

PLN405-605 Planning and Design Studio Spring 2024

Climate Resilience Planning and Design

In Collaboration with Borough of Downingtown & Chester County Planning Commission



Class Members:

PLN605: Madelyn Mae Zaprowski; Riley Nolan.

PLN405: Annalise Elizabeth Large; Austin James Shaner; Brandon J Litwin; Gabriel D. Lloyd; Gabriel M. Hirsch; Gianna Nicole Zinni; Gil Isaac E. Gabriel; Grace Finley Broadwell; John Patrick Duffy; Joseph A. Mashura; Kimberly Suarez; Michael James Robinson; Rose Rice.

Instructor: Dr. Yingying Lyu, Assistant Professor of Planning, Geography & Planning Department

Acknowledgments

Borough of Downingtown

Cori Trice, Matt Bush, Max Howard, Jack Law,
Alex Rakoff, Phil Dague, Jeff Smith

Chester County Planning Commission

Rachael Griffith

Brandywine Conservancy

Grant DeCosta, Sarah Sharp

Guest Speakers

Dr. Qiong Wang, Shuai Hao, Gia Qin,
Rachael Griffith, Grant DeCosta, Sarah Sharp,
Dr. Bradley Flamm, Dr. Yao Wang

West Chester University

Adam Thomas, Dr. Dorothy (Dottie) Ives Dewey,
Dr. Gary Coutu, Dr. Bradley Flamm, Dr. Amy Lynch

Background

Extreme Climate Events

- Floods
- Droughts
- Wildfires
- Heat waves
- Cold waves
- Storms/tropical cyclones

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Image source: Internet

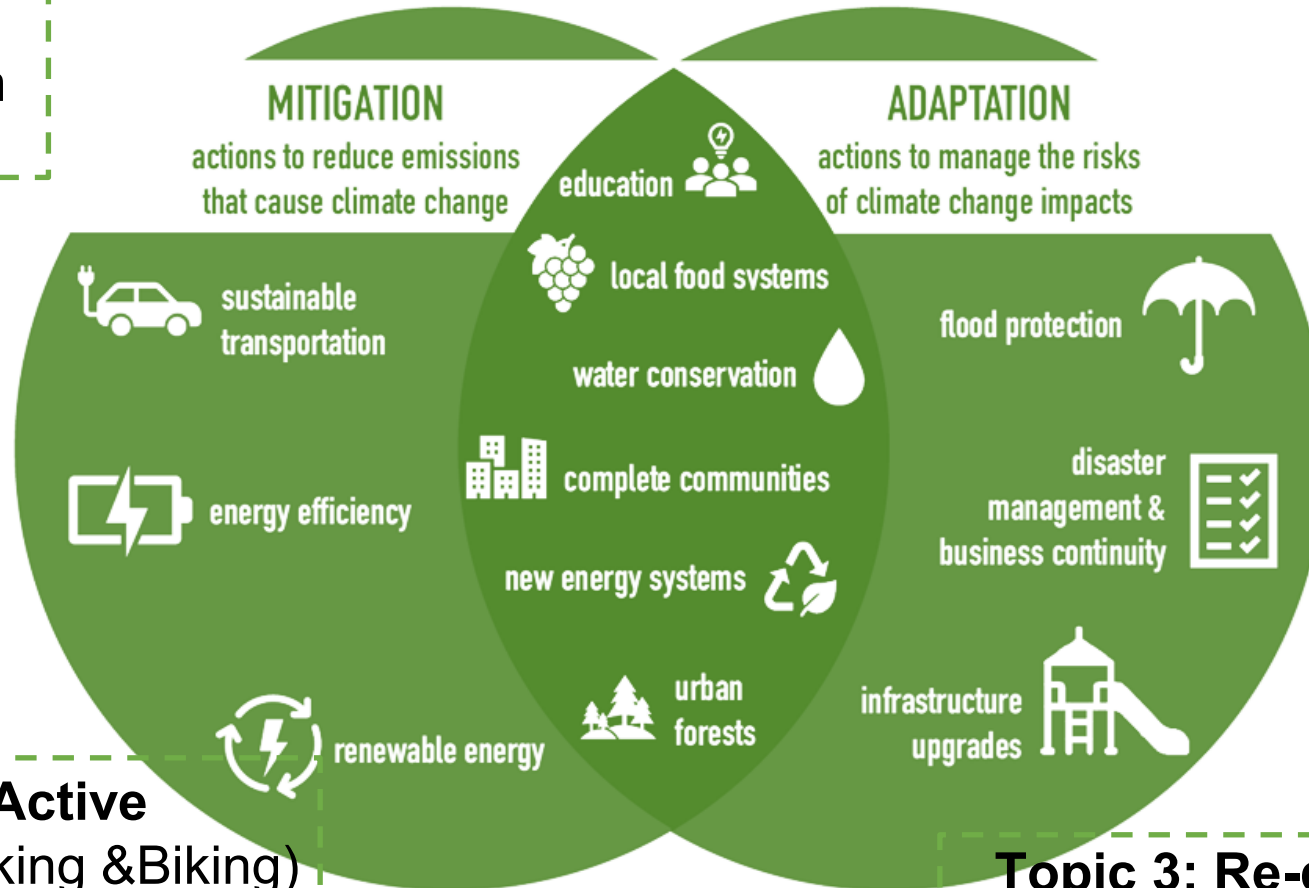
Climate Resilience Planning and Design

Topic 1: Rethinking Land Use and Urban Density

Compact Development

Low-carbon Transportation

Topic 4: Promoting Active Transportation (Walking & Biking)
– Interconnecting Communities through Chester Valley Trail



Stormwater management

Topic 2: Reevaluating Parking Infrastructure
– A preliminary Parking Study

Park(ing)

Floodable Parks

Topic 3: Re-designing Urban Open Space as Green Infrastructure
– A Floodable Park

A Two-phase Exploration

Site: **Downingtown, PA**

- A borough in Chester County, PA.
- An attractive place for people to live.
- The population will continue growing.

Phase One: Analysis of Existing Conditions

- 1) History and Population
- 2) Economy
- 3) Transportation
- 4) Environment

Phase Two: Planning & Design Recommendations

Topic 1: Rethinking Land Use and Urban Density

Topic 2: Reevaluating Parking Infrastructure

- A preliminary Parking Study

Topic 3: Re-designing Urban Open Space as Green Infrastructure

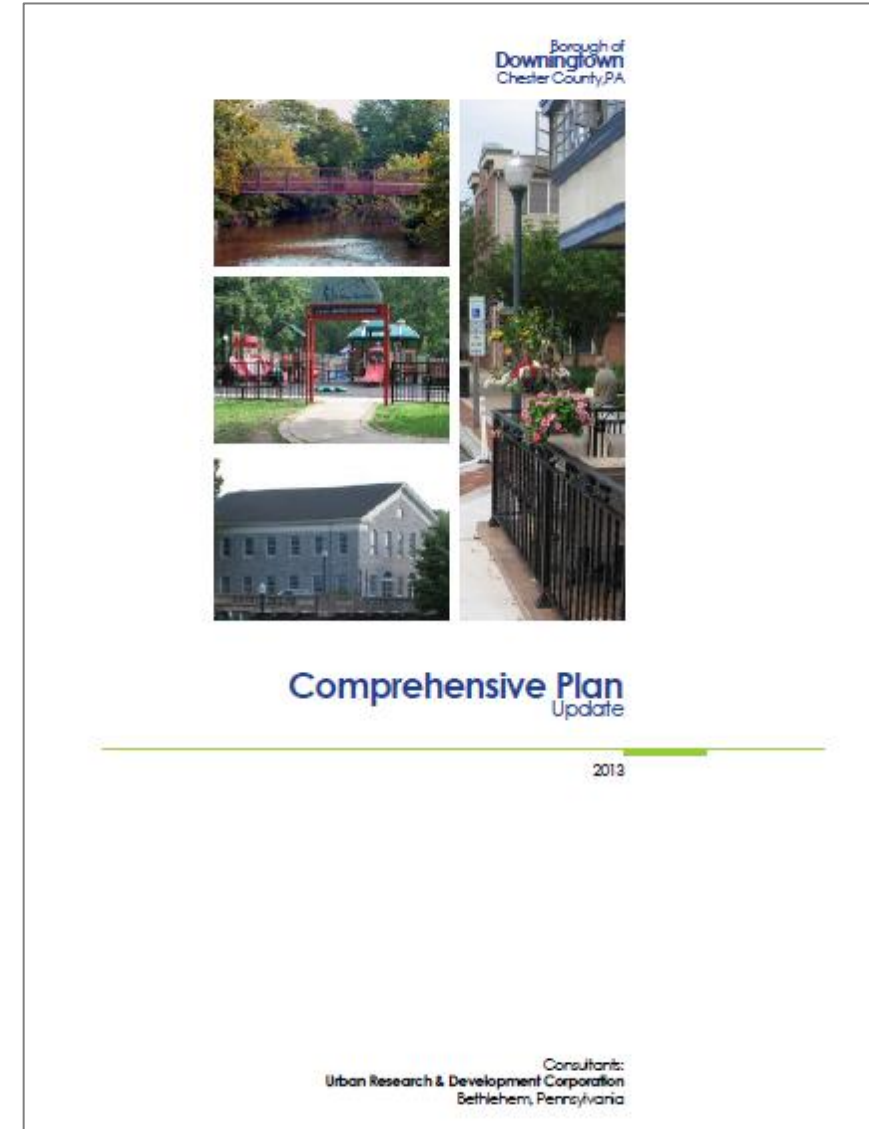
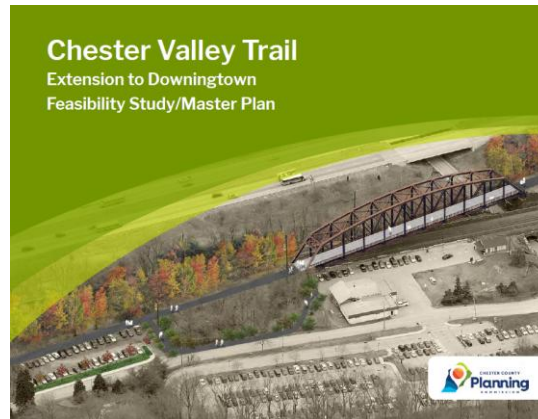
- A Floodable Park

Topic 4: Promoting Active Transportation

- Interconnecting Communities through Chester Valley Trail

Planning Documents

- Urban Center Revitalization 2014
- **Downingtown Comprehensive Plan Update 2013**
- Downingtown Comprehensive Plan Community Profile 2023
- **Downingtown Comprehensive Plan Community Survey Report 2023**
- **Chester Valley Trail Extension Study 2017**
- Central Chester Country Bicycle and Pedestrian Circulation Plan 2013
- Downingtown Area Transportation Study 2022
- Borough of Downingtown Municipal Zoning Map 2015



Phase 1 Analysis of Existing Conditions

- 1 History and Population
- 2 Economy
- 3 Transportation
- 4 Environment

01 History and Population

Team Members and Contributions

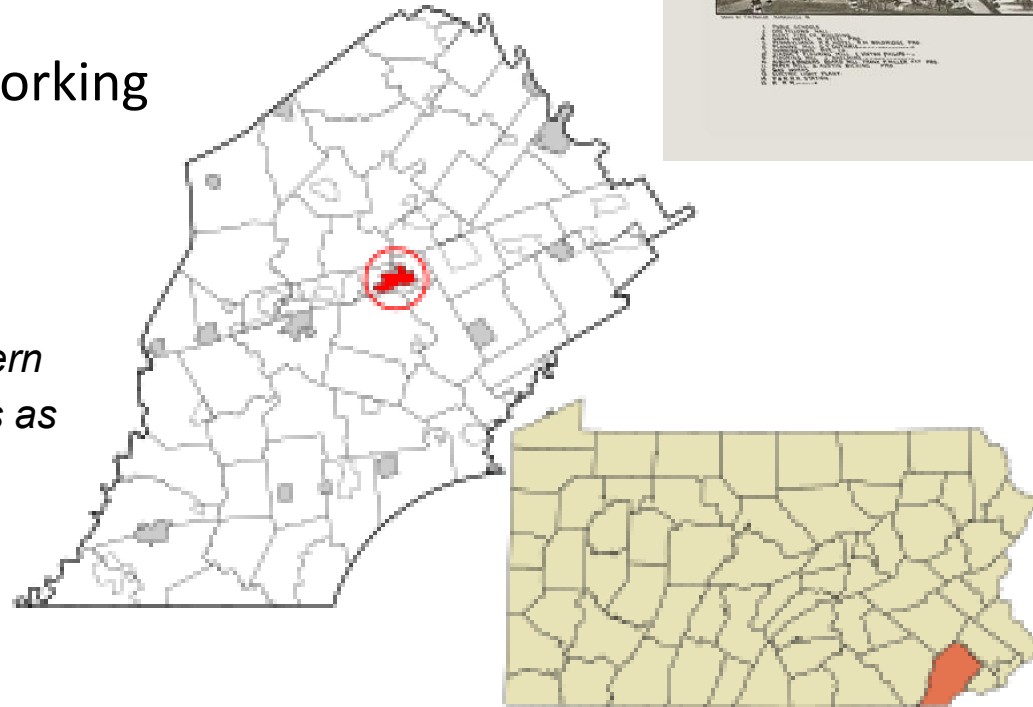
- a. Michael Robinson | History & Who Lived There
- b. Riley Nolan | Community Profile
- c. Gabriel Hirsch | Population & Housing Trends
- d. Grace Broadwell | Community Resources

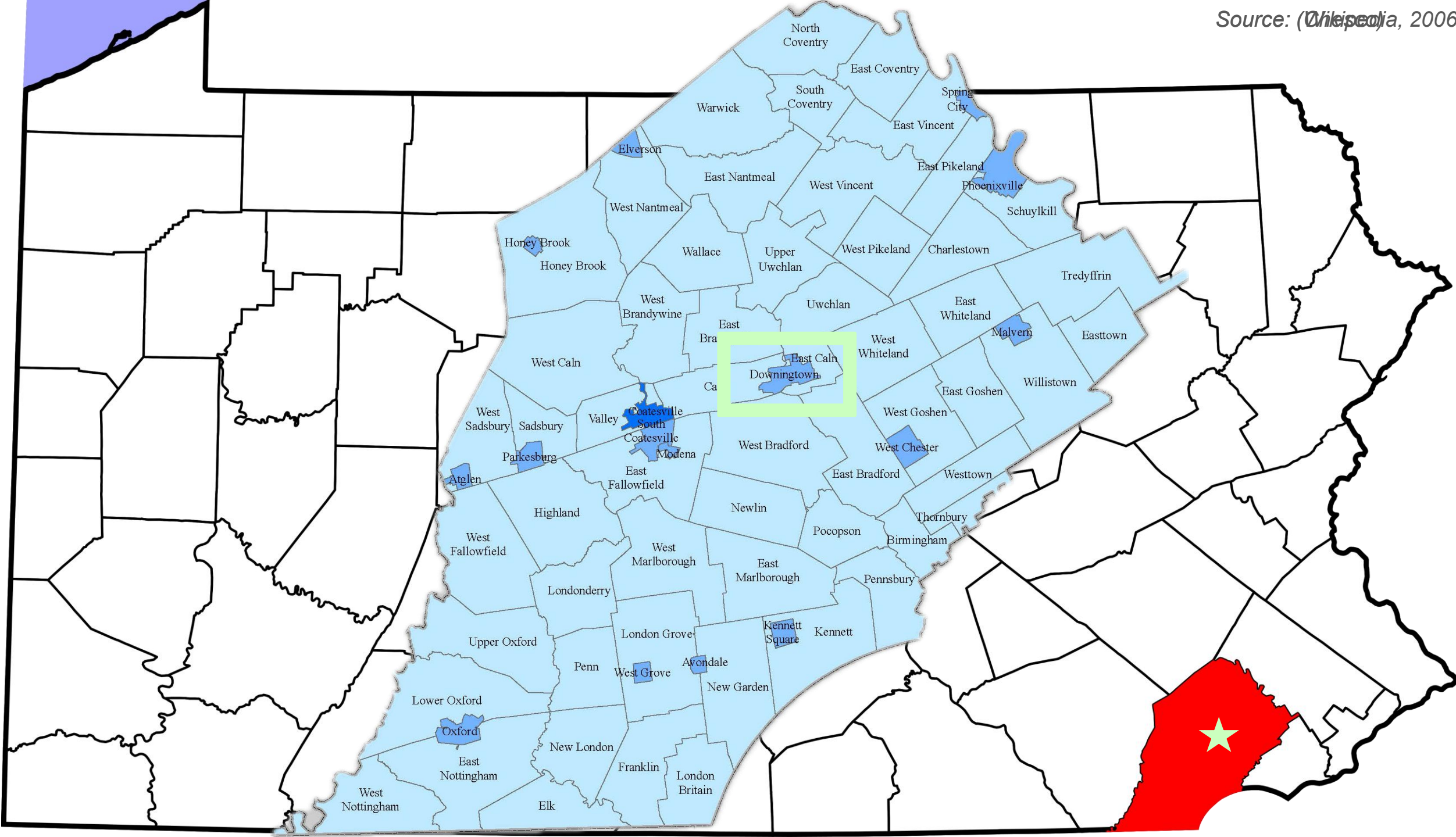
01 History and Population

Summary of Findings

- History
Rich historical area with an industrial background
- Community Profile
Young, white collar working force

Located in Chester County—Southeastern PA; 37 West of Philadelphia, or 26 miles as the crow flies





Downingtown History

- Downingtown was founded in 1716, originally named Milltown
- Small town between Philadelphia and Lancaster
- Formally named **Milltown** due to the various **mills** in the area
 - Paper & Water mills built along Brandywine Creek
- Industrial complex of mills were built during the American Revolution, which put Downingtown on the map
- Following the war of 1812, Milltown was renamed to **Downingtown** after businessman: Thomas **Downing**

(History of Downingtown History, 2024)

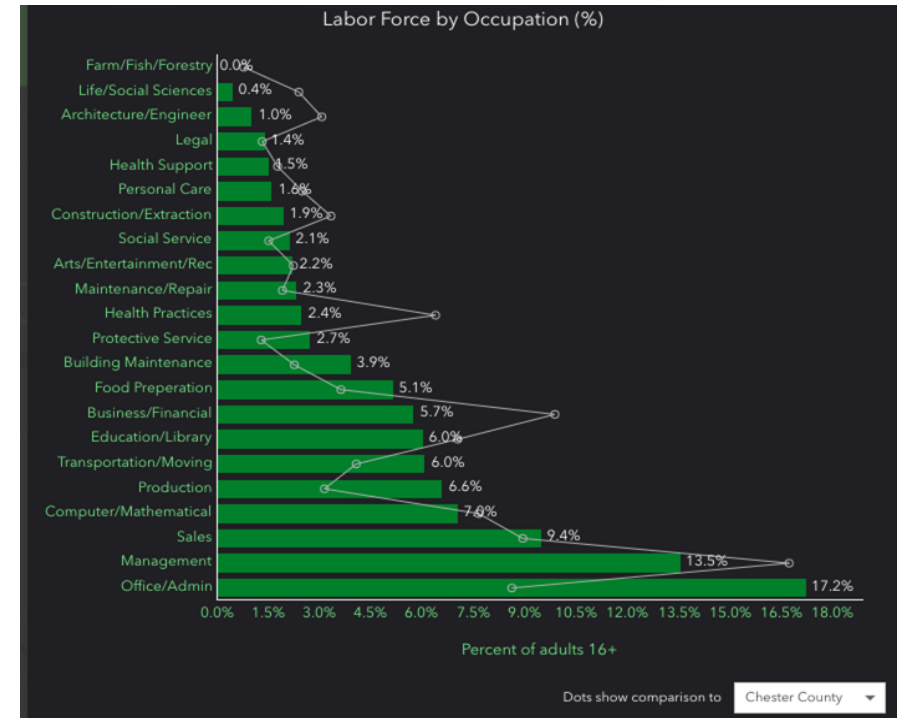


(Keystone, 2017)

Community Profile

Population Characteristics

- “Bright Young Professionals” Tapestry Segment
 - Characterized as young, educated, working professionals.
- Median age: 38.7
 - Largest age groups: Males 25-29, Females 35-39
- Median Household Income: \$78,965
 - US Median Household Income: \$74,580
- 63.9% achieved an Associate’s Degree or higher
- 2.3% Unemployment rate
 - US Unemployment rate: 3.9%
 - Majority employed in white collar industries



(Esri, 2023)

01 History & Population

Key Recommendations

- Key Recommendation #1

Future Development for Multifamily homes:

As population increases, multifamily housing can reduce potential urban sprawl.

- Key Recommendation #2

Incorporate Green Space:

As housing density increases, more green space will offset increase in impervious surfaces.

- Key Recommendation #3

Increase in Infrastructure:

Better roadways, sewer line infiltration, efficient transportation services, and retaining walls for flooding to accommodate residents and commuters.

02 Economy

Team Members and Contributions

- a. Austin Shaner
- b. Joe Mashura
- c. Gabe Lloyd

Site Context

- \$78,965k(BAO, 2023). The US median is nearly \$75k(Census, 2022)
- The area features an extensive park and trail system which supports the area as a potential economic asset for outdoors oriented retail or entertainment.
- According to the Revitalization Plan, improvements to walkability within the downtown area and improved methods of public transportation are methods that are believed to help breath life into the downtown economic sector.

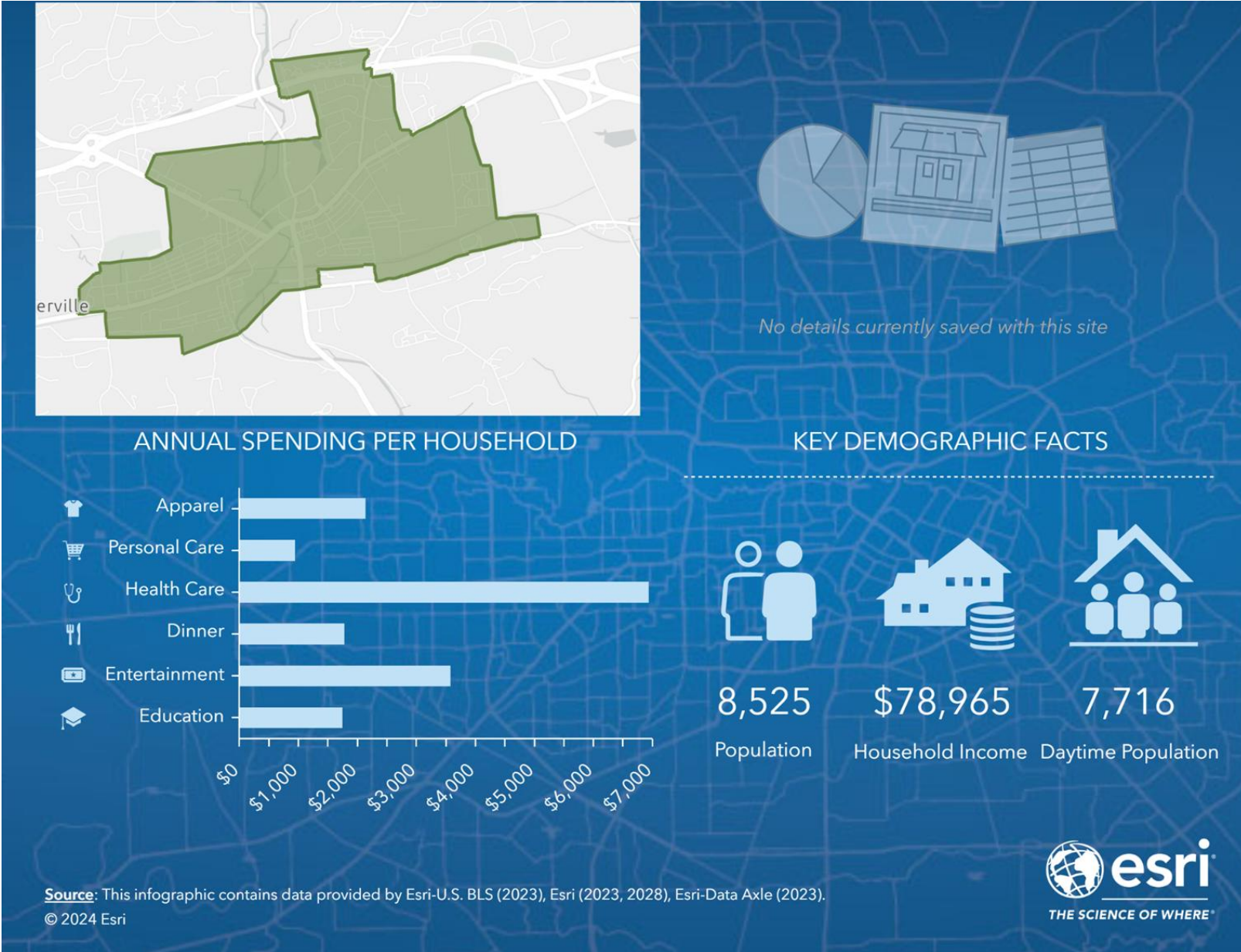


2. Spending

Heading

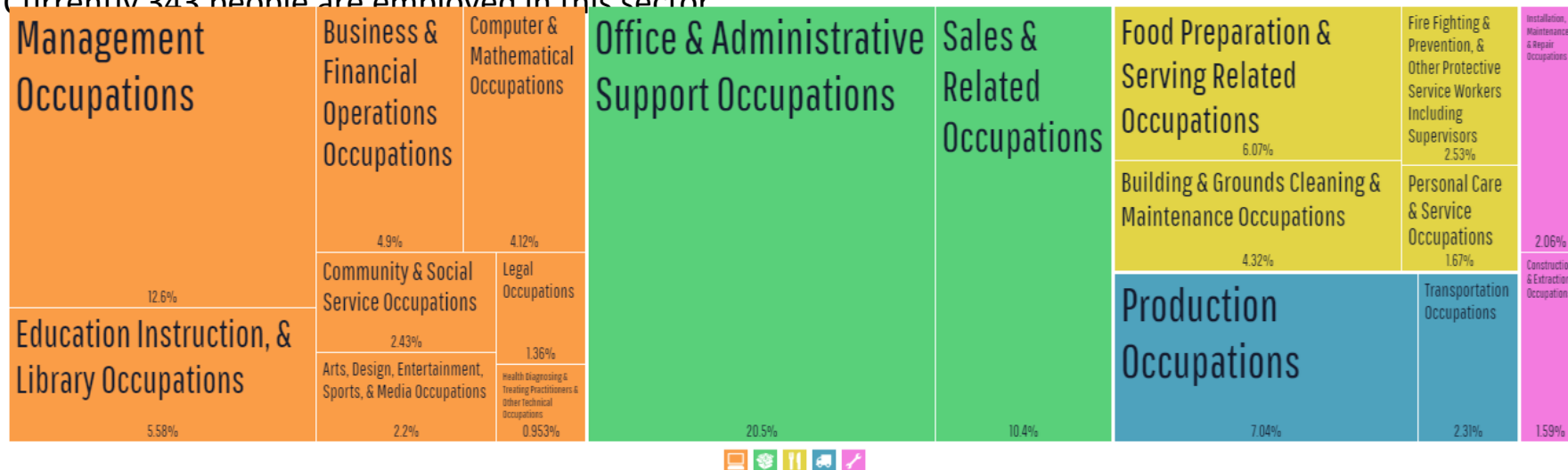
- According to ESRI's Business Analyst, the borough spends a total of ~\$90 million on retail goods and services. ~\$11k Per Capita (US avg per capita ~\$16.6k)
- The borough spends ~\$15 million on food services each year
- Rent, mortgage, and car payments are the three highest single expenditures for the area

Image Title: Spending Profile
Source: BAO



Job workforce

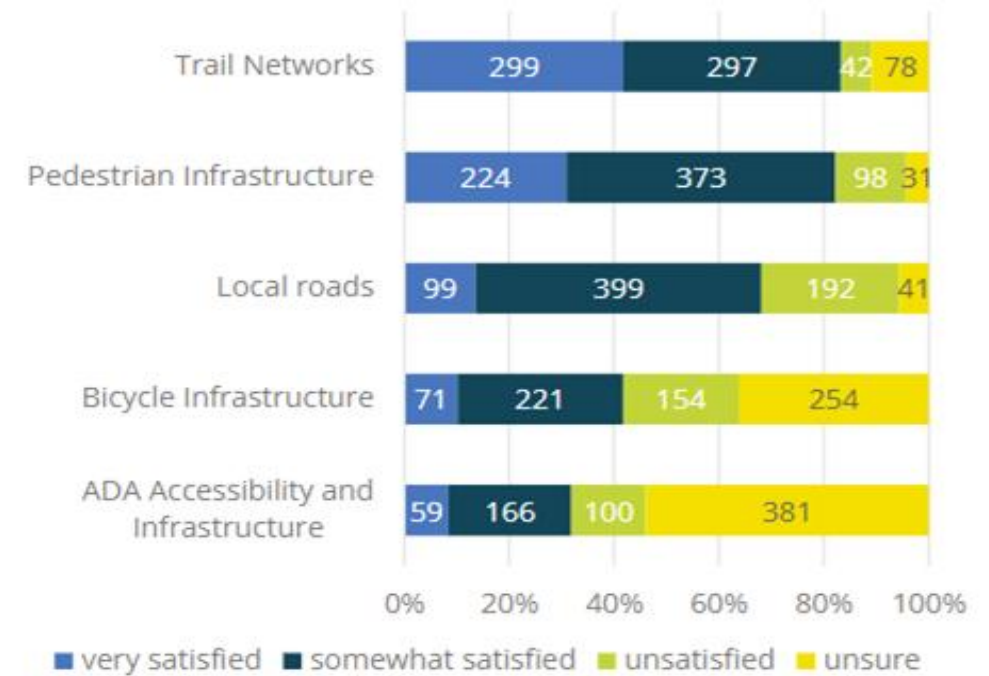
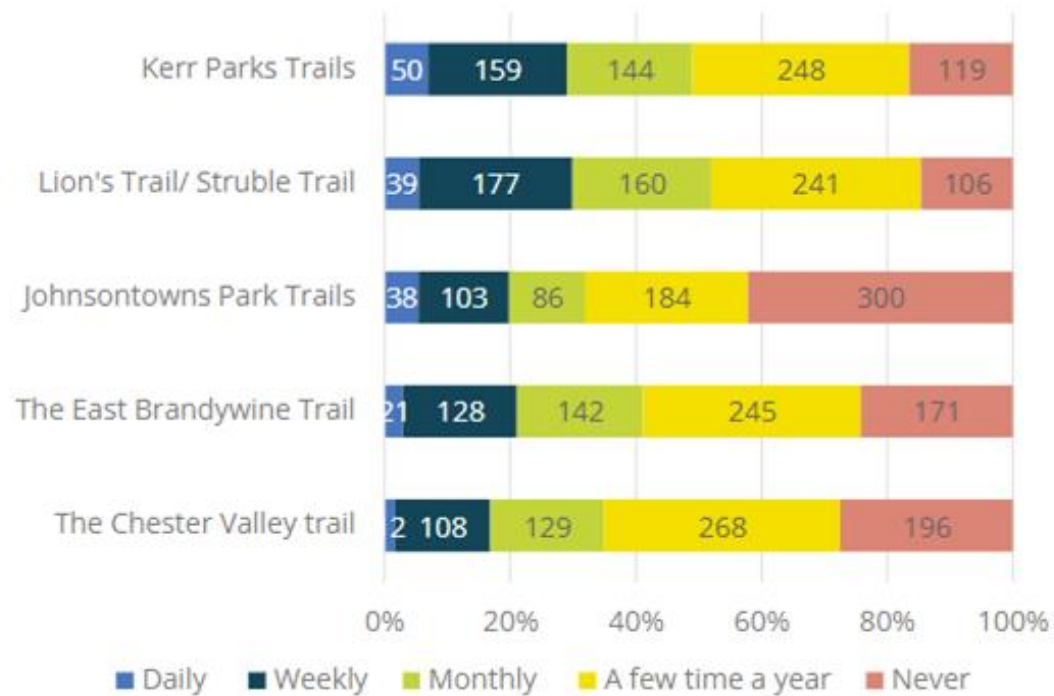
- Downingtown has a diverse job market with 4.8 thousand people currently employed at 419 businesses in Downingtown
 - up 1.64% from the last census data in 2020 showing growth in the job market (census 2020)
- Office and Administrative Support has one of the largest job markets in Downingtown with 1,055 people currently employed
- Educational services holds the most people employed with 1,710 people taking up 35.4% of the total jobs in Downingtown
- The job industry with the best wage distribution is Warehouse and Distribution with a median income of \$78,000 per year. (Census 2020)
 - Currently 343 people are employed in this sector



