



FINAL REPORT
June 21, 2019

12TH STREET CONNECTOR TRANSPORTATION IMPROVEMENTS STUDY



1. Project Introduction

The Northeast Wilmington community (**Figures 1 and 2**) includes the neighborhoods of Brandywine Village, Lower Brandywine Village, and East Lake situated along the Brandywine Riverfront across from Wilmington’s downtown central business district. Many of Wilmington’s riverfront properties have experienced a resurgence with new development bringing housing, businesses, cultural amenities, and parkland. This has created regionally-significant economic growth and is a catalyst for expanding waterfront development in Wilmington. The Northeast Wilmington area has a stable residential community with many thriving businesses, but it also has pockets of underutilized and vacant properties primarily concentrated near the waterfront. Many of these vacant properties are located within the floodplain and are also contaminated brownfield sites. Furthermore, the street network near the waterfront is disjointed, lacking multi-modal amenities, and falling into disrepair. The lack of connectivity and environmental concerns have limited potential for waterfront redevelopment and economic growth in this community.

The 12th Street corridor is an important link within Northeast Wilmington between the I-495, Route 13, and Route 202 corridors and downtown Wilmington. The disjointed street network, however, makes access difficult and diverts traffic onto neighborhood streets. Although local transit serves the community, many of these local streets also lack sidewalks, crosswalks, bicycle facilities, and lighting. Improving multi-modal access and safety in the Northeast Wilmington waterfront area presents a valuable opportunity for redevelopment that can help spur economic growth in the underutilized land along the Brandywine waterfront.



Figure 1 - Aerial View of the Northeast Wilmington Area (Google Earth)

This study reimagines the 12th Street Corridor with better connectivity for all modes of transportation to enhance the existing community fabric and to generate new economic growth. Additionally, public investments in transportation can benefit the community and the environment by cleaning up brownfield sites, integrating green infrastructure to minimize flood risk, and creating a more attractive streetscape. The 12th Street Corridor will also promote the expansion of public open space with the opportunity to build new waterfront park amenities, and to sell City-owned land to private developers. These actions will have significant benefits to the existing community and will also help attract new investment from the private sector to redevelop underutilized properties.



Figure 2 - Area Photos - top left: Jessup Street at the 16th Street Bridge, top right: 12th Street east of Northeast Boulevard, bottom: Vacant waterfront brownfield site (Photos by JMT)

A. Project Background

The Wilmington Area Metropolitan Council (WILMAPCO) is leading this study in collaboration with the Wilmington Initiatives group, which is an advisory council comprised of representatives from the City of Wilmington, the Delaware Department of Transportation (DelDOT), Delaware Transit Corporation (DTC), and WILMAPCO. Johnson, Mirmiran, and Thompson, Inc (JMT) along with Stromberg, Garrigan and Associates, Inc. (SGA) are supporting WILMAPCO on this study.

The study initiates the National Environmental Policy Act (NEPA) process to determine the Purpose and Need, identify alternatives, select a preferred alternative, assess environmental impacts, estimate a project cost, and engage with the local community and stakeholders. This study does not complete the NEPA process, however it does follow the Federal Highway Administration’s (FHWA’s) Planning and Environmental Linkages (PEL) guidelines¹ allowing this project to progress into a streamlined Preliminary Design and NEPA Approval. This report serves as a response to the PEL Questionnaire, and a checklist is provided in **Appendix A**.

The project study area is within the Northeast Wilmington community. The boundary as shown in **Figure 3** below is bordered by the Brandywine Riverfront to the south, Jessup Street to the west, Vandever Avenue to the north, and North Heald Street to the east. The intersection of Vandever Avenue and Northeast Boulevard is also included in the Study Area.



Figure 3 - 12th Street Connector Study Area

¹ https://www.environment.fhwa.dot.gov/env_initiatives/pel/pel_quest.aspx

B. Existing Transportation Network

Wilmington’s street network follows a traditional grid pattern. The grid is interrupted by natural features like the Brandywine River and manmade features like railroads and a quarry. 12th Street connects directly between two of the city’s main roadway corridors: I-495 and US 13 (Northeast Boulevard). Northeast Boulevard serves as a north/south arterial roadway. 12th Street ends at Northeast Boulevard and re-emerges across the Brandywine River in downtown Wilmington without a direct link. This interruption diverts traffic onto Northeast Boulevard where it disperses onto other community streets. Transit, freight, and bicycle routes also traverse the Study Area as shown in **Figure 4** below and in **Appendix B**:

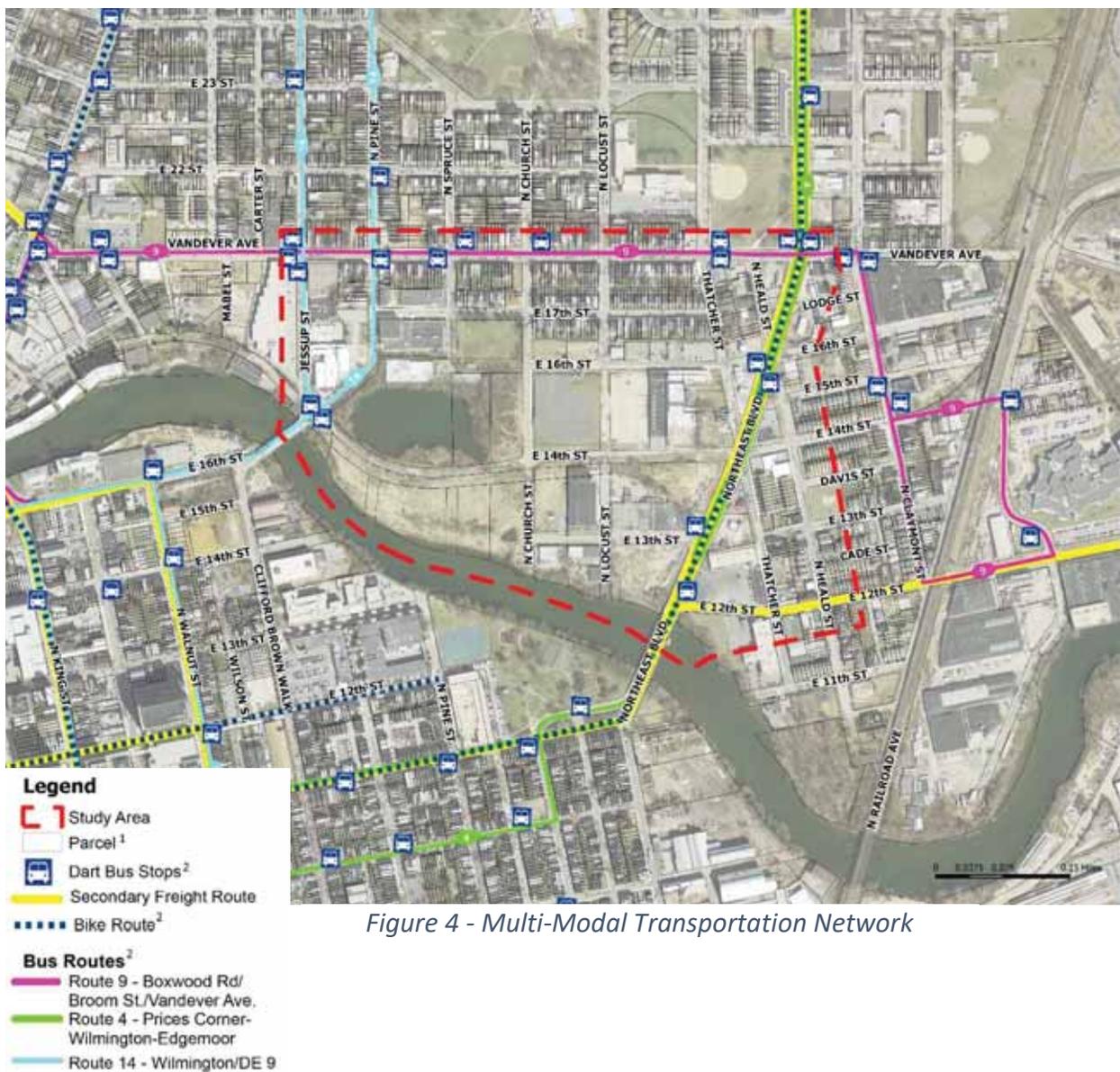


Figure 4 - Multi-Modal Transportation Network

C. Existing Traffic Volumes and Capacity Analysis

Weekday morning (6:00 a.m. to 9:00 a.m.) and weekday evening (3:00 p.m. to 6:00 p.m.) traffic counts were collected by WILMAPCO on Thursday, May 31, 2018 and Tuesday, June 5, 2018. The existing volumes were then adjusted to represent a more balanced volume network. Northeast Boulevard and 12th Street are classified as arterial roadways and Vandever Avenue is classified as a collector roadway. Based on the count data, these streets along with Jessup Street, Pine Street, and Thatcher Street carry the most traffic, with the remaining streets serving as lower volume neighborhood streets.

Capacity analysis within the study area was performed using Synchro 10 software. Per the Highway Capacity Manual (HCM), Level of Service (LOS) for signalized and unsignalized intersections is a function of the average vehicle control delay in seconds and measured on an A to F scale with LOS A representing the best operating conditions. Based on the Synchro results, under existing conditions, the study intersections operate at acceptable LOS B or better. This suggests minimal traffic delays throughout the study area and that the existing roadway network is operating with adequate capacity for current traffic volumes. See **Appendix B** for the 2018 existing traffic volumes and the existing LOS for the study intersections.

D. Crash Data

Crash data was collected within the Study Area over a three-year period between 2015 and 2018. 140 total crashes occurred in the Study Area, with most crashes happening at the 12th Street and Northeast Boulevard intersection (21) or along Vandever Avenue (83). The intersections with the most crashes along Vandever Avenue include Northeast Boulevard (24), Thatcher Street (19), and Locust Street (13). 25 crashes involved a parked car, 24 of which were along Vandever Avenue. There were no fatal crashes during this time period, however, there

were eight crashes involving pedestrians and two involving bicyclists. See **Figure 6** for a map of crash locations and type (See also **Appendix B**):

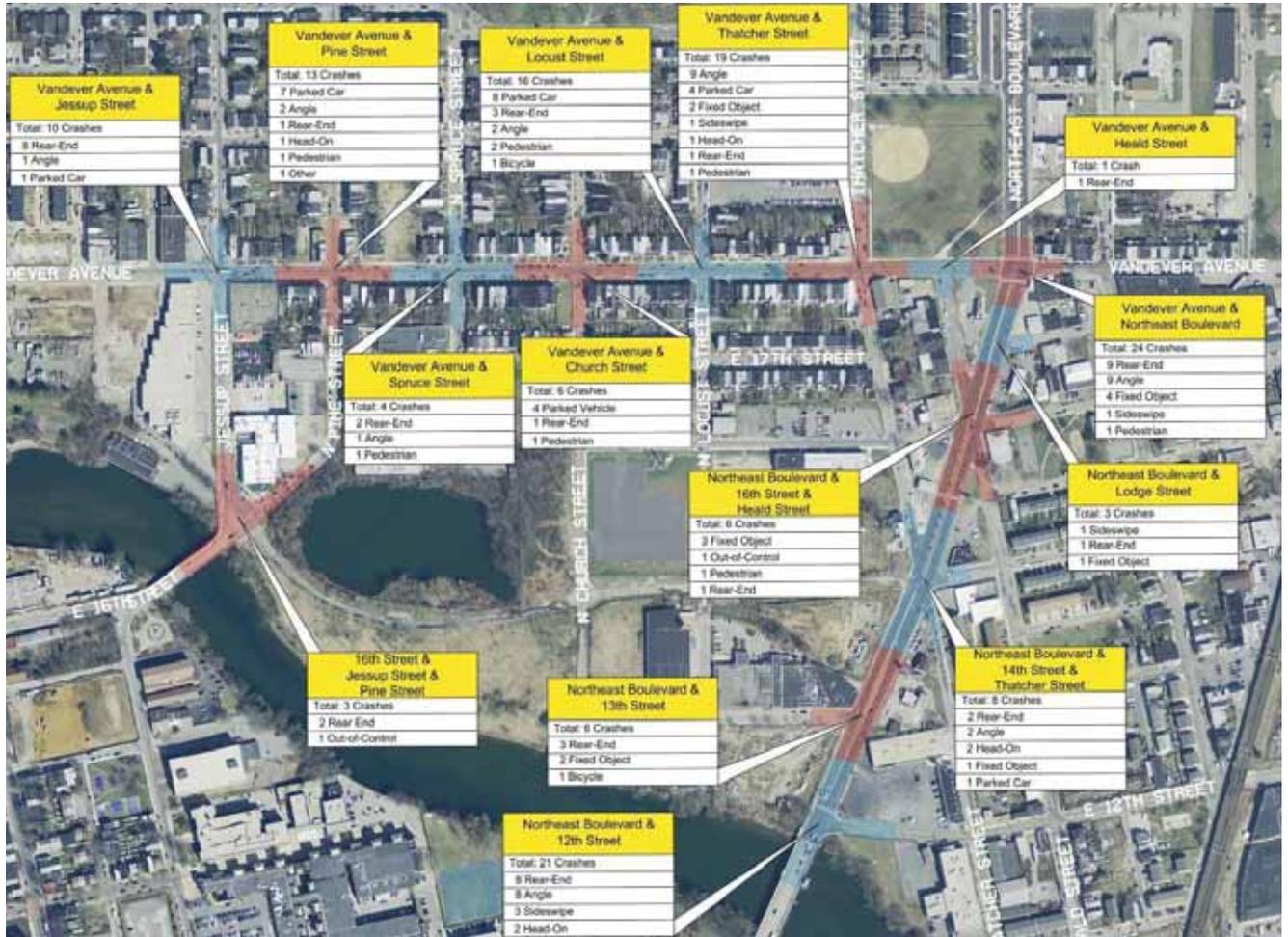


Figure 5 - Crash Locations

E. Previous Transportation Studies

There are a number of related planning studies in the project area, including studies that are completed and ongoing. A 12th Street Connector has been studied in the past and has been included in the aspirational list of projects in the WILMAPCO Long Range Transportation Plan; however, the connection has never been built. This plan included an option for new roadway

servicing as the 12th Street Connector. **Figure 7** below shows an illustration from a transportation plan by the City of Wilmington during the 1980's.

