costs (2008): \$43,560  
Phase 3 Estimated Engineering Costs (2008): \$ 45,000  
Phase 3 Estimated Total Cost (2008): \$88,560  
Recommended Grant Funding: ODNR Recreational Trails Program (RTP), Natureworks

## PHASE 4

### PHASE 4: WALWORTH AVENUE CONNECTOR

Phase 4 is the construction of the Walworth Avenue Connector, along Walworth Avenue from West 53rd to Clark Avenue. Phase 4 includes all construction within the right-of-way.

Phase 4 Estimated Construction Costs (2008): \$173,800  
Phase 4 Estimated Engineering Costs (2008): \$42,500  
Phase 4 Estimated Total Cost (2008): \$216,300  
Recommended Grant Funding: Transportation Enhancement Program, ODNR Recreational Trails Program (RTP), The Clean Ohio Trails Fund, ODH Community Obesity Prevention Program, Safe Routes to School

## PHASE 5

### PHASE 5: CONNECTOR BIKE LANES

Phase 5 consists of re-painting the existing pavement to include bike lanes for the connector trails, along with bike lane signage.

Phase 5 Estimated Total Cost (2008): \$16,500  
Recommended Grant Funding: Transportation Enhancement Program

## PHASE 6

### PHASE 6: W 65TH CONNECTOR

Phase 6 is the construction of an all-purpose trail and signage as part of the West 65th Street Connector, along West 65th, extending north to Edgewater Park and connecting with other streets south to end at Brookside Reservation. Phase 6 includes retrofitting sidewalks with an all-purpose trail and using share-the-road signage.

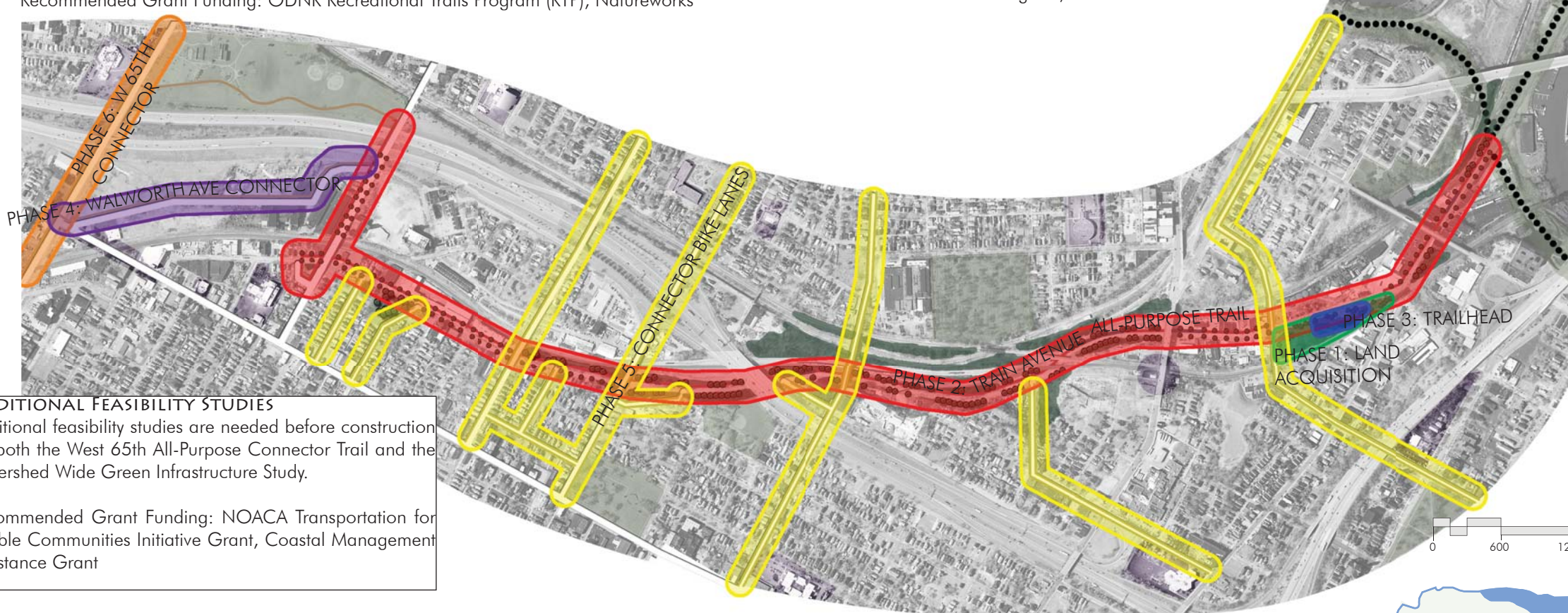
Phase 6 Estimated Construction Costs (2008): \$623,260  
Phase 6 Estimated Engineering Costs (2008): \$125,000  
Phase 6 Estimated Total Cost (2008): \$748,260  
Recommended Grant Funding: Transportation Enhancement Program, Clean Ohio Trails Fund