Land Use and Redevelopment

- Principal issues - Not much area for large-scale development
 - Area around river = former industrial site, will require impact assessment
 - Parking = Major concern for citizens (Borough of Downingtown, 2023)
 - Current trail system = Mainly seen as recreation (Borough of Downingtown, 2023)
- Possible develop opportunities
 - FEMA Buyout Parcels
 - Stepping on toes = required otherwise
- Desire for flood resist efforts, present
 - 19% Downingtown floods, 82% parks in 100 yr floodplain (Borough of Downingtown, 2023)
 - 35% flooded 2-3 times per year (Borough of Downingtown, 2023)
 - 86% residents flooded to some degree (Borough of Downingtown, 2023)
 - Hurricane Ida - Most flood comes from upriver
- Struble - E. Brandywine - Chester trails could meet here; connect 3 for bike traffic/pedestrian use (Chester County Planning Commission, 2017)

1. Downingtown Borough Comprehensive Survey Report (Borough of Downingtown, 2023)
2. Borough of Downingtown Community Profile (Borough of Downingtown, 2023)
3. Chester Valley Trail Extension to Downingtown Feasibility/Master Plan (Chester County Planning Commission, 2017)



1. Downingtown Borough Comprehensive Survey Report (Borough of Downingtown, 2023)

03 Transportation

Team Members and Contributions

- a. Rose Rice – Road and Street Network
- b. Kimberly Suárez– Transit Options
- c. Isaac Gabriel – Chester Valley Trail
- d. Brandon Litwin – Pedestrian and Bike Network

3. Transportation

Summary of Findings

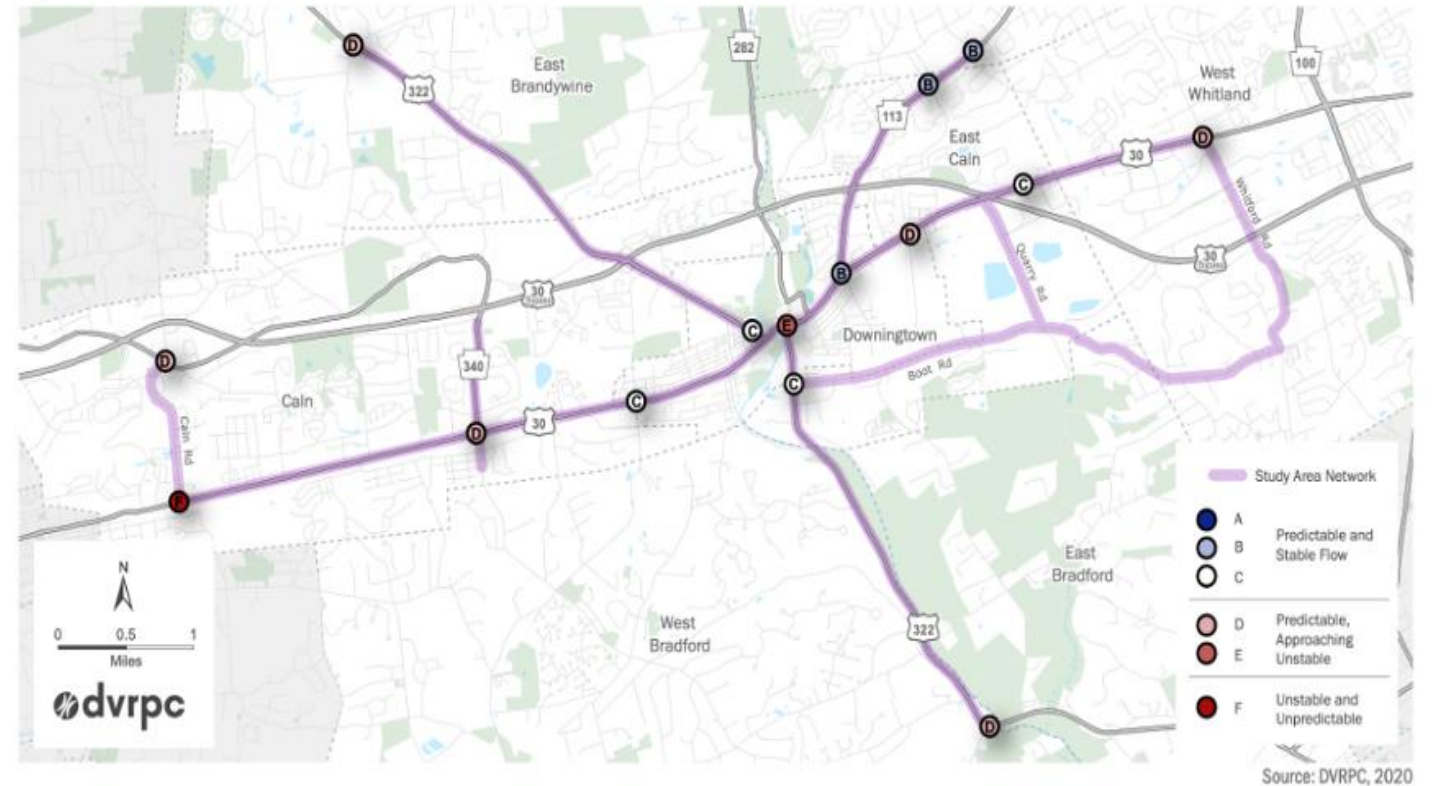
- Downtown sees high volumes vehicular traffic, and congestion at Business 30 / Lancaster Avenue (Downtown, 2022)
- Major roadways are in the floodplain, including Business 30 and US 322 (Chester County, 2017).
- Numerous plans were thoroughly discussed for extending the Chester Valley Trail into Downtown and connecting to the existing Struble and East Branch Brandywine Trails (Chester County Planning Commission [CCPC], 2017).
- A new train station is being created to make it more ADA friendly along with bike racks and other amenities.
- Downtown is considered very walkable.
- Despite its walkability, there are no bike facilities on the roads in Downtown.

3. Transportation

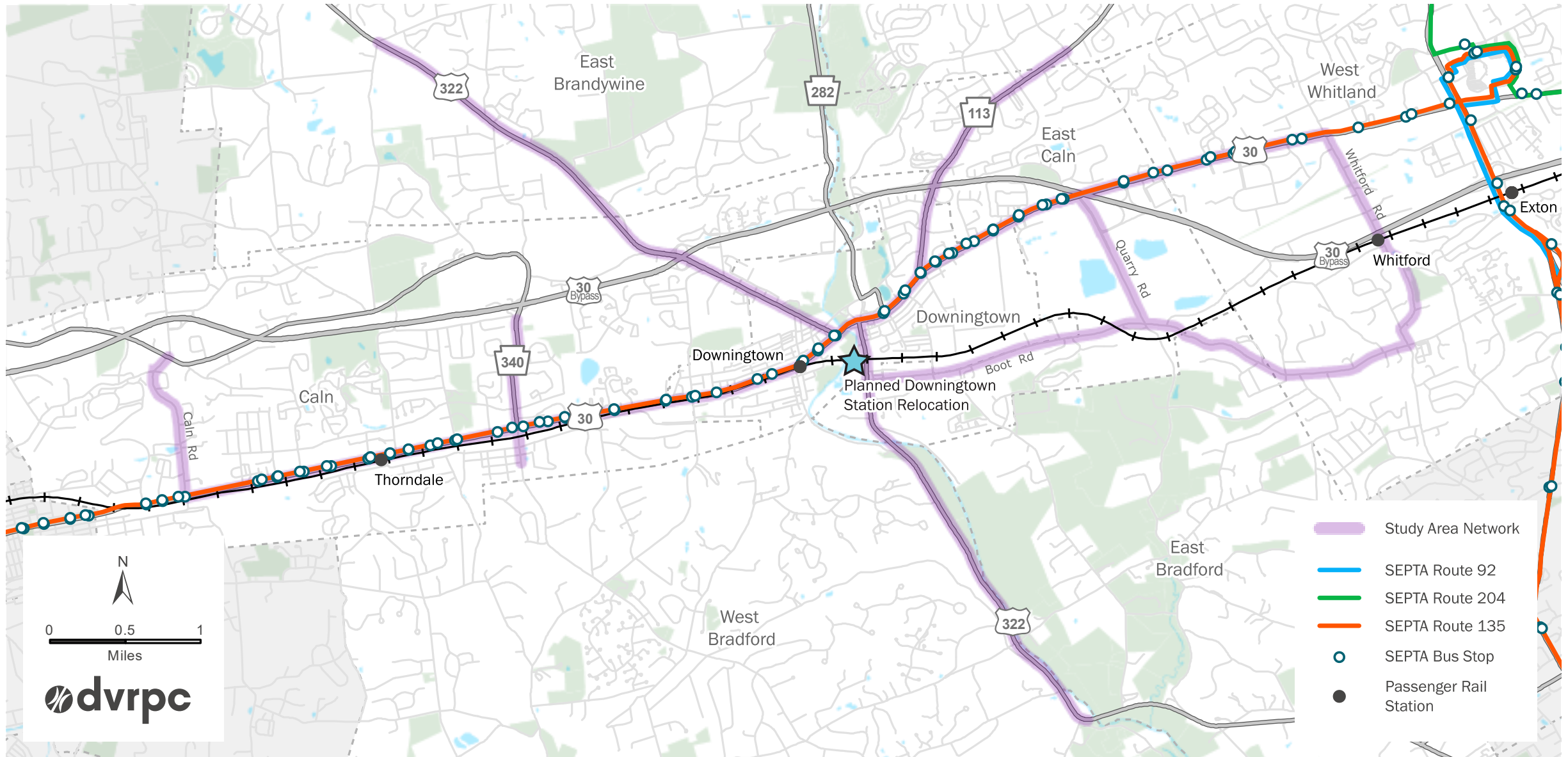
Road and Street Network

- Business 30 sees the most traffic and congestion in Downingtown (Borough of Downingtown, 2013).
- Most people who responded to the community survey drive to work (Borough of Downingtown, 2023).
- The biggest traffic concern is the congestion on Business 30 (Borough of Downingtown, 2023).
- Signal changes can alleviate some congestion in Downingtown (DVRPC, 2022).

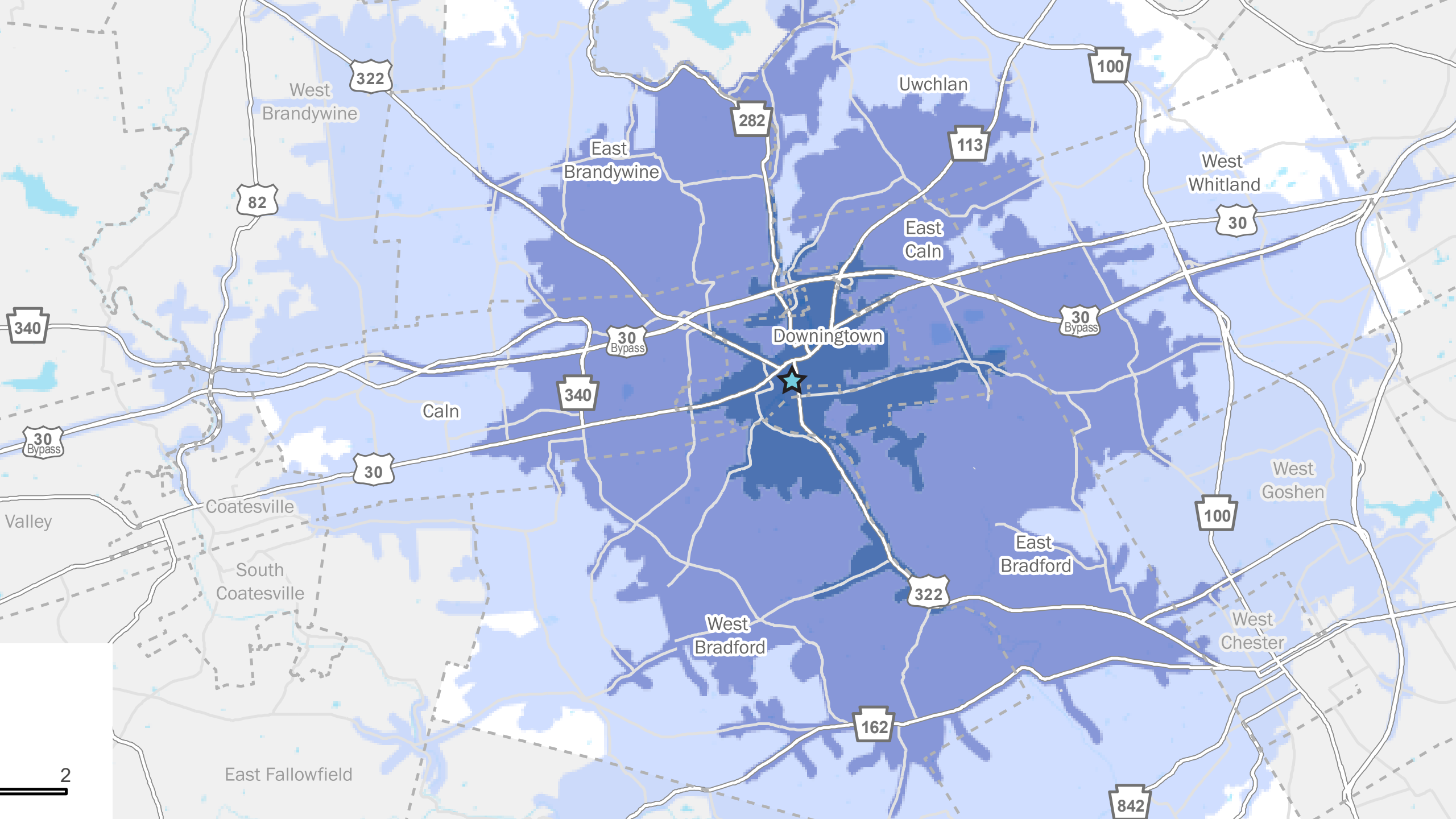
Figure 18: AM Peak Hour Level of Service — Existing Conditions



AM Peak Hour Level of Service Map
(Source: DVRPC, 2022)



Source: SEPTA, 2021

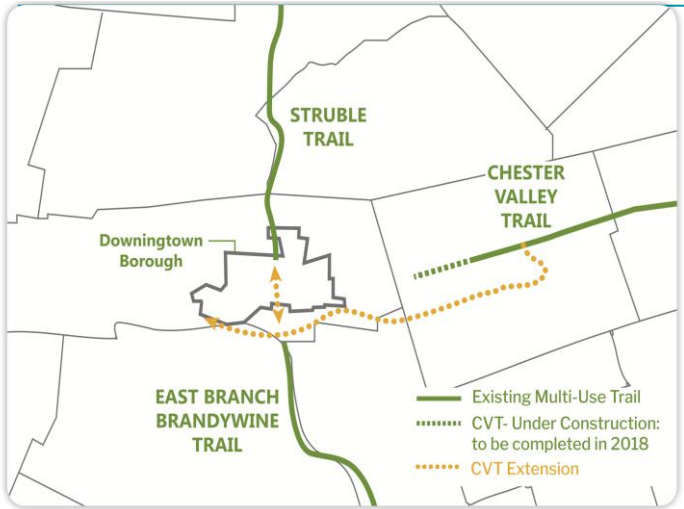




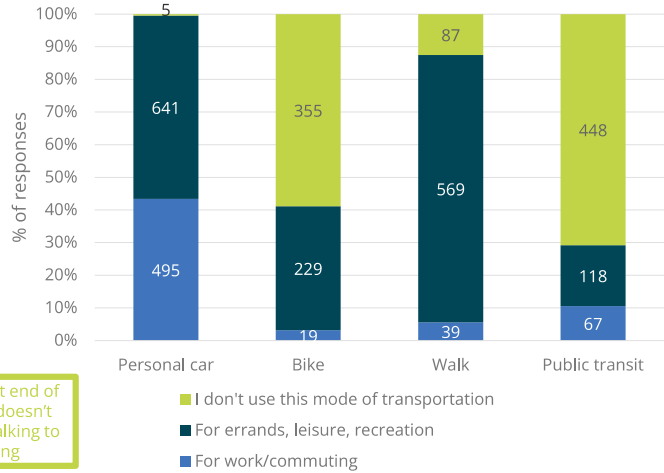
There's no bike connection in the Downtown Station plan :(

3. Transportation

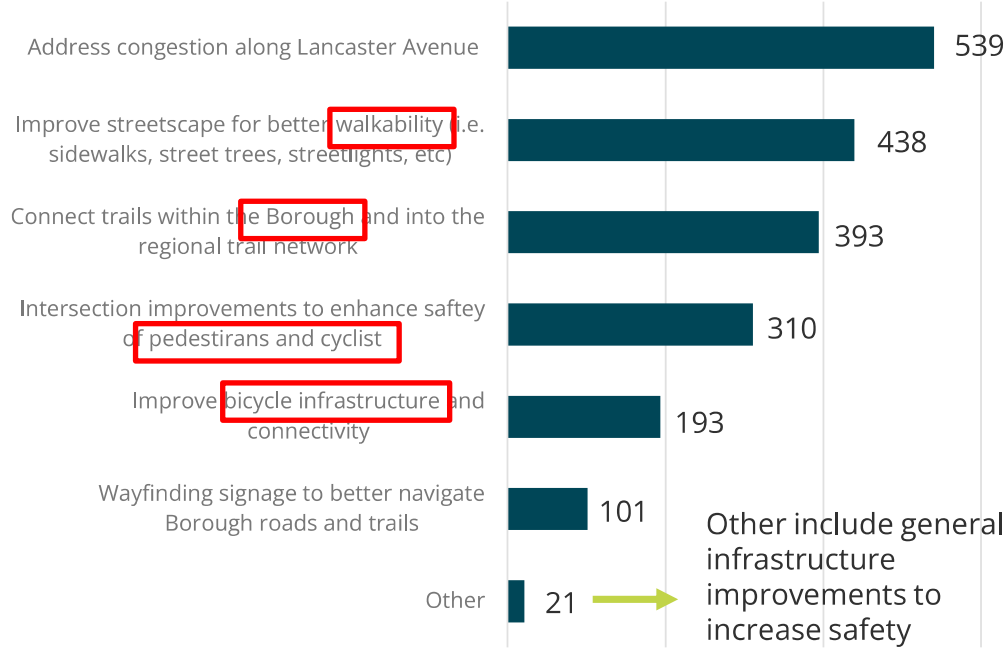
Bike and Pedestrian network



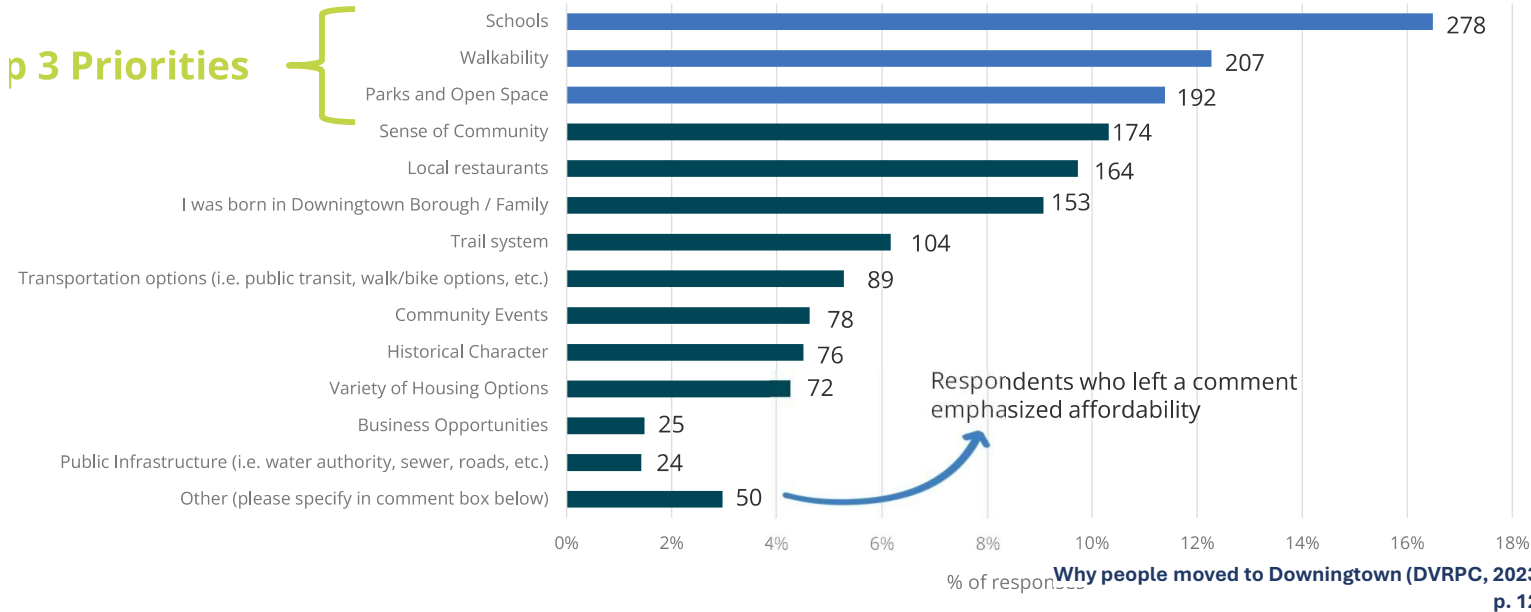
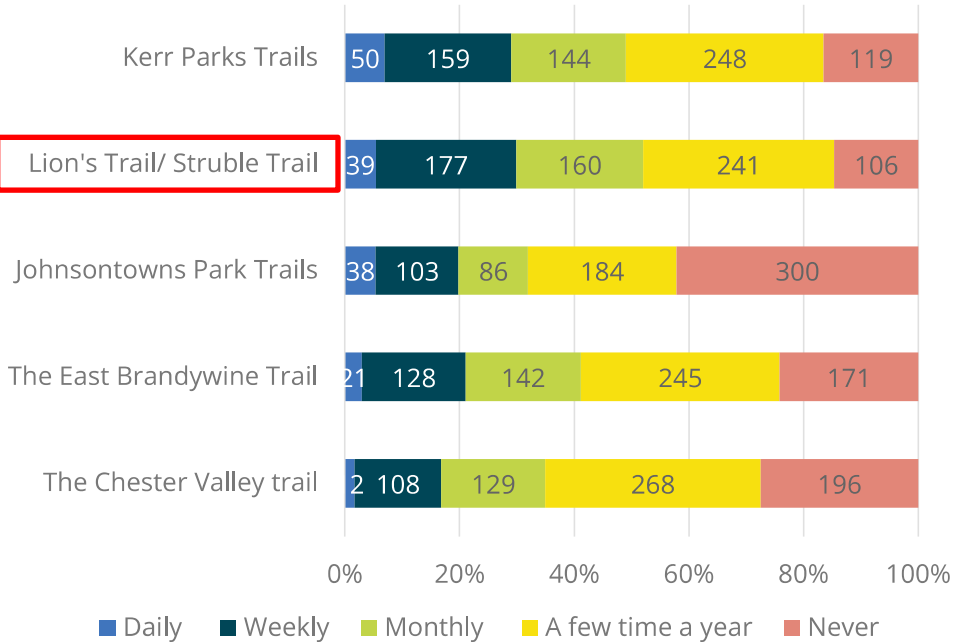
Trails around Downingtown (CCPC, 2017, p. 5).



Those who bike do so mostly for errands, leisure, and recreation (DVRPC, 2023, p. 26)



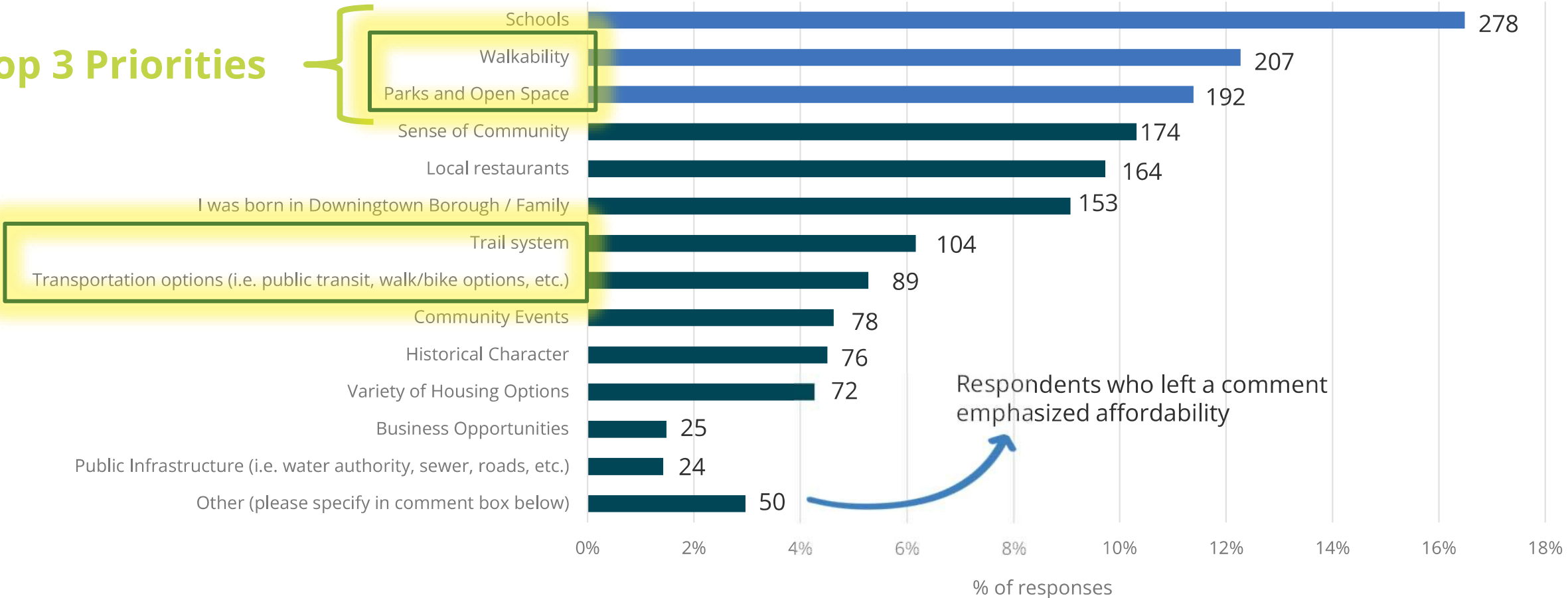
Improving Walkability and Bikeability emerge as transportation priorities for residents. From Downingtown Borough Comprehensive Plan Community Survey Report (October 2023)