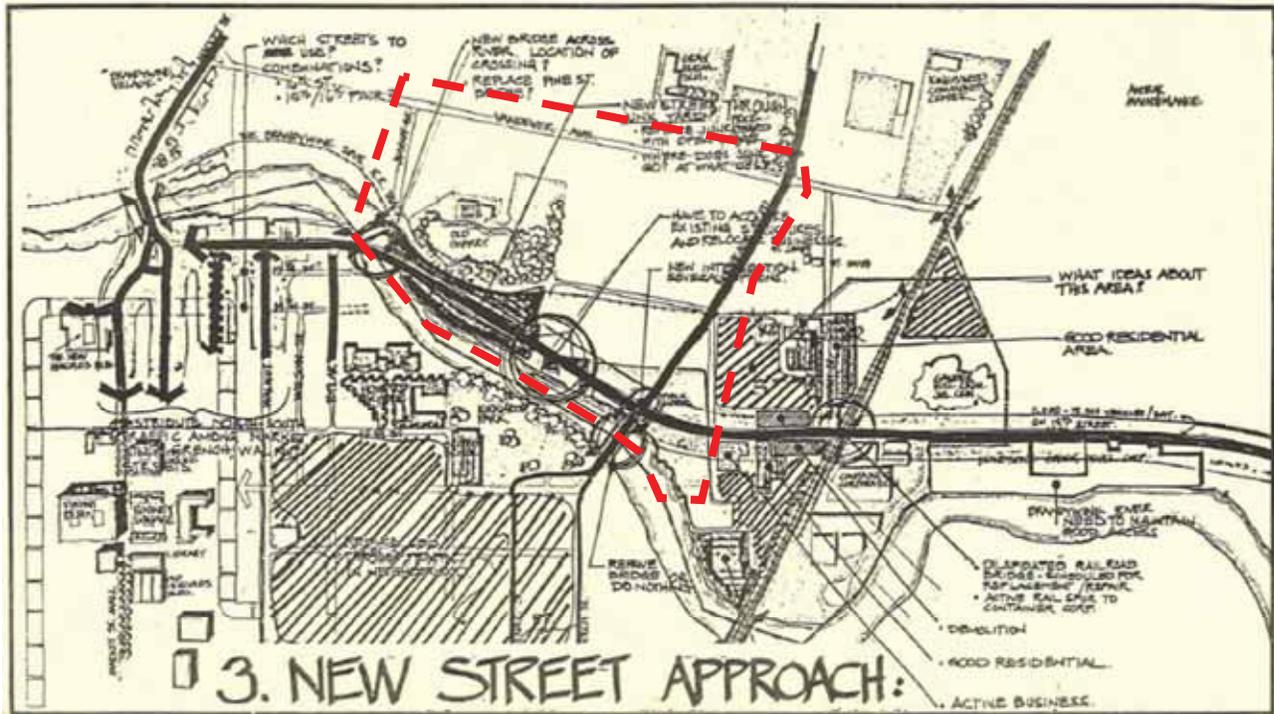


Figure 6 - Alternative from a City of Wilmington Transportation Planning Study circa 1981, with the current project Study Area shown in red.

The City of Wilmington also studied the 12th Street Connector in 2005 and provided much of the foundation analysis for the current study. The 2005 study established a project Purpose and Need statement, collected traffic data, conducted traffic analyses, developed roadway alignment alternatives, assessed potential impacts, and developed an estimated cost. The recommended alternative is shown in **Figure 8** on the following page.



Figure 7 - 2005 12th Street Connector Preferred Alternative (image by Urban Engineers)

F. Related Planning Studies

In addition to the plans that focused on transportation improvements including a 12th Street Connector, there are numerous other related planning studies and initiatives that support transportation improvements in Northeast Wilmington. These include:

- 2006: Greater Brandywine Village Market Analysis
- 2012: Neighborhood Comprehensive Development Plan for the Price's Run/Riverside-11th St Bridge Analysis Area
- 2013: Brandywine River/Northeast Wilmington Redevelopment Plan
- 2014: Economic Development SWOT Analysis
- 2014: Economic Development Target Industry Report
- 2014: City of Wilmington Economic Development Strategic Action Plan
- 2016: City of Wilmington Delaware Neighborhood Revitalization Strategic Area (NRSA)
- 2016: City of Wilmington Brandywine Riverfront Northeast Living Shoreline
- 2016: Market Value Analysis (MVA): City of Wilmington, DE. The Reinvestment Fund
- 2017 (ONGOING): Blueprint Communities Northeast Community Revitalization Plan
- 2018 (ONGOING): Wilmington 2028 Comprehensive Plan for our City

The City of Wilmington is also conducting a coinciding planning study to assess redevelopment potential in Northeast Wilmington through the Environmental Protection Agency's (EPA's) Brownfields Area-Wide planning Service grant program. This study includes a detailed economic analysis and redevelopment scenarios for brownfield sites and other targeted redevelopment sites in Northeast Wilmington. The 12th Street connector is a vital component to this plan's success ensuring developable sites are provided the access they need to be economically viable. Building the 12th Street Connector project is one of several key public investments recommended in this study. The 12th Street Connector Planning Team has coordinated with the Brownfields Area-Wide Planning Team to develop compatible alternatives.

Figure 9 below shows the proposed Reuse Plan for the Study Area, including the proposed 12th Street Connector. Additional recommendations include a new waterfront park promoting active and passive recreation along the Brandywine Riverfront; filling the existing quarry lake to create more developable land; and new infill development to be compatible with the existing community.



Figure 8 –Proposed Reuse Plan for Northeast Wilmington from the 2019 Brownfields Area-Wide Planning Study (image by SGA) with the 12th Street Connector Study Area shown in Red

This plan includes many recommendations to improve the existing community without displacing community members. Redevelopment proposed in this plan includes new townhomes, multi-family flats, and condominiums as well as over 26,000 square feet of new commercial/retail space. The plan also proposes a robust housing stock improvement plan to restore and rehabilitate the existing housing stock, and the creation of a new waterfront park

with a living shoreline, trail systems, and public open space. The park would also feature an environmental center, small boat launch, and open space that can be used for community festivals and pop-up events.

2. Planning Methodology

WILMAPCO serves as the Metropolitan Planning Organization for the region and manages the regional Unified Planning Work Program (UPWP). The UPWP is a program funded partially by the Federal Highway Administration and state and local partners to advance planning for priority projects. The 12th Street Connector is part of the fiscal year 2018 UPWP and has been funded to initiate planning and the NEPA process for the project.

A. Project Scope and Schedule

The planning study has been an open and collaborative process engaging with stakeholder agencies and community members through the decision-making process. This planning study has occurred over a twelve-month period with the goals to engage the local community and to collaboratively develop a Purpose and Need Statement, study alternatives, select a preferred alternative, assess environmental considerations, and respond to the FHWA PEL Questionnaire (See **Appendix A**). The schedule is as follows:

Table 1 – Project Schedule													
Task	2018									2019			
	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr
Study Initiation													
Inventory Existing Conditions													
Develop Purpose and Need													
Public Visioning Meeting													
Traffic Modeling													
Alternatives Development													
Alternatives Public Mtg													
Refine Preferred Alt													
Develop Final Report													
Final Public Meeting													

The project has been moved from the aspirational list to the WILMAPCO Constrained Long Range Plan. Although funding has not been secured, the project is anticipated to be funded within the existing transportation program budget. Public engagement will be a necessary component to keep the community informed and to address community concerns throughout the project development process.

B. Agency Coordination

The Wilmington Initiatives Group is comprised of stakeholder agencies and has served as an advisory committee throughout the project planning process. Members of the Wilmington Initiatives advisory committee include representatives from WILMAPCO, The City of Wilmington, and DeIDOT. Representatives from the City include staff members from the Department of Public Works, Department of Planning, and Department of Economic Development. DeIDOT representatives include staff members from Department of Planning, Department of Transportation Solutions, and the Delaware Transit Corporation (DTC). The group meet regularly to coordinate transportation investments in Wilmington, including the 12th Street Connector study and other transportation initiatives.

The 12th Street Connector project team coordinated with the Wilmington Initiatives advisory committee throughout the planning process. Advisory committee input was considered and integrated into the study before each public meeting. A summary of meetings is described in **Table 2** below:

Table 2 – Summary of Wilmington Initiatives Coordination Meetings	
Meeting Date	Meeting Topic
May 16, 2018	Project Introduction, Goals, Proposed Methodology, and Review of Existing Conditions
June 13, 2018	Presentation of Traffic Analysis and Purpose and Need Statement
July 20, 2018	Alternatives Design Charrette
September 20, 2018	Present Alternatives, Traffic Modeling Scenarios, and estimated impacts and costs
January 17, 2019	Review of Public Input
February 25, 2019	Review of Preferred Alternative
March 20, 2019	Review of Draft Report

C. Public Engagement

Public engagement was used to gather public input throughout the planning process. In order to reach as many stakeholders as possible, a variety of online and in-person outreach methods were used.

Project Website: Project information and events are posted online at www.WILMAPCO.com/12thStreetConnector where the public can get up-to-date information about the project status and upcoming events. The website also featured an online survey to provide an opportunity for community members to provide input even if they were unable to attend any of the public meetings. The brief survey mirrored the community preference poll asking participants about their concerns, ideas for improvements, and hopes for project area. The survey received over 25 responses and reflected similar responses as the in-person poll, with a few exceptions.

Survey participants agreed that speeding traffic and disjointed streets are a concern in the area, but a lack of continuous sidewalks was also a top concern. Access to the waterfront was the favored feature noted by survey takers for the future, but they also identified better opportunities to walk or bike and easier access to I-495 as top choices as well. Survey participants agreed that new development on vacant properties and more public open space with recreation opportunities were important improvements to the area, but they also chose more attractive streetscapes and new developments as an important improvement for the community.

Visioning Workshop: The visioning workshop was facilitated in June 2018 as a presentation and workshop to introduce the 12th Street project to the community and to generate ideas to consider as the planning process progresses. The meeting included:

- Review of existing conditions, opportunities, constraints;
- Presentation of a draft Purpose and Need statement;
- A summary of the related EPA Area-wide Planning Study;
- A community preference poll, in which members could weigh in on their needs, wants, and concerns for the project area; and
- Break out discussions to conceptualize community member's ideas for the corridor by sketching on plans of the project area. **Figure 10** (following page) maps locations of comments from the break out discussions:

Overall, participants expressed strong support for improvements. Major themes and valuable feedback emerged from the visioning workshop. According to the community preference poll, some of the biggest transportation concerns of attendees were:

- Lack of safe street crossings
- Speeding traffic
- Disjointed streets

Important features that should be incorporated in the project include:

- Easier access to the waterfront

- Improve sidewalks and crosswalks
- Better options for parking
- Reduced congestion on neighborhood streets
- Maintain truck access to local industrial businesses
- Improve area aesthetics

The most desired community improvements were:

- More development with community amenities and job opportunities
- New development on vacant properties
- More public open space with recreational opportunities

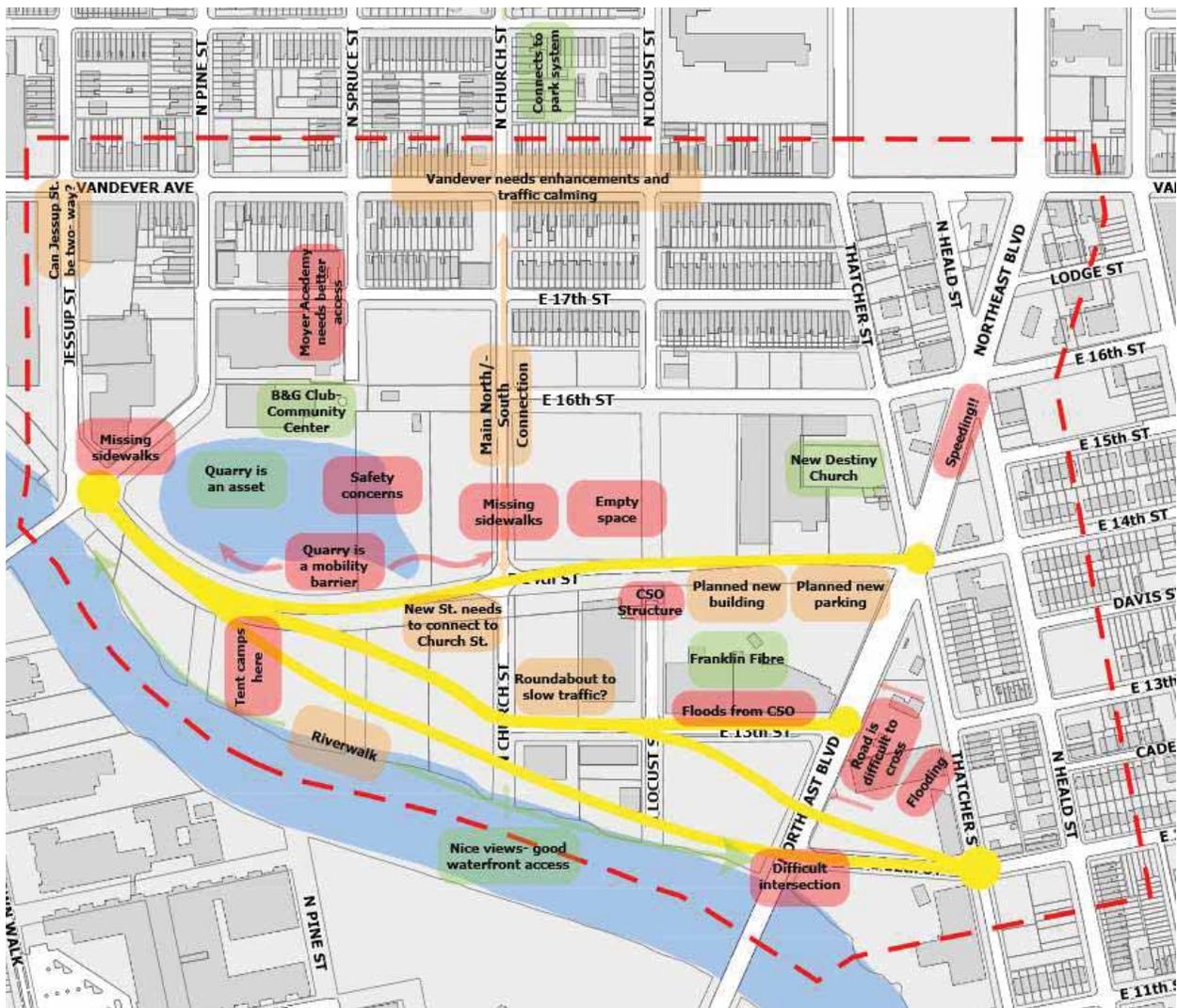


Figure 9 - Summary of Public Comments during the Visioning Workshop

Open House: An open house was hosted in January 2019 to present the three alternatives and to gather input from attendees as to which alternative they prefer. Community members were also able to review information about environmental resources, current traffic conditions, possible land uses, and future economic development. Attendees were able to note their alternative preference through comment cards.