## PHASING THE GREENWAY PLAN

Phases 1-6 were ordered according to recommended priority of construction. With the exception of the trailhead, the order of phases can be rearranged according to available funding or to coincide with other agencies and development opportunities.

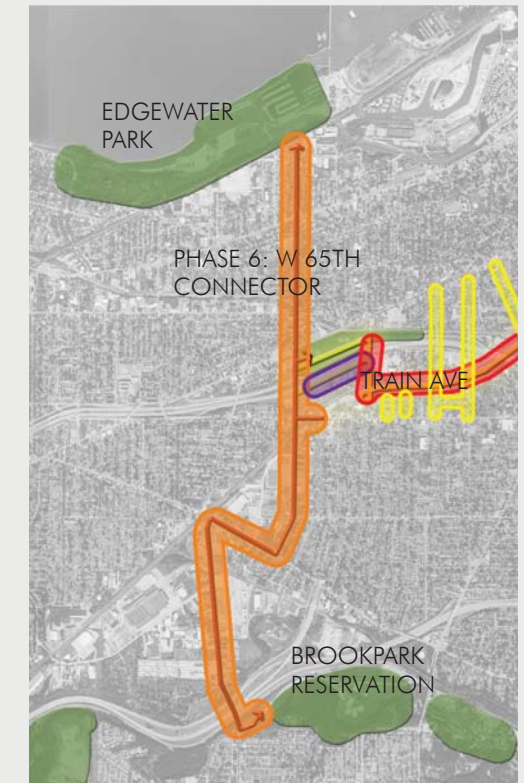
Phase 2, the Train Avenue All-Purpose Trail has the greatest priority. The Train Avenue Greenway Plan has the option of being built using this phase and altering the trail to be entirely inside the right-of-way (this would eliminate the trailhead and Phases 1 & 3). However, if maximum trail use and neighborhood connections are desired, all 6 phases are recommended.

Detailed cost estimates for the overall Train Avenue Greenway, as well as breakdowns for Phases 1-6 can be found in the Appendix.



**ADDITIONAL FEASIBILITY STUDIES**  
Additional feasibility studies are needed before construction of both the West 65th All-Purpose Connector Trail and the Watershed Wide Green Infrastructure Study.

Recommended Grant Funding: NOACA Transportation for Livable Communities Initiative Grant, Coastal Management Assistance Grant



Phase 6, the West 65th Street Connector, will be a combination of an all-purpose trail and bike lanes on the road that will connect Edgewater Park to Brookpark Reservation



# GRANT FUNDING

## GRANT FUNDING

Grant opportunities offer financial assistance to fund both construction projects and planning documents, such as this one funded by NOACA's TLCI Grant.

To the right are brief descriptions of recommended grant sources specifically applicable to Phases 1-6 and further feasibility studies. See Phasing the Greenway Plan for more information on which phases each grant could be applied to. Some phases may be eligible to combine grants.

Grant applications vary in length and time needed to complete. Most grants require a local match fund, which in some cases can come from another grant.



## PHASE 1-6 CONSTRUCTION:

### CLEAN OHIO OPEN SPACE CONSERVATION GRANT

This grant could be used to purchase open space, create easements, restore streams or wetlands, and to fund public access construction including parking lots and trails. Past projects have received from \$7500 - \$1 million. Funding requires a minimum of a 25% local or federal match. This fund was approved on the November 2008 ballot.

### CLEAN OHIO TRAILS FUND

The Clean Ohio Trails Fund works to improve outdoor recreational opportunities for Ohioans by funding trails for outdoor pursuits of all kinds. Special emphasis was given to projects that:

- Are consistent with the statewide trail plan
- Complete regional trail systems and links to the statewide trail plan
- Link population centers with outdoor recreation area and facilities
- Involve the purchase of rail lines linked to the statewide trail plan
- Preserve natural corridors
- Provide links in urban areas to support commuter access and provide economic benefit.