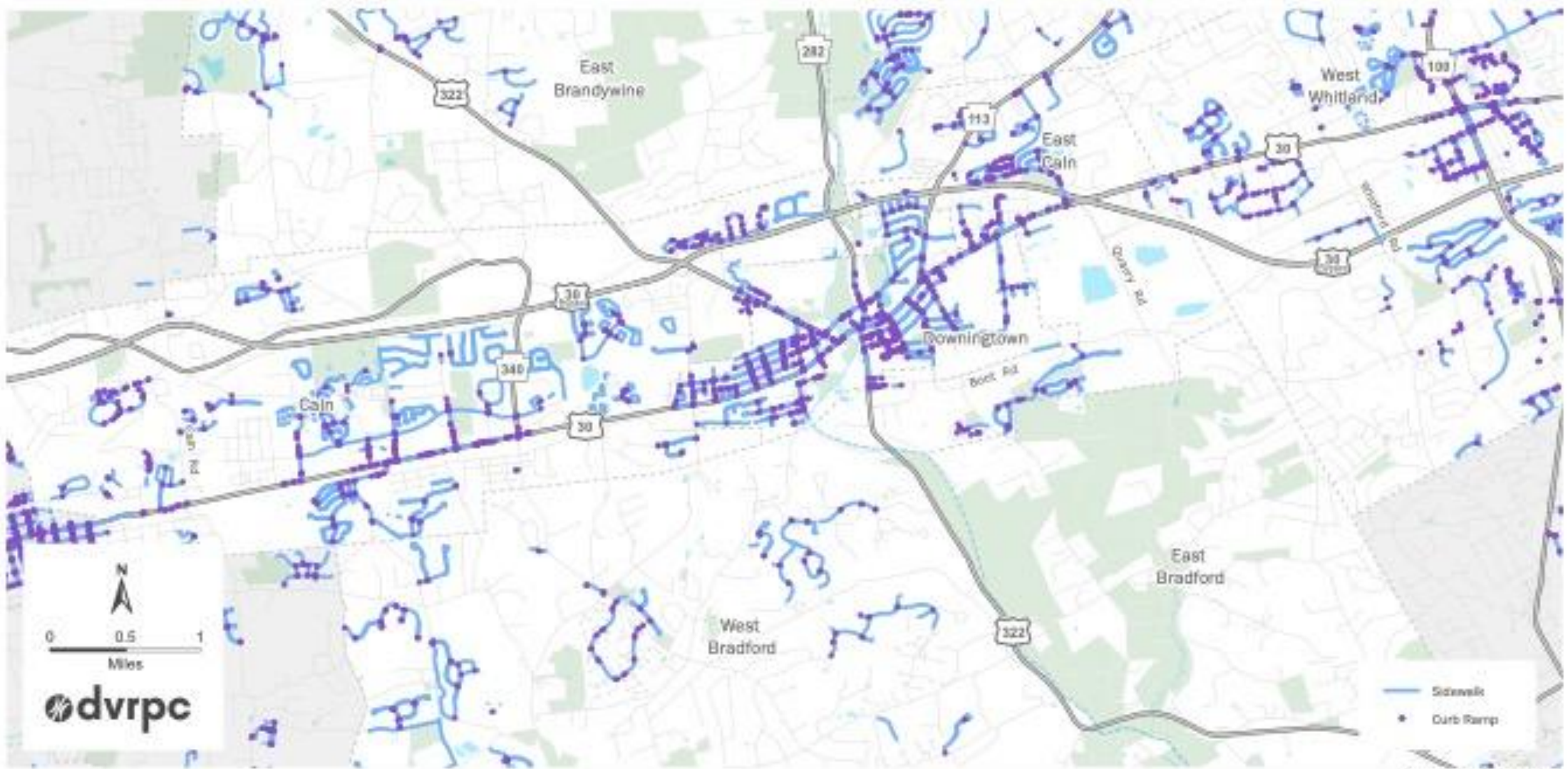
3. Transportation

Bike and Pedestrian network

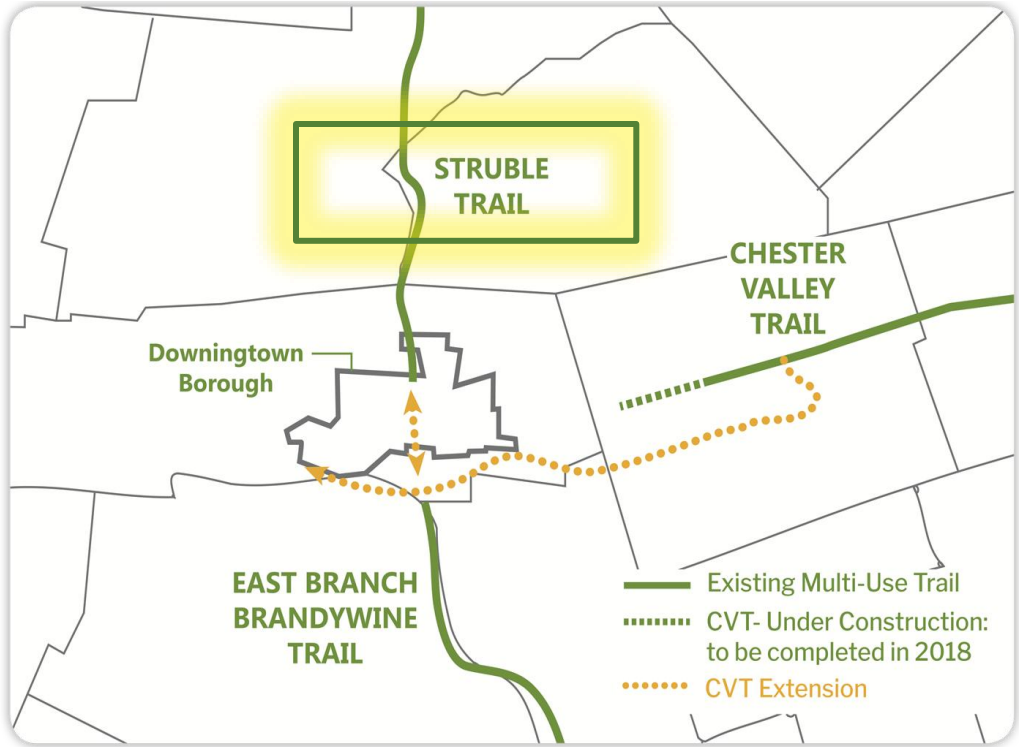
Top 3 Priorities



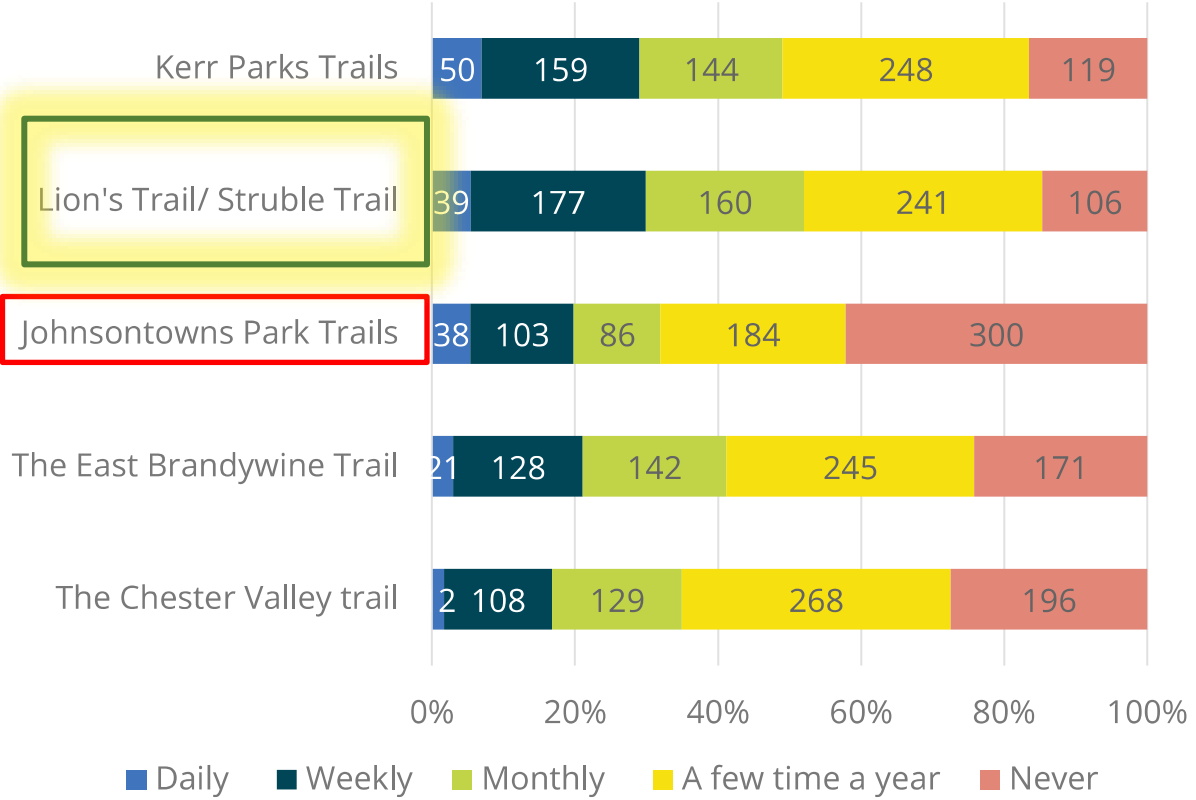
Why people moved to Downingtown (DVRPC, 2023, p. 12)

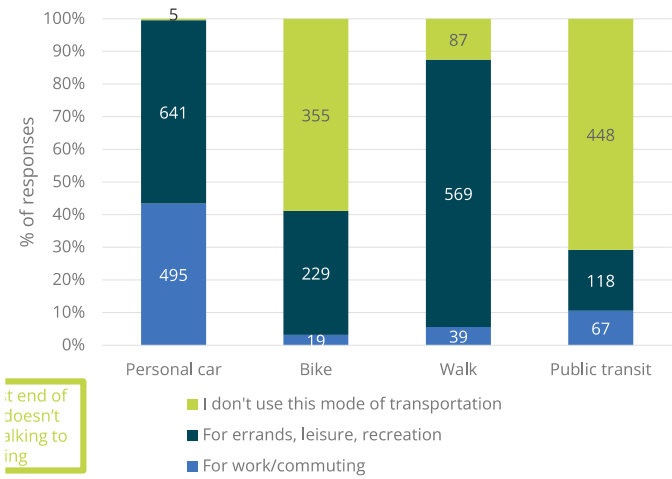


Pedestrian Network, DVRPC (2022)



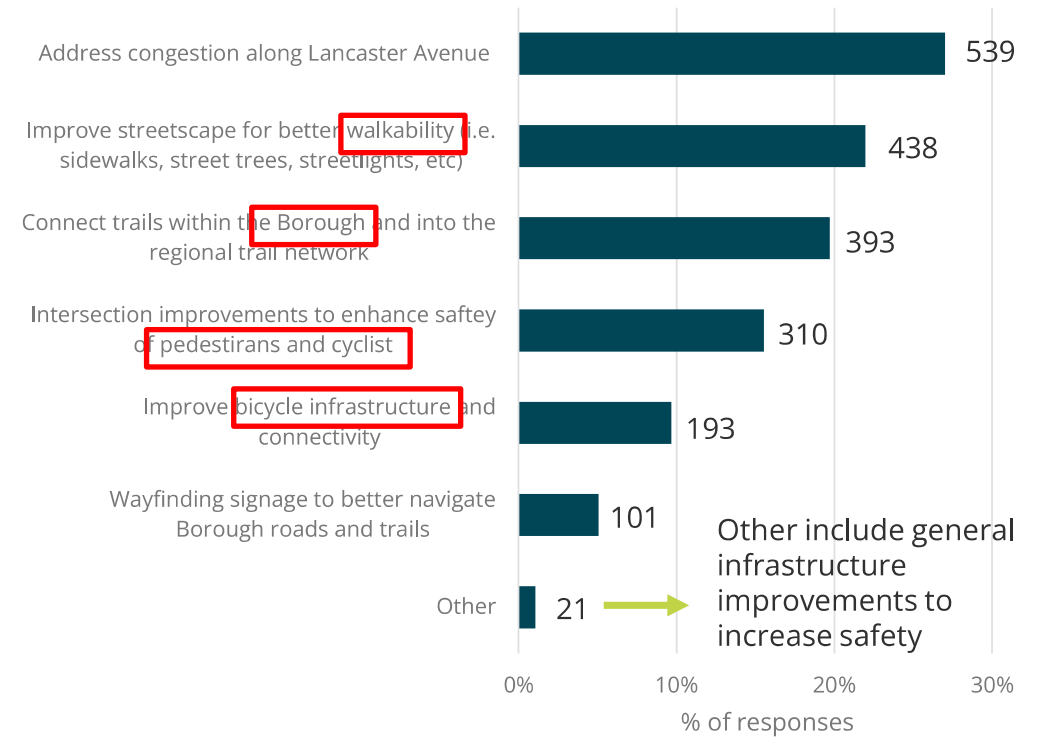
Trails around Downingtown (CCPC, 2017, p. 5).





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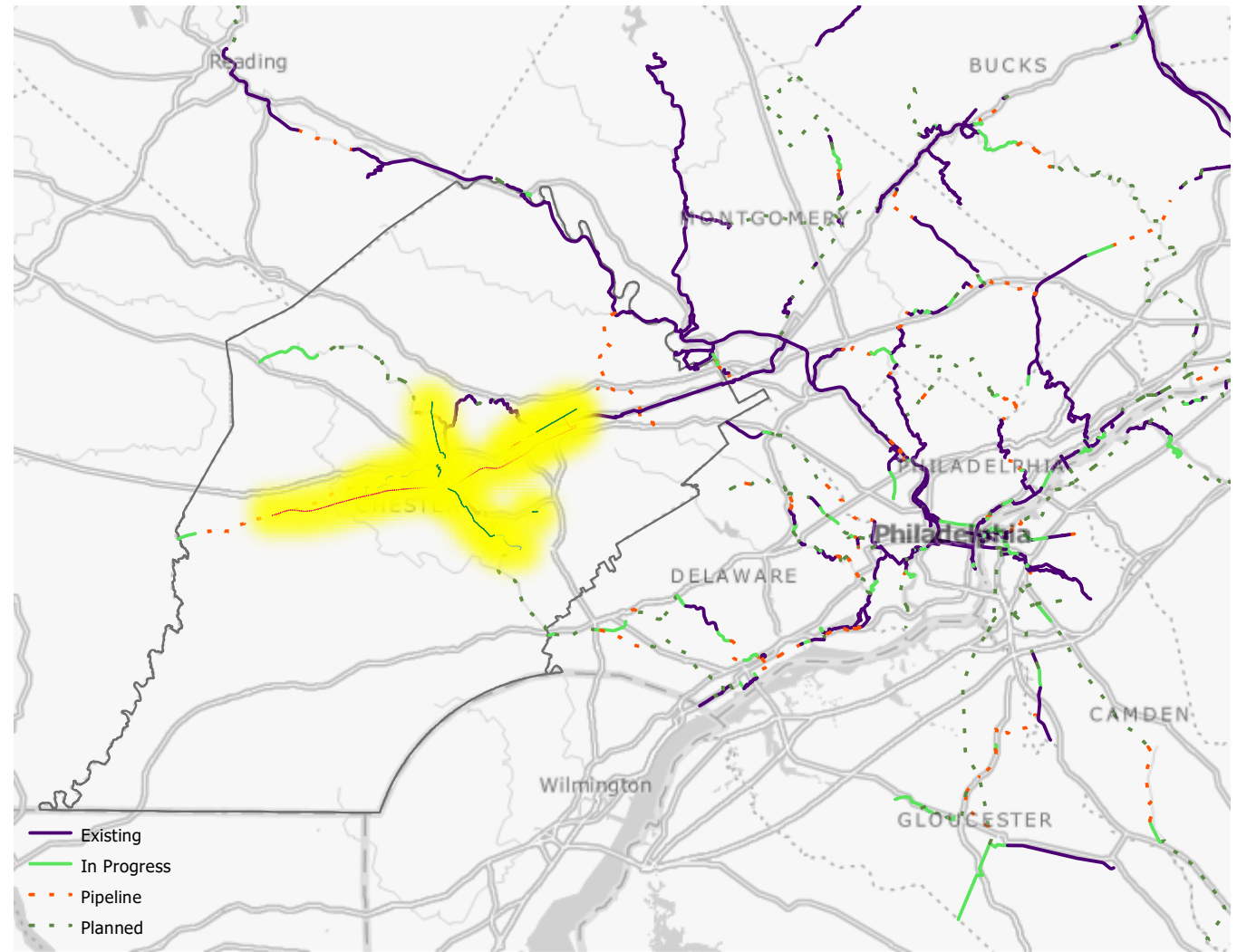
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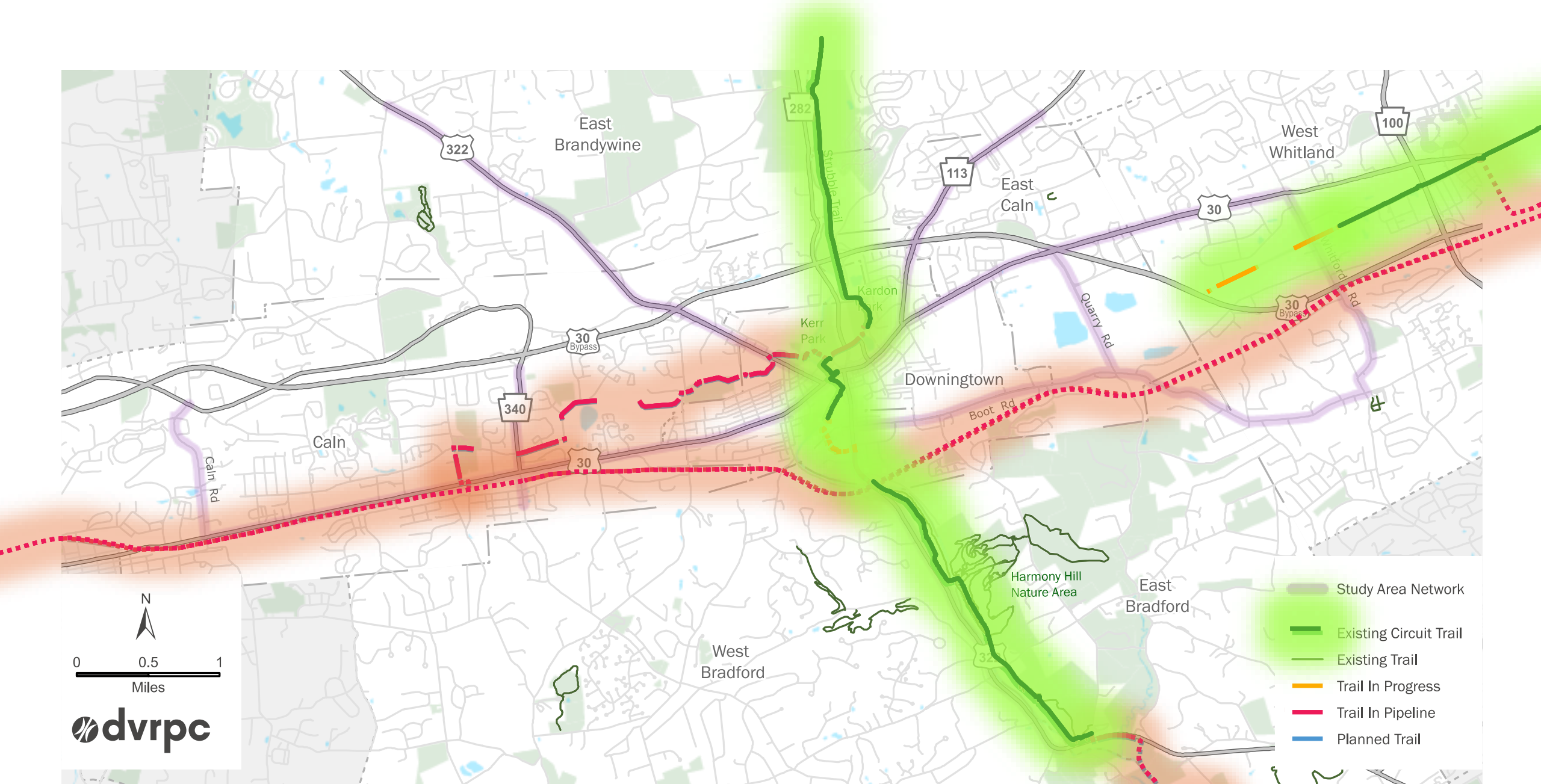
3. Transportation: Chester Valley Trail (CVT)

- ~20 miles
of existing multi-use trail
- Current terminus: **Exton**
- Plans to extend!
CVT Extension Master Plan and Feasibility Study
published by CCPC (2017)
- Importance
 - Part of larger trail network: Circuit Trails
 - Philadelphia's Regional Trail Network
 - Economic implications
 - Accessibility, Equity



Census, Workers 16+ yrs:
0% biked to work,
1.2% of workers in households have no car.

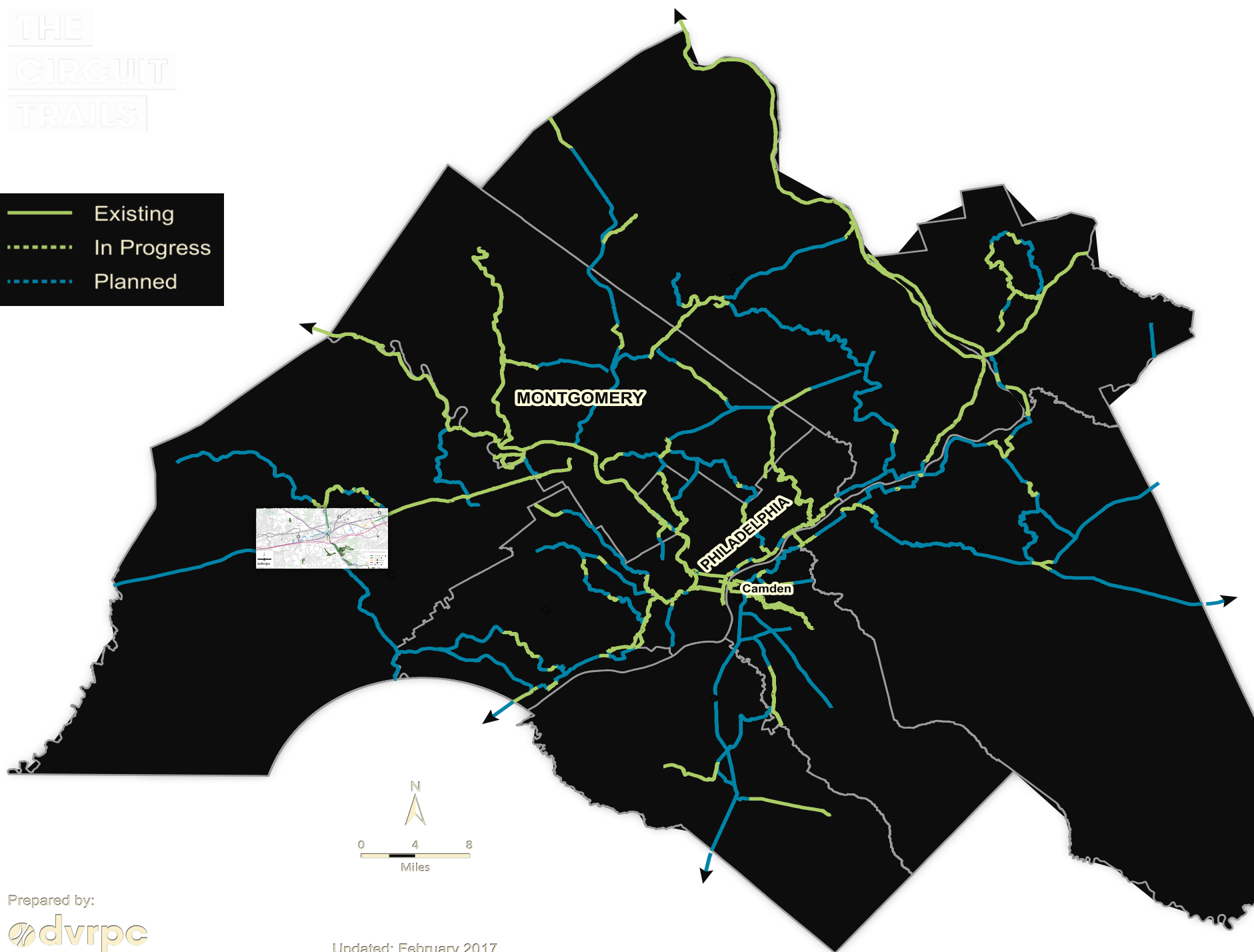
Source: (CCPC, 2017).



Bicycle Facilities and Trails (Delaware Valley Regional Planning Commission [DVRPC], 2022, p. 15)

THE CIRCUIT TRAILS

- Existing
- In Progress
- Planned



Prepared by:



Updated: February 2017

Source: (CCPC, 2017).

3. Transportation

Preliminary Recommendations

- Utilize Green Infrastructure for pedestrian safety and storm water reduction
- Improve Trail Connectivity between CVT, Struble, and E. Brandywine using the P&T rail corridor.
- Install bike lanes to encourage more biking throughout Downtown and the surrounding area.



Top: Reference Photo of Pedestrian Island

Bottom: Reference Photo of Buffered Bike Lanes

04 Environment

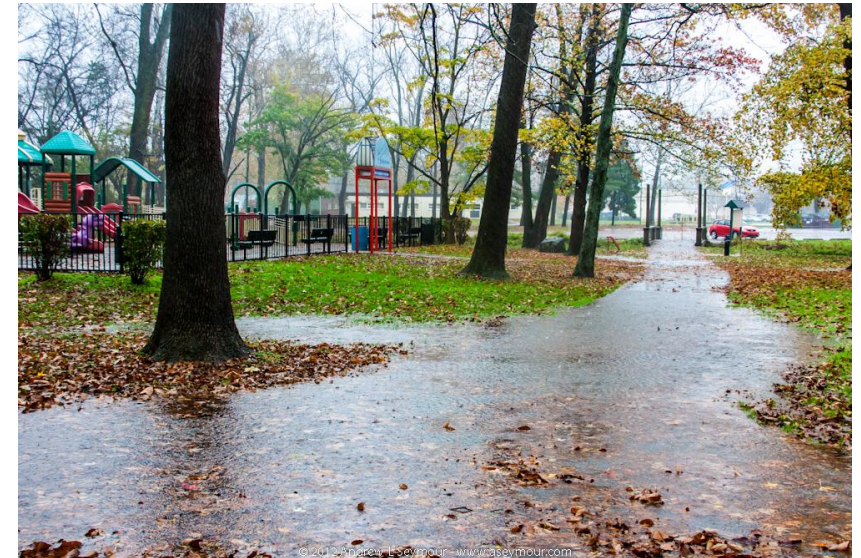
Team Members and Contributions

- a. John-Patrick Duffy- Impervious Surfaces, Parks and Natural Resources
- b. Annalise Large- Climate Profile, Impervious Surfaces, Stormwater Management
- c. Madelyn Zaprowski- Flood Risk, Industry, Parks and Natural Resources
- d. Gianna Zinni- Trees and Vegetation, Industry and Pollution

04 Environment

Summary of Findings

- **Flooding**
Historical and current issues with flooding make it a top priority for Downtown.
- **Impervious Surfaces**
These conditions exacerbate flooding and should be considered in plans going forward.
- **Parks, Greenspace, and Natural Resources**
Greenspace and vegetation should be utilized for sustainable means of flood mitigation.



Top: (Community Profile, 2023)

Bottom: Kerr Park

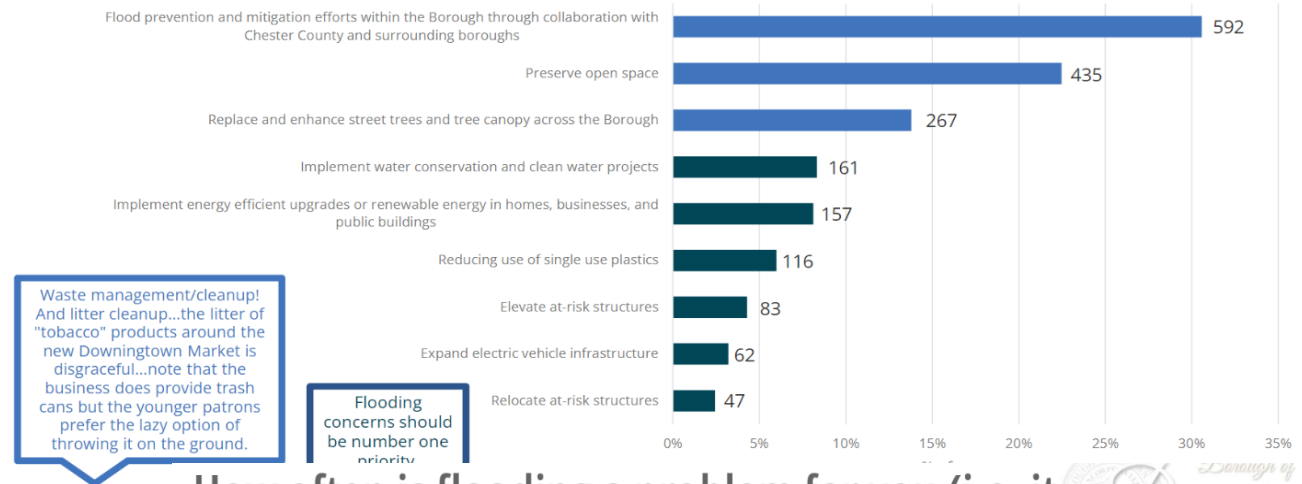
(<https://www.aseymour.com/tag/kerr-park/>)

04 Environment

Community Survey Feedback

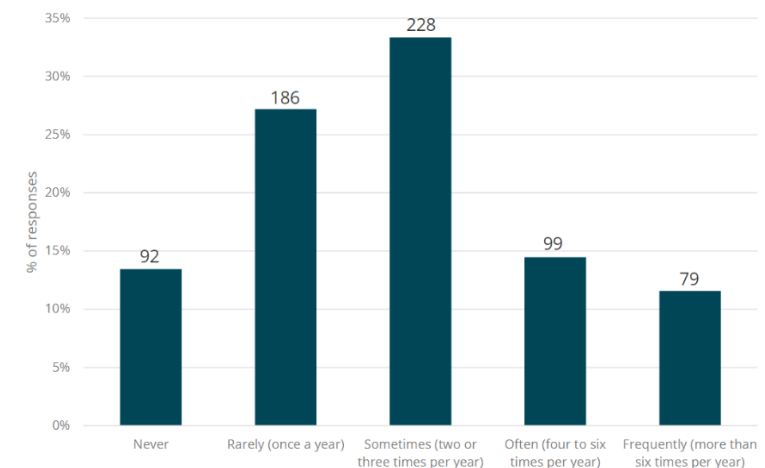
- Just over 30% of respondents view flood prevention and mitigation as their top priorities for environmental efforts.
- Followed by preserving open space (22%) and replacing and enhancing street trees through the Borough (14%).
- 33% of respondents experience flooding two or three times a year.

Which three environmental efforts should Downingtown prioritize?



How often is flooding a problem for you (i.e. it affects your property, places you visit, regularly, your commute, etc.)?

- Respondents who live in East Downingtown East have the most problems with flooding (21%)
- Respondents who left a comment elaborated that when it comes to flooding, roads are more of an issue than housing



04 Environment

Flooding

- Based on what we heard during our visit to the borough and through community feedback, flooding is a top environmental priority in any plan recommended for the Borough.
- Hurricane Ida highlighted major systemic issues with the stormwater and flood capabilities of Downingtown.

Potential loses:

- We learned on our visit that Hurricane Ida produced a 1,000-year flood which, while rare, could happen again.
- These were also the projections from 2017, so based on the new data from Ida these numbers could be more severe if they get another storm of that magnitude.