Through conversation and available comments cards, it was noted that attendees favored Alternative B. Alternative A was the second choice while Alternative C was the third choice. Some frequently discussed features shown in the alternatives were:

- The cul-de-sac proposed on Thatcher Street was mostly disliked by attendees
- Preferences for Roundabouts were split with both negative and positive remarks
- Access to waterfront and more greenspace were favorable topics

Final Presentation – The study team presented the final recommendations to the public at a Final Presentation meeting to be held on April 3, 2019. Over 50 community members attended and the presentation including a review of both the 12th Street Connector project and the Brownfields Areawide Planning Study final recommendations. Both projects were well received at the meeting, and public support continued through a 30-day public comment period. Comments collected during the meeting and afterwards included:

- Overall project support
- Encouraging new development opportunities
- Preference for more green space and pedestrian and bicycle amenities
- Suggestion to name the road after City Councilman Theodore “Ted” Blunt.

3. Purpose and Need

Establishing the project Purpose and Need is an important step in the NEPA process as defined in CEQ regulation 1502.13. It establishes a foundation for decision-making by providing the rationale and justification for a proposed action. The Project Purpose defines the goals and underlying issues to be addressed by the proposed action. The Project Needs justify the Purpose with qualitative and quantitative effects and expected outcomes of the proposed action. The Purpose and Need statement is used to assess and justify the proposed action. A draft Purpose and Need statement was prepared and presented to the Wilmington Initiatives advisory committee and the public for review, and was received with positive support.

The 12th Street Connector Purpose and Need is as described below in **Table 3** on the following page:

Table 3 – 12 th Street Connector Purpose and Need	
Project Purpose	Project Needs
Improve access between Northeast Wilmington and the Brandywine River Waterfront and downtown Wilmington Central Business District.	The street system in Northeast Wilmington is incomplete and discontinuous. The main cross street closest to the waterfront is closed to traffic between Church Street and Pine Street at the former Diamond State Salvage Site, and multiple other streets end within the Project Area including 13 th Street, 16 th Street, 17 th Street, North Church Street, and North Locust Street. System linkages can be improved to provide better access locally in the community and to the Brandywine River Waterfront, and destinations in downtown Wilmington.
Improve multi-modal access for pedestrians, bicycles, and transit riders.	Discontinuous sidewalks, missing crosswalks, and missing pedestrian ramps inhibit pedestrian safety, mobility, and access to transit service. A lack of bicycle facilities and accommodations inhibit bicycle access and safety. Transportation improvements for multi-modal users can improve mobility and safety.
Improve traffic operations.	Traffic volumes in the project area are heaviest on Vandever Avenue, Northeast Boulevard, and 12 th Street while traffic volumes remain low on the 16 th Street Bridge and on local streets. Within the Project Area, accidents most frequently occur on the streets with the most congestion, including Vandever Avenue, Northeast Boulevard, and 12 th Street at the Northeast Boulevard Intersection. Redirecting traffic to a corridor closer to the waterfront and 16 th Street Bridge can reduce congestion and improve safety.
Support economic development and job creation.	The City of Wilmington has conducted multiple planning studies that identify the Brandywine River Waterfront in Northeast Wilmington as a strategic redevelopment site for economic growth. These studies include the Brandywine River and Northeast Wilmington Redevelopment Plan (2013), the Wilmington Economic Development SWOT Analysis (2014), the City of Wilmington Economic Development Strategic Plan (2014), the Blueprint Communities Northeast Wilmington Community Revitalization Plan (ongoing), the Wilmington Comprehensive Plan for our City and our Communities (ongoing), and the Northeast Brandywine Riverfront Area Wide Plan for Brownfield Redevelopment (ongoing). Access to vacant and underutilized properties and redevelopable land along the Brandywine River Waterfront is limited and inhibits redevelopment potential. Improving access along the Brandywine River Waterfront will support the City’s vision for redevelopment and provide new job opportunities.
Provide better accommodations for freight movement for local businesses while minimizing impacts to the community.	Local industrial businesses need freight access to operate, and freight movement passes through the community. 12 th Street connects freight traffic to I-495 from areas to the north west, northeast, and south via Northeast Boulevard. Freight movement passes through residential communities along Vandever Avenue in the Project Area and along the Spruce Street / Church Street corridor in residential areas south of the Project Area. Freight access must be maintained to support local businesses and improving freight access to the 16 th Street Bridge can reduce freight through traffic in residential communities and improve neighborhood safety and quality and life.

4. Existing Environment

A. Land Use

The 12th Street Connector Study Area is an urban community with a mix of residential, commercial, industrial, and institutional land uses as shown in **Figure 10** below. Residential homes are located north of 16th Street, and east of Thatcher Street and are characterized predominantly by single family townhomes. There are also several parks serving the local community. Harry W. Langer Memorial Field and Joe White Field are two ball fields located inside the Study Area, and Johnston Park is a playground and basketball court inside the Study Area. Local institutional properties include several schools and churches, some of which are abandoned and vacant including two prominent former charter school sites. A major community landmark located centrally in the Study Area is the William Fletcher Boys and Girls Club offering educational and recreational services for local youth and community members.

Commercial properties are in pockets throughout the Study Area, primarily along Northeast Boulevard, Vandever Avenue, and Jessup Street. They are primarily small shops and auto-service businesses. A small shopping center is located on the corner of 12th Street and Northeast Boulevard. A private club restaurant is located on the Waterfront off Locust Street. Businesses along Jessup Street include a commercial warehousing center, a medical center, and daycare facility. Industrial uses are concentrated along the southern side of the Study Area. They include manufacturing, packaging, warehousing, and chemical processing companies. Several institutional and industrial sites are currently vacant. These vacant properties offer redevelopment potential that could have a significant impact on economic growth to benefit the community.

The Study Area's character is also influenced by man-made infrastructure. A prominent, high-voltage power line crosses through the middle of the Study Area. A prominent combined sewer valve is located at Locust Street and 14th Street and effectively closes Locust street from through traffic. A deep, abandoned quarry filled with water is another prominent feature in the southwest part of the Study Area. This quarry lake is secluded, surrounded by steep slopes, and fenced off from public access and is a major safety concern should people cross the fence and fall in. Relocation or removal of these elements would be extremely costly, and therefore development will need to consider public safety around these elements.

Figure 11 on the following page maps the Study Area's land use features (See also **Appendix C**).

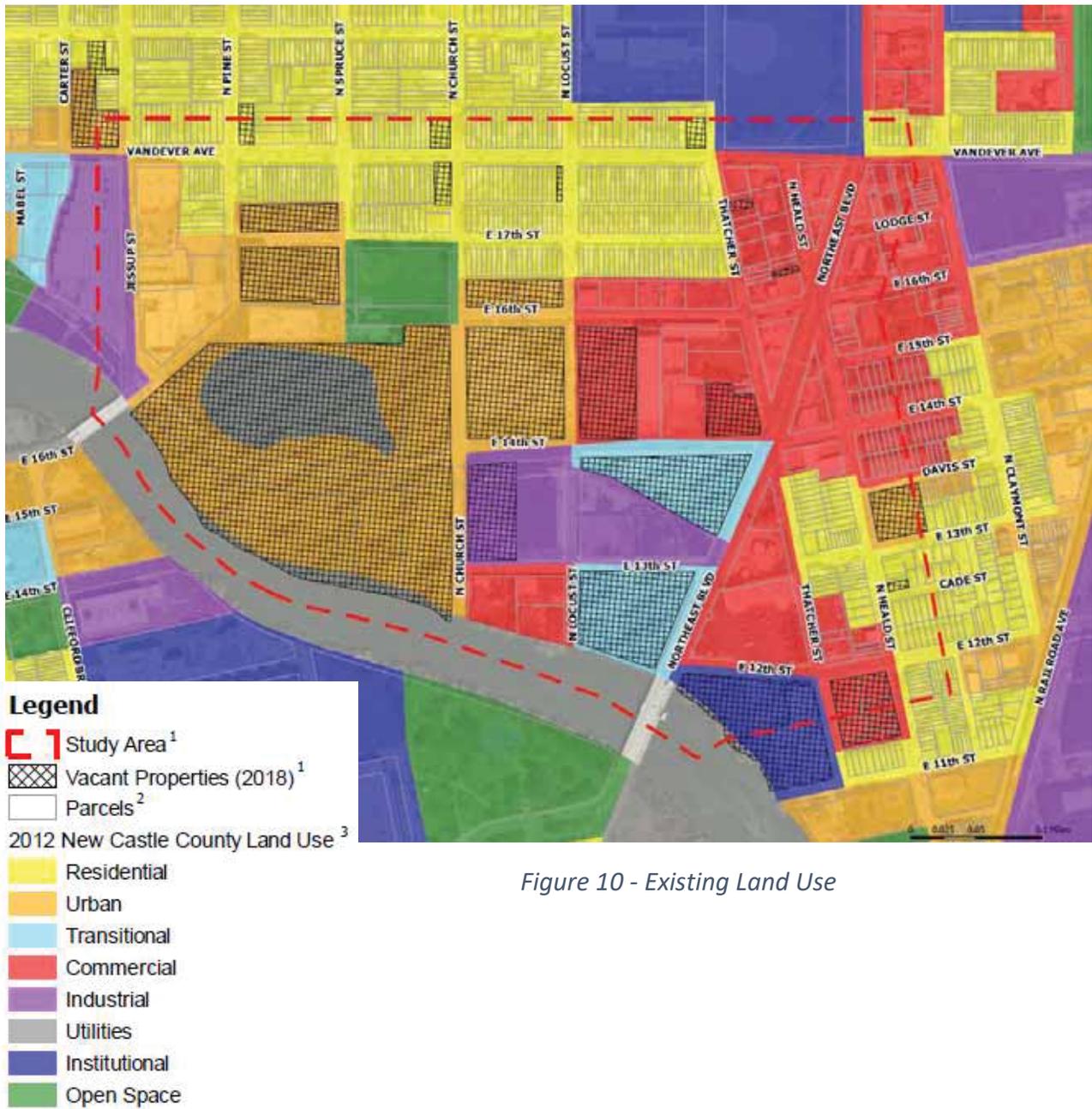


Figure 10 - Existing Land Use

B. Demographic Characteristics

The Study Area includes portions of two US Census blocks. The majority of the Study Area falls within Block 6022 and is most representative of the Study Area’s demographic profile. A portion of the Study Area east of Northeast Boulevard is within Block 30023. As described below in **Table 4**, US Census data shows the Study Area is above the 90th percentile for minority and above the 85st percentile for low-income populations as compared to the State population. The surrounding demographic profile is similarly falling at or above the 95th percentile for minority populations and 96th percentile for low-income populations. This community qualifies as an Environmental Justice population, and all efforts must be taken to ensure there are no disproportionate impacts to minority and low-income groups. Public engagement throughout the planning, design, and construction process will be a critical component to ensuring community needs are met, and impacts are not disproportionate to minority and low-income people.