There is a local match of 25% non-federal money. Planning, engineering, construction and acquisition are funded through this program. This fund was approved on the November 2008 ballot.

### COMMUNITY DEVELOPMENT BLOCK GRANT

Block Grants provide federal funding for neighborhood improvement projects that are locally initiated. The primary objective of the Block Grant program is to develop viable urban communities through decent housing, suitable living environment and expanded economic opportunities. Every project must meet one of three certifying conditions:

- Directly benefits low-and moderate-income persons.
- Eliminates and prevents blight and property deterioration
- Serves an urgent need

### LAND & WATER CONSERVATION FUND

Administered by Ohio Department of Natural Resources (ODNR) this statewide grant typically funds open space acquisition and small recreation based projects. Typical award amount is \$50,000. Funding requires a minimum of 50% local match. This grant application is due February 1st every year.

### NATUREWORKS

Administered by Ohio Department of Natural Resources (ODNR) this statewide grant typically funds playgrounds, parking improvements, landscaping and other small projects. Typical award amount is less than \$30,000. Funding requires a minimum of 25% local match. This grant application is due February 1st every year.

### ODH COMMUNITY OBESITY PREVENTION PROGRAM

Grant program to support infrastructure investments and comprehensive community-based strategies to control and prevent obesity in Ohio communities. Eligible applicants must be local public health departments of nonprofit groups partnering with the local public health department as the lead applicant. An applicant may apply for only one of the following grant options:

- ENVIRONMENTAL CHANGE: A minimum of five grants may be awarded for a total amount not to exceed \$300,000. Grant range - minimum of \$30,000 to a maximum of \$75,000.
- CAPACITY BUILDING: A minimum of three grants may be awarded for a total amount not to exceed \$250,000. Grant range - minimum of \$30,000 to a maximum of \$85,000.
- COMMUNITY-BASED EXPANSION: A minimum of three grants may be awarded for a total amount not to exceed \$350,000. Grant range - minimum of \$30,000 to a maximum of \$150,000.

### ODNR RECREATIONAL TRAILS PROGRAM (RTP)

Funded by the U.S. Federal Highway Administration, the ODNR Trails is administered in Ohio by Ohio Department of Natural Resources, which reviews local applications and recommends grant recipients for final federal approval. The federal government provides up to 80 percent reimbursement for trail projects that can include construction, acquisition, maintenance, and equipment.

### SAFE ROUTES TO SCHOOL

Administered by Ohio Department of Transportation, improve safety, encourage and enable children, including those with disabilities, to walk or ride their bikes to school. Project must address an actual or perceived safety issue; infrastructure project must be within 2 miles of K-8 school; applicants can be the individual school, school district, municipality, health district or other public or private entity including nonprofit organizations; and applicant must have an ODOT approved School Travel Plan (STP) in place unless funding is to develop a STP.

Ohio has \$4 – \$6 million is available this funding round for 2008. 10% of that funding is for non infrastructure projects such as: Bike Rodeo - Educational Program - Encouragement Program; 70 % of that funding is for infrastructure projects such as: Crossing Improvements - Planning - Engineering Studies; 20 % of that funding is for either Infrastructure or Non Infrastructure.

### TRANSPORTATION ENHANCEMENT PROGRAM

Provides funds for projects that enhance the transportation experience by improving the cultural, historic, aesthetic and environmental aspects of transportation infrastructure. Primary project categories are Historic and Archaeological, Scenic and Environmental, and Bicycle and Pedestrian. This Federal-aid reimbursement program provides up to 80% of eligible costs for construction only. The two-step application cycle is annual, beginning each January 1 with submittal of a Letter of Interest (LOI) due to the respective ODOT district by February 1. Based on the acceptance of the LOI, sponsors will be invited to submit an application. Next cycle, beginning January 1, 2008, is for the selection of projects for FY 2011.

## FEASIBILITY STUDIES:

### COASTAL MANAGEMENT ASSISTANCE GRANT

The Ohio Coastal Management Program and its grants strive to promote a sustainable coast and lake. Comprehensive community planning, watershed planning to address coastal non-point pollution and balanced growth have been given priority for grant funding. Projects must preserve, protect and enhance Lake Erie area coastal resources or improve public access to them. Reimbursement is for up to 50% of matching funds.