Borough of Downingtown (420274): Estimated Potential Losses for Flood Event Scenarios
Flood Risk Project Refined Losses

	Estimated Potential Losses for Flood Event Scenarios											
	Total Inventory		10% (10-yr)		2% (50-yr)		1% (100-yr)		0.2% (500-yr)		Annualized (\$/yr)	
	Estimated Value	% of Total	Dollar Losses ⁵	Loss Ratio ^{1,6}	Dollar Losses ⁵	Loss Ratio ^{1,6}	Dollar Losses ⁵	Loss Ratio ^{1,6}	Dollar Losses ⁵	Loss Ratio ^{1,6}	Dollar Losses ⁵	Loss Ratio ^{1,6}
Residential Building/Contents	\$878,100,000	52%	\$6,300,000	1%	\$9,300,000	1%	\$11,000,000	1%	\$17,900,000	2%	\$900,000	<1%
Commercial Building/Contents	\$442,400,000	26%	\$8,400,000	2%	\$13,300,000	3%	\$15,100,000	3%	\$21,500,000	5%	\$1,200,000	<1%
Other Building/Contents	\$380,700,000	22%	\$7,500,000	2%	\$10,700,000	3%	\$11,600,000	3%	\$14,700,000	4%	\$1,000,000	<1%
Total Building/Contents ²	\$1,701,200,000	100%	\$22,200,000	1%	\$33,300,000	2%	\$37,700,000	2%	\$54,100,000	3%	\$3,100,000	<1%
Business Disruption ³	N/A	N/A	\$400,000	N/A	\$600,000	N/A	\$600,000	N/A	\$900,000	N/A	\$0	N/A
TOTAL ⁴	\$1,701,200,000	N/A	\$22,600,000	1%	\$33,900,000	2%	\$38,300,000	2%	\$55,000,000	3%	\$3,100,000	<1%

Source: Hazus analysis results stored as the Flood Risk Assessment Dataset in the Flood Risk Database.

(FEMA Flood Risk Report 2017)



(Minquas Fire Department, 2010)

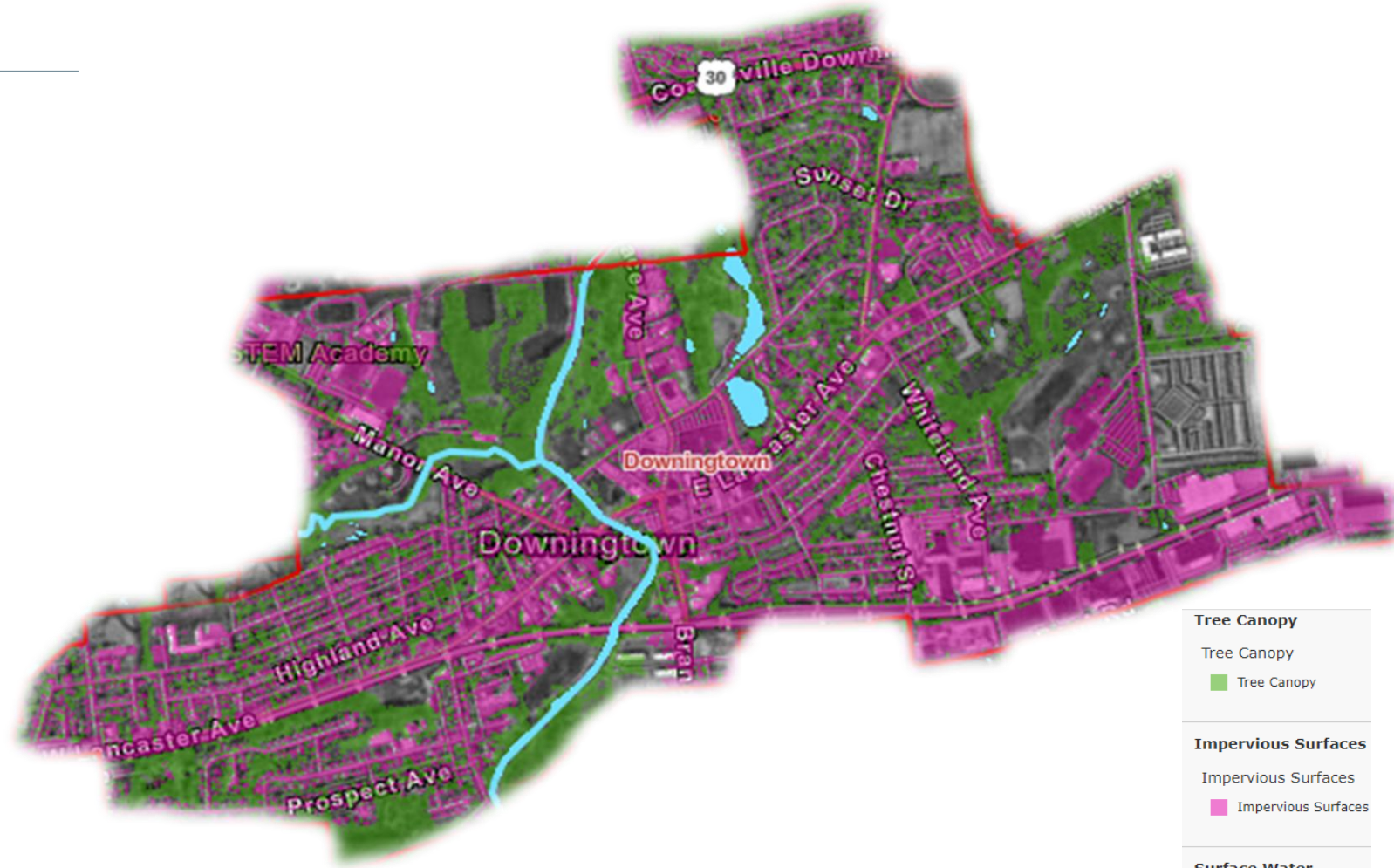


(VistaToday, Ida flooding 2017)

04 Environment

Impervious Surfaces

- 36% of Downingtown is impervious meaning water cannot soak through
- Low Elevation
- Flooding, Flash-Flooding, UHI Effect
 - Average Annual Rain: 49 inches/year
- Climate change is increasing the chance of flash floods, especially in South-Eastern PA
- Most impervious surface found in the Borough of Downingtown, where flooding is worst (Commercial + Residential)

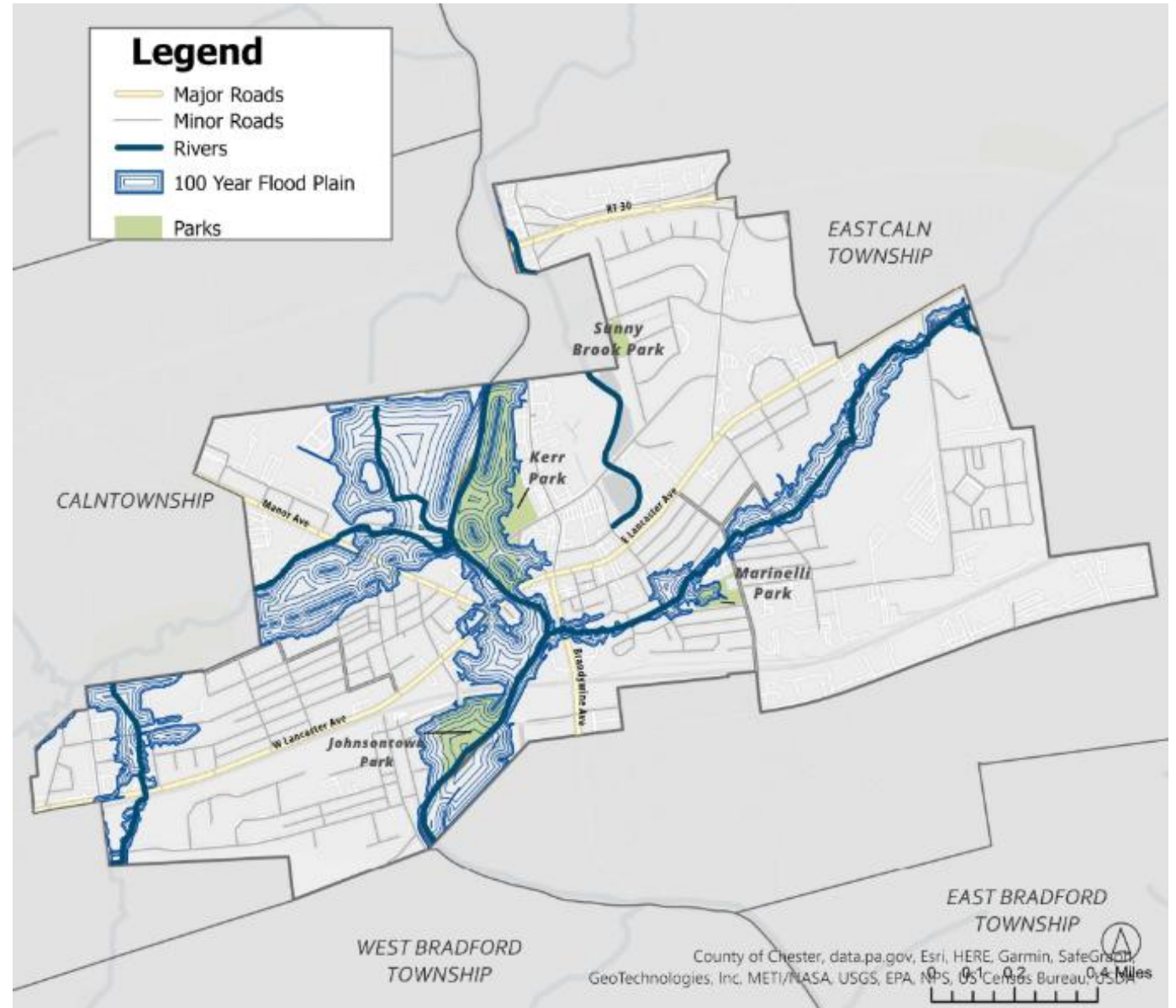


Downingtown Impervious Surface Map

04 Environment

Parks, Greenspace, and Natural Resources

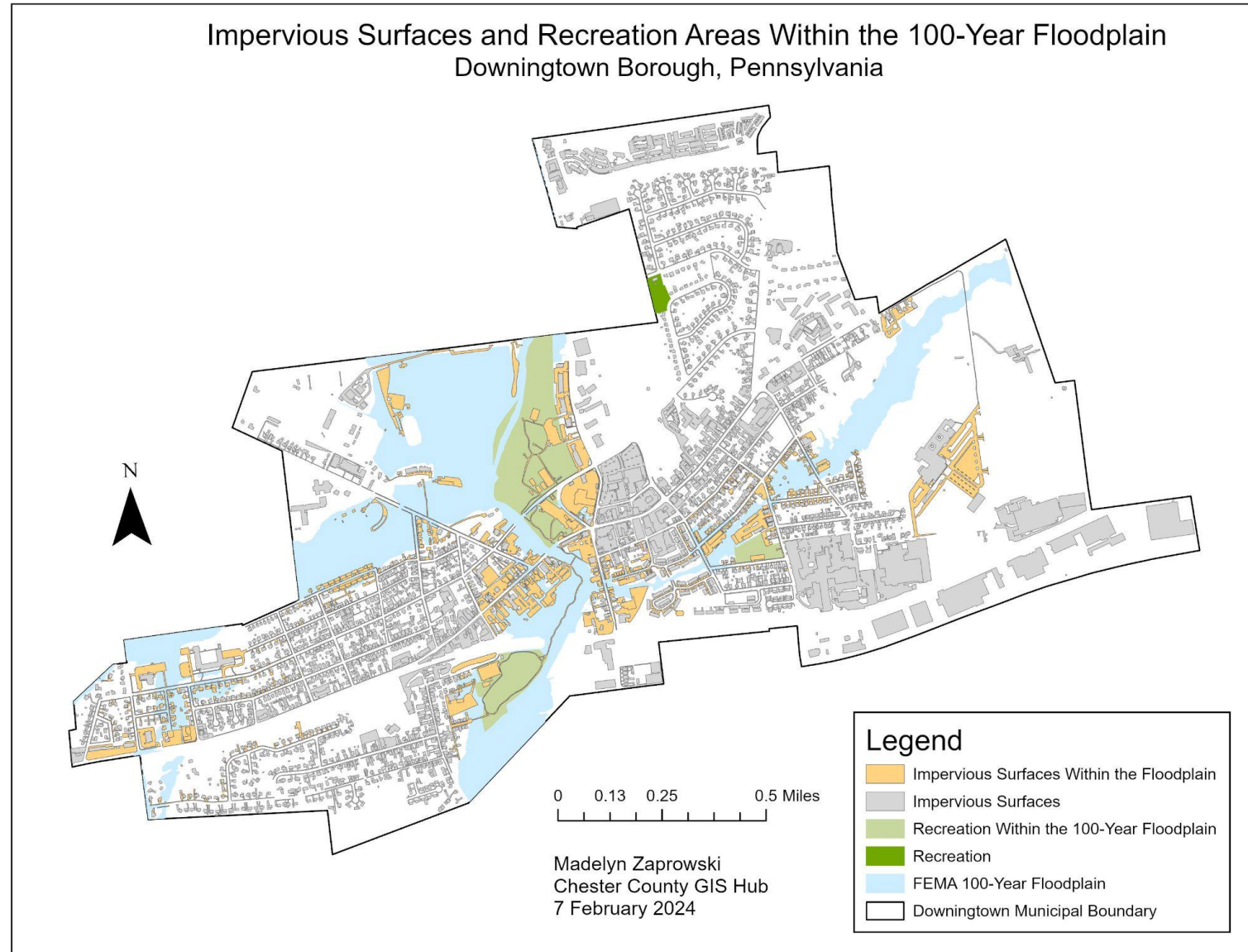
- The entirety of the borough is within the watershed of the East Branch of the Brandywine Creek, running north to south, and is a tributary of the Delaware River.
- They also have Beaver Creek in the west, which is a tributary of the Brandywine Creek.
- Brandywine Creek provides drinking water and recreation to town.



04 Environment

Parks, Greenspace, and Natural Resources

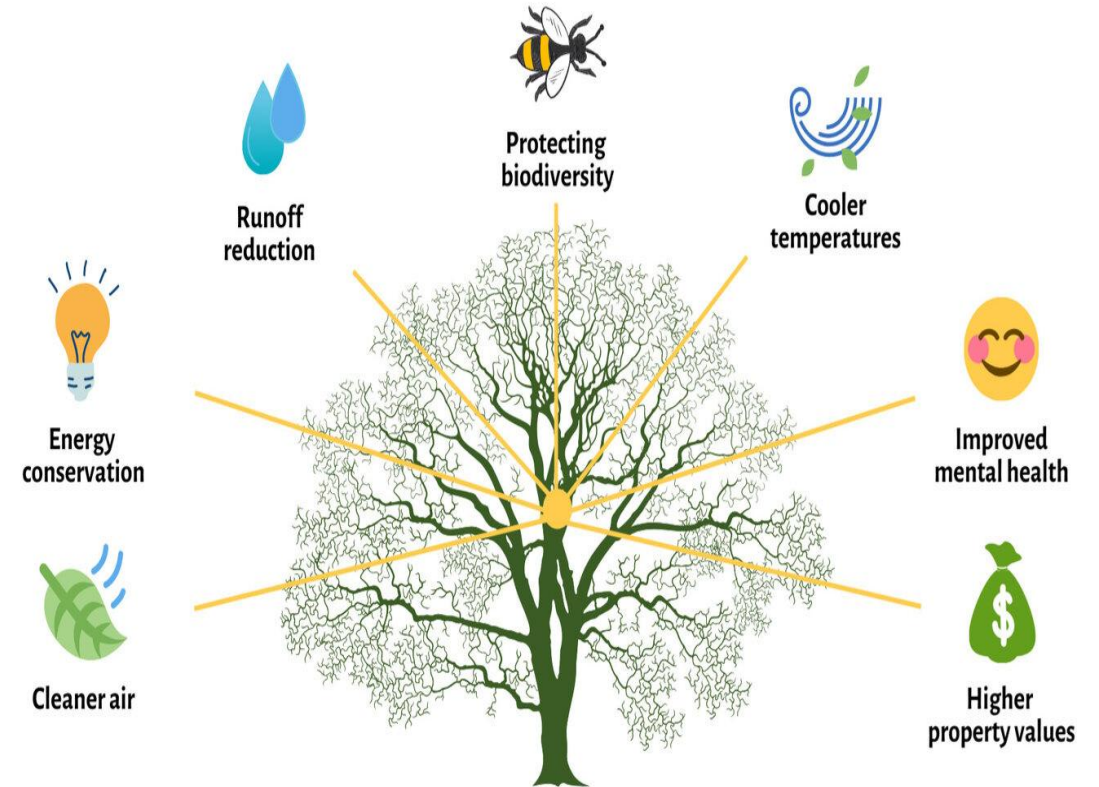
- 66.4 acres of parks in Downingtown.
- Four main parks, according to Downingtown:
 - Kerr Park
 - Johnsontown Park
 - Marinelli Park
 - Sunnybrook Park
- 82% of parks fall within the 100-year floodplain (42/51 acres total).



04 Environment

Trees and Vegetation

- Trees/vegetation coverage are a great way to reduce the impacts of major storms and flooding.
- The Borough of Downingtown community engagement: Residents are very concerned with overdevelopment and flooding & want to know how they can help.
 - Developments do not have enough preparation for major storms and absorbing stormwater.



04 Environment

Key Recommendations

- Focus on preventing further development within the floodplain.
- Where possible, remove existing development from within the floodplain.
- Plan to plant more trees to reduce flood risk.
- Finding sustainable solutions to the problems in Downingtown at municipal and individual levels.

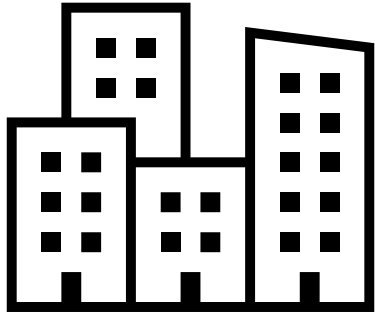
Phase 2 Planning & Design Recommendations

Team 1: Rethinking Land Use and Urban Density

Team 2: A Preliminary Parking Study in Downtown Downingtown

Team 3: Re-designing Urban Open Space as Green Infrastructure

Team 4: Promoting Active Transportation – Empowering Communities through Connectivity, with a Focus on the Chester Valley Trail



Team 1 Rethinking Land Use and Urban Density

Team members and Contributions:

1. Riley Nolan: Introduction, ArcGIS Urban, Urban Plan
2. Rose Rice: Site Context, Goals and Visions, Inspiration, Site Design and Flow Maps
3. Michael Robinson: Functions and Existing Conditions, Local Inspiration, Bubble Map
4. Madelyn Zaprowski: Goals and Visions, Inspiration, Design Considerations, Urban Project

Introduction

- We were tasked with choosing a site in the Borough of Downingtown for a redevelopment vision that centers urban densification.
- With the growing population and the existing impervious surfaces creating floodplain conflicts, it is important for the Borough going forward to consider zoning, environmental implications, and the most recent concerns of the existing community.
- The Borough gave us a few recommended sites to explore, including the current SEPTA station that is being moved to a new location, and the Reedman Toll Honda Dealership.



(Styer Real Estate, n.d.)

Functions and Existing Conditions

- **Currently:** Reedman Toll Honda Car Dealership
- Prime location in the Downingtown Borough:
 - Separates Kerr Park & E. Lancaster Ave.
- Parking lot minimally maintained.
- Area is often used for citizens to walk or drive through (as a shortcut).
- Considered an eye sore to the citizens & unfitting lot for a dealership.

Location:

19 Park Lane, Downingtown, PA

Lot size: 4.531

Total SQ FT: 49,544

Legal Description:

4.5 AC & COMM BLDGS LOT B



(LoopNet, 2024)

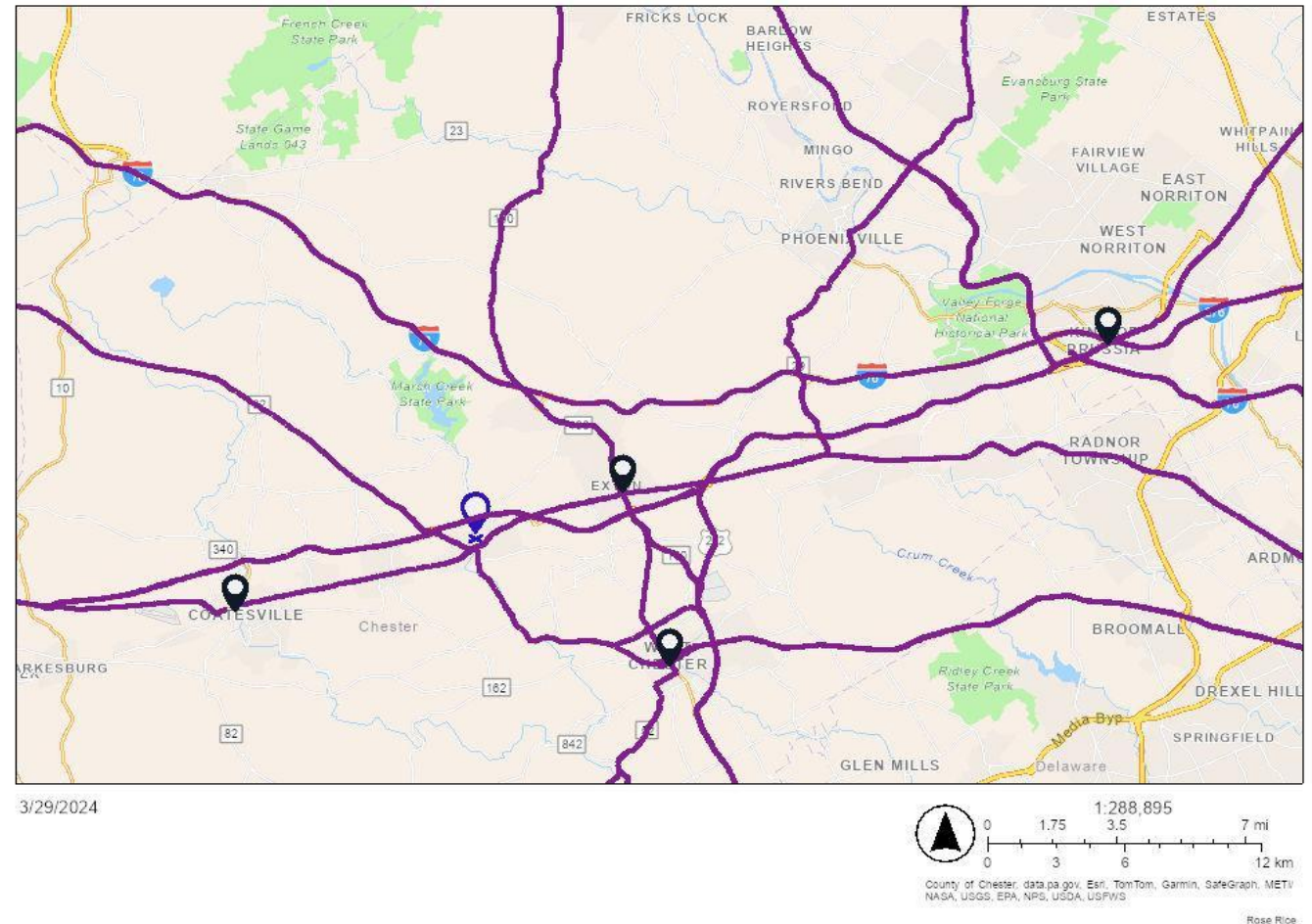


(Google, 2024)

Site Context

- 15-minute drive area around the site Includes other towns such as Coatesville, Exton, West Chester.
- In this area, there are 153,737 people that make up 59,938 households.
- There are 6,473 businesses in this area that employ 85,067.
- 3% of households do not own a car

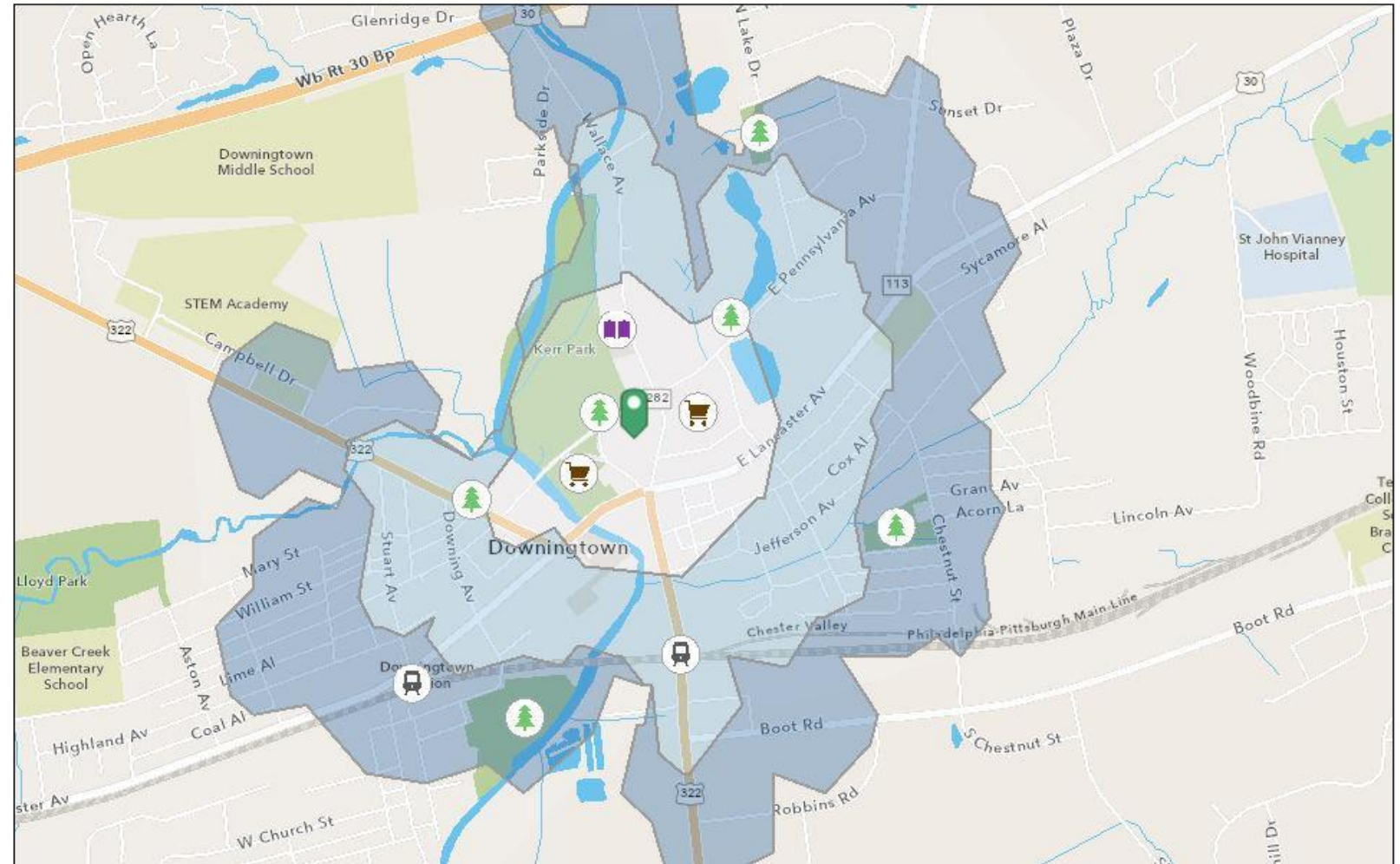
Reedman Toll Honda - Broader Context



Site Context

- 6 parks
- Both the current and new SEPTA station.
- Library
- Grocery Store
- Farmer's Market

Reedman Toll - Nearby Amenities



3/29/2024



Downingtwn Grocery



Dowingtwn Transportation



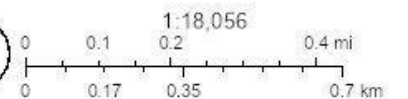
Dowingtwn Parks



Dowingtwn Library



Location Points



Esri Community Maps Contributors, County of Chester, data.pa.gov, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, MET/NASA, USGS,

Rose Rice

Goals and Visions

After visiting Downingtown in person and conducting initial research on the Borough, we developed a vision and created both 2D and 3D design concepts to present here today.



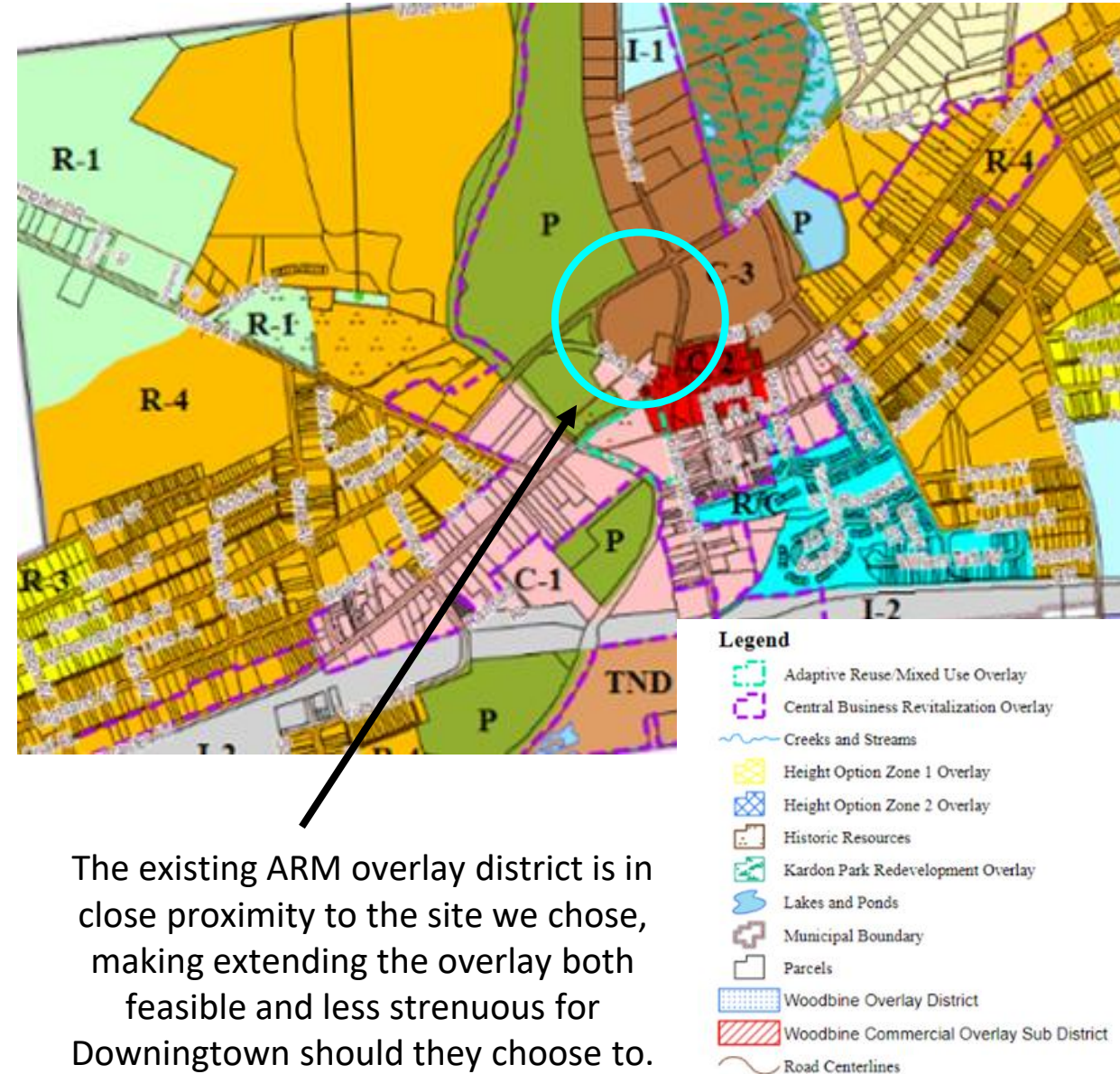
(VistaToday, 2021)

- **Goal:** Mixed-use development that promotes urban density, accessibility, enhances and promotes economic development, and uplifts the existing and future community of Downingtown.
- A multi-story building with commercial space on the ground floor and apartments above.
- **Outdoor patio space** for both residents and visitors to utilize.
- Highlighting the site as a **connection or steppingstone** between existing commercial areas like Mill Town Center and Downtown, and recreation in Kerr Park.
- It is also important for us to improve **pedestrian safety** when proposing a development that will bring more people to the area.