Table 4 – Demographic Profile						
Census Data ¹	Study Area Block Groups		Adjoining Block Groups			
	6022 ²	30023 ³	6013	6023	30022	9001
Total Population	1348	1980	1049	833	829	519
% Minority	97% (98 Percentile)	73% (90 Percentile)	95% (97 Percentile)	87% (95 Percentile)	91% (96 Percentile)	98% (99 Percentile)
% Linguistic Isolation	0% (45 Percentile)	0% (45 Percentile)	0% (45 Percentile)	0% (45 Percentile)	6% (86 Percentile)	0% (45 Percentile)
% Adults with less than High School education	34% (97 Percentile)	50% (99 Percentile)	15% (70 Percentile)	30% (95 Percentile)	32% (96 Percentile)	36% (98 Percentile)
% Under the age of 5	14% (98 Percentile)	2% (13 Percentile)	10% (84 Percentile)	13% (97 Percentile)	15% (98 Percentile)	12% (95 Percentile)
% Over the age of 64	9% (19 Percentile)	4% (3 Percentile)	16% (56 Percentile)	15% (52 Percentile)	5% (5 Percentile)	1% (1 Percentile)
% Low Income	65% (96 Percentile)	45% (85 Percentile)	77% (98 Percentile)	64% (96 Percentile)	84% (98 Percentile)	62% (95 Percentile)
Percentile calculations based on the statewide average						
¹ Based on 2018 US Census Data available from https://ejscreen.epa.gov/mapper/						
² Block 6022 represents the majority of the project Study Area						
³ Includes population within the Howard R. Young Correctional Institution						

Community features and census block boundaries are shown on **Figure 12** on the following page (See also **Appendix C**)

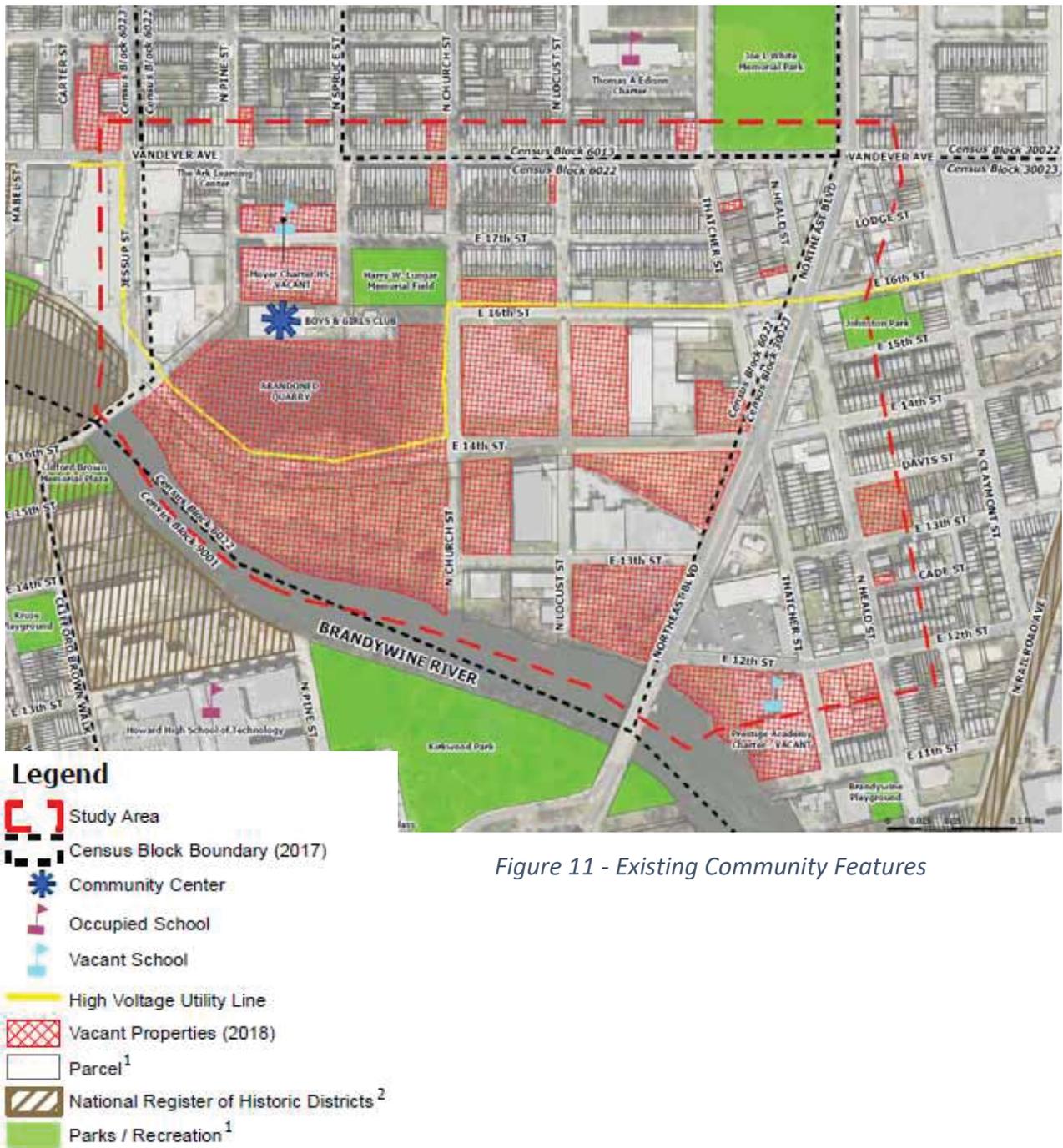


Figure 11 - Existing Community Features

C. Environmental Features

Flooding is an issue within the Study Area. Located along the waterfront, a large portion of the Study Area is within the 100-Year Floodplain, which means the area has a 1% chance to be flooded by high river water every year. Furthermore, the entire Study Area is within a combined sewershed where stormwater runoff and sewage water are directed into the same drainage system. This can cause flooding from storm drains with contaminated water during rain events even when the river is not flooding. To mitigate the potential impacts of flooding in the future, stormwater management best practices should be put into place regarding any new development. Landscapes that soak up and infiltrate water help to reduce flood impacts from high river water and combined sewer overflows.

Additionally, there are several properties located within the Study Area that are designated as brownfield sites. These are sites recognized by the EPA as contaminated with hazardous materials. This can complicate development because additional provisions will be necessary to contain or clean up contamination and to protect the community and workers from potentially harmful substances. Redeveloping these sites will be an important tool to enhance the economic vitality of the project area.

Figure 13 below maps the existing environmental features within the Study Area (See also Appendix C).



Figure 12 - Existing Environmental Features

5. Alternatives Considered

Alternatives were developed through a collaborative charrette process with representatives from the project team and agency partners from the Wilmington Initiatives group. The day-long charrette considered traffic volume and redevelopment opportunities, and participants proposed potential typical sections, alignments, and intersection treatments for a potential 12th Street Connector through the Study Area. These alternatives were refined and presented during a Public Open House to community stakeholders for comment.

A. Typical Section

The existing 12th Street typical section is approximately 38 feet wide with two 11' through lanes and eight foot on-street parking lanes. Some areas include a sidewalk at about five feet wide,

but sidewalks are not continuous. Traffic volumes are not predicted to require more than two lanes of traffic, and the proposed extension of 12th Street will use the same 38-foot roadway typical section. However, a wider footprint is proposed to provide better accommodations for pedestrians, bicyclists, and green infrastructure. A 12-foot hiker/biker trail is proposed along the south side of the road, and a six-foot sidewalk is proposed along the north side. Ample greenspace is proposed between the roadway and the trail or sidewalk for street trees and stormwater management incorporating green technologies into the streetscape. Street trees and stormwater infiltration systems can reduce flood risk, filter pollutants from stormwater, and add aesthetic appeal to the streetscape. If needed, additional non-structural stormwater management best practices may be utilized, such as permeable pavement on the hiker/biker trail, sidewalk, and parking areas, and stream bank stabilization along the river edge using vegetative bioengineered techniques.

Bicycle lanes were considered along the roadway but were not incorporated because bicyclists are accommodated with the proposed hiker/biker trail. Bicyclists can also opt to share the travel lanes with traffic. The proposed typical section is shown below in **Figure 14**:



Figure 13 - Proposed Typical Section

B. Alternative Alignments

Multiple alignments were considered to connect 12th Street across the Study Area to link directly with the 16th Street Bridge on the southwest side of the Study Area. This connection would provide access to potential development sites along the Brandywine waterfront and help alleviate traffic congestion on neighborhood streets. The alignment would also redirect some freight traffic from residential areas along Church Street south of the Study Area and from Vandever Avenue on the north side of the Study Area with a more direct link into the

downtown commercial area from 16th Street. Several alignments were proposed, and a 25 mile per hour design speed was used for each.

After the charrette, the design team compiled ideas into three unique alignments. These include:

Alternative A – This alignment provides a direct path parallel to the waterfront from 12th Street at Northeast Boulevard to the 16th Street Bridge at the intersection of Jessup Street and Pine Street. See **Figure 15** (page 24) for a plan view (See also **Appendix D**). Features of this Alternative include:

- The intersection of 12th Street and Northeast Boulevard is moved slightly north to direct the road away from the river edge, bisecting the existing city-owned vacant parcel along the waterfront. This allows this parcel to be developed both as waterfront open space south of the proposed roadway and commercial redevelopment north of the roadway.
- The existing street grid of 13th Street and North Locust Street and North Church Street south of 14th Street is removed and replaced with the new 12th Street Connector. New intersections with North Church Street and North Locust Street are introduced.
- The 12th Street Connector follows the abandoned 14th Street alignment between North Church Street and Pine Street connecting to the 16th Street Bridge.

Alternative B – This alignment connects 12th Street directly to North Church Street and improves existing 14th Street between Northeast Boulevard and Pine Street. See **Figure 16** (page 25) for a plan view (See also **Appendix D**). Features of this Alternative include:

- Similar to Alternative A, the intersection of 12th Street and Northeast Boulevard is moved slightly north to direct the road away from the river edge and bisecting the existing city-owned vacant parcel along the waterfront. This allows this parcel to be developed both as waterfront open space south of the proposed roadway and commercial redevelopment north of the roadway.
- North Church Street is extended and realigned to curve over to connect with 12th Street at Northeast Boulevard. The existing street grid of 13th Street and North Locust Street and North Church Street south of 14th Street is removed and replaced with the new North Church Street extension. New intersections with 14th Street and North Locust Street are introduced.
- 14th Street is improved between Northeast Boulevard and North Church Street and extended between North Church Street and Pine Street connecting to the 16th Street Bridge. The extension follows the abandoned roadway alignment of 14th Street.

Alternative C – This alignment uses existing roadway alignments with some improvements. See **Figure 17** (page 25) for a plan view (See also **Appendix D**). Features of this Alternative include:

- As opposed to Alternatives A and B, the existing 12th Street intersection remains in place, and east/west through traffic is directed onto Northeast Boulevard and then to turn on 13th Street.
- 13th Street is realigned to curve and connect with North Church Street.
- Similar to Alternative B, 14th Street is improved between Northeast Boulevard and North Church Street and extended between North Church Street and Pine Street connecting to the 16th Street Bridge. The extension follows the abandoned roadway alignment of 14th Street.



Figure 14 - Alternative A



Figure 16 - Alternative B



Figure 17 - Alternative C

A comparison of impacts for each Alternative is shown below in **Table 5**:

Table 5 – Alternative Cost and Impact Comparison			
	Alternative A	Alternative B	Alternative C
Estimated Construction Cost	\$7.71M	\$7.77M	\$7.64M
Commercial Property Impacts (Acres)	0.94	0.98	0.14
Industrial Property Impacts (Acres)	1.14	0.67	0.94
Institutional Property Impacts (Acres)	0.05	0.1	0.07
Vacant / City-Owned Property Impacts (Acres)	3.88	3.37	1.53
Total Right of Way (Acres)	6.01	5.12	2.68
Displacements ¹	2	2	0
Floodplain Impacts (Acres)	7.8	7.9	8.24
Brownfield Impacts (Acres)	1.26	0.74	0.4
¹ Displacements include commercial properties on the 1200 Block of North Locust Street			

C. Intersection Options

A number of options were also considered to be included with each of the Alternative Alignments listed above. These options are developed to address different alternatives for traffic movement and operations at intersections. Options include different lane configurations, traffic calming measures, and roundabouts. Roundabouts are a circular intersection configuration that helps to reduce speed and safety conflicts in comparison to traditional intersections. Traffic entering a roundabout yields to traffic in the circle and to any pedestrians or cyclists crossing at designated crosswalks along the outside of the circle. Traffic in the roundabout is one-way counter-clockwise, which minimizes potential conflicts between turning vehicles. Pedestrians should not cross traffic in the circle since traffic is free flowing.

The options developed for consideration are outlined in **Table 6** on the following page, and some area depicted as options on **Figures 15, 16, and 17**.

Table 6 – Intersection Options

Intersection Location	Reason for Consideration	Base Alternative	Optional Treatment
16th Street at Jessup Street and Pine Street	New 12 th Street Connector will modify the existing intersection	Traditional four-way intersection	Roundabout to improve traffic operations, calm speeding traffic, and introduce a gateway feature
14 th Street at North Church Street	New 12 th Street Connector will modify the existing intersection	Traditional four-way intersection	Roundabout to improve traffic operations, calm speeding traffic, and introduce a gateway feature
12 th Street at Northeast Boulevard	New 12 th Street Connector will modify the existing intersection	Maintain four through lanes on Northeast Boulevard	Provide dedicated left and right turn lanes from north and southbound traffic, with two through lanes on Northeast Blvd.
14 th Street at Northeast Boulevard and Thatcher Street	The diagonal alignment of Northeast Boulevard across a traditional street grid has created an intersection with six “legs”. This combination of roadways converging in one spot creates a traffic operations and safety hazard, and makes pedestrian crossing more difficult.	No change to current conditions	Reconfigure the intersection so that Thatcher Street is cut-off from Northeast Boulevard creating a more traditional four-way intersection between 14 th Street and Northeast Blvd. Access to Thatcher Street remains from 16 th street to the north and 13 th Street from the south.
Vandever Avenue at Northeast Boulevard	This is currently a higher accident intersection with longer queues for turn movements	No change to current conditions	Signal timing adjustments with new turn signal phases to improve the wait time helping to reduce traffic congestion
16 th St at Thatcher Street	This intersection has some constraints with sight distance and speeding traffic.	No change to current conditions	Add sidewalk extension bump outs to help calm traffic, widen the sidewalk, shorten the crosswalk, and improve sight distance
Thatcher Street at Vandever Avenue	This is a higher accident intersection with sight distance constraints	No change to current conditions	Add sidewalk extension bump outs to help calm traffic, widen the sidewalk, shorten the crosswalk, and improve sight distance

6. Traffic Analysis

A. Future Volumes

The existing 2018 traffic volumes were based on traffic counts from the previous 2005 study, and increased by an annual growth factor of 0.25% to develop the future 2040 base volumes. Peak hour trip assignments from future development (which are summarized in **Appendix E**) were added to the future 2040 base volumes to create the 2040 projected peak hour volumes without roadway improvements. Volumes were then adjusted to take into account the alternatives considered. The resulting volumes utilized in the analysis for no build and build alternatives are presented in **Appendix E**.