### NOACA TRANSPORTATION FOR LIVABLE COMMUNITIES INITIATIVE GRANT

Provides federal funding to conduct or contract for the planning of transportation improvements that advance the Initiative's goals. Since 2005, the NOACA Governing Board has allocated approximately \$1 million each fiscal year for the planning grant program, awarding individual grants up to \$75,000.





## SECTION 7: APPENDICES

Appendix A: Conceptual Cost Estimates

Appendix B: Watershed Wide Raingarden Study  
Calculations Details



# APPENDIX A: CONCEPTUAL COST ESTIMATES

Preliminary Cost of Construction: Greenway Enhancements				Date Prepared	15-Oct-08
				Page	1
PROJECT:	Train Avenue Greenway Masterplan			BASIS FOR ESTIMATE	
Overall Greenway Plan Estimate- Phases 1-6		X	Code A (Conceptual design) Code B (Preliminary design) Code C (Final design) Other (Specify)	ESTIMATOR	LB
				PROJECT #	13812261
QUANTITY	LABOR &			TOTAL	
NO. UNIT	MATERIAL			COST	
UNITS	MEAS.	PER UNIT			
<b>Preliminary Greenway Estimate:</b>					
<b>Overall Greenway Plan</b>					
Demolition	1 LUMP	50,000		50,000	
Mobilization	1 LUMP	74,000		74,000	
Construction Staking	1 LUMP	30,000		30,000	
Tree Removal	1 LUMP	17,500		17,500	
Pole Relocation	45 EA	3,000		135,000	
Earthwork	1 LUMP	125,000		125,000	
Topsoil Strip/Spread	3,500 CY	15		52,500	
Topsoil Furnishing	400 CY	35		14,000	
Site Drainage	1 LUMP	10,000		10,000	
Block Retaining Wall	1 LUMP	50,000		50,000	
10' All-Purpose Asphalt Trail	25,100 LF	30		753,000	
10' Permeable Recycled Glass/Tires Trail	1,500 LF	80		120,000	
Asphalt- Trailhead Parking Lot	290 SY	15		4,350	
Road Striping	4200 LF	3		10,500	
Railroad Crossing	1 EA	5,000		5,000	
Crosswalks with ADA Ramps	25 EA	3,000		75,000	
Guardrail Relocation	1 LUMP	10,000		10,000	
Chain Link Fence Replacement	1 LUMP	15,000		15,000	
Traffic Sign Relocation	1 LUMP	30,000		30,000	
Gateway Signage	4 EA	3000		12,000	
Historic Signage	26 EA	1000		26,000	
Mile Markers/Directional Signage to Neighborhood Destinations	50 EA	500		25,000	
"Share the Road" signage	20 EA	250		5,000	
Traffic Signage	1 LUMP	15,000		15,000	
Roadside Bioswales	7,500 SF	25		187,500	
Invasive Species removal	1 LUMP	15,000		15,000	
Deciduous Shade Trees, 2" cal.	400 EA	350		140,000	
Reforestation: 3' whips	150 EA	5		750	
Landscaping	1 LUMP	3,000		3,000	
Seeding	27,200 SY	1		27,200	
<b>Land Acquisition Costs (2008)</b>					
Auditor's evaluation, parcel 004-25-007				\$	72,800.00
Phase 1 Assessment				\$	10,000.00
<b>Land Acquisition Total</b>				\$	<b>82,800.00</b>
<b>Construction Costs (2008)</b>					
Overall Greenway Plan Construction Subtotal				\$	2,037,300.00
10% Contingency				\$	203,730.00
<b>Overall Greenway Plan Construction Total</b>				\$	<b>2,241,030.00</b>
<b>Engineering Costs (2008)</b>					
Survey				\$	30,000.00
Engineering Fees				\$	145,000.00
Construction Administration				\$	72,500.00
Environmental Document				\$	50,000.00
<b>Overall Greenway Plan Engineering Total</b>				\$	<b>297,500.00</b>
<b>Project Total (2008)</b>				\$	<b>2,621,330.00</b>
3 Yr Inflation to 2011, @ 8% per year as per ODOT				\$	<b>3,250,449.20</b>