Design Considerations

- The current zoning is C-3 Highway Oriented Commercial.
- Extending the Adaptive Reuse/Mixed Use overlay up to include the Reedman Toll parcel.
- Height restrictions from zoning restrict how many floors of apartments we can include.
- Elevation requirements due to the parcel intersecting the floodplain mean that we are required to utilize the first floor as parking.

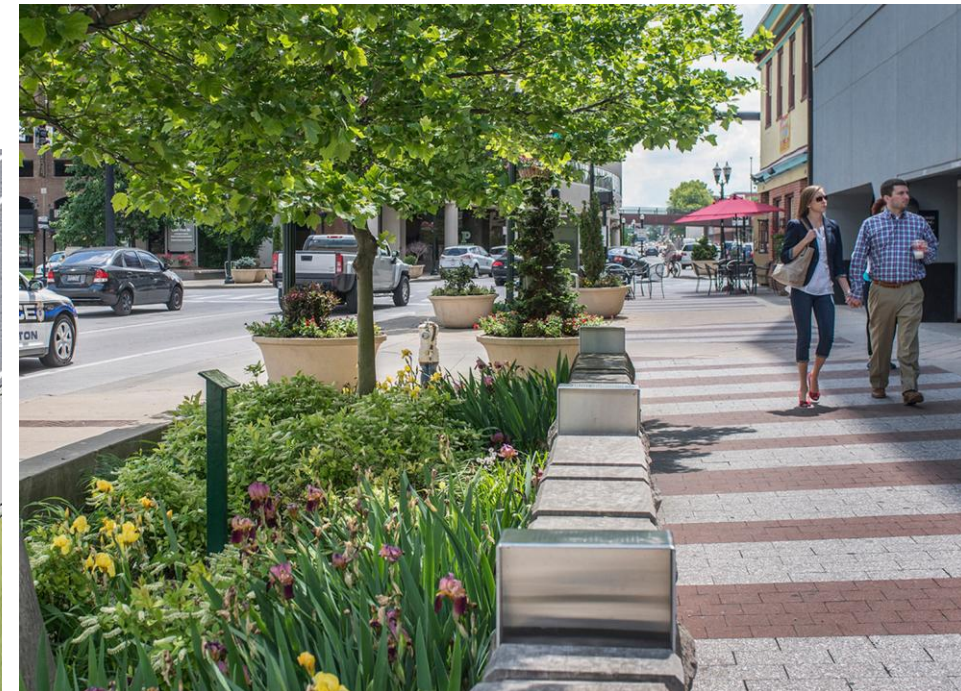
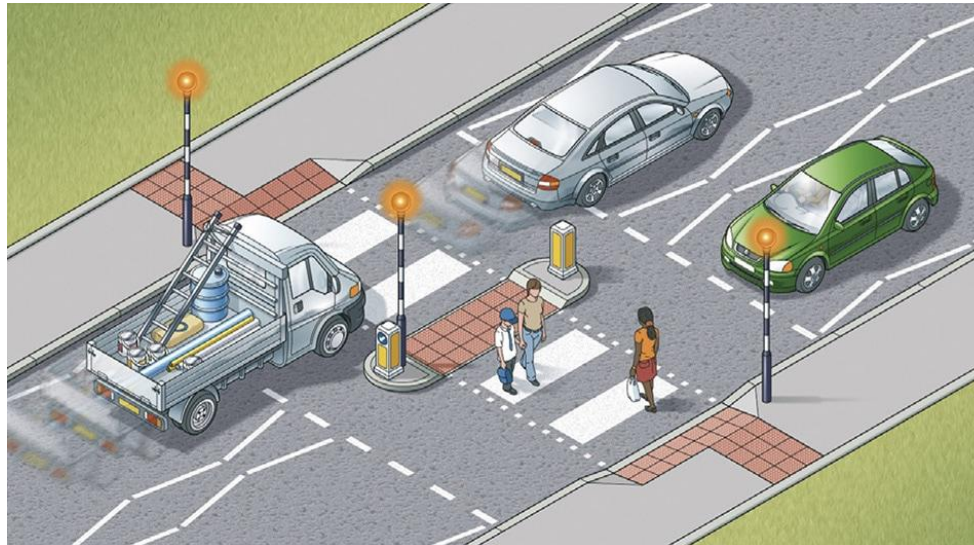
Image Title: Downingtown
Zoning Map
Source: Borough of Downingtown, 2015



The existing ARM overlay district is in close proximity to the site we chose, making extending the overlay both feasible and less strenuous for Downingtown should they choose to.

Visual Inspiration

- Elevated building
- Mid-block crossings
- Streetscape and rain gardens



Top Left: (Katz, n.d.)
Bottom Left: (The Highway Code, n.d.)
Top Right: (S3DA, n.d.)
Bottom Right: (MKSK, 2023)

Local Inspiration

Eagleview Town Center

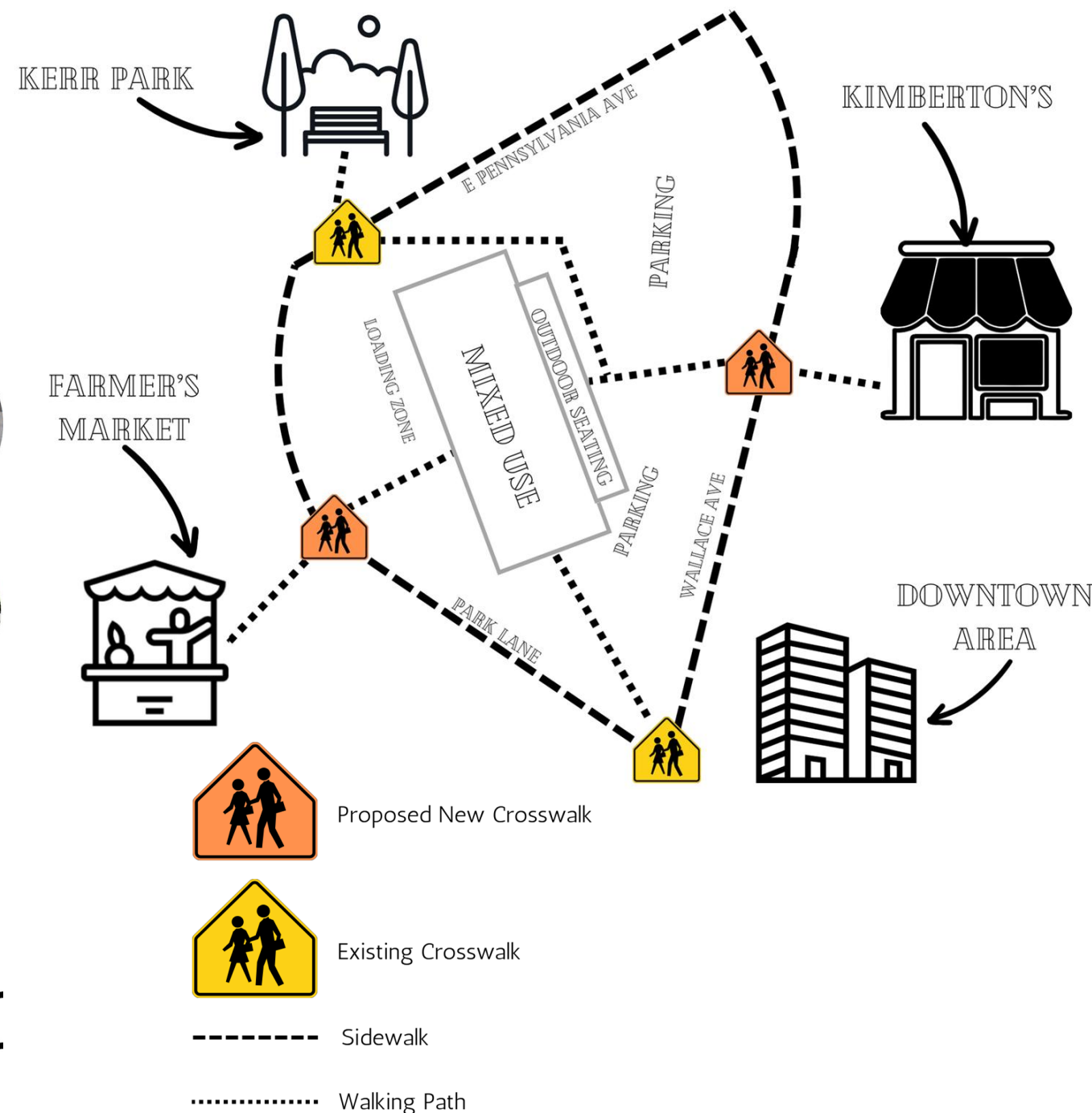
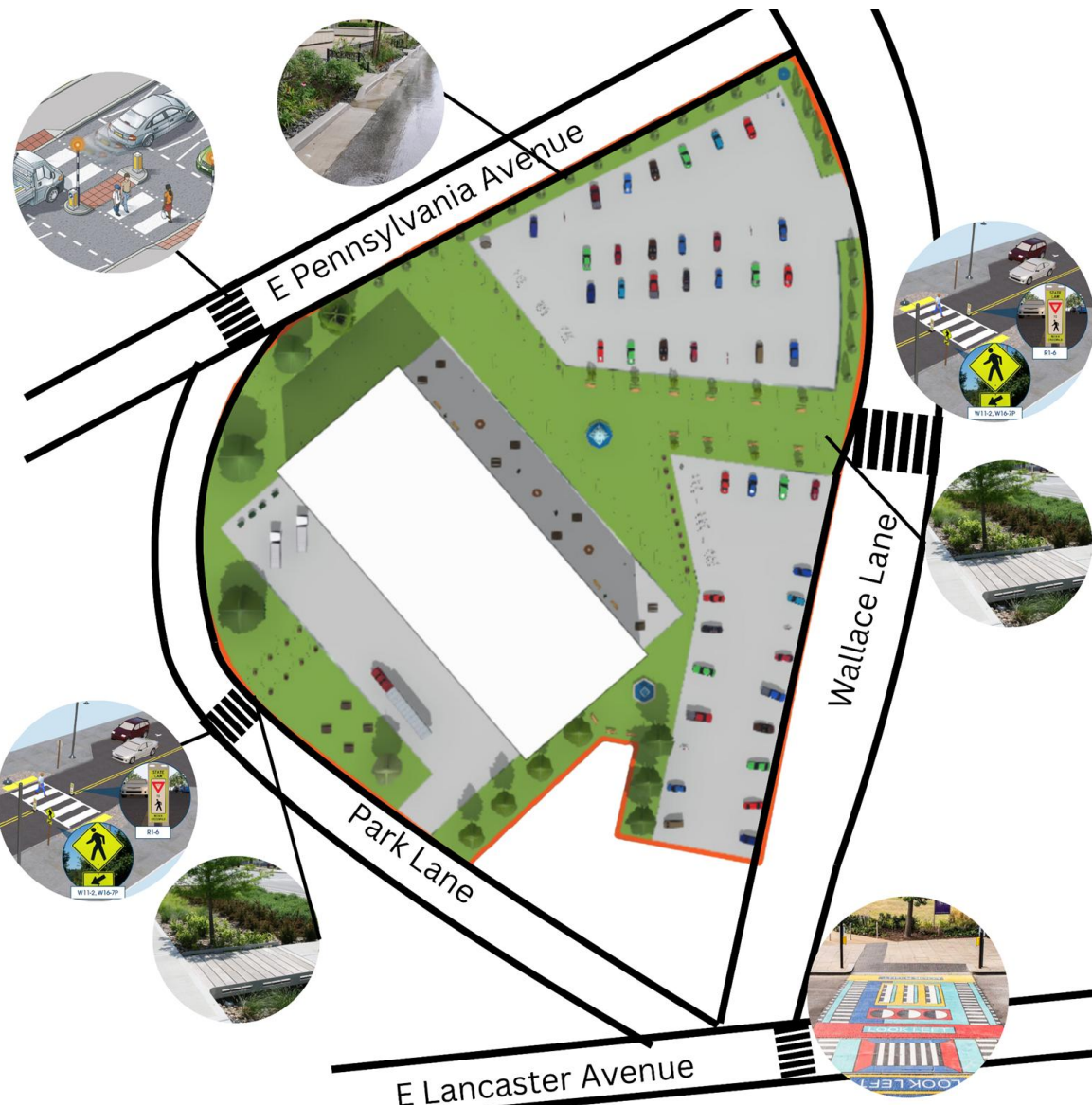
- First floor commercial & above floors residential.
- Engaging shops and restaurants.
- Shops and first floor commercial space create an area for residents to gather.
- Lighting and water features to make it visually appealing and inviting.
- Green roof and access to a rooftop.



Bubble Diagram



Site Design and Flow

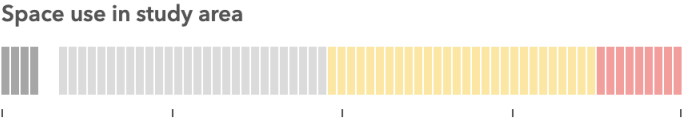


ArcGIS Urban

- Work on the Urban model began early in the semester to ensure we had the data necessary.
- We began by gathering the existing zoning layer from Downtown and inserting the physical boundaries and attribute data into the model.
- With this information and the square footage of the proposed design, Urban calculates metrics.



ArcGIS Urban



Total new floor area: 235,056 sqft

IND_L	12,565 sqft
OTH	5,750 sqft
PKG	92,051 sqft
RES_MF	93,517 sqft
RET	31,172 sqft

	First Design	Final Design
Population	254	196
Households	137	105
Jobs	30	27
Energy Use	17,868.34 kWh/d	14040.92 kWh/d
CO2 Emissions	4,489.58 lb/d	4,627.84 lb/d
Internal Water Use	16,130.94 gal/d	12,559.46 gal/d
External Water Use	6,912.3 gal/d	5,381.89 gal/d

ArcGIS Urban

Project

<https://urban.arcgis.com/?id=901e670e411349888cdba2dae62e8cc7&camera=330.369%2C0.499%2C-8427003.830%2C4867209.421%2C10003.877>



Team 2 Reevaluating Parking Infrastructure

– A Preliminary Parking Study in Downtown Downingtown, PA

Team members and Contributions:

Brandon Litwin

JP Duffy

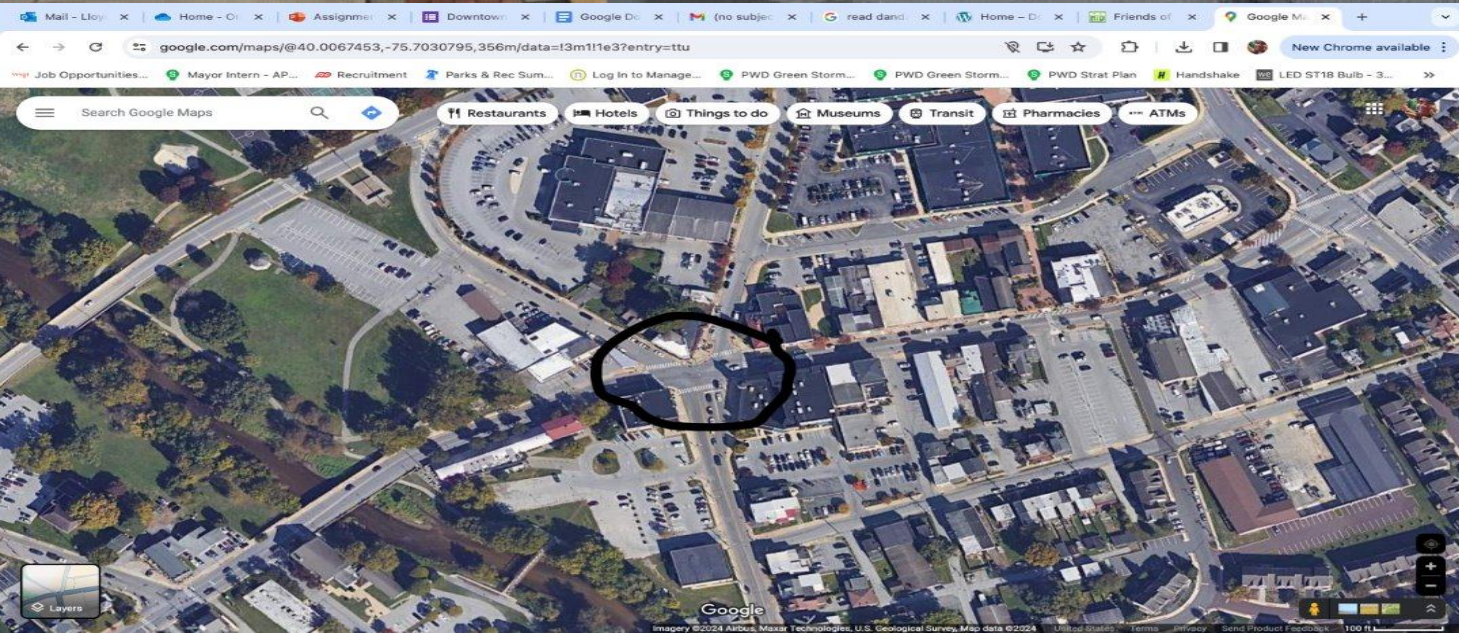
Gabriel Lloyd

Introduction

Questions to be Answered

- **WHY** does parking matter?
- 2013 Comprehensive Plan
- 2023 Town Hall
 - WHAT* currently exists?
- **Survey results**
 - WANTS* of residents?
- **Parking Study**
 - NEEDS* of Downingtown?





Downingtown Borough

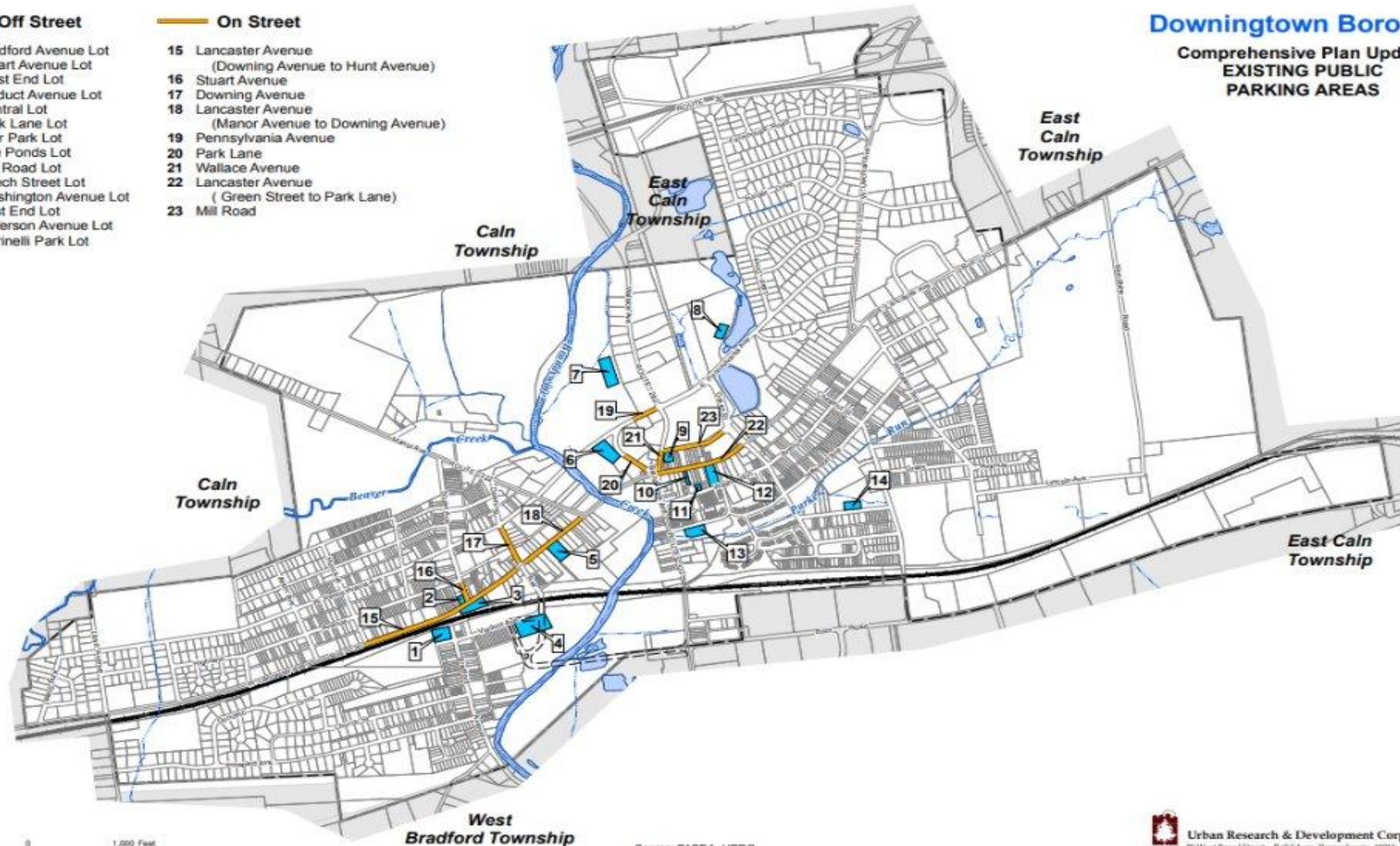
Comprehensive Plan Update
EXISTING PUBLIC
PARKING AREAS

Off Street

- 1 Bradford Avenue Lot
- 2 Stuart Avenue Lot
- 3 West End Lot
- 4 Viaduct Avenue Lot
- 5 Central Lot
- 6 Park Lane Lot
- 7 Kerr Park Lot
- 8 The Ponds Lot
- 9 Mill Road Lot
- 10 Beech Street Lot
- 11 Washington Avenue Lot
- 12 East End Lot
- 13 Jefferson Avenue Lot
- 14 Marinelli Park Lot

On Street

- 15 Lancaster Avenue
(Downing Avenue to Hunt Avenue)
- 16 Stuart Avenue
- 17 Downing Avenue
- 18 Lancaster Avenue
(Manor Avenue to Downing Avenue)
- 19 Pennsylvania Avenue
- 20 Park Lane
- 21 Wallace Avenue
- 22 Lancaster Avenue
(Green Street to Park Lane)
- 23 Mill Road



1,000 0 1,000 Feet

Source: PASDA, URDC



Urban Research & Development Corporation
28 West Broad Street Bethlehem, Pennsylvania 18018 610-865-0700

Downingtown Parking Study (1999)

- In 1999 the Borough government conducted a parking study that came up with a number of conclusions and recommendations. At the time there were only 6 municipal lots.
- An adequate amount of parking does not exist
- Shortage of parking at peak hours in close proximity to shopping and business
- The mill street lot was observed at 93% capacity during peak hours
- Recommendations:
- Parking in close distance of stores and business should be constrained by time and cost



Comprehensive Plan 2013



Downingtown provides both public on-street parking spaces and public off-street parking facilities. The Borough manages fourteen off-street parking lots, with three (Kerr Park, The Ponds, and Marinelli Park) primarily intended for public park visitors. Additionally, two other off-street lots (Viaduct Avenue and Bradford Avenue) mainly cater to SEPTA/Amtrak commuters.



The majority of Downingtown's remaining off-street public parking lots cater to customers patronizing businesses located along the Lancaster Avenue corridor.



Apart from off-street options, Downingtown also allows on-street parking along different stretches of Lancaster Avenue and its adjacent cross streets.

Comprehensive Plan 2013-cont.

The Borough Planning Commission recommended a three-phased approach to modernizing the Borough's parking

Standardizing parking fees

Improved lots

Modern kiosks

The Planning Commission also had no recommendations for a parking garage at the time of writing the comprehensive plan.



[HISTORY: Adopted by the Borough Council of the Borough of Downingtown 3-8-1989 by Ord. No. 89-5. Amended in 2005 & 2009]

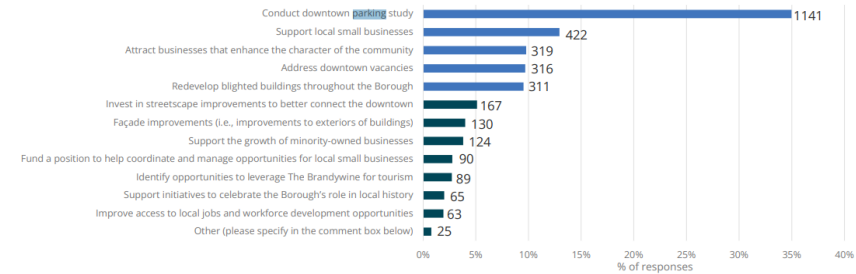
Zoning & Ordinances

Parking Minimums

- § 287-107 Schedule of required parking spaces. [Amended 2-2-2005 by Ord. No. 2005-4; 4-15-2009 by Ord. No. 2009-02; 7-15-2009 by Ord. No. 2009-05]
- The following shall be the minimum number of off-street parking spaces required for each land use, activity, building or structure permitted by this chapter.
- Parking spaces required on the basis of building floor area shall apply to gross area, unless otherwise specified.
- **.(1) Residential uses.**
 - (a) Single-family, two-family, quadraplex and townhouse dwellings: two parking spaces for each dwelling unit.
 - (b) Apartments and similar multifamily dwellings:
 - [1] Two-and-one-half parking spaces for each dwelling unit..
- **Retail and service uses.**
- (a) Retail businesses (shops and department stores):
 - [1] Parking or storage spaces for all vehicles used directly in the conduct of such business shall be provided, plus one parking space for each 250 square feet of gross area devoted to sales and/or customer service functions.
- **Grocery store or supermarket:**
 - [1] One space per 250 square feet of sales area.
- **Car wash:**
 - [1] One and one-half spaces per wash bay.
- **Bowling alleys**
 - five parking spaces per lane.

Resident Feedback

Which three community development initiatives should Downingtown prioritize?



- Respondents who identified as living in another municipality are the most concerned with addressing downtown vacancies
- Respondents who left a comment elaborated on the desire to have parking downtown

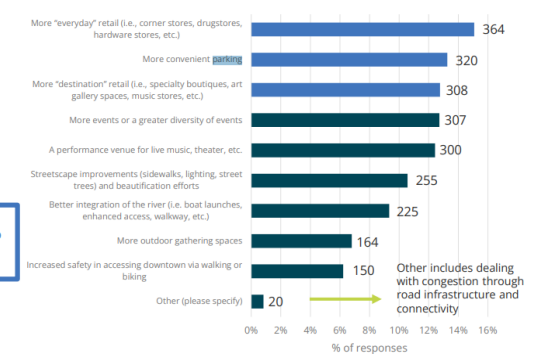
I would visit downtown Downingtown more often if there were...



- Respondents ages 18-35 want more events or a greater diversity of events the most
- Respondents who have lived in Downingtown for 20+ years want more convenient parking

Downtown should invest in outdoor spaces and making walking more pleasant. Cars should be limited and slowed downtown. If our walk/bike was more safe and pleasant we'd spend much more time downtown. There's no point having cars flying through downtown streets - there are plenty of fast roads elsewhere. The riverfront could be much better utilized with a nice walkway and outdoor seating.

If I didn't have to pay to park.

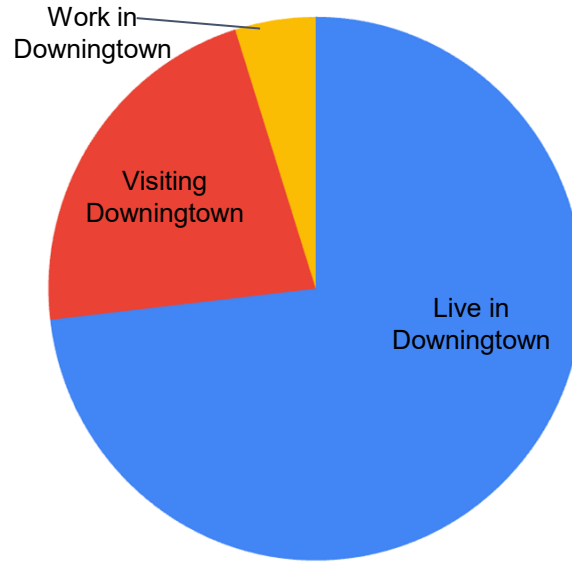


02 Reevaluating Parking Infrastructure

Results of Parking Survey

- Purpose: To understand public sentiment on parking within Downingtown
- 42 Results; limited
- Findings
 - Rough 50/50 split between issue/non-issue
 - Issue primarily in 'Main Street'
 - Top Issues: Too few spots + Spots inconveniently located
 - Advised Solutions: Closer parking + Free parking
 - Disabled parking = 50/50 split between issue/non-issue

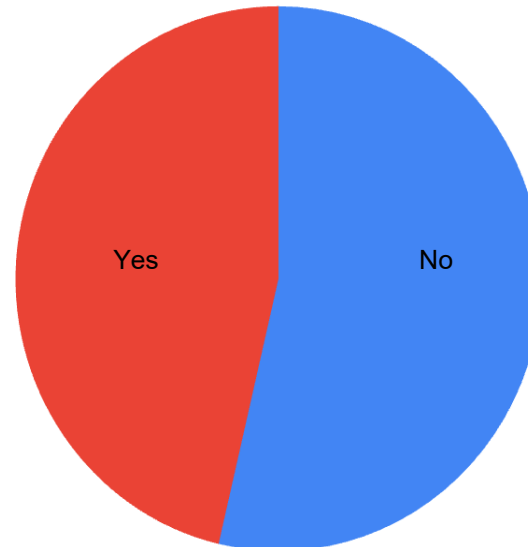
Which of the following best describes you?