To account for the new connector road, some additional adjustments were made to the future volumes. Specifically, 60% of traffic utilizing roadways south of the Northeast Boulevard/Vandever Avenue intersection to access downtown Wilmington were redistributed to utilize the new connector road instead. Additionally, 50% of traffic utilizing roadways north of the Northeast Boulevard/Vandever Avenue intersection to access downtown Wilmington were redistributed to utilize the new connector road instead. Also, as the new connector road may attract new drivers to utilize the roadway, the volumes traverses along the new connector road were increased by 10%.

B. Traffic Analysis Methodology

The weekday morning and evening peak hour volumes within the study area were analyzed utilizing Synchro/Simtraffic 10 software, which is a macroscopic traffic analysis and traffic simulation software. The Synchro models were setup to match the existing conditions with respect to roadway geometry, traffic control, traffic flow, and queue lengths. Additionally, each existing peak hour model was calibrated to be consistent with travel time field collected data.

Supplemental analyses in HCS7 software was performed on the potential roundabout locations as well. This was performed in HCS7, which is based on Highway Capacity Manual (HCM) 6th Edition, to maintain consistency with the recommended methodologies from DelDOT (Delaware Department of Transportation) to analyze roundabouts. **Appendix E** summarizes the results from the HCS7 analysis.

C. Traffic Modeling Results

Weekday morning and evening peak hour travel times, delay, levels of service, and 95th percentile results from the study area using Synchro/Simtraffic 10 software are summarized in

Appendix E for the future 2040 cases with and without the alternatives considered. Note, Alternative C was not analyzed as feedback from the public workshop and the stakeholders revealed this alternative to not be preferred. The analyses of each alternative takes into account signal timing and phasing optimizations at the Northeast Boulevard intersections with Vandever Avenue and 12th Street.

Based on the Synchro results, the study intersections for Alternative A would operate at LOS D or better and for Alternative B the study intersections would operate at LOS C or better. Based on the HCS7 results, roundabouts at 12th Street and Church Street as well as at Jessup Street and Pine Street/16th Street intersections would operate at LOS A for both alternatives.

Although the study intersections would operate at acceptable LOS for either alternative, long queue lengths are expected at the Northeast Boulevard and 12th Street intersection. To mitigate the long queue lengths, an additional analysis was performed considering restriping the northbound and southbound Northeast Boulevard approaches to 12th Street to provide one left turn lane, one through lane, and one right turn lane. With this modification, the Northeast Boulevard and 12th Street intersection would operate at LOS C or better for Alternative A and LOS B for Alternative B. Additionally, the long queue lengths along the northbound 12th Street approach would reduce from approximately 520 feet to approximately 310 feet for Alternative A and from approximately 400 feet to 350 feet for Alternative B.

7. Preferred Alternative

A. Preferred Alignment

Alternatives A, B, and C are alignments that each offer community benefits and support the Project Purpose and Need. **Alternative B** is the preferred alignment because it has the most support from the project stakeholders, including representatives from the Wilmington Initiatives Committee and community members who participated in the public outreach activities.

Although Alternative C was the least impactful to existing right-of-way and environmental resources, it is not preferred because it provides an indirect link from 12th Street to the waterfront using existing 12th Street and 13th Street roadways. Alternative C would require more intersections and turn movements that could potentially introduce traffic congestion and safety concerns on Northeast Boulevard. The redevelopment associated with either Alternatives A or B will impact more right-of-way, brownfield properties, and floodplain. However, the roadway redevelopment offers an opportunity to improve existing conditions

through environmental cleanup and stormwater management best practices. Furthermore, the right-of-way acquisition introduces new redevelopment opportunities to support community revitalization and economic growth.

Alternative A and B are both considered favorable by project stakeholders. They both improve access to the waterfront and improve connectivity by extending the roadway network from 12th Street to the 16th Street bridge. However, Alternative B has greater potential for the City to sell surplus right-of-way to private entities for new development. This provides greater potential for the City to collect revenues that can be used for additional public investments within the community, including developing a waterfront park and upgrading sewer infrastructure to avoid or reduce the risk of combined sewer overflow flooding. Alternative A's alignment introduces a new, fairly straight roadway that has greater potential for speeding traffic. Therefore, with consensus from the Wilmington Initiatives Committee, Alternative B is selected as the preferred alignment.

B. Preferred Options

Several options have been considered to improve traffic operations in association with this project. The options recommended to include are as follows:

Traditional 4-way intersection at Jessup/16th Street/Pine Street

- Pros:
 - Simplifies the intersection reconfiguration to a four-way stop.
 - Allows for flexibility to change one-way streets into two-way streets, if this is something the Community wishes to pursue.
 - As roundabouts are uncommon in this area, public education may be needed. A roundabout would be particularly more confusing for pedestrians and cyclists – will need to incorporate clear design markings to guide users
 - Fewer Right-of-Way impacts than the roundabout option.
- Cons:
 - Private driveway for Masley Gloves property (1601 Jessup Street) would need to be relocated partially onto the adjacent property, where the driveway can be shared.

Roundabout at Church Street/14th Street

- Pros:
 - Creates a community gateway feature – possibly with landscaping or artwork in the center circle
 - Provides traffic calming by reducing speeds of vehicles approaching intersection

- Likelihood of severe angle type crashes is reduced
- Capacity of roundabout is expected to accommodate projected 2040 future volumes
- Reduces the need for turn lanes with high turn movement volumes anticipated
- Cons:
 - As roundabouts are uncommon in this area, public education may be needed
 - Particularly more confusing for pedestrians and cyclists – will need to incorporate clear design markings to guide users
 - Could be difficult for trucks to maneuver within roundabout

Provision of protected/permission left turn signal phasing at Northeast Boulevard/Vandever Avenue

- Reduce risk of left turn crashes
- Capacity at intersection can accommodate provision of protected turn phase without significantly impacting delay along Northeast Boulevard
- Existing geometry would allow for simple implementation with only changing the signal equipment to accommodate protected left turn phasing

Modify Northeast Boulevard approaches to 12th Street

- Northbound and southbound Northeast Boulevard approaches to 12th Street would be restriped to provide one left turn lane, one through lane, and one right turn lane
- Reducing southbound Northeast Boulevard approach to one through lane would not significantly impact traffic operations
- Signal timing along Northeast Boulevard would be modified to provide protected/permissive left turn signal phasing, which would reduce occurrence of left turn crashes
- Provision of protected/permissive left turn phasing would not significantly impact traffic operations
- Maintain shoulders for bicycle access, consider adding buffer striping or monolithic feature for protected bike lanes along Northeast Boulevard

Traffic Calming on Thatcher Street

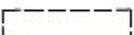
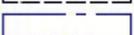
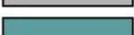
- Closing access to Thatcher from Northeast Boulevard was not supported by the Community
- Sidewalk extensions at intersections with 16th St and Vandever Avenue can help calm traffic, improve pedestrian safety, and improve sight distance.

The preferred Alternative with Preferred Options are shown in **Figure 18** on the following page and **Appendix F**:



Figure 18 - Preferred Alternative

Legend

-  Public Green Space
-  Redevelopable Area
-  Building Displacement
-  Crosswalk
-  Parcel Line
-  Limit of Disturbance
-  Roadway
-  Bike Path
-  Sidewalk
-  Pavement Removal

C. Conceptual Cost Estimate

Description	Unit	Quantity	Unit Cost	Total Cost
Grading				
Class I Excavation, Full Depth, 12"	CY	10,309	\$ 30.00	\$ 309,281.67
Clearing and Grubbing	LS	1	\$ 50,000.00	\$ 50,000.00
Common Borrow	CY	5,000	\$ 15.00	\$ 75,000.00
Pavement Removal	CY	439	\$ 20.00	\$ 8,781.11
Furnished Topsoil 4" Depth	SY	13,224	\$ 4.00	\$ 52,894.92
				\$ 423,957.70
Paving and Shoulders				
Full Depth Pavement (Assume 8" Depth)	TON	4,582	\$ 150.00	\$ 687,292.59
Concrete Sidewalk/Path, 5" Depth	SF	67,403	\$ 7.00	\$ 471,821.00
Graded Aggregate Base Course, 8"	SY	16,495	\$ 18.00	\$ 296,910.40
Type A Concrete Curb and Gutter	LF	9,722	\$ 30.00	\$ 291,660.00
Driveway Apron	SF	1,347	\$ 90.00	\$ 121,230.00
				\$ 1,868,913.99
			Subtotal 1	\$ 2,292,871.69
Traffic				
Traffic Signal (12 th St at Northeast Blvd)	EA	1	\$ 200,000.00	\$ 200,000.00
Lighting - Pedestrian Scale (40' On Center)	EA	210	\$ 3,000.00	\$ 630,000.00
				\$ 830,000.00
Contingent Categories				
Mobilization, Maintenance of Traffic		20% of Subtotal 1		\$ 472,974.34
Erosion and Sediment Control		5% of Subtotal 1		\$ 118,243.58
Drainage and Stormwater Management		25% of Subtotal 1		\$ 591,217.92
Hazardous Materials Remediation		10% of Subtotal 1		\$ 236,487.17
Traffic Markings and Signage		5% of Subtotal 1		\$ 118,243.58
Utilities & Conduit		8% of Subtotal 1		\$ 189,189.74
Landscape		6% of Subtotal 1		\$ 141,892.30
				\$ 1,868,248.64
			Subtotal 2	\$ 5,063,120.33
Contingency		30% of Subtotal 2		\$ 1,518,936.10
			Subtotal 3	\$ 6,582,056.43
Design and Permitting		15% of Subtotal 3		\$ 987,308.46
Construction Management		10% of Subtotal 3		\$ 151,893.61
				\$ 1,139,202.07
Total Conceptual Construction Cost (without Right of Way)				\$ 7,721,258.50

D. Direct, Indirect, and Cumulative Effects

The 12th Street Connector Project will introduce several community benefits and has significant potential to promote new development and economic growth in Northeast Wilmington. The public investment for this project offers several direct benefits to the community including:

- Improved transportation infrastructure
- Improved traffic operations
- Improved pedestrian and bicycle access and safety
- Improved lighting
- Improved streetscape aesthetics
- Integration of stormwater management and environmental best practices

These direct effects support indirect benefits to the community including:

- Improved mobility and community cohesion
- Improved access to potential redevelopment sites
- Improved safety and security
- Improved sense of place
- Reduced risk of flooding
- Reduced risk of exposure to pollutants and hazardous materials

The cumulative benefits over time can have a significant improvement to the community. An economic analysis incorporated as part of the EPA's **Area-Wide Brownfield Redevelopment Study** for the same area has shown that the public investment in the 12th Street Connector can attract significant job growth and redevelopment opportunities. This economic growth would support the existing community with new services and jobs and would not require community displacement. The 12th Street Connector can also lead to additional public investments for parkland offering recreational and environmental enhancements to further benefit the community.

The market assessment for the **Area-Wide Brownfield Redevelopment Study** found there is an unmet demand for some commercial and housing redevelopment, and a projected demand in the future for more growth. Within the 20-year planning horizon, the projected market demand includes:

- Housing – New housing should be a complimentary style to existing housing and offer a combination of market rate and affordable housing
 - Rehabilitate existing homes in need of repairs
 - Condominiums / town homes – up to 72 units
 - Modest rate rental housing – up to 150 units

- Affordable rental housing – should be combined as smaller units within modest rate housing developments
- Retail Development – Over 26,000 square feet of retail can be absorbed into the Study Area to meet the projected market demand
 - Restaurants
 - Supermarket
 - Hardware store
 - Pharmacy and medical supplies store
 - Garden center
 - Apparel/shoe stores
 - Sporting goods stores and equipment rentals (such as bike shop)
 - Home furnishing stores
- Hotel – Mid-scale to upper-scale waterfront hotel up to 100 rooms
- Recreation – Open space should be publicly accessible with opportunities for both active and passive recreation and should incorporate environmental enhancements, particularly along the Brandywine River shoreline.
 - Trails
 - Playgrounds
 - Kayak/Canoe Launch with opportunity for a commercial “outfitter” operation on the waterfront offering retail equipment and instructional services
 - Open space for community festivals and “Pop Up” events, such as a farmer’s market or flea market
- Agriculture – Consider urban garden and/or a plant nursery as part of public open space

New office and industrial flex space is not recommended for the area because the area market is already saturated with these uses.