Preliminary Cost of Construction: Greenway Enhancements				Date Prepared	15-Oct-08
				Page	1
PROJECT:	Train Avenue Greenway Plan			BASIS FOR ESTIMATE	
Phase 1: Trailhead Land Acquisition Cleveland, Ohio		X	Code A (Conceptual design) Code B (Preliminary design) Code C (Final design) Other (Specify)	ESTIMATOR	LB
				PROJECT #	13812261
QUANTITY	LABOR &			TOTAL	
NO. UNIT	MATERIAL			COST	
UNITS	MEAS.	PER UNIT			
<b>Conceptual Greenway Estimate:</b>					
<b>Trailhead Land Acquisition</b>					
Land Acquisition- auditor's evaluation for parcel 004-25-007*	1	LUMP	72,800		72,800
Phase 1 Assessment	1	LUMP	10,000		10,000
<b>Project Total (2008)</b>				\$	<b>82,800.00</b>
3 Yr Inflation, 8% per year as per ODOT				\$	<b>102,672.00</b>
* taken from County Auditor's website					

Preliminary Cost of Construction: Greenway Enhancements				Date Prepared	15-Oct-08
				Page	1
PROJECT:	Train Avenue Greenway Masterplan			BASIS FOR ESTIMATE	
Phase 2: Train Avenue All-Purpose Trail		X	Code A (Conceptual design) Code B (Preliminary design) Code C (Final design) Other (Specify)	ESTIMATOR	LB
				PROJECT #	13812261
QUANTITY	LABOR &			TOTAL	
NO. UNIT	MATERIAL			COST	
UNITS	MEAS.	PER UNIT			
<b>Conceptual Greenway Estimate:</b>					
<b>Train Avenue All-Purpose Trail</b>					
Demolition	1	LUMP	20,000		20,000
Mobilization	1	LUMP	50,000		50,000
Construction Staking	1	LUMP	20,000		20,000
Tree Removal	1	LUMP	10,000		10,000
Pole Relocation	20	EA	3,000		60,000
Earthwork	1	LUMP	100,000		100,000
Topsoil Strip/Spread	2,000	CY	15		30,000
Topsoil Furnishing	300	CY	35		10,500
Block Retaining Wall	1	LUMP	50,000		50,000
10' All-Purpose Asphalt Trail	11,500	LF	30		345,000
10' Permeable Recycled Glass/Tires Trail	1,500	LF	80		120,000
Railroad Crossing	1	EA	5,000		5,000
Crosswalks with ADA Ramps	6	EA	3,000		18,000
Guardrail Relocation	1	LUMP	10,000		10,000
Chain Link Fence Replacement	1	LUMP	15,000		15,000
Traffic Sign Relocation	1	LUMP	20,000		20,000
Gateway Signage	1	EA	3000		3,000
Historic Signage	16	EA	1000		16,000
Mile Markers/Directional Signage to Neighborhood Destinations	25	EA	500		12,500
Roadside Bioswales	7,500	SF	25		187,500
Invasive Species removal	1	LUMP	10,000		10,000
Deciduous Shade Trees, 2" cal.	400	EA	350		140,000
Seeding	15,000	SY	1		15,000
<b>Construction Costs (2008)</b>					
Trail Construction Subtotal				\$	1,267,500.00
10% Contingency				\$	126,750.00
<b>Trail Construction Total</b>				\$	<b>1,394,250.00</b>
<b>Engineering Costs (2008)</b>					
Survey				\$	20,000.00
Engineering Fees				\$	100,000.00
Construction Administration				\$	50,000.00
Environmental Document				\$	40,000.00
<b>Trail Engineering Total</b>				\$	<b>210,000.00</b>
<b>Project Total (2008)</b>				\$	<b>1,604,250.00</b>
3 Yr Inflation to 2011, @ 8% per year as per ODOT				\$	<b>1,989,270.00</b>