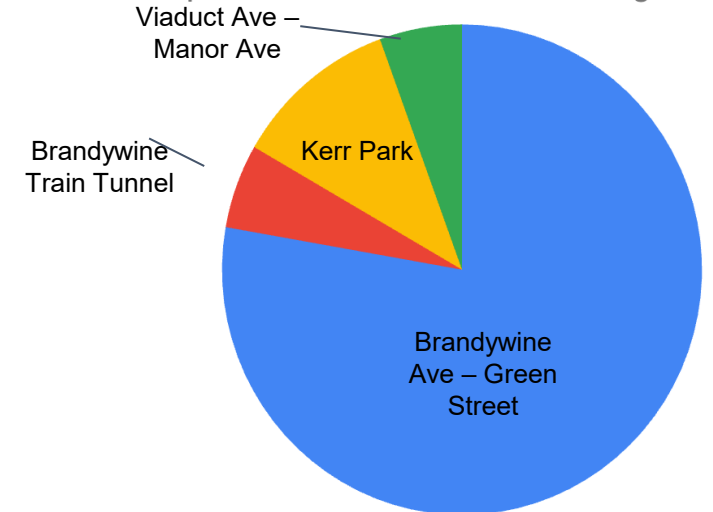
How do you usually travel to Downtown Downingtown?



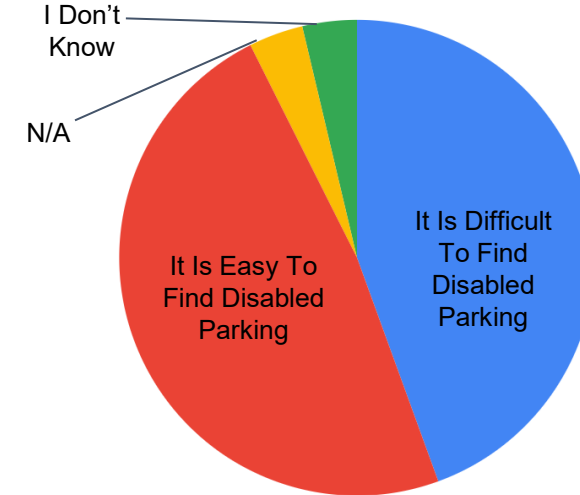
Do you ever have issues parking your car in Downtown Downingtown?



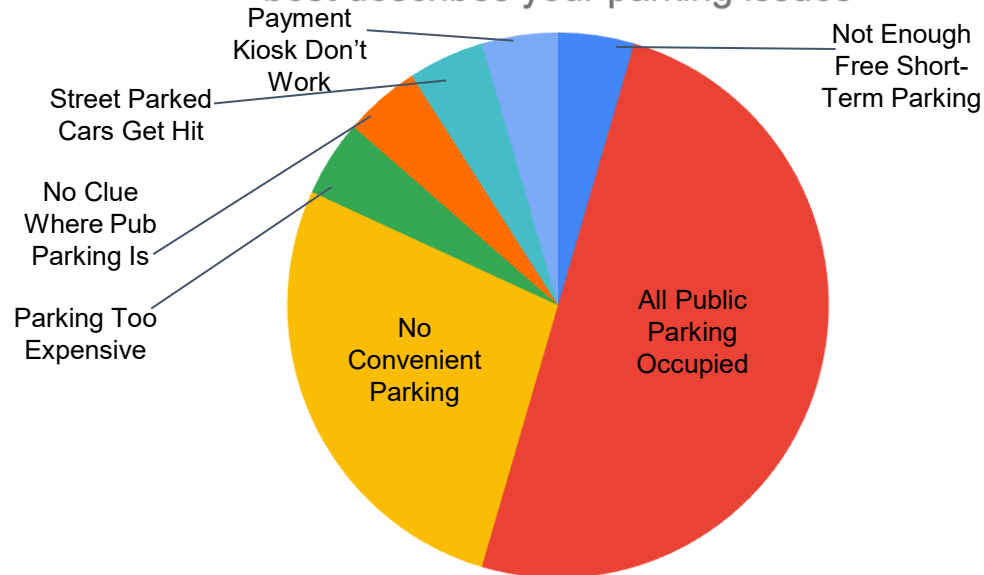
For the parking issue you identified in the previous question, can you specify WHERE this issue is most prevalent in Downtown Downingtown?



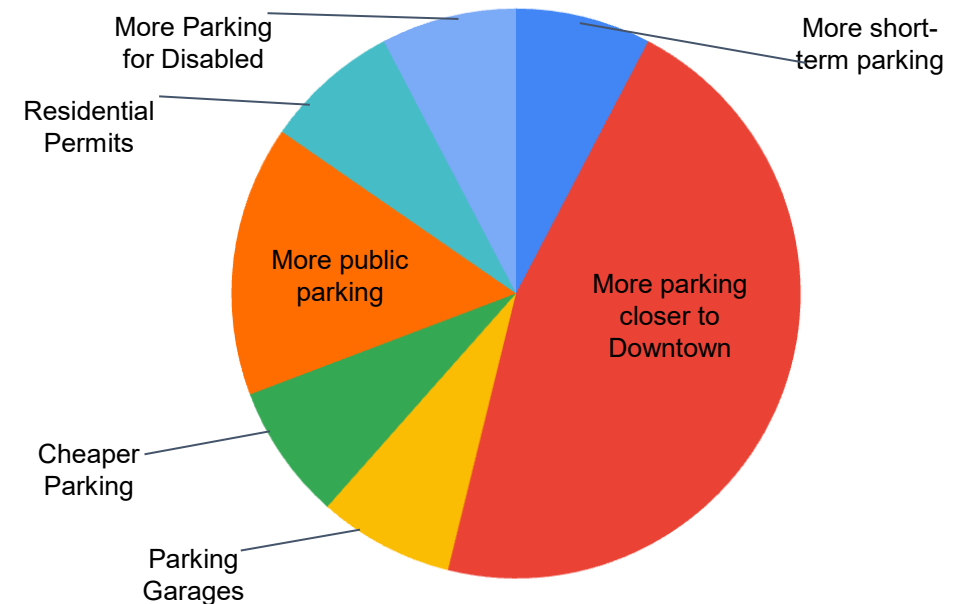
Based on your observation, which of the following best describes the parking spaces for physically disabled persons?



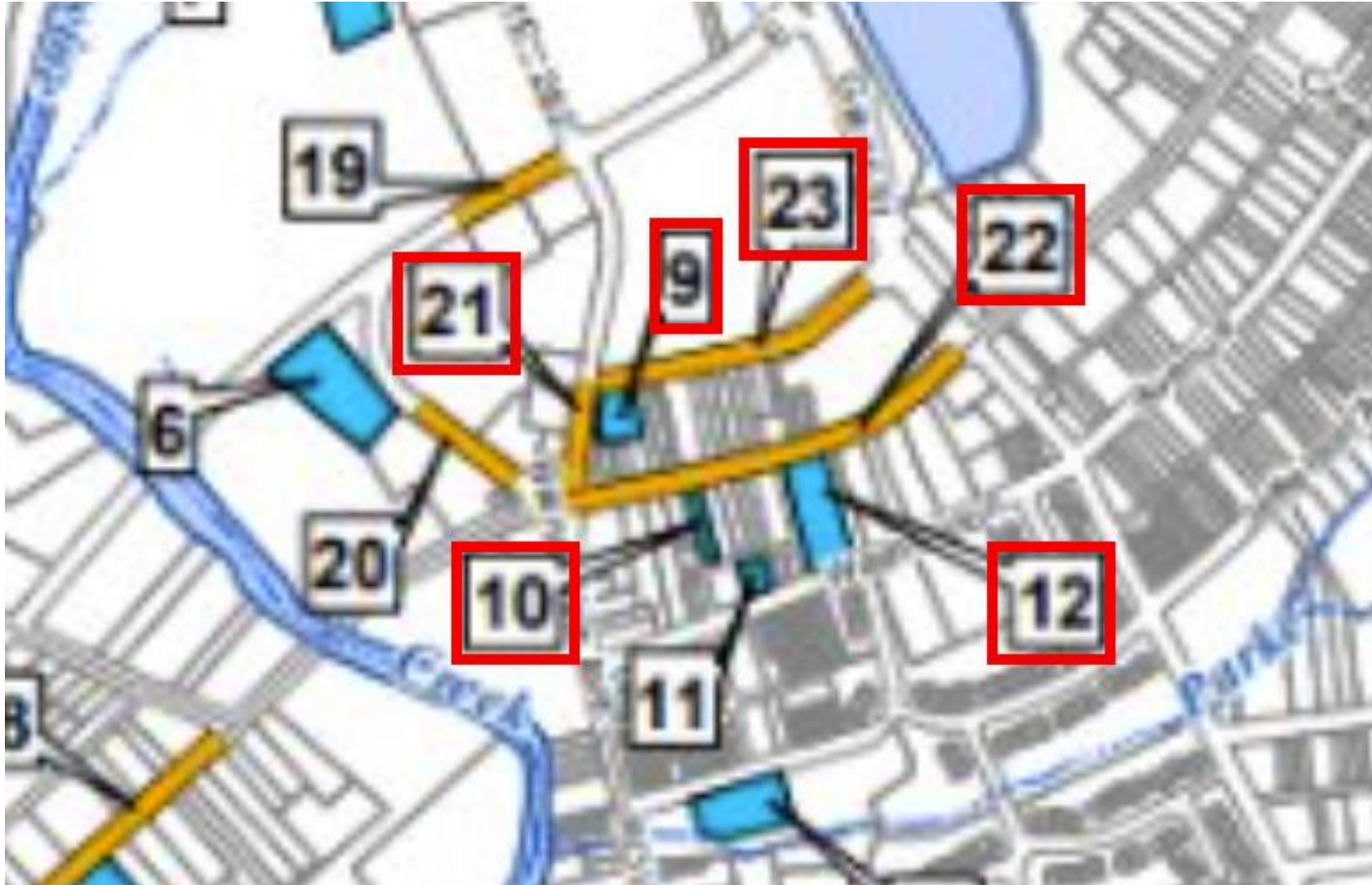
If you answered yes, which of the following best describes your parking issues



If you have parking issues, what would you consider 'convenient parking'? Please use one sentence or a few key words to describe.



Study Area



John Patrick

Student Parking Study

March 21, 2024

8-Minute route

Starting at Brandywine & Lancaster - going north along the route

	0:00	0:30	1:30	2:00	2:30	NOTES
WALLACE STR.						
East #1	MEY	→	==			
East #2	332	MJR	==			
West #1	JD	→	==			
West #2	LD	→	==			
West #3	LVM	→	==			
West #4	DOES	→	==			
West #5	DOES	→	→			
West #6	DOES	→	→			
West #7	X	X	X			
West #8	X	X	X			
MILL ALLEY						
North #1	X	X	X			
North #2	X	X	X			
North #3	201	→	→			
North #4	X	→	X			
North #5	X	→	HFG			
North #6	X	→	→			
North #7	X	→	→			
North #8	X	→	→			
North #9	X	→	→			
North #10	X	X	X			
North #11	X	X	X			
North #12	CSC	→	431B			
North #13	X	X	LC			
North #14	M68	→	M68			

	0:00	0:30	1:00	1:30	2:00	2:30	NOTES
WALLACE STR.							
East #1	MEY	→	—				
East #2	SSZ	MJR	—				
West #1	JT	→	—				
West #2	LD	—	—				
West #3	LVH	—	—				
West #4	X	—	—				
West #5	DOES	—	—				
West #6	LC	—	—				
West #7	X	X	X				
West #8	X	X	X				
MILL ALLEY							
North #1	X	X	X				
North #2	X	X	X				
North #3	ZD	—	—				
North #4	X	X	X				
North #5	X	X	X				
North #6	X	X	HHS				
North #7	X	X	X				
North #8	X	X	KMT				
North #9	X	X	X				
North #10	X	X	X				
North #11	X	X	X				
North #12	CS	—	431				
North #13	X	X	LC				
North #14	MK	—	MGL				

K. Hagen 40th Spring 2023

Month #1	Month #2	Month #3	Month #4	Month #5	Month #6
March #1	$\frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$	$\frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$	$\frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$		
March #2					
March #3					
March #4					
March #5					
March #6					
Complexity					
Jan #1					
Jan #2					
Jan #3					
Jan #4					
Jan #5					
Jan #6					
Feb #1					
Feb #2					
Feb #3					
Feb #4					
Feb #5					
Feb #6					
Low Complexity					
Jan #1					
Jan #2					
Jan #3					
Jan #4					
Jan #5					
Jan #6					
Feb #1					
Feb #2					
Feb #3					
Feb #4					
Feb #5					
Feb #6					

LOT @ LANC				clockwise
#1				
#2	X	X	X	
#3	150			
#4		X	X	
#5	1-2-2-2	X	X	
#6				
#7		X	X	
#8	1-2-2	X	X	
#9				
#10		X	X	
#11	1-2-2	X	X	
#12	1-2-2	X	X	
#13	1-2-2	X	X	
#14	1-2-2	X	X	
#15	1-2-2	X	X	
#16	1-2-2	X	X	
#17				
#18		X	X	
#19	1-2-2	X	X	
#20			X	
#21			X	
#22	X	X	X	
#23			X	
#24			X	
#25			X	
#26	1-2-2			
#27				
#28		X	X	
#29				
#30				
#31		X	X	
#32				
#33				
#34				
#35				
#36		X	X	
#37				
#38				
#39				
#40				
#41				
#42				
#43				
#44				
#45				

#46			
#47			
#48			
#49			
#50			
#51			
#52			
#53			
#54			
#55			
#56			
#57			
#58			
#59			
#60			
#61			
#62			
#63			
#64			
#65			
#66			

Further Notes:

Damage/loss crossing @
star,.

Handicaps should be
accounted for,

Crossing Needs #3

#52	X		
#53	X	X	X
#54	DOB		
#55	X	X	X
#56	LZV		X
#57	LZP		X
#58	X	X	X
#59	X	X	X
#60	LVD		X
#61	HKM		X
#62	LSN		X
#63	CLY		X
#64	LTS		X
#65	X	X	X
#66	LAK		X
#67	X	X	X

Bark	st	Lot
#11	X	X
#12	NEXD	X
#13	LUT	X
#14	CAF	X
#15	X	X
#16	JDT	X
#17	X	X
#18	POTIA9	X
#19	LS3	X

Handwritten manuscript page 10r from the Voynich manuscript. The page contains a table with columns labeled 'X' and 'Y' and rows labeled 'X' and 'Y'. The table is filled with handwritten symbols, including 'X', 'Y', and 'Z'. The symbols are arranged in a grid pattern, with some symbols appearing to be combinations of 'X' and 'Y'. The handwriting is in a cursive style, typical of the Voynich script.

	X	Y
X	X	Y
Y	X	Y

The page also contains several lines of text at the bottom, which appear to be a list of symbols or a key. The symbols are arranged in a vertical column, with some symbols appearing to be combinations of 'X' and 'Y'. The text is written in a cursive style, typical of the Voynich script.

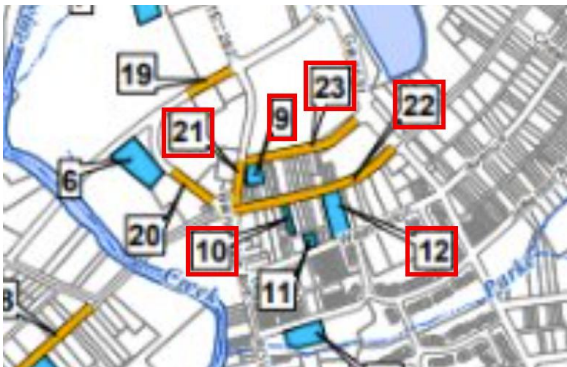
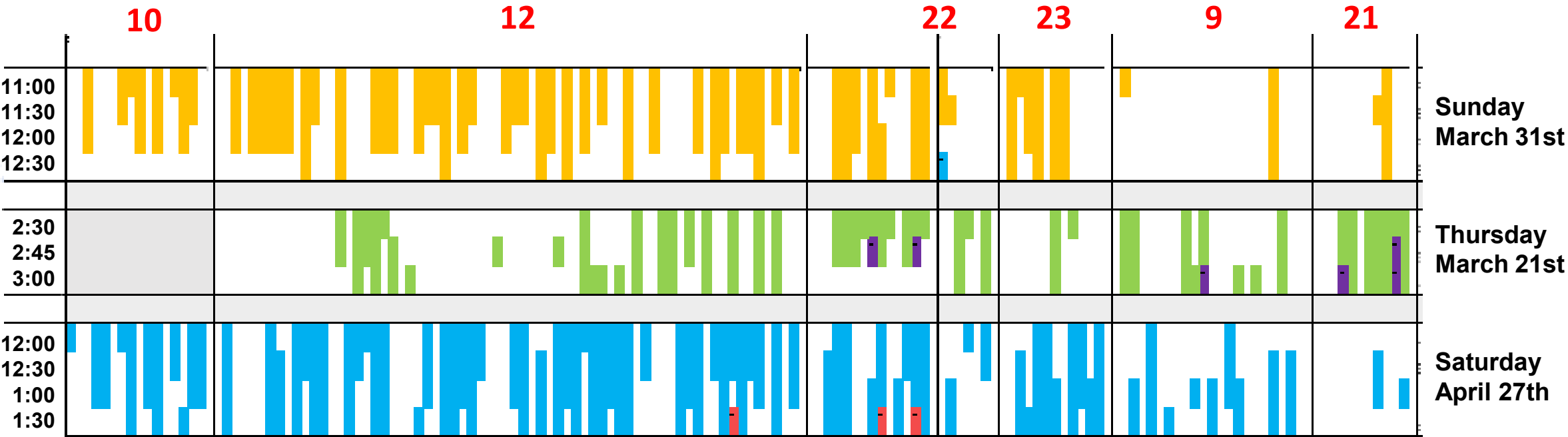
HLR	+	+	+	+
Canary HT				
31	X	X	X	X
42	X	X	X	X
47	X	X	X	X
48	X	X	X	X
51	X	X	X	X
52	X	X	X	X
53	X	X	X	X
54	X	X	X	X
55	X	X	X	X
56	X	X	X	X
57	X	X	X	X
58	X	X	X	X
59	X	X	X	X
60	X	X	X	X
61	X	X	X	X
62	X	X	X	X
63	X	X	X	X
64	X	X	X	X
65	X	X	X	X
66	X	X	X	X
67	X	X	X	X
68	X	X	X	X
69	X	X	X	X
70	X	X	X	X
71	X	X	X	X
72	X	X	X	X
73	X	X	X	X
74	X	X	X	X
75	X	X	X	X
76	X	X	X	X
77	X	X	X	X
78	X	X	X	X
79	X	X	X	X
80	X	X	X	X
81	X	X	X	X
82	X	X	X	X
83	X	X	X	X
84	X	X	X	X
85	X	X	X	X
86	X	X	X	X
87	X	X	X	X
88	X	X	X	X
89	X	X	X	X
90	X	X	X	X
91	X	X	X	X
92	X	X	X	X
93	X	X	X	X
94	X	X	X	X
95	X	X	X	X
96	X	X	X	X
97	X	X	X	X
98	X	X	X	X
99	X	X	X	X

Down in town
Study

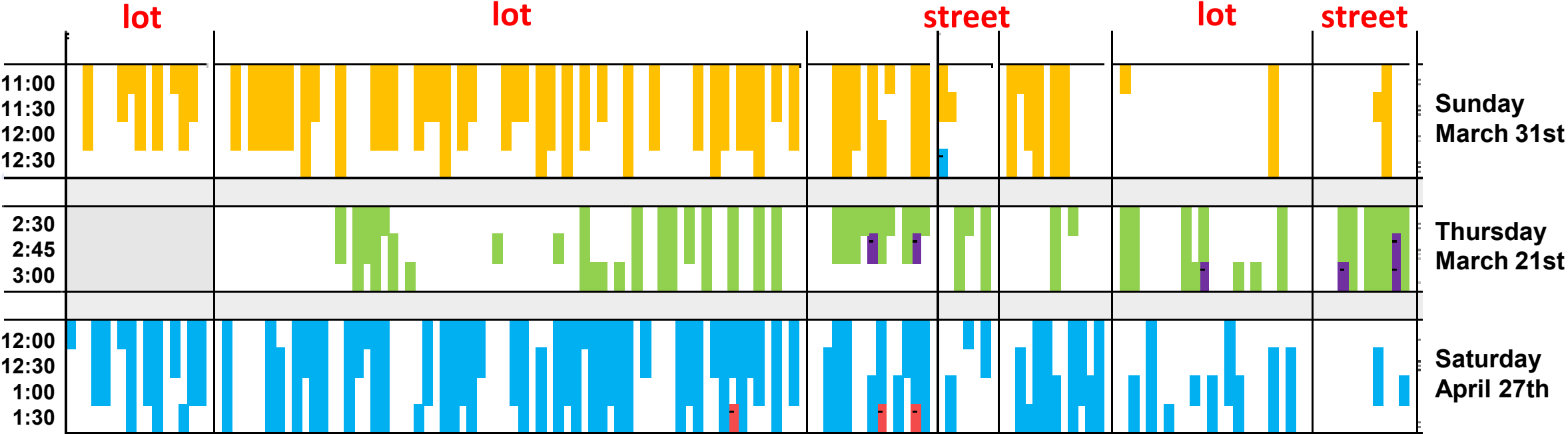
3/31/24

	11:00	11:30	12:00	12:30
WALL 2F				
E#1 208A	X	X	X	
E#2	X			X
WHL 2LF	→	→	→	
#2 X	LEA	X		X
#3 X	X	X		X
#4 X	X	X		X
#5 X	X	X		X
#6 X	X	X		X
#7 X	X	X		X
#8 X	X	X		X
MILL Alley				
#1 X	X	X	X	X
#2 X	X	X	X	X
#3 208E X	X	X	X	X
#4 208E 2LF	→	→	→	
#5 208E X	X	X	X	X
#6 208A X	X	X	X	X
#7 X	X	X	X	X

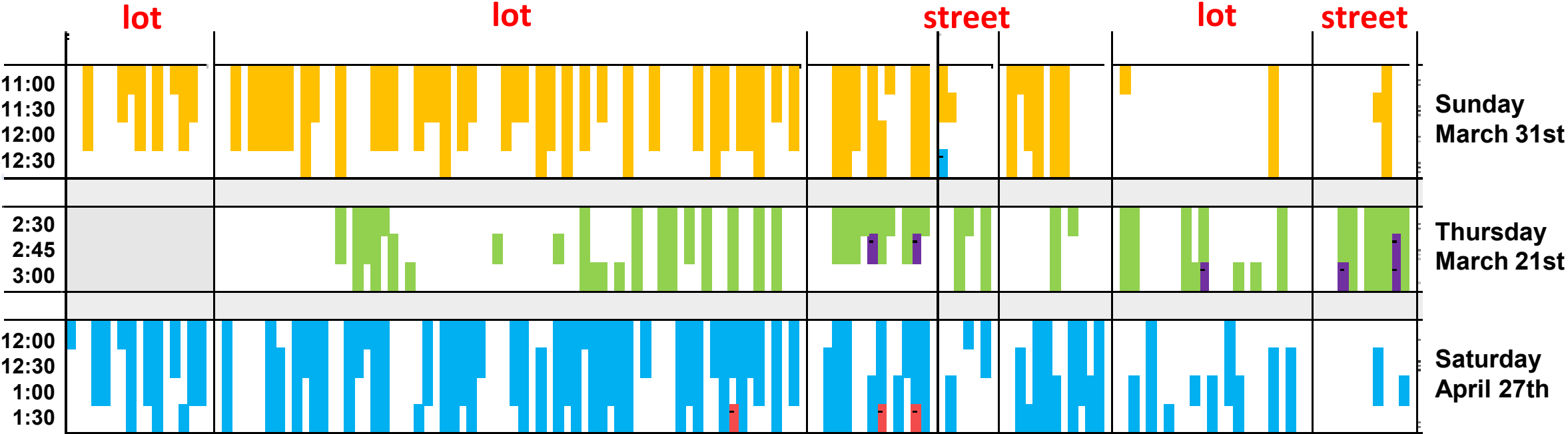
Survey Results



Survey Results



Survey Results



TOTAL:	61	58	46	21		41	38	33		65	67	67	54
out of?	143	143	143	143		127	127	127		143	143	143	143
% Filled:	43%	41%	32%	15%		32%	30%	26%		45%	47%	47%	38%
			Average:	33%			Average:	29%			Average:	44%	
				Tot. Avg:	35%								

Final Thoughts

- Survey
 - Residents split on *want*
- Parking Study
 - Expansion not *needed*
- Update comprehensive plan based on new findings
 - *what exists*
- Update zoning to remove minimums in downtown district
 - *what exists*



Team 3: Re-designing Urban Open Space as Green Infrastructure

Speakers

1. **Grace Broadwell** - Introduction, Riparian Forest Buffer
2. **Annalise Large** - Site Analysis, Welcome Area, Bike Rack and Benches, Hammock Hideaway, Signage, Cost Reduction
3. **Kimberly Suárez** - Master Plan/Park Map, Pervious Surfaces (Paved Half-Mile Loop, Multi-Sport Court, & Splashpad), Floodplain Native PA Trees & Shrubs, Big Tree Park Vision
4. **Gianna Zinni** - Population and Potential Users, Flower Labyrinth, Budget

Johnsontown Park

Redesigning into a Stormwater Park

Environmental Concerns

- Flooding/Overdevelopment
- Low topography
- Stormwater Management

Current State

- Brandywine Creek East Branch
- Flat/Bare
- Forgotten- Culturally
- River Station Apartment Development
- Hurricane Ida Settlement

Goals

- Serve Community
- Incorporate GI techniques for flood mitigation
- Bring back life



Johnsontown Park

"Stormwater parks are recreational spaces that are designed to flood during extreme events and to withstand flooding. By storing and treating floodwaters, stormwater parks can reduce flooding elsewhere and improve water quality"
-FEMA

Population and Potential Users

- Average population: 37 years (Young families and children)
- 278 households with a disability
- 74 households with no car
- Population
 - 5.5% under 5 years
 - 16.2% between 5 and 17
 - 60% 18 to 64
 - 17% 65 and older



Site Analysis

Maps

- Areas of High Elevation
- Stormwater Flow
- Trail Flood Spots
- Tree Canopy
- 100 Year Floodplain

Site Photos

(Annalise Large 2024)

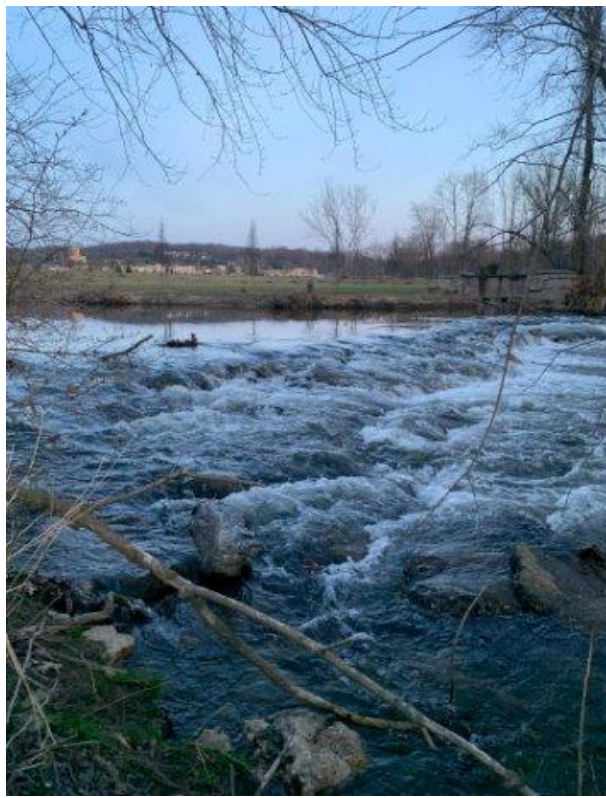
- Brandywine Creek
- Ida Sediment Buildup
- Trail Flooding (March)

(Sherie Gazzerro 2021)

- Hurricane Ida Aftermath

(Daily Local 2021)

- Disaster Impacts



Master Plan / Park Map

1. Benches
2. Bike Rack
3. Hammock Hide-away  
4. Labyrinth 
5. Multi-sport court  
6. Open Space 
7. Parking lot  
8. Paved half-mile loop  
9. Pavilion (east of parking lot)  
10. Pavilion (south of parking lot)  
11. Playground 
12. Splash pad  
13. Native Trees, Shrubs, & Plants 
14. Welcome Area  
15. Riparian Forest Buffer 





Welcome Area + Accessories

Park Sign Redesign

- Carved rock (4'x10')

Fountain

- Sittable rim
- thrifed

Native Plants

- Buttonbush
- Joe Pye Weed
- Shenandoah Reed
- Switch Grass (tolerant to flooding)