8. Next Steps

The 12th Connector Study has been intended to serve as a conceptual plan and preliminary NEPA analysis. More detailed preliminary design and NEPA analysis will be required to obtain NEPA approval and advance this project into final design and ultimately construction. After the completion of the 12th Street Connector Transportation Improvement Study, the following steps are anticipated to advance the project to completion:

- Preliminary Engineering and NEPA Documentation – Approximately 18-24 months
 - Engage with the Federal Highway Administration and regulatory agencies to initiate NEPA scoping and documentation
 - Continue ongoing public engagement

- Conduct topographic survey and metes and bounds survey to confirm existing topographic features and property lines
 - Conduct detailed environmental inventory with field delineations
 - Perform Environmental Site Assessments to determine a presence of contaminated or hazardous materials
 - Develop a floodplain model and determine grading, limit of disturbance, and hydrology patterns to minimize flood impacts.
 - Conduct geotechnical investigations for pavement conditions and soil structure and characterization.
 - Conduct utility investigations
 - Refine Traffic Analysis
 - Update traffic counts and modeling projections
 - Assess one-way or two-way movements for streets within the Study Area and potential impacts beyond the Study Area
 - Reassess intersection configurations and signal phasing based on updated counts and modeling projections
 - Refine concept plans
 - Establish and refine roadway stationing
 - Refine horizontal alignment
 - Establish a vertical alignment
 - Develop preliminary drainage and stormwater management plan
 - Develop preliminary grading
 - Establish a Limit of Disturbance
 - Identify areas for right of way acquisition
 - Assess environmental impacts and mitigation requirements
 - Coordinate any potential utility relocations with utility companies
 - Update project cost estimate
 - Coordinate with Federal Highway Administration to develop and approve a NEPA Document
 - Secure project funding for final design and construction
- Final Design and Environmental Compliance – Approximately 18-24 months
 - Continue ongoing public engagement
 - Prepare Final Design Plans
 - Roadway
 - Structures
 - Drainage and Stormwater Management
 - Erosion and sediment control
 - Lighting

- Utility plans and relocations (if needed)
 - Traffic signing, striping, and signalization
 - Landscaping
 - Conduct a Phase III Environmental Assessment and develop a brownfield cleanup plan
 - Develop a flood mitigation plan
 - Complete environmental permits in coordination with regulatory agencies
 - Purchase right of way
 - Prepare construction bid documents
 - Advertise the Project for Construction
- Construction – Approximately 24-36 months with ongoing public engagement

9. Funding Opportunities

Funding for the 12th Street Connector is already accounted for in the WILMACPO Constrained Long Range Plan. Once funding is allocated, additional funding may be necessary for project elements. Federal, State, and local appropriations are anticipated to advance this project forward, and the project may qualify for supplemental grant programs to help offset the state and local funding. Potential funding opportunities for the 12th Street Connector include:

Federal Funding Opportunities:

- BUILD Discretionary Grant² – Previously known as the TIGER Grant, this program is a competitive and merit-based federal funding program for transportation projects that play a critical role in economic development. Projects must be over \$6.25 million, and should also involve innovative technologies, explore ways to deliver projects faster while also saving on construction costs, and make needed investments in the Nation's infrastructure.
- Congestion Mitigation and Air Quality Improvement (CMAQ) Grant³ - CMAQ funds may be used for a transportation project or program that is likely to contribute to the attainment or maintenance of a national ambient air quality standard, with a high level of effectiveness in reducing air pollution, and that is included in the metropolitan planning organization's (MPO's) current transportation plan and transportation improvement program (TIP) or the current state transportation improvement program (STIP) in areas without an MPO. Reducing traffic congestion and improving pedestrian, bicycle, and transit mobility are supported by the CMAQ program. The pedestrian,

² <https://www.transportation.gov/BUILDgrants/about>

³ <https://www.fhwa.dot.gov/fastact/factsheets/cmaqfs.cfm>

bicycle, and transit components of this project may qualify for this funding, but the roadway construction will not qualify.

- EPA Brownfield Grants⁴ - The EPA Brownfield Area-Wide Planning Study Grant has already been used to develop a master plan for community revitalization efforts, and additional EPA grants may be pursued as the initiatives progress into more detailed planning, design, and implementation. These may include:
 - Site-specific Assessment Grant - This program is appropriate when a specific site is identified, and the applicant plans to spend grant funds on this one site only. An applicant may request up to \$200,000 to assess a site contaminated by hazardous substances, pollutants, contaminants (including hazardous substances co-mingled with petroleum), and/or petroleum. Although some environmental assessments have already been completed for sites within the Study Area, a specific Environmental Site Assessment for this project has not been done. This grant may be appropriate for cleanup activities required to construct the roadway improvements.
 - Revolving Loan Fund Grant – This program provides funding for a grant recipient, such as the City of Wilmington, to capitalize a revolving loan fund and to provide subawards to carry out cleanup activities at brownfield sites. When loans are repaid, the loan amount is returned into the fund and re-lent to other borrowers, providing an ongoing source of capital within a community. This may be appropriate for ongoing cleanup activities associated with the roadway improvements and new development that follows.
 - Cleanup Grant – These grants are competitively awarded and provide funding to carry out cleanup activities at brownfield sites. An applicant may request up to \$500,000 to address one brownfield site, or multiple brownfield sites, contaminated by hazardous substances, pollutants, contaminants (including hazardous substances co-mingled with petroleum), and/or petroleum. An applicant must own the site for which it is requesting funding. The performance period for these grants is three years.
 - Multipurpose Grant – This program provides funding to carry out a range of eligible assessment and cleanup activities with a proposed target area. An applicant can apply for up to \$800,000 and should demonstrate how grant funds will result in at least one Phase II site assessment, brownfield cleanup site, and revitalization plan if a plan is not already in place. This project does already have a plan in place with the *Area-Wide Brownfield Redevelopment Study*. The performance period for these grants is five years.

⁴ <https://www.epa.gov/brownfields/types-brownfields-grant-funding>

- Environmental Workforce Development and Job Training Grant – This program allows local governments, non-profits, and other organizations to recruit, train, and place unemployed and under-employed residents of areas affected by the presence of brownfields. Through this program, graduates develop the skills needed to secure full-time, sustainable employment in various aspects of hazardous and solid waste management and within the larger environmental field, including sustainable cleanup and reuse, water quality improvement, chemical safety, and emergency response. These green jobs reduce environmental contamination and build more sustainable futures for communities. Based on US Census data presented in Section 4 of this report, this community has a high level of underemployed people who can benefit from this program and work locally in their community to improve environmental health as a part of the redevelopment effort.
- Technical Assistance, Training, and Research Grant – This competitive grant program provides financial assistance for training, research, and technical support to facilitate the inventory, assessment, and remediation of brownfield sites. The grant can also be used to support community engagement efforts and site preparation for redevelopment.
- Transportation Alternatives (TA) Grant⁵ - The TA program has set-aside funds for projects and activities that encompass a variety of smaller-scale transportation projects such as pedestrian and bicycle facilities, recreational trails, safe routes to school projects, community improvements such as historic preservation and vegetation management, and environmental mitigation related to stormwater and habitat connectivity. These funds may be considered for components related improvements in the 12th Street Connector Study Area, but not for the main roadway project itself.

State and Local Financing Opportunities:

- Transportation Improvement District (TID)⁶ – DeIDOT’s TID program offers a collaborative planning method to forecast, estimate, and implement transportation improvements for areas where new development and redevelopment is occurring or expected to occur. The transportation investments are needed to support and keep pace with anticipated growth. TIDs help to define the expectations from developers up front, streamline the development review process, and equitably distribute impact fees for new development to provide a funding source for public infrastructure. TIDs require a partnership with local jurisdictions to develop land use projections and adopt the TID

⁵ <https://www.fhwa.dot.gov/fastact/factsheets/transportationalternativesfs.cfm>

⁶ <https://www.deldot.gov/Programs/transportation-improvement-districts/index.shtml>

as part of the Comprehensive Plan. Costs for supporting infrastructure are estimated and divided between public and private partners within the TID boundary.

- Development Impact Fees – Impact fees are costs imposed on private developers by a municipality to pay for supporting public infrastructure. As noted above, TIDs are a type of impact fee. However, the City of Wilmington can also impose an impact fee outside of the DeIDOT TID program and utilize the funding for transportation investments as well as other public infrastructure such as utilities, parkland, or schools.
- Tax Increment Financing (TIF) – This is a funding mechanism that can be used to allocate money up front for public investments that are expected to increase property tax revenues in the future after the project is completed. The anticipated growth in property values would be dependent on the public investments to support that growth. TIF programs have successfully been used to fund transportation, utility, and parkland infrastructure. The funding is essentially borrowed against revenues that are expected in the future, and helps provide some assurance to attract private developers without forcing them to pay extraordinary costs upfront for supporting infrastructure. However, it is important to consider an accurate projection of anticipated revenue growth to ensure a balance in the level of investments spent.

12th Street Connector Transportation Improvement Study

Federal Highway Administration - Planning and Environmental Linkages Questionnaire https://www.environment.fhwa.dot.gov/env_initiatives/pe/pe_quest.aspx		
Topic	Section Reference	Comments
1. Background:		
a. Who is the sponsor of the PEL study? (state DOT, Local Agency, Other)	Part 1. A.	
b. What is the name of the PEL study document and other identifying project information (e.g. sub-account or STIP numbers, long-range plan, or transportation improvement program years)?		12 th Street Connector Transportation Improvement Study
c. Who was included on the study team (Name and title of agency representatives, consultants, etc.)?	Part 1. A.	
d. Provide a description of the existing transportation facility within the corridor, including project limits, modes, functional classification, number of lanes, shoulder width, access control and type of surrounding environment (urban vs. rural, residential vs. commercial, etc.)	Part 1.B. and C. and Part 4.A.	
e. Provide a brief chronology of the planning activities (PEL study) including the year(s) the studies were completed.	Part 2.A.	
f. Are there recent, current, or near future planning studies or projects in the vicinity? What is the relationship of this project to those studies/projects?	Part 1.E. and F.	
2. Methodology used:		
a. What was the scope of the PEL study and the reason for completing it?	Part 2 and Part 6	Yes
b. Did you use NEPA-like language? Why or why not?		
c. What were the actual terms used and how did you define them? (Provide examples or list)		Purpose and Need, Existing Environment, Environmental Justice, Alternatives Considered, Options, No Build and Build, Indirect and Cumulative Effects, and Preferred Alternative
d. How do you see these terms being used in NEPA documents?		These analyses are described in the report for reference in a future NEPA study

12th Street Connector Transportation Improvement Study

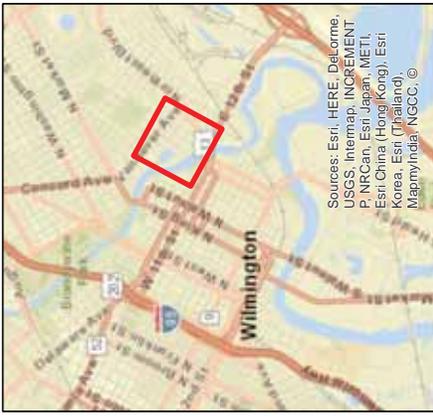
Federal Highway Administration - Planning and Environmental Linkages Questionnaire https://www.environment.fhwa.dot.gov/env_initiatives/pe/pe_quest.aspx		
Topic	Section Reference	Comments
e. What were the key steps and coordination points in the PEL decision-making process? Who were the decision-makers and who else participated in those key steps? For example, for the corridor vision, the decision was made by state DOT and the local agency, with buy-in from FHWA, the USACE, and USFWS and other resource/regulatory agencies.	Part 2.B.	
f. How should the PEL information be presented in NEPA?		The PEL Study may be attached
3. Agency coordination:		
a. Provide a synopsis of coordination with Federal, tribal, state and local environmental, regulatory and resource agencies. Describe their level of participation and how you coordinated with them.	Part 2.B.	
b. What transportation agencies (e.g. for adjacent jurisdictions) did you coordinate with or were involved during the PEL study?	Part 2.B.	
c. What steps will need to be taken with each agency during NEPA scoping?	Part 7.D.	
4. Public coordination:		
1. Provide a synopsis of your coordination efforts with the public and stakeholders.	Part 2.C.	
5. Purpose and Need for the PEL study:		
a. What was the scope of the PEL study and the reason for completing it?	Part 1 and 1.A.	
b. Provide the purpose and need statement, or the corridor vision and transportation goals and objectives to realize that vision.	Part 3	
c. What steps will need to be taken during the NEPA process to make this a project-level purpose and need statement?	Part 7.D.	
6. Range of alternatives:		
a. What types of alternatives were looked at?	Part 6	
b. How did you select the screening criteria and screening process?	Part 7.A.	
c. For alternative(s) that were screened out, briefly summarize the reasons for eliminating the alternative(s). (During the initial screenings, this generally will focus on fatal flaws.)	Part 7.A.	
d. Which alternatives should be brought forward into NEPA and why?	Part 7.A and B.	

12th Street Connector Transportation Improvement Study

Federal Highway Administration - Planning and Environmental Linkages Questionnaire https://www.environment.fhwa.dot.gov/env_initiatives/pe/pe_quest.aspx		
Topic	Section Reference	Comments
e. Did the public, stakeholders, and agencies have an opportunity to comment during this process?	Part 2.B. and C.	
f. Were there unresolved issues with the public, stakeholders, and/or agencies?		No
7. Planning assumptions and analytical methods:		
a. What is the forecast year used in the PEL study?	Part 6.A.	
b. What method was used for forecasting traffic volumes?	Part 6.B.	
c. Are the planning assumptions and the corridor vision/purpose and need statement consistent with each other and with the long-range transportation plan? Are the assumptions still valid?	Part 6.A.	
d. What were the future year policy and/or data assumptions used in the transportation planning process related to land use, economic development, transportation costs, and network expansion?	Part 6.A. and B.	
8. Environmental resources (wetlands, cultural, etc.) reviewed.		
a. In the PEL study, at what level of detail was the resource reviewed and what was the method of review?	Part 4	
b. Is this resource present in the area and what is the existing environmental condition for this resource?	Part 4	
c. What are the issues that need to be considered during NEPA, including potential resource impacts and potential mitigation requirements (if known)?	Part 7.E.	
d. How will the planning data provided need to be supplemented during NEPA?	Part 7.E.	
9. List environmental resources you are aware of that were not reviewed in the PEL study and why. Indicate whether or not they will need to be reviewed in NEPA and explain why.		None known based on available desktop data sources
10. Were cumulative impacts considered in the PEL study? If yes, provide the information or reference where the analysis can be found.	Part 7.D.	