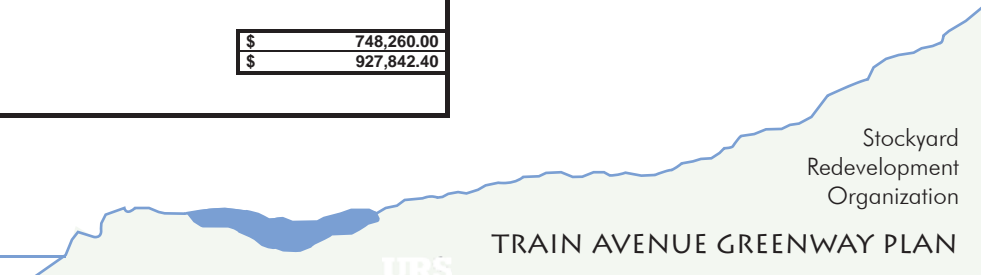


Preliminary Cost of Construction: Greenway Enhancements		Date Prepared	15-Oct-08
		Page	1
PROJECT:	<b>Train Avenue Greenway Masterplan</b> Phase 3: Trailhead	BASIS FOR ESTIMATE	X Code A (Conceptual design) Code B (Preliminary design) Code C (Final design) Other (Specify)
		ESTIMATOR	LB
		PROJECT #	13812261
		QUANTITY	
		NO. UNIT	
		LABOR & MATERIAL	
		PER UNIT	
		TOTAL	
		COST	
<b>Conceptual Greenway Estimate:</b>			
<b>Trailhead</b>			
Earthwork	1 LUMP	10,000	10,000
Topsoil Strip/Spread	400 CY	15	6,000
Asphalt	290 SY	15	4,350
Invasive Species removal	1 LUMP	2,500	2,500
Seeding	3,000 SY	1	3,000
Landscaping	1 LUMP	3,000	3,000
Site Drainage	1 LUMP	10,000	10,000
Reforestation: 3' whips	150 EA	5	750
<b>Construction Costs (2008)</b>			
Trailhead Construction Subtotal		\$	39,600.00
10% Contingency		\$	3,960.00
Trailhead Construction Total		\$	43,560.00
<b>Engineering Costs (2008)</b>			
Survey		\$	5,000.00
Engineering Fees		\$	20,000.00
Construction Administration		\$	10,000.00
Environmental Document		\$	10,000.00
Trailhead Engineering Total		\$	45,000.00
<b>Project Total (2008)</b>		\$	88,560.00
3 Yr Inflation to 2011, @ 8% per year as per ODOT		\$	109,814.40

Preliminary Cost of Construction: Greenway Enhancements		Date Prepared	15-Oct-08
		Page	1
PROJECT:	<b>Train Avenue Greenway Masterplan</b> Phase 4: Walworth Avenue All-Purpose Trail Connector	BASIS FOR ESTIMATE	X Code A (Conceptual design) Code B (Preliminary design) Code C (Final design) Other (Specify)
		ESTIMATOR	LB
		PROJECT #	13812261
		QUANTITY	
		NO. UNIT	
		LABOR & MATERIAL	
		PER UNIT	
		TOTAL	
		COST	
<b>Conceptual Greenway Estimate:</b>			
<b>Walworth Avenue Connector</b>			
Demolition	1 LUMP	5,000	5,000
Mobilization	1 LUMP	12,000	12,000
Construction Staking	1 LUMP	5,000	5,000
Tree Removal	1 LUMP	2,500	2,500
Pole Relocation	5 EA	3,000	15,000
Earthwork	1 LUMP	10,000	10,000
Topsoil Strip/Spread	400 CY	15	6,000
Topsoil Furnishing	100 CY	35	3,500
10' All-Purpose Asphalt Trail	2,600 LF	30	78,000
Crosswalks with ADA Ramps	1 EA	3,000	3,000
Traffic Sign Relocation	1 LUMP	5,000	5,000
Gateway Signage	1 EA	3,000	3,000
Historic Signage	2 EA	1,000	2,000
Mile Markers/Directional Signage to Neighborhood Destinations	5 EA	500	2,500
Invasive Species removal	1 LUMP	2,500	2,500
Seeding	3,000 SY	1	3,000
<b>Construction Costs (2008)</b>			
Trail Construction Subtotal		\$	158,000.00
10% Contingency		\$	15,800.00
Trail Construction Total		\$	173,800.00
<b>Engineering Costs (2008)</b>			
Survey		\$	5,000.00
Engineering Fees		\$	25,000.00
Construction Administration		\$	12,500.00
Trail Engineering Total		\$	42,500.00
<b>Project Total (2008)</b>		\$	216,300.00
3 Yr Inflation to 2011, @ 8% per year as per ODOT		\$	268,212.00