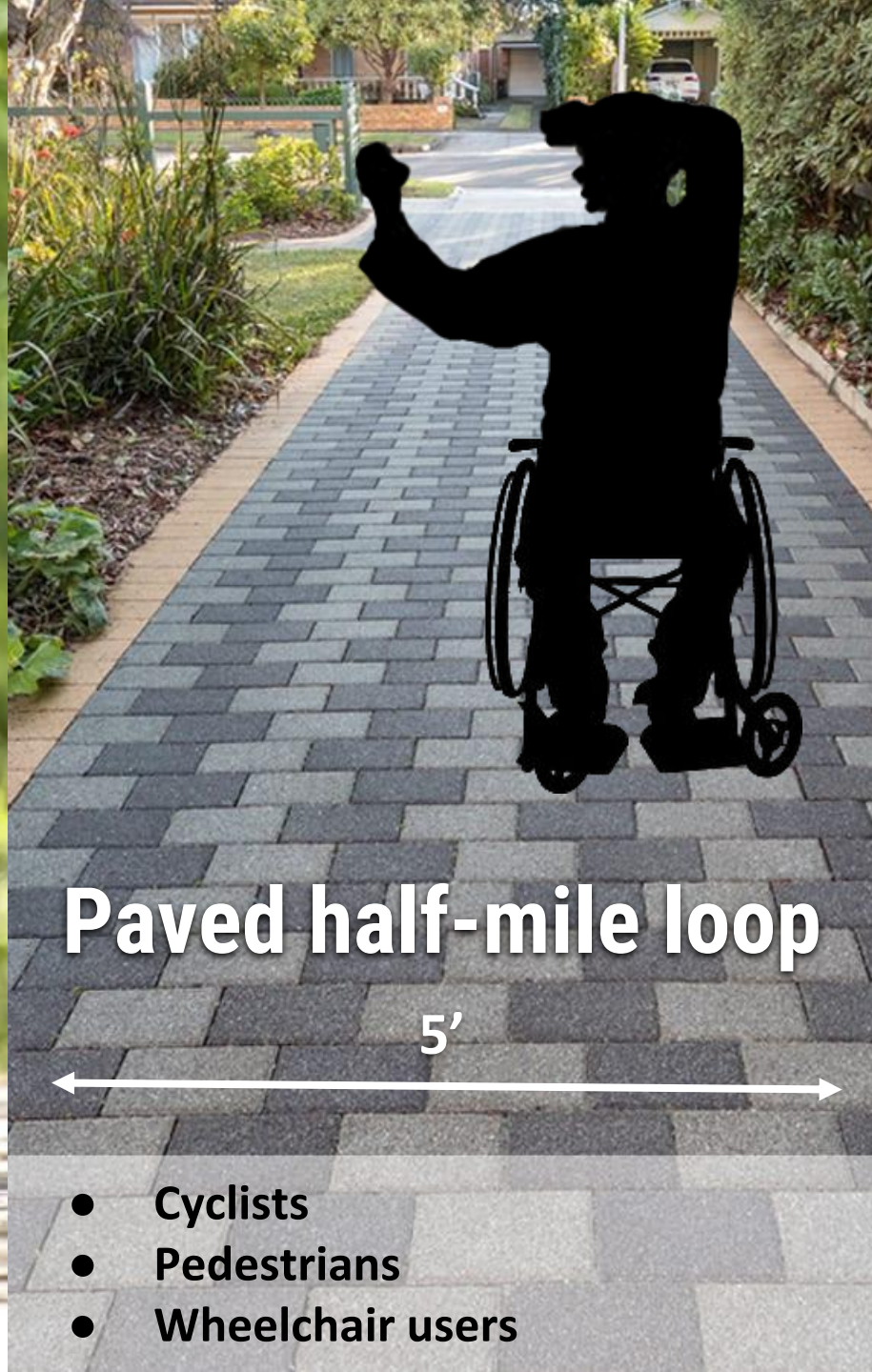
Bike Rack

- Metal
- Brandywine Creek Inspired Design
- Durable, Floodable

Benches

- Millstone- Cultural, Resilient, Unique





Paved half-mile loop

5'

- Cyclists
- Pedestrians
- Wheelchair users

Americans with Disabilities Act (ADA)

- ✓ Slip Resistance
- ✓ Stability and Firmness
- ✓ Surface Smoothness (gaps must be $< \frac{1}{2}$ ")



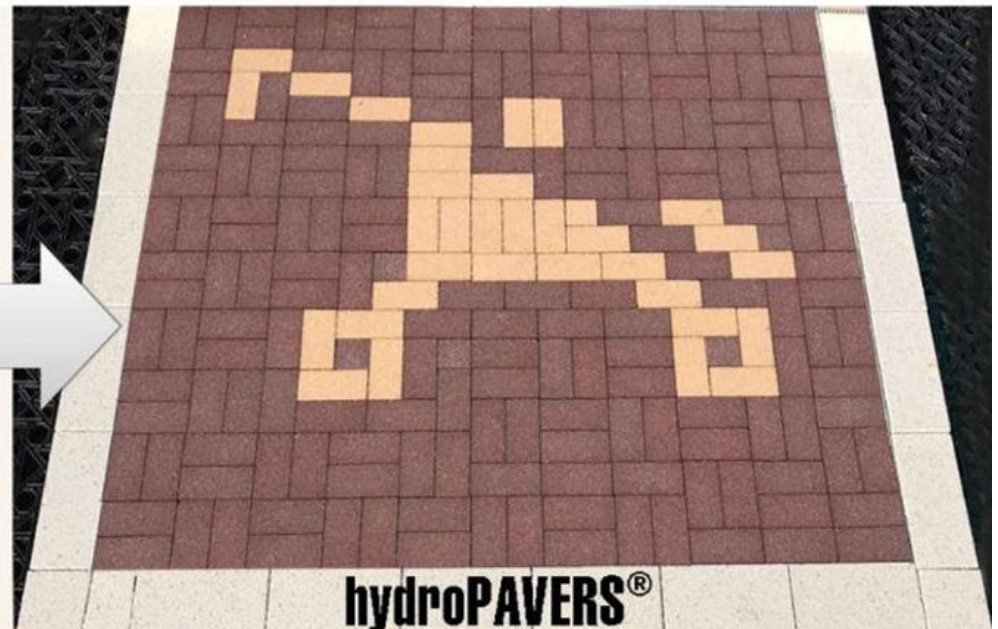
Paint cost \$300-\$500/yr per space



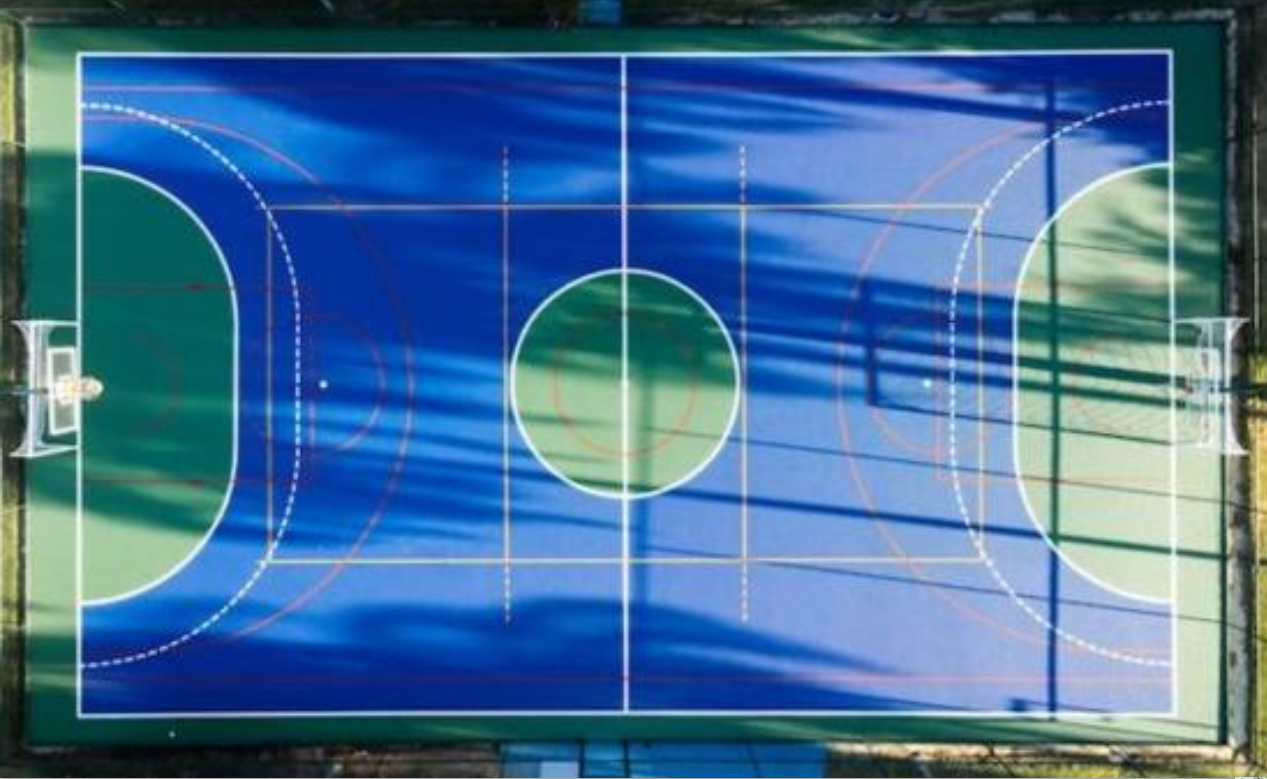
NO paint or re-paint maintenance costs



Paint cost \$300-\$500/yr per space



NO paint or re-paint maintenance costs



Multi-sport Court

(instead of just a basketball court)

- Basketball
- Pickleball
- Volleyball
- Futsal
- Tennis

Splash Pad

- Recommended 25 ft² / bather
 - 10 bathers = 250 ft² (~15.8 ft x ~15.8 ft)
- Cools off families during the summer
- Triangle between splash pad, pavilion and playground for easy celebrations



Hammock Hideaway Features



Flower Labyrinth

- Floodplain native PA flowers & plants
- Placed in top “bulb” of the park
- Invites pollinators!
- Bee Balm, Blue Vervain, Cardinal Flower, Swamp Rose
- Adds to aesthetic and fun for all ages



Inspiration 1



Inspiration 2





Box Elder (*Acer negundo*)



River Birch
(*Betula nigra*)



Persimmon
(*Diospyros virginiana*)



(Common) Honeylocust
(*Gleditsia triacanthos*)



Umbrella Magnolia
(*Magnolia tripetala*)



Sycamore /
Buttonwood /
American Planetree
(*Platanus occidentalis*)



Bigtooth /
Large Toothed - Aspen
(*Populus grandidentata*)



Allegheny Plum
(*Prunus alleghaniensis*)



Black Oak
(*Robinia pseudoacacia*)



American or White Elm
(*Ulmus americana*)

Floodplain Native Shrubs in Pennsylvania



American Euonymus /
Hearts-a-bursting
(*Euonymus americanus*)

native



Burning Bush / Wahoo
(*Euonymus atropurpureus*)

invasive



Burning Bush
(*Euonymus alatus*)

Planting Floodplain Native Species

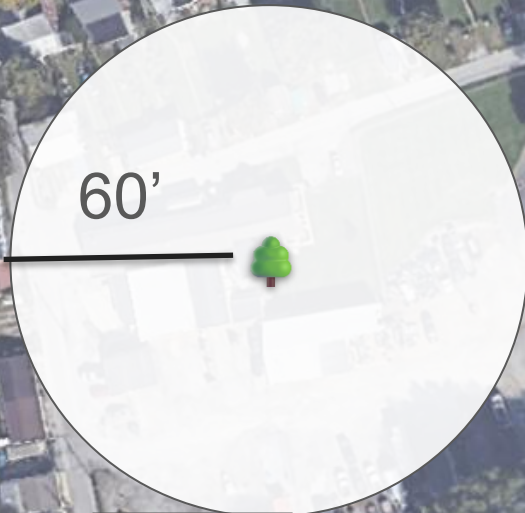
13.9 acre park

Trees

- ~68 within loop
- 60' radius

Shrubs

- ~264 along outer loop
- 10' radius



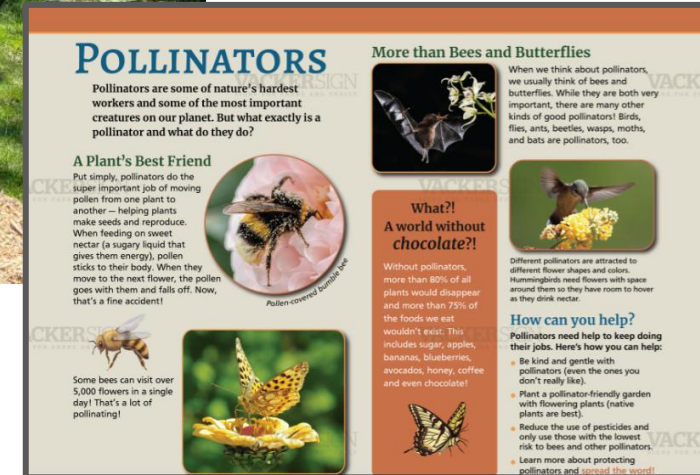
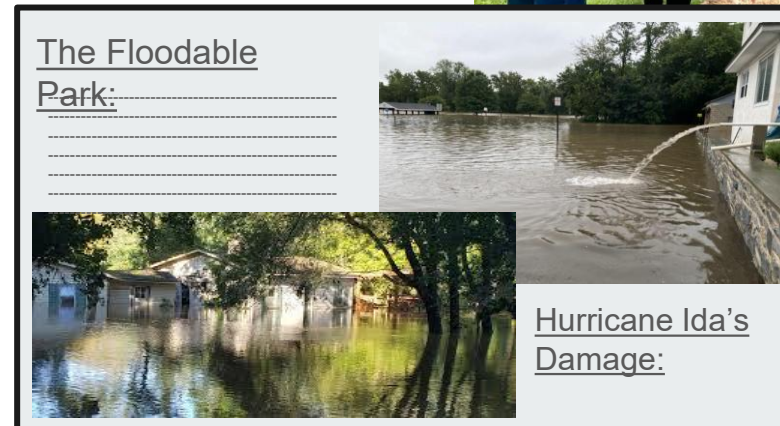
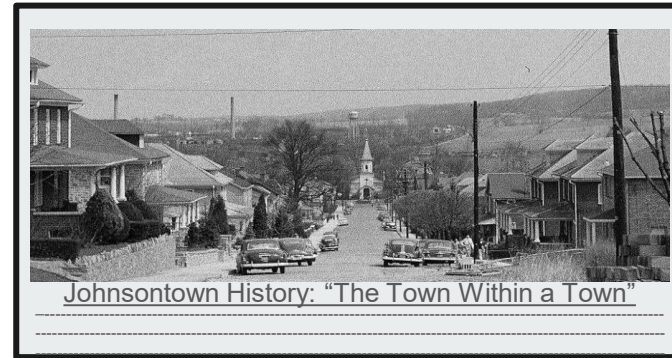
Signage

Park Rule Update

1. Dogs must be leashed at all times!
2. Must pick up after dog!

Educational Plaques

- Public education
- Community engagement
- Made from recycled plastic
- Various topics
 - Native Species
 - Wildlife
 - Pollinators
 - Johnsontown History (Cultural)
 - “A Floodable Park” (Ida, flooding, the Brandywine, and climate change)





Cost Reductions

Total cost **without** labor: \$807,902

Total cost **with** labor: \$2,600,253

Labor

- Community service hours (NHS, Grad projects)
- Volunteer to plant trees in the park!
 - Planting trees
 - Pavement Party
 - Make bird feeders to hang in the park!
 - Brandywine Cleanups/Trash Pickups

Materials

- Have items donated or thrifted!
 - Fountain
 - Hammock posts from landscapers

Team 4: Promoting Active Transportation

- Empowering Communities through Connectivity, with a Focus on the Chester Valley Trail



Members and contributions

1. **Isaac Gabriel:** Design Proposals
2. **Gabriel Hirsch:** Equity & Accessibility
3. **Joseph Mashura:** LTS



Active Transportation

Research Questions

How to **strengthen the Active Transportation (AT) network** in Downingtown?

As the Chester Valley Trail (CVT) extends to Downingtown, **what strategies can be implemented to enhance community connectivity to the trail?**





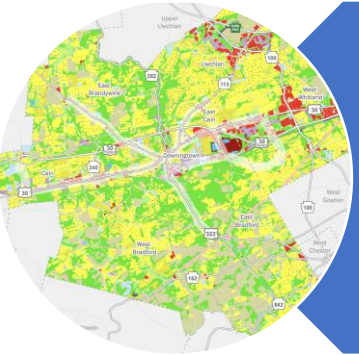
Identify **LTS** Islands

Low-traffic streets such as residential streets have low bike traffic stress but are disconnected by high-traffic stress roads.



Evaluate proximity to **existing and planned AT infrastructure**.

The network must be well-connected so it can be also used for non-recreational travel.



Land Use

Connecting areas with high traffic volumes with AT infrastructure may reduce congestion by converting travel mode.

Improving Walkability and Bikeability emerge as transportation priorities for residents. Commercial areas are also identified as priority for siting AT infrastructure to promote economic activity through commerce and employment.

Road segment selection logic for AT infrastructure



CVT connects numerous economic centers such as Exton and Malvern.



CVT ends in Bridgeport and connects to the Schuylkill Valley Trail across the bridge



Part of CVT runs along a highway, which is noisy.



Large intersections are unfriendly to AT users.

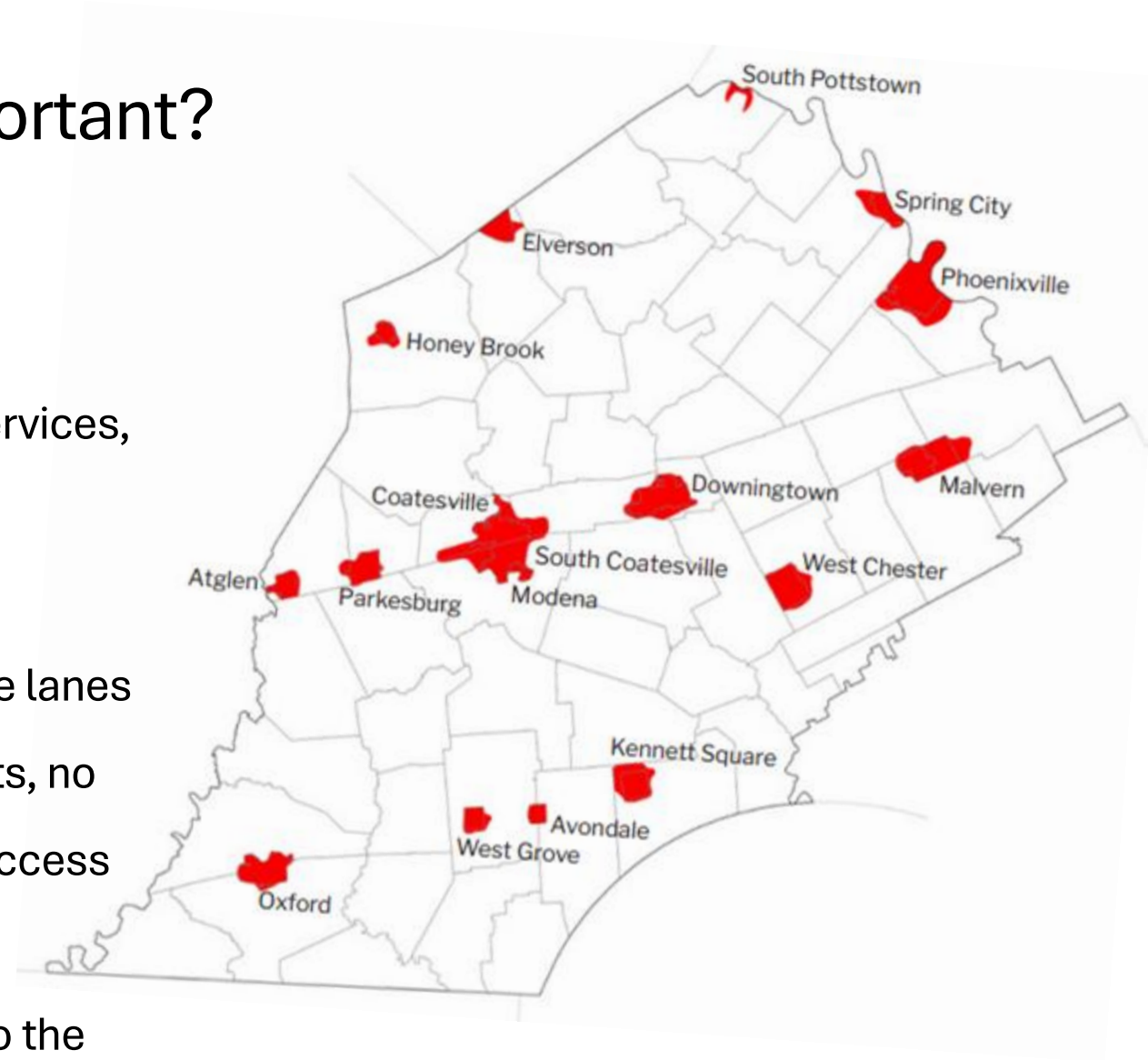


CVT ends in Exton :(

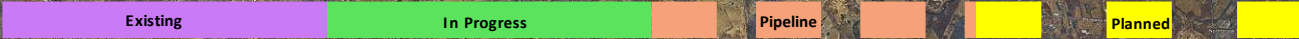
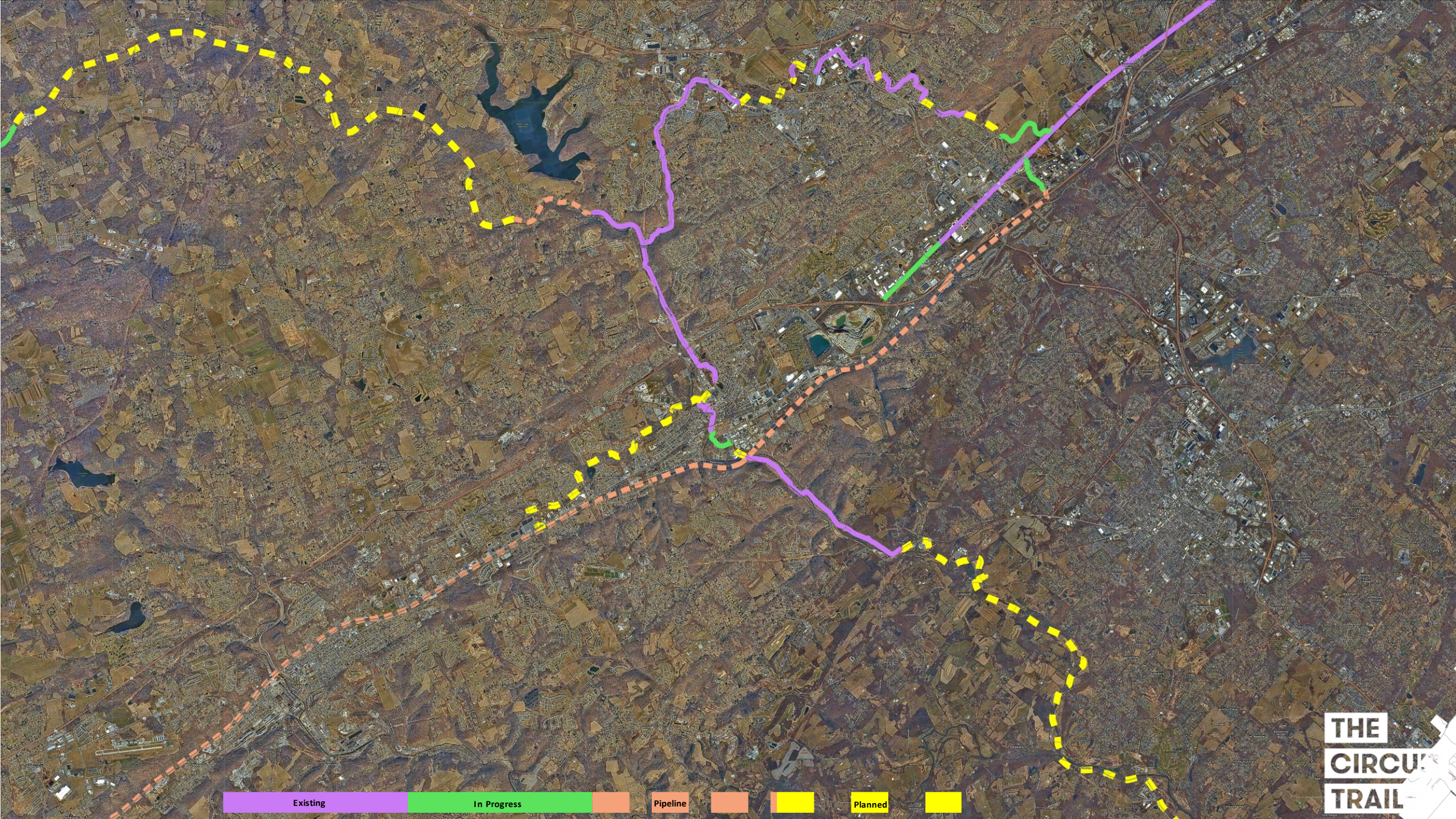
Why is community connectivity important?

Access to Active Transportation Promotes Social Equity!

- AT options means improved access to essential services, like healthcare and employment, especially for underserved communities.
- Improving this network of trails, sidewalks, and bike lanes means the entire Downingtown community benefits, no matter what mode(s) of transportation they have access to.
- Downingtown residents will be better connected to the surrounding communities.



Source: (Chesco Planning Commission)

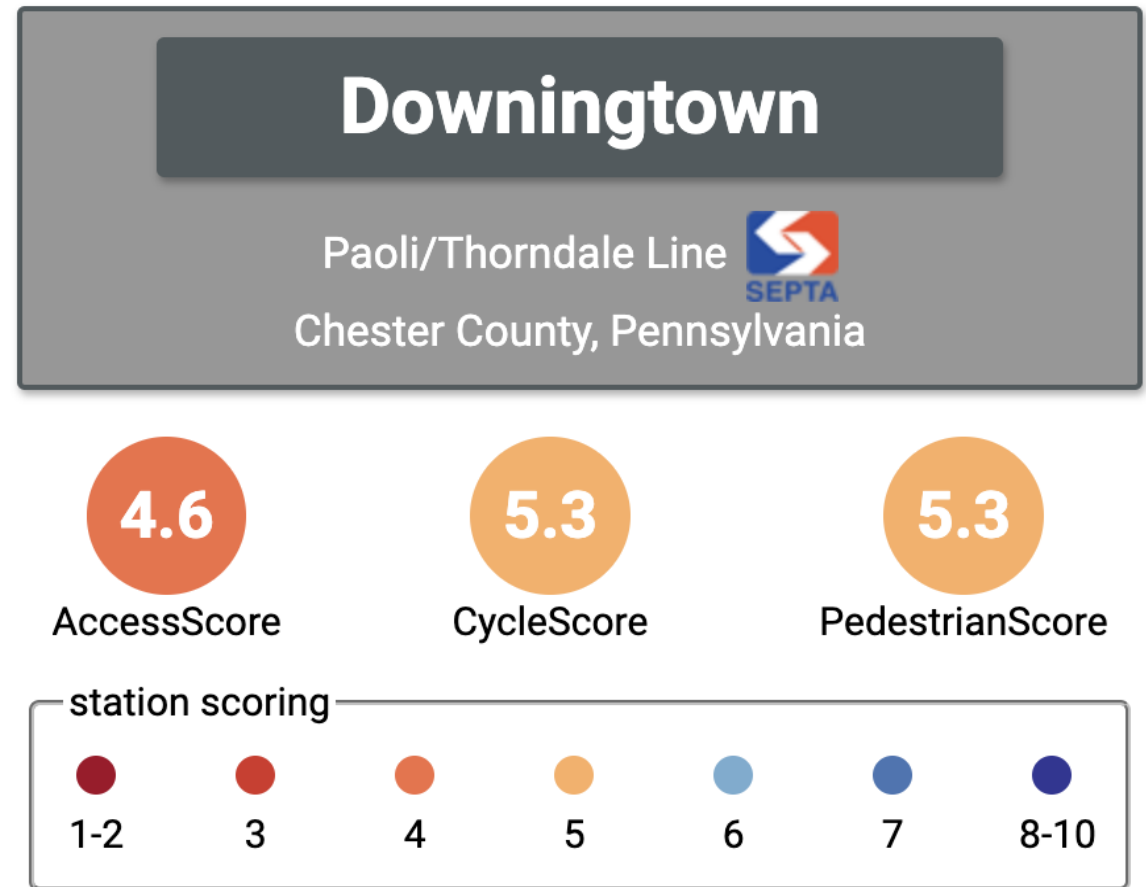


How accessible is Downingtown?

DVRPC Access Score & LTS

Considers factors such as

- Land use & Density
- Demographics
- Transit Density & Access
- Bike & Ped Safety/Access



Source: (DVRPC, PENNDDOT)

What is LTS?

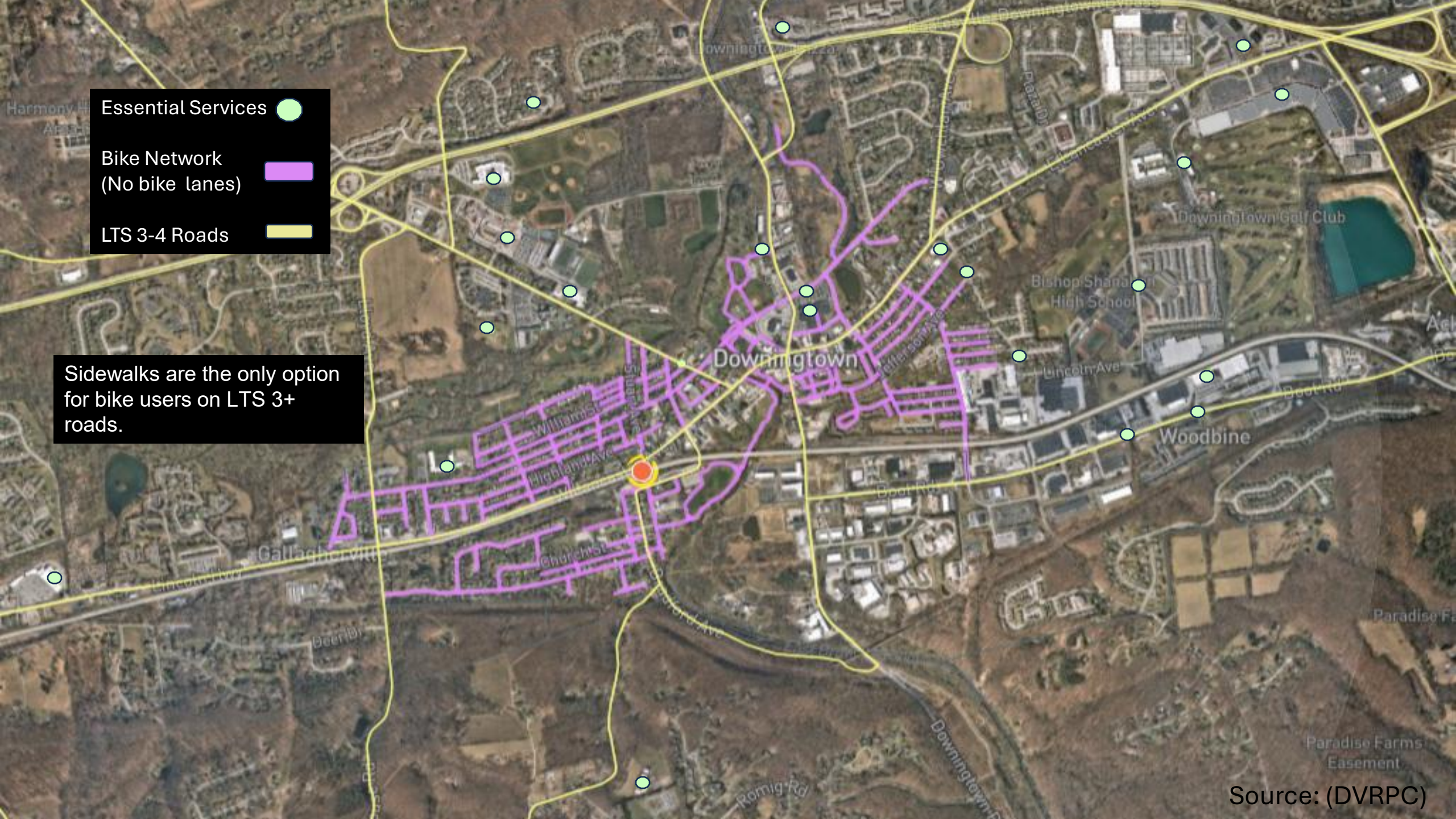
Level of Traffic Stress (LTS) is a system used to classify roads based on how comfortable they are for bicyclists to ride on, considering factors like:

- The number of lanes
- Vehicle speed
- Presence of bicycle infrastructure

The Delaware Valley Regional Planning Commission (DVRPC) uses LTS to assign a level to different road segments, which helps assess the suitability of these roads for biking and plan for improvements to make them safer and more accommodating for cyclists.