12th Street Connector Transportation Improvement Study

Federal Highway Administration - Planning and Environmental Linkages Questionnaire https://www.environment.fhwa.dot.gov/env_initiatives/pe/pe_quest.aspx		
Topic	Section Reference	Comments
11. Describe any mitigation strategies discussed at the planning level that should be analyzed during NEPA.		A floodplain study should be conducted to consider floodplain impacts, environmental remediation should be considered for brownfield sites
12. What needs to be done during NEPA to make information from the PEL study available to the agencies and the public? Are there PEL study products which can be used or provided to agencies or the public during the NEPA scoping process?		The PEL Study will be available to agencies involved in the planning and design process
13. Are there any other issues a future project team should be aware of?		The Study Area includes an Environmental Justice Population, and engagement will be necessary to ensure the community is not disproportionately impacted. The Study Area also has high-voltage utility lines and a combined sewer system that should be considered during the design process.



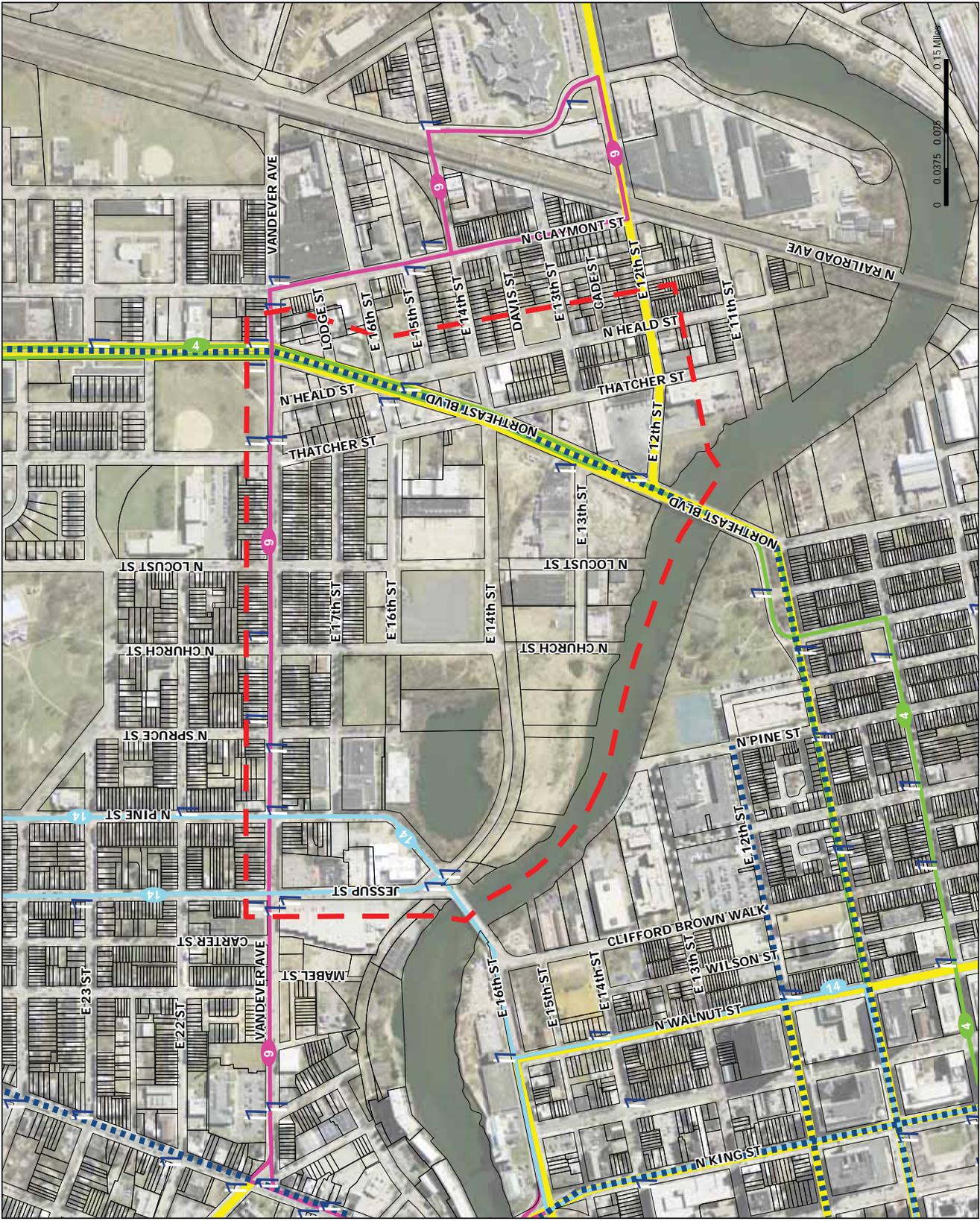
Multi Modal Transportation Connector

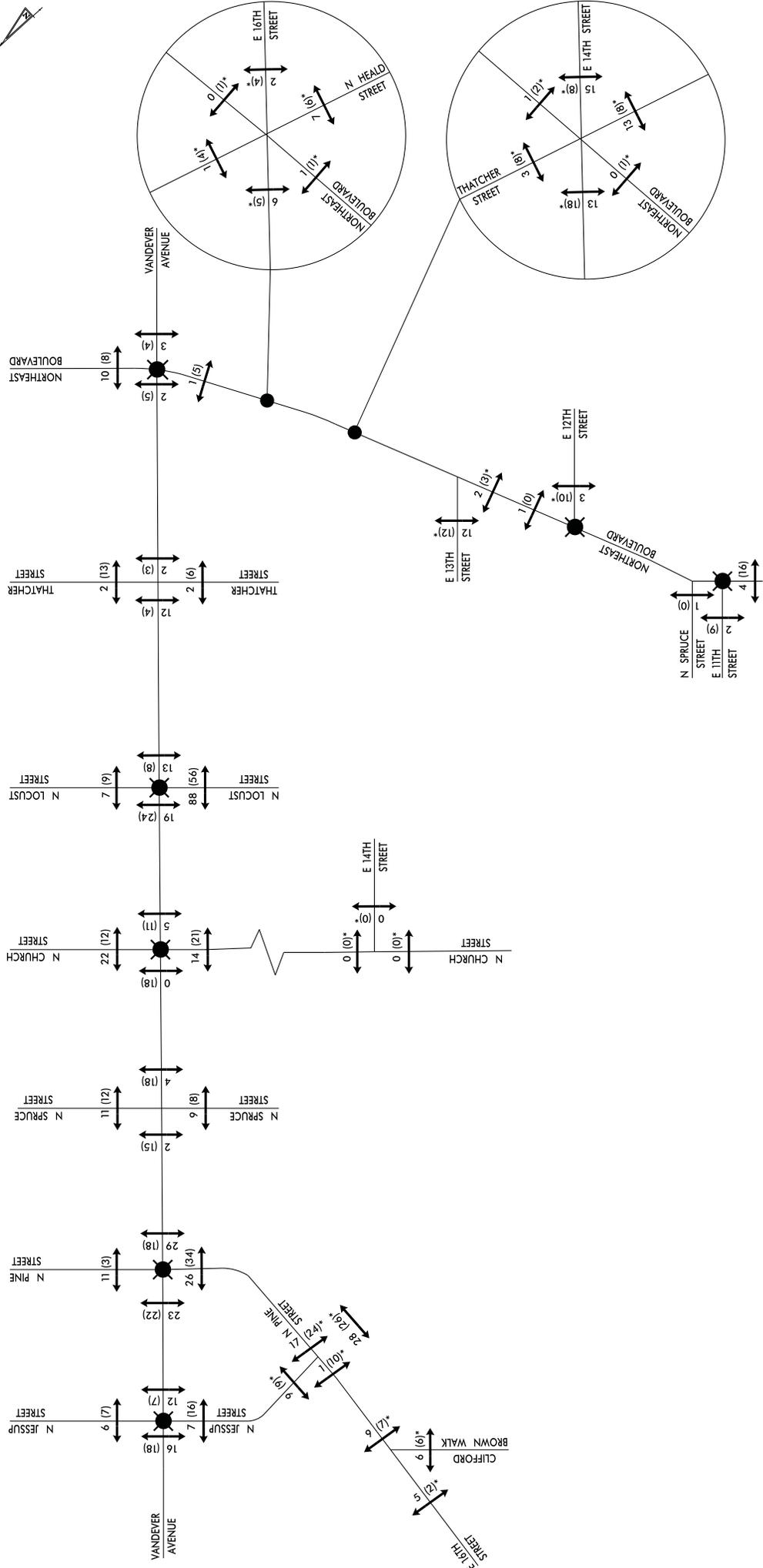
12th Street Connector

- Legend**
- Study Area
 - Parcel¹
 - ↔ Dart Bus Stops²
 - Secondary Freight Route
 - Bike Route²
- Bus Routes²**
- Route 9 - Boxwood Rd/ Broom St./Vandever Ave.
 - Route 4 - Prices Corner- Wilmington-Edgemoor
 - Route 14 - Wilmington/DE 9



Map Updated: 6/22/2018
 Data Sources:
¹New Castle County
²Stromberg / Garrigan & Associates





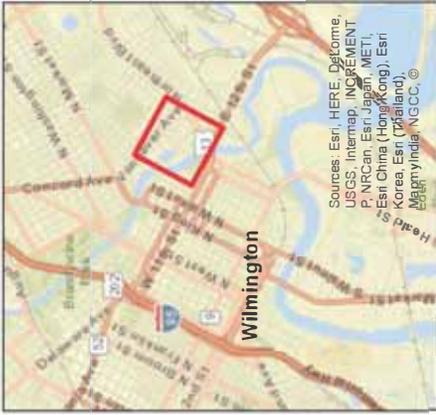
LEGEND

- XX (XX) AM (PM) PEAK PEDESTRIAN VOLUMES
- EXISTING ROADWAY
- EXISTING TRAFFIC SIGNAL
- INDICATES LOCATION WHERE NO CROSSWALK EXISTS



2018 EXISTING PEDESTRIAN PEAK HOUR VOLUMES

12TH STREET CONNECTOR
CITY OF WILMINGTON
NEW CASTLE COUNTY, DELAWARE



Sources: Esri, HERE, DeLorme, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Taiwan), Esri (India), NGCC, ©