Preliminary Cost of Construction: Greenway Enhancements		Date Prepared	15-Oct-08
		Page	1
PROJECT:	<b>Train Avenue Greenway Masterplan</b> Phase 5: Connector Bike Lanes	BASIS FOR ESTIMATE	X Code A (Conceptual design) Code B (Preliminary design) Code C (Final design) Other (Specify)
		ESTIMATOR	LB
		PROJECT #	13812261
		QUANTITY	
		NO. UNIT	
		LABOR & MATERIAL	
		PER UNIT	
		TOTAL	
		COST	
<b>Conceptual Greenway Estimate:</b>			
<b>Connector Bike Lanes</b>			
Road Striping	3400 LF	2.5	8,500
Traffic Signage	1 LUMP	15000	15,000
<b>Construction Costs (2008)</b>			
Bike Lanes Construction Subtotal		\$	15,000.00
10% Contingency		\$	1,500.00
Bike Lanes Construction Total		\$	16,500.00
<b>Project Total (2008)</b>		\$	16,500.00
3 Yr Inflation to 2011, @ 8% per year as per ODOT		\$	20,460.00

Preliminary Cost of Construction: Greenway Enhancements		Date Prepared	15-Oct-08
		Page	1
PROJECT:	<b>Train Avenue Greenway Masterplan</b> Phase 6: West 65th All-Purpose & Signage Connector	BASIS FOR ESTIMATE	X Code A (Conceptual design) Code B (Preliminary design) Code C (Final design) Other (Specify)
		ESTIMATOR	LB
		PROJECT #	13812261
		QUANTITY	
		NO. UNIT	
		LABOR & MATERIAL	
		PER UNIT	
		TOTAL	
		COST	
<b>Conceptual Greenway Estimate:</b>			
<b>West 65th Street Connector</b>			
Demolition	1 LUMP	25,000	25,000
Mobilization	1 LUMP	12,000	12,000
Construction Staking	1 LUMP	5,000	5,000
Tree Removal	1 LUMP	5,000	5,000
Pole Relocation	20 EA	3,000	60,000
Earthwork	1 LUMP	5,000	5,000
Topsoil Strip/Spread	700 CY	15	10,500
10' All-Purpose Asphalt Trail	11,000 LF	30	330,000
Road Striping	8,000 LF	2.5	20,000
"Share the Road" signage	20 EA	250	5,000
Crosswalks with ADA Ramps	18 EA	3,000	54,000
Traffic Sign Relocation	1 LUMP	5,000	5,000
Gateway Signage	2 EA	3,000	6,000
Historic Signage	8 EA	1,000	8,000
Mile Markers/Directional Signage to Neighborhood Destinations	20 EA	500	10,000
Seeding	6,100 SY	1	6,100
<b>Construction Costs (2008)</b>			
Trail Construction Subtotal		\$	566,600.00
10% Contingency		\$	56,660.00
Trail Construction Total		\$	623,260.00
<b>Engineering Costs (2008)</b>			
Survey		\$	25,000.00
Engineering Fees		\$	75,000.00
Construction Administration		\$	25,000.00
Trail Engineering Total		\$	125,000.00
<b>Project Total (2008)</b>		\$	748,260.00
3 Yr Inflation to 2011, @ 8% per year as per ODOT		\$	927,842.40





## Train Avenue Vacant Lot Raingarden Calculations Rationale 9/25/08Draft

### 1. Run-off Modeling

- **Average Yearly Rainfall = 36.42"**  
(mean average for fifty years of daily data ranging from 1957 through 2007)
- **Model Year (2002) Rainfall = 36.38"**  
(chosen based on proximity to fifty-year mean average)
- **Total Storm Events for Model Year = 70\***
- **Total Storm Events Less than 0.75" = 56\***
- **Total Storm Events Greater than 0.75" = 14**
- **Total Watershed Area = 2,125 Acres**
- **Average Volume of a 0.75" Storm Event for Entire Watershed = 2,025,540 CF**
- **Total Volume of Model Year Storm Events = 127,294,517 CF\***  
(based on a ratio of 2,025,540 CF average volume per 0.75" of rainfall for entire watershed and calculated on a storm-by storm basis)
- **Number of Raingardens Required to Capture Rainfall Less Than or Equal to 0.75" = 531**  
(assuming a 4-acre upstream watershed and 4,000 square feet for each raingarden; 2,125 acres/4 acres =531)
- **Estimated Volume Captured by 531 Raingardens Annually = 64,139,399 CF\***  
(531 raingardens capturing 85% of rainfall or 15% of water released to the CSO <= first 0.75" of 70 discrete storm events assuming a 4 acre sub-watershed draining to each raingarden)
- **Percentage of Total Annual Rainfall Captured by 531 Raingardens = 50%\***  
(volume of storm water captured and remediated/total volume for year)