LTS	Comfortable Enough	Characteristics
1	Most People	Lowest Stress Comfortable for most ages and abilities
2	Interested, but Concerned	Suitable for most adults Presenting little traffic stress
3	Enthused and Confident	Moderate traffic stress Comfortable for those already biking in American cities
4	Strong and Fearless	High traffic stress Multilane, fast moving traffic

Source: (DVRPC)



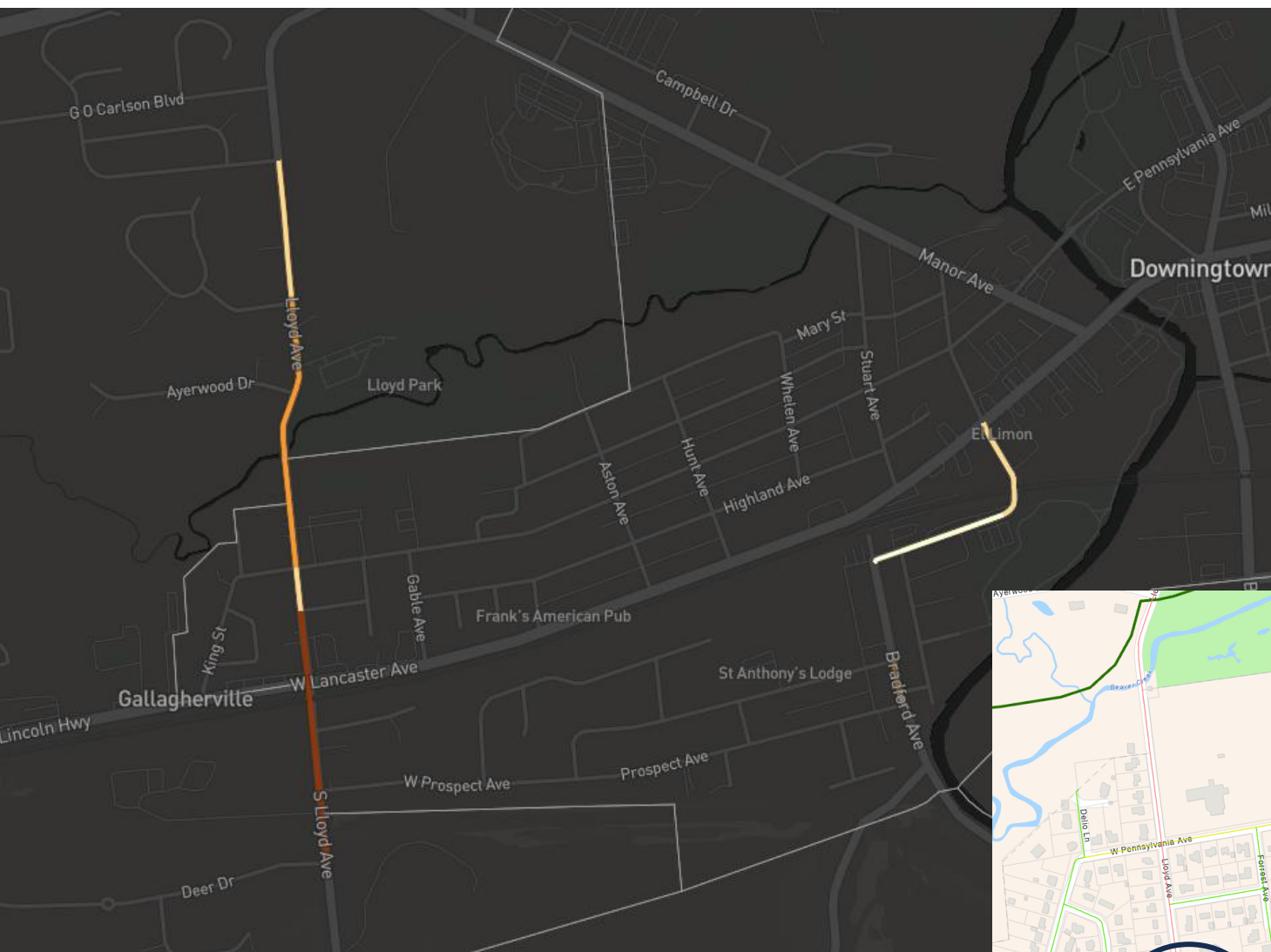
- Essential Services ●
- Bike Network
(No bike lanes) ■
- LTS 3-4 Roads ■

Sidewalks are the only option for bike users on LTS 3+ roads.



- Essential Services
- Pedestrian Network
- LTS 3-4 Roads

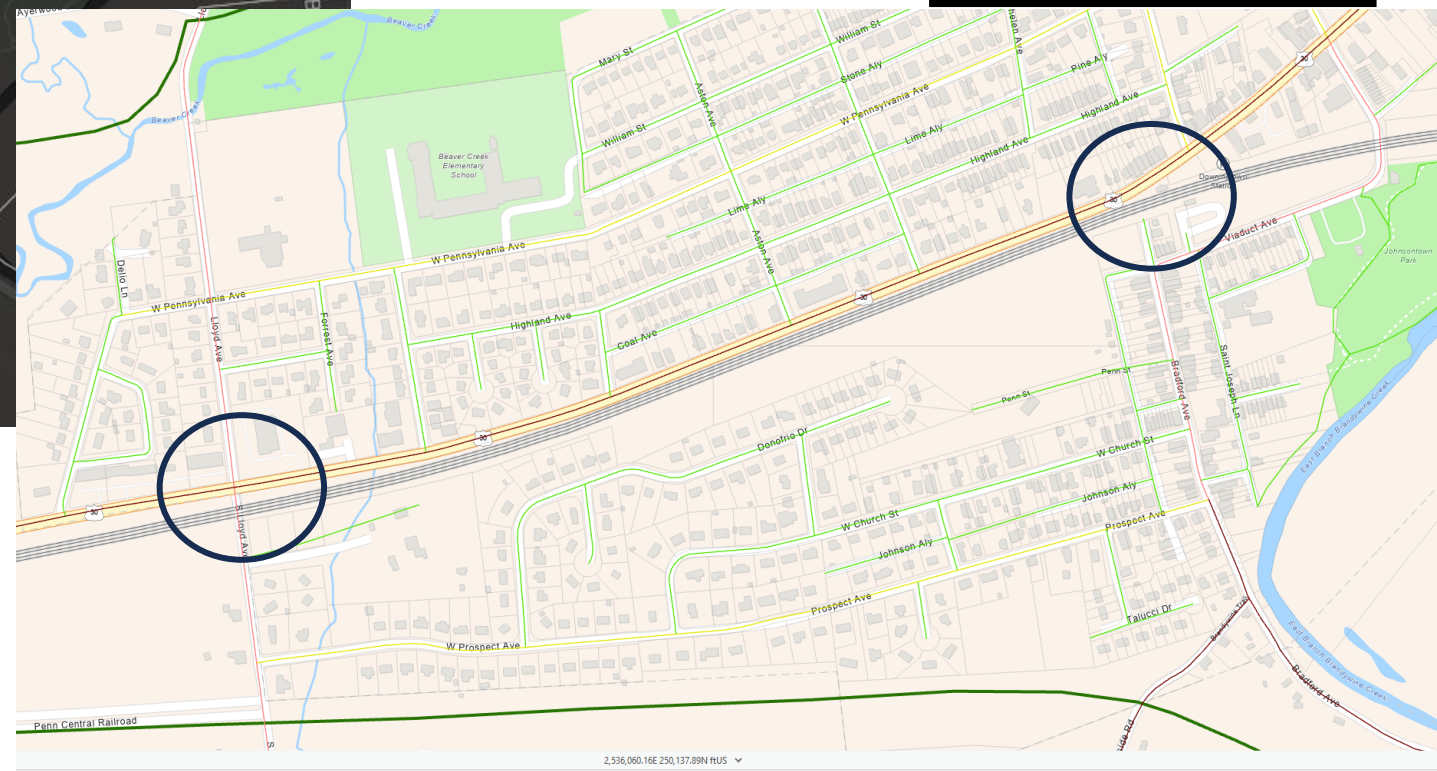
Pedestrian network includes access to E. Lancaster Ave

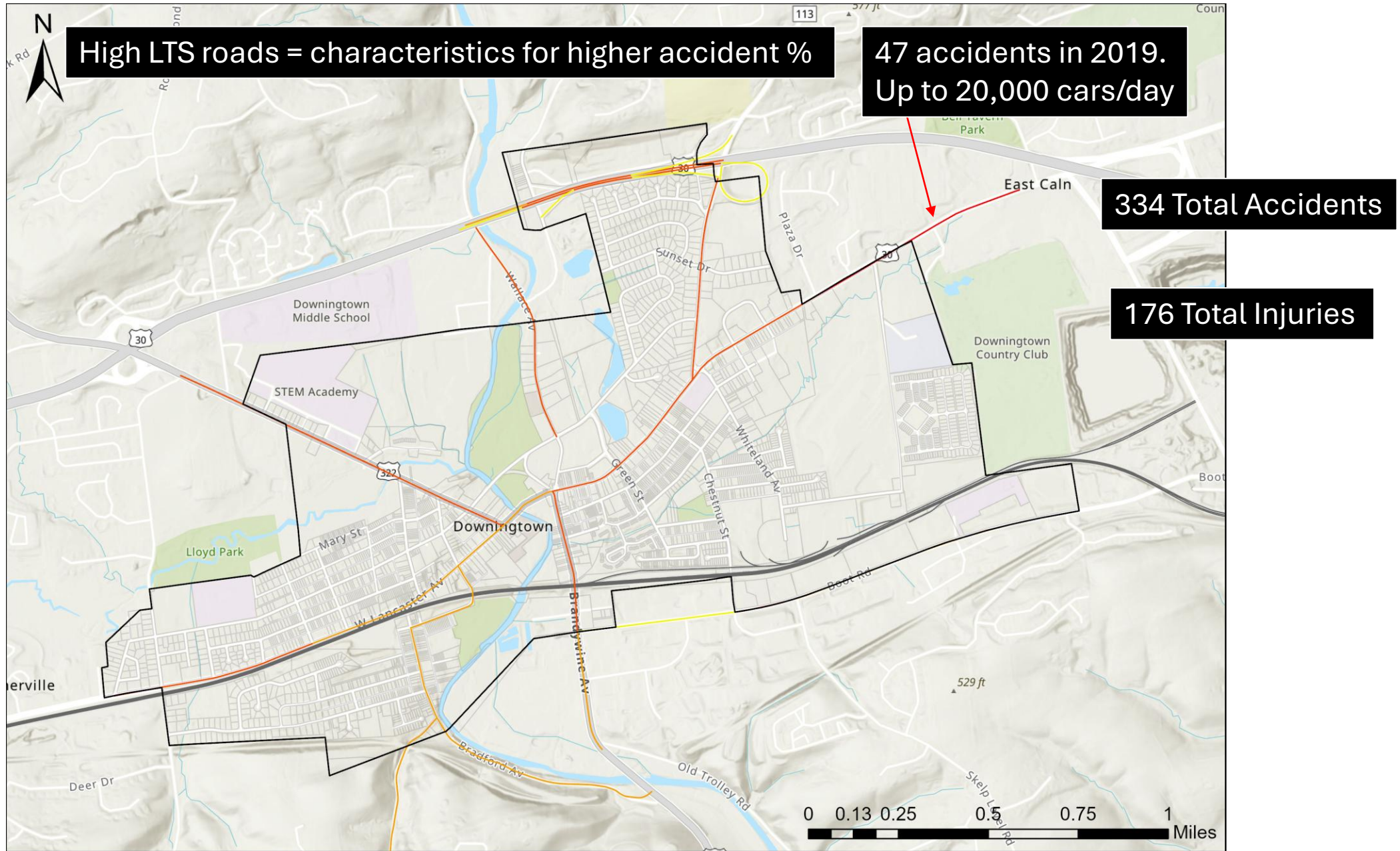


Connecting areas of low traffic stress with bike and foot accessibility plans enables people to travel further without a vehicle

Connectivity needs to be inclusive. Opportunity to increase walkability among impoverished communities

Source: (DVRPC)





Borough of Downingtown, PA
Total Accidents per Roadway

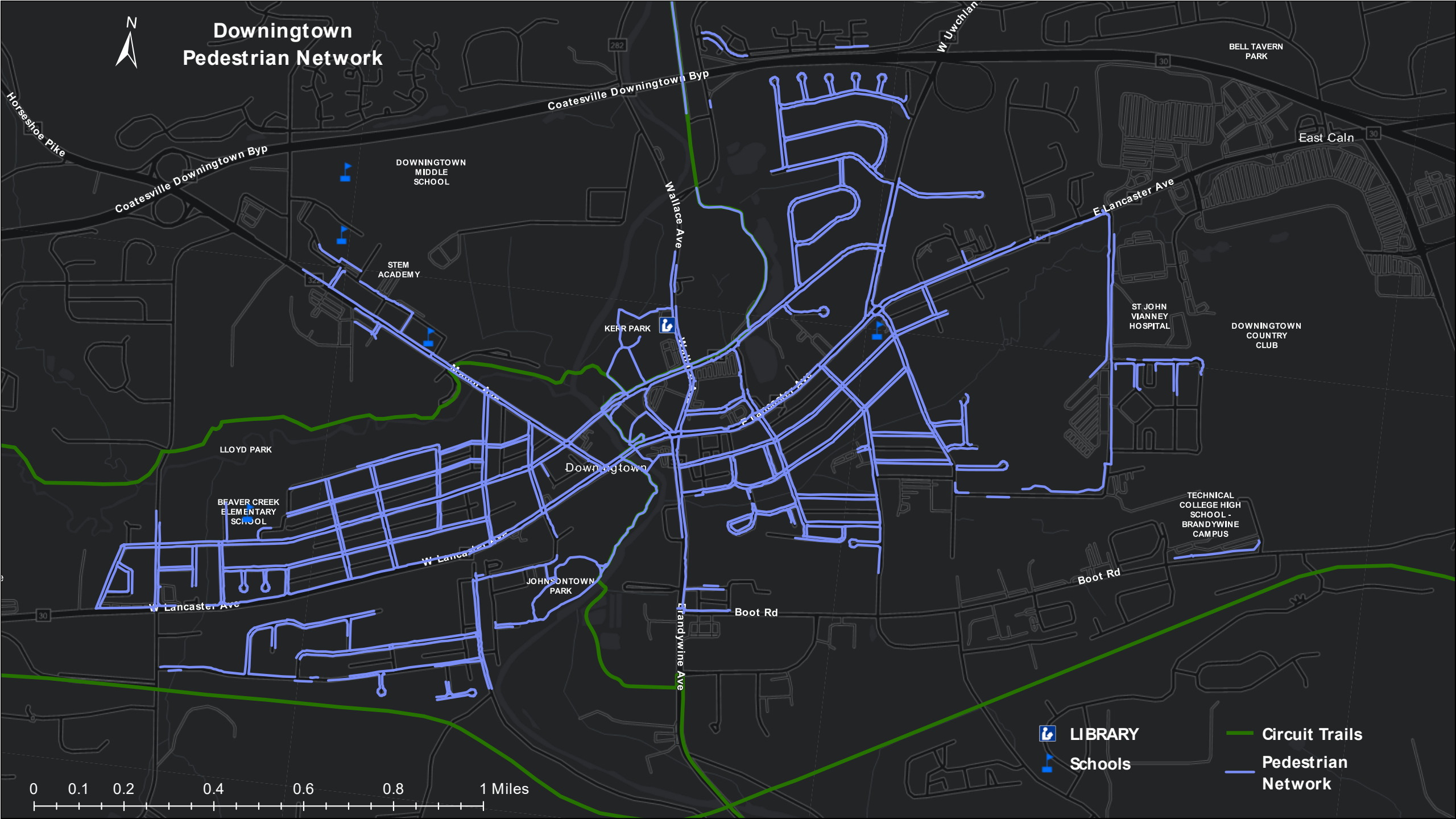
2019 Crash Frequency
totcount

5 - 12
13 - 22
1 - 4

23 - 47



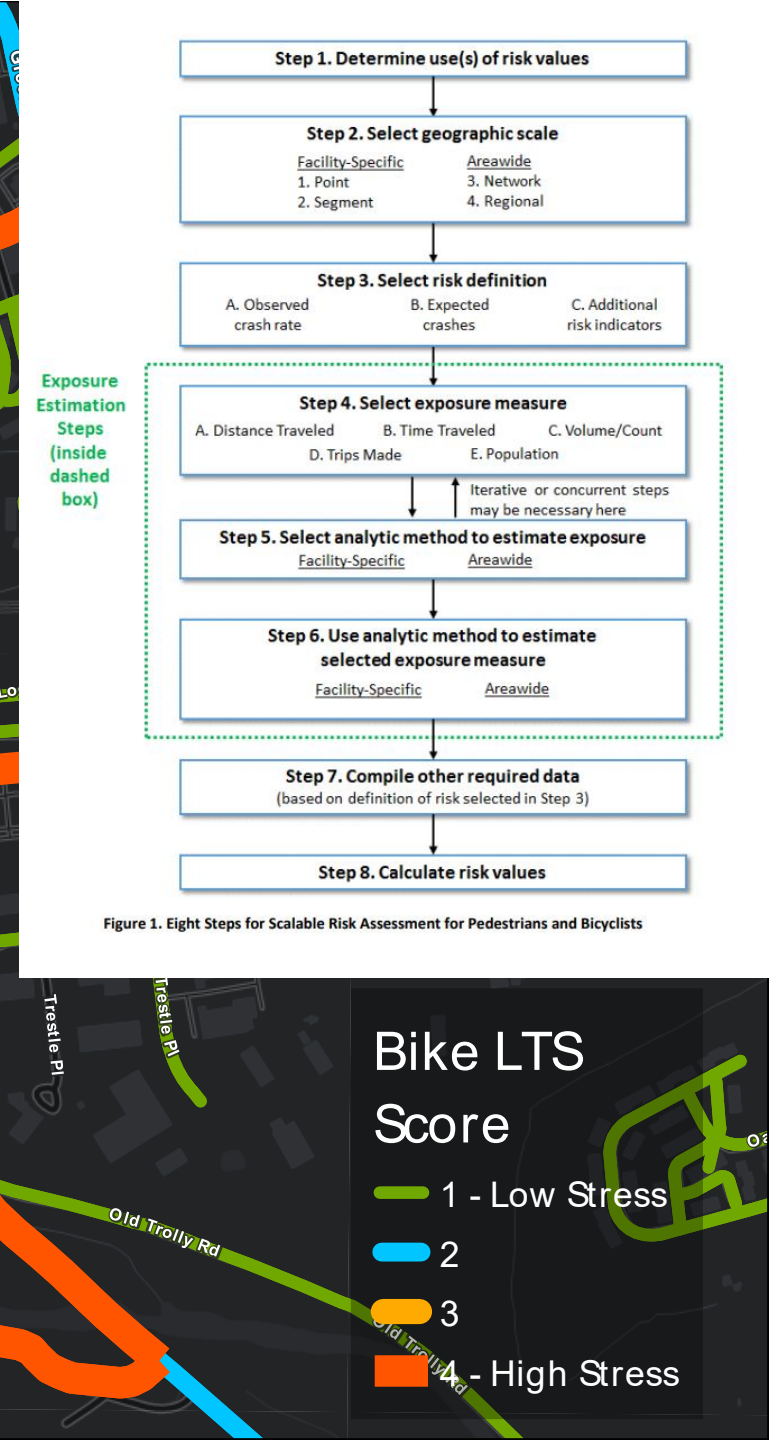
Downingtown Pedestrian Network



 LIBRARY
 Schools

 Circuit Trails
 Pedestrian Network





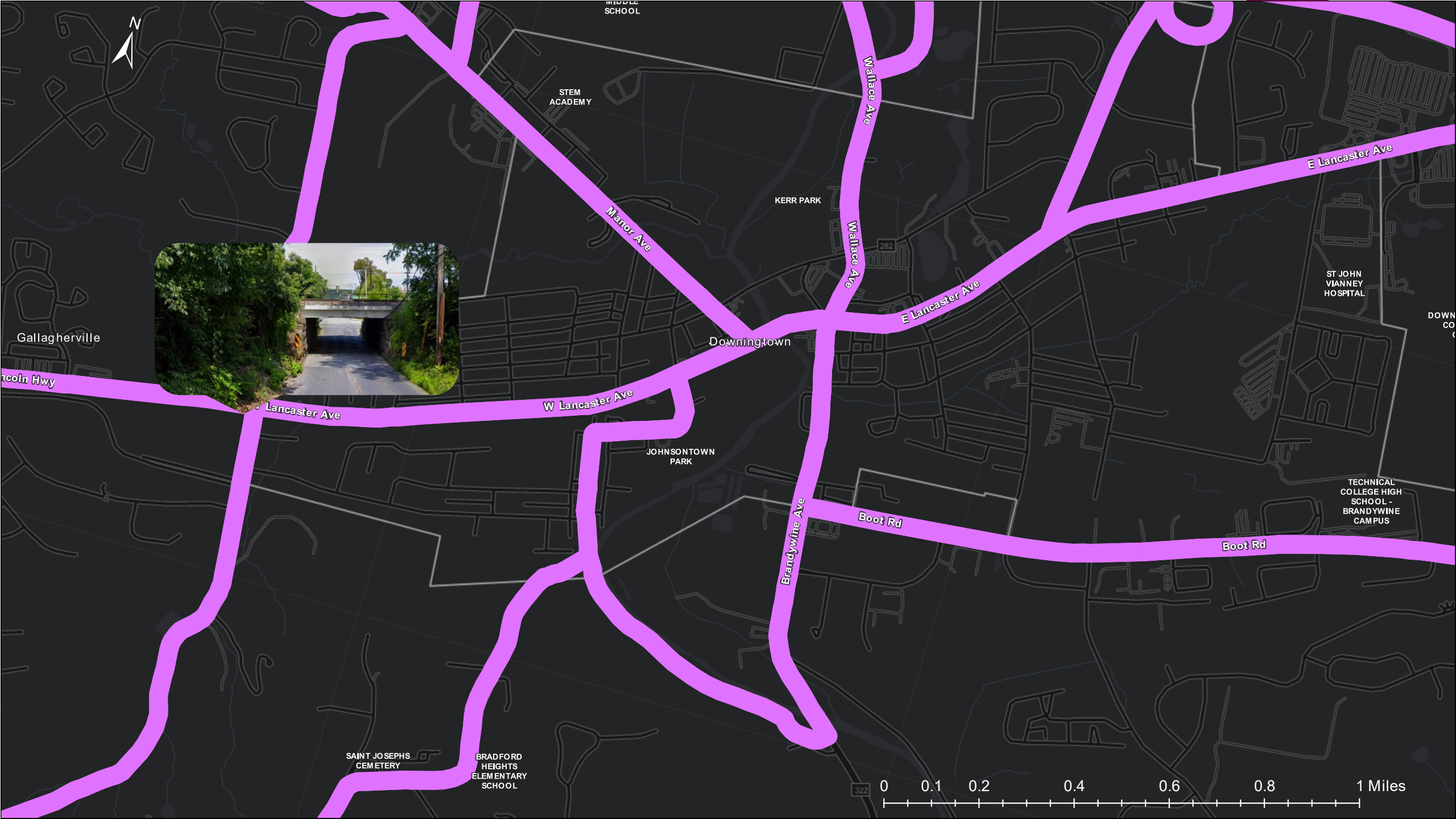


Existing train station
features a foot path

Staircases make bike
travel more difficult
through the tunnel

Opportunity to
increase accessibility
for bike paths.





South Lloyd Avenue Connection DVRPC Bicycle LTS

- Dealing with this connection break caused by a tunnel that supports train tracks would create a safe bike connection between Downingtown proper and developments south of the train station.

- ## **South Lloyd Avenue Connection DVRPC Bicycle LTS**
- Dealing with this connection break caused by a tunnel that supports train tracks would create a safe bike connection between Downingtown proper and developments south of the train station.



S. Lloyd Ave Tunnel



No sidewalk connection for pedestrians. No bike lanes.



Damaged asphalt, difficult for crossings. Minimal sidewalk.





I think of you when I see a baby laugh

I leave my past on one side
start my future on the other



walk this bridge
the lights of hope

it, because it's raining,
doesn't mean you can't dance

dear unknown,
bring it on!

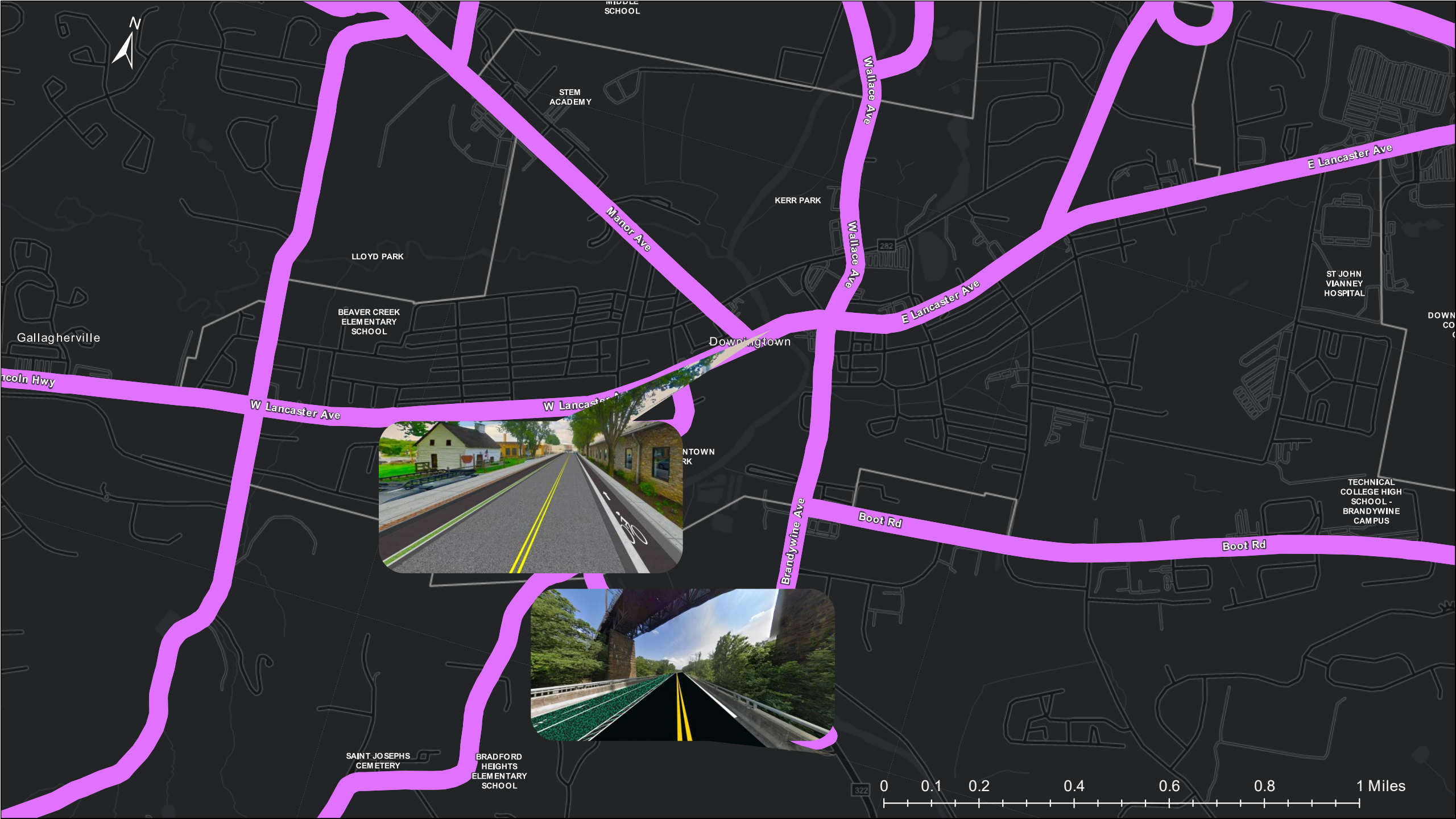
get hungry for laughter
fatten happiness

Messages of hope, High Level Bridge, Edmonton, AB—inspiration for Downtown Trestle Bridge.



E. Lancaster Ave.











An e-bike charging station and a resting place for cyclists near the town of Trstené pri Hornáde, Košice Region, Slovakia opened on April 30, 2021. Two more resting places are also situated near Nižná Myšľa and Skároš. (Source: TASR)

Bikeshare network should be expanded throughout the Philadelphia region.

Photo by Brady Miller Copyright: 2010 Monkey Depot LLC



Thank you!
&
Questions?