Crash Data

12th Street Connector

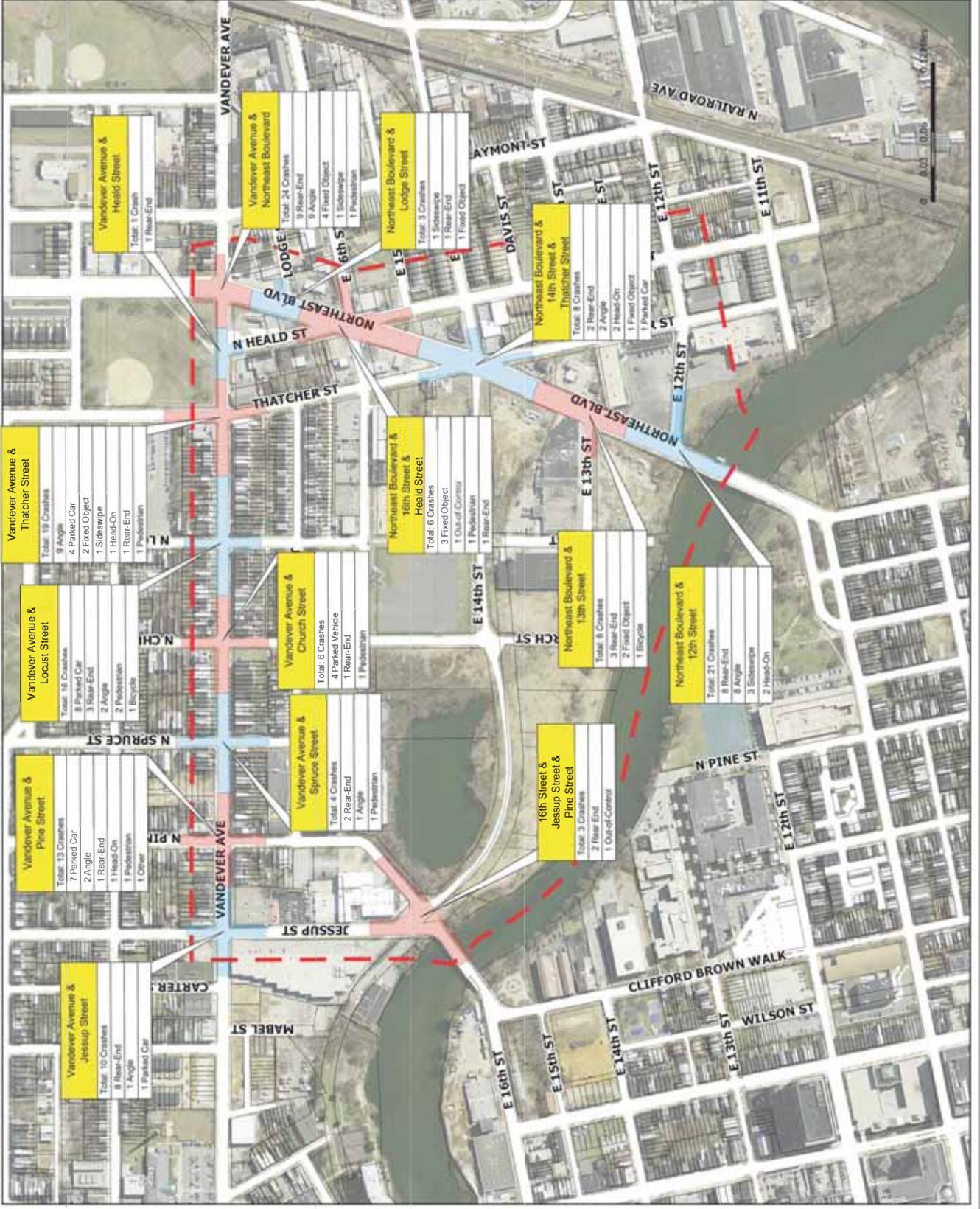
April 2015 - April 2018

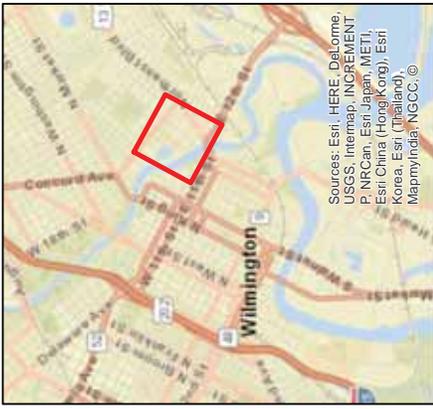
Legend

- Study Area
- Parcel¹
- Project Area²



Map Updated: 6/20/2018
 Data Sources:
¹ New Castle County
² DelDOT





Existing Land Use

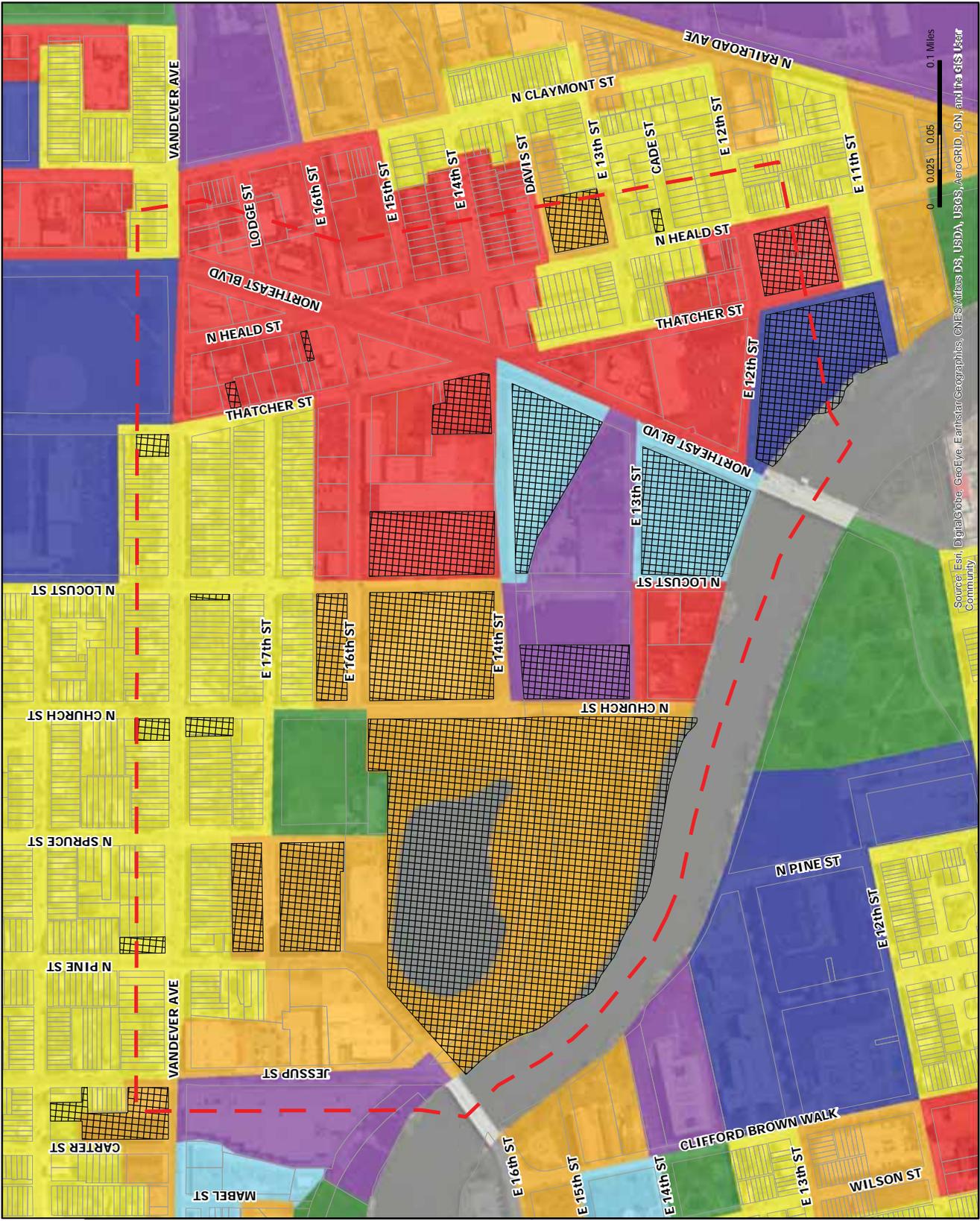
12th Street Connector

Legend

- Study Area ¹
- Vacant Properties (2018) ¹
- Parcels ²
- 2012 New Castle County Land Use ³
- Residential
- Urban
- Transitional
- Commercial
- Industrial
- Utilities
- Institutional
- Open Space



Map Updated: 2/28/2019
¹ JMT, Vacant Properties field verified May 2018, ² New Castle County, ³ Delaware Department of Natural Resources and Environmental Control



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Community Features

12th Street Connector

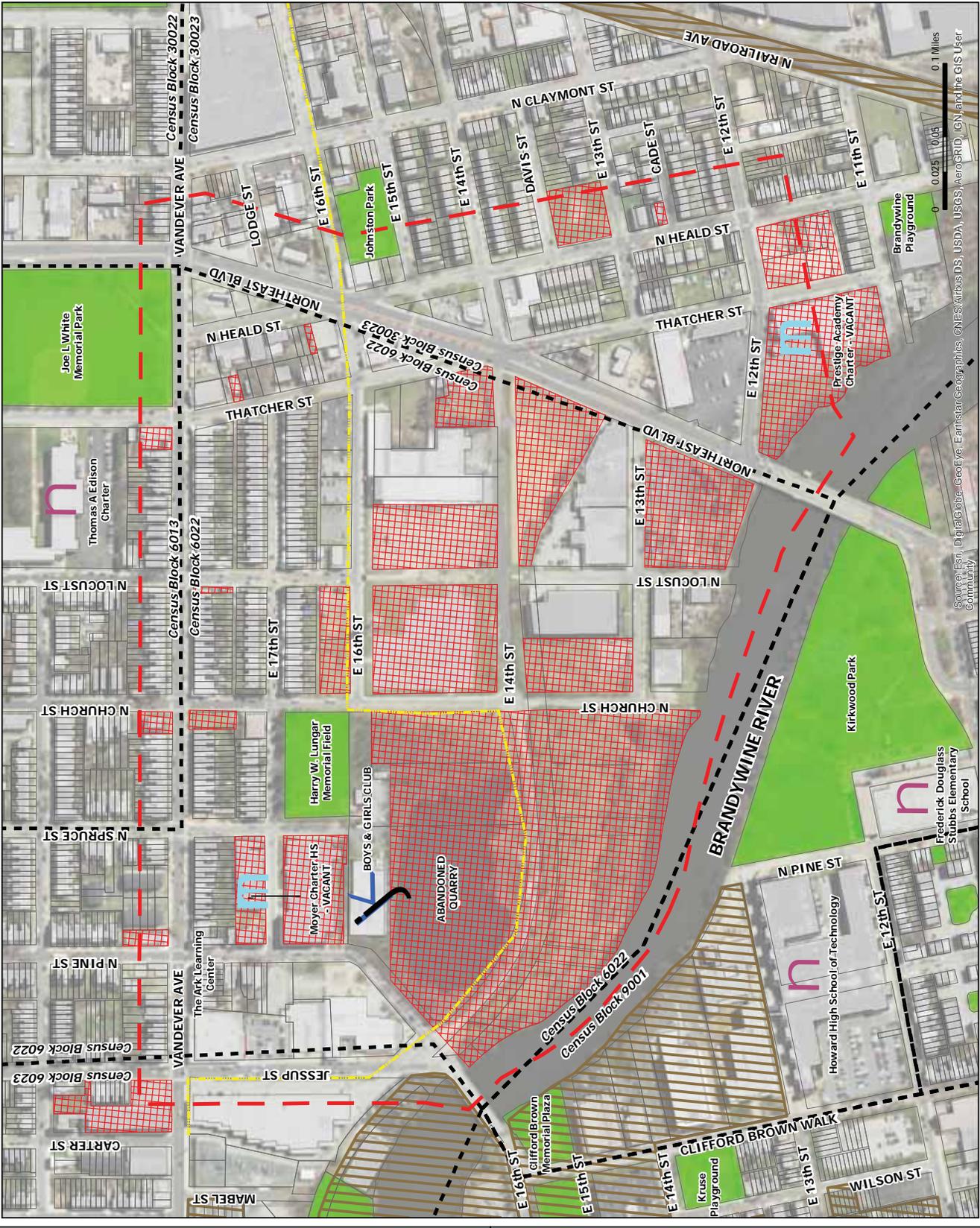
Legend

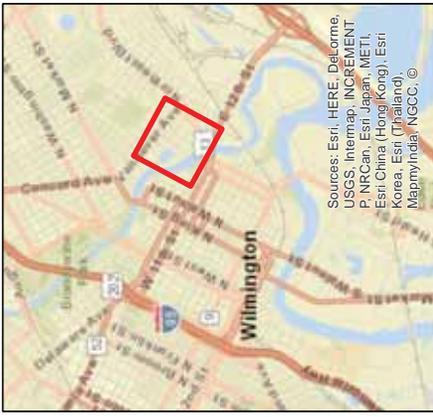
- Study Area
- Census Block Boundary (2017)
- Community Center
- Occupied School
- Vacant School
- High Voltage Utility Line
- Vacant Properties (2018)
- Parcel¹
- National Register of Historic Districts²
- Parks / Recreation¹
- Building Footprint



Map Updated: 2/26/2019

Data Sources:
¹New Castle County
²First Map Delaware





Environmental Features

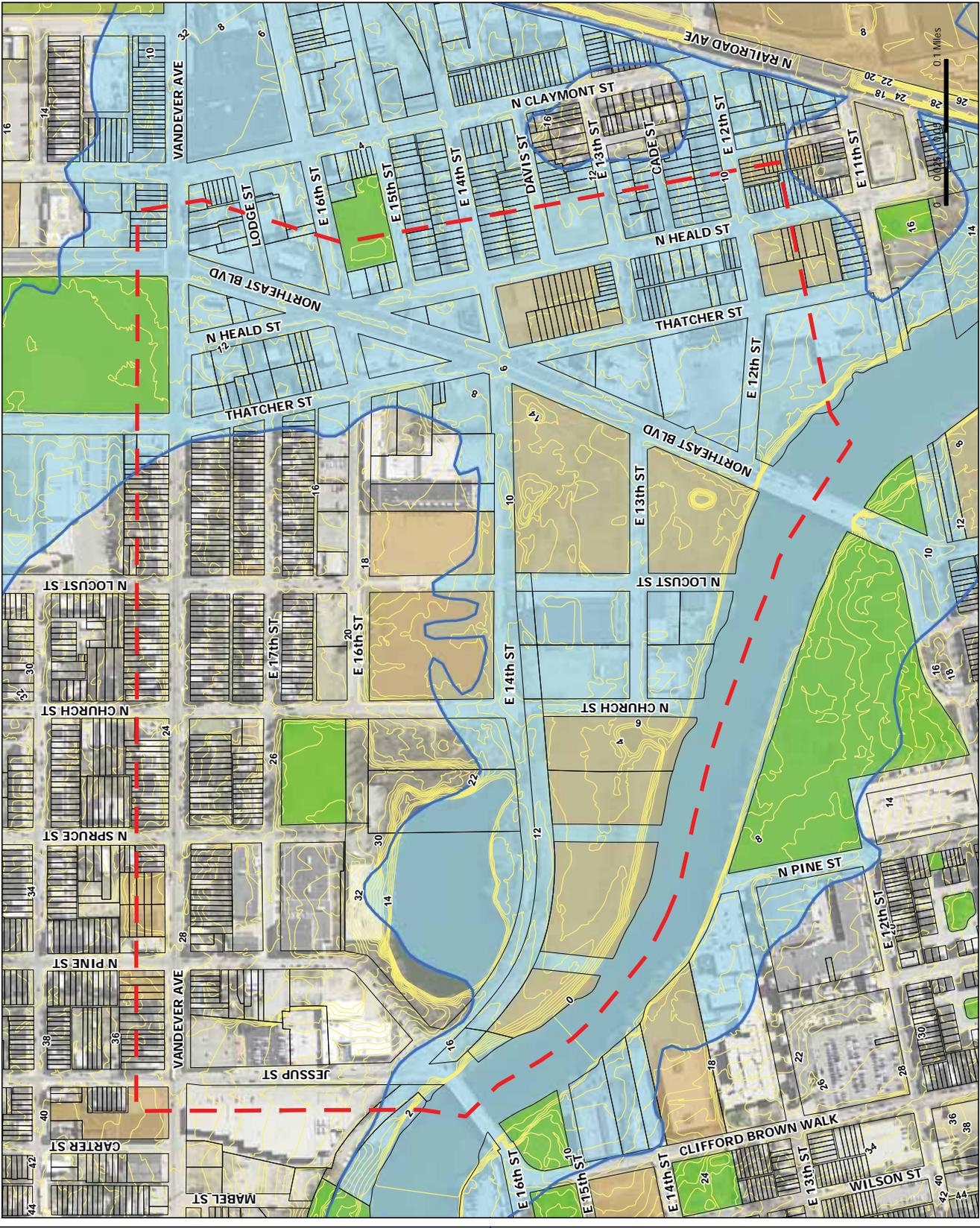
12th Street Connector

Legend

- Study Area
- 2' Contour Line²
- Parcel¹
- Brownfield²
- 100 Year Floodplain²
- Parks / Recreation¹



Map Updated: 6/22/2018
Data Sources:
¹New Castle County
²Stromberg / Garrigan & Associates
³First Map Delaware