\*excluding trace rainfall amounts





## Train Avenue Vacant Lot Raingarden Calculations Rationale 9/25/08Draft

### 2. Conceptual Cost Analysis

#### A. Vacant Lot Raingardens Costs

- Estimated Real Estate Cost of 531 Vacant Lots at \$5,000 each = \$2,655,000
- Estimated Installation Cost of Raingardens = \$15/square foot
- Estimated Installation Cost of 531 Raingardens at 4,000 square feet each = \$31,860,000
- Estimated Life Span of Raingarden = 20 years
- Estimated Total Maintenance Costs Over 20 Year Project Life Span = \$500,000/year (adjusted for inflation)  
(maintenance staff, supplies and materials) x 20 years = \$13,435,187

○ **TOTAL COST OF VACANT LOT RAINGARDENS OVER 20 YEARS = \$47,950,187**

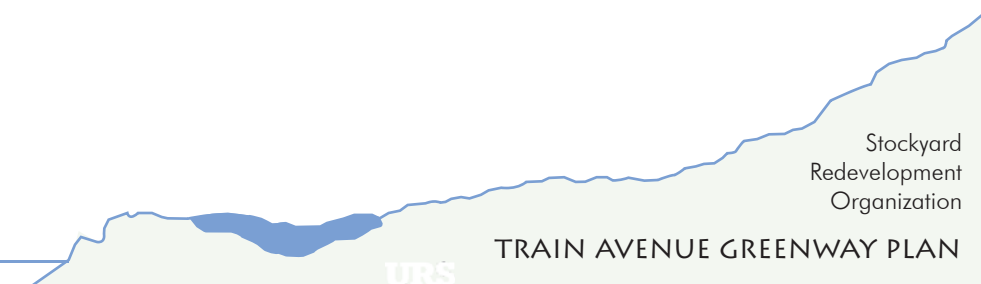
#### B. Conventional CSO Savings

- Estimated Savings on Storm Water Treatment with 531 Raingardens = \$2,565,575/yr (adjusted for inflation)  
(64,139,399 CF captured/remediated by raingardens/yr x 20yrs = \$68,937,961  
x \$40/1,000 CF conventional treatment = \$2,565,575/yr)
- Estimated Savings on Cost of New CSO Facility = \$106,000,000 – 25% = \$26,500,000

○ **TOTAL SAVINGS ON CONVENTIONAL CSO OVER 20 YEARS = \$95,437,961**

#### C. Estimated Net Savings from Vacant Lot Raingarden/CSO Reduction Program

**\$47,487,774**





## TRAIN AVENUE GREENWAY PLAN

### VACANT LOT RAINGARDEN CONCEPTUAL STUDY- 9/25/2008 DRAFT

#### SUMMARY OF FINDINGS

Walworth Watershed = 2,125 Acres

Number of Vacant Lot Raingardens needed to capture the first 0.75" flush of rainfall = 531

Estimated volume captured by 531 raingardens annually = 64,139,399 CF

Estimated life span of Raingardens = 20 years

The Northeast Ohio Regional Sewer District and the City of Cleveland applied for a Coastal Management Assistance Grant (CMAG) in November 2008.

The Estimated Net Savings and other preliminary cost calculations could be verified with the approval of this grant.

Total <b>savings</b> on conventional CSO over 20 years =			
(estimated savings on storm water treatment with 531 Raingardens over 20 years)	\$69,000,000	}	Savings - Cost = <u>Estimated Net Savings</u>
	+		
(estimated savings on cost of new CSO facility)	<u>\$26,500,000</u>		\$47,500,000
	<b>\$95,500,000</b>		
Total <b>cost</b> of vacant lot Raingardens over 20 years =			
(estimated real estate cost of 531 vacant lots)	\$2,500,000	}	
	+		
(estimated installation cost of 531 raingardens)	\$32,000,000		
	+		
(estimated maintenance cost over 20 years)	<u>\$13,500,000</u>		
	<b>\$48,000,000</b>		

*\*All calculations based on conceptual watershed modelling of Walworth Run CSO Watershed. See Train Avenue Greenway Masterplan Document for assumptions, criteria and calculations.*

*\*\*Further detailed feasibility studies are required to more accurately calculate estimated cost savings.*







# SECTION 8: REFERENCES

Data Sources & References



# DATA & IMAGE SOURCES AND REFERENCES

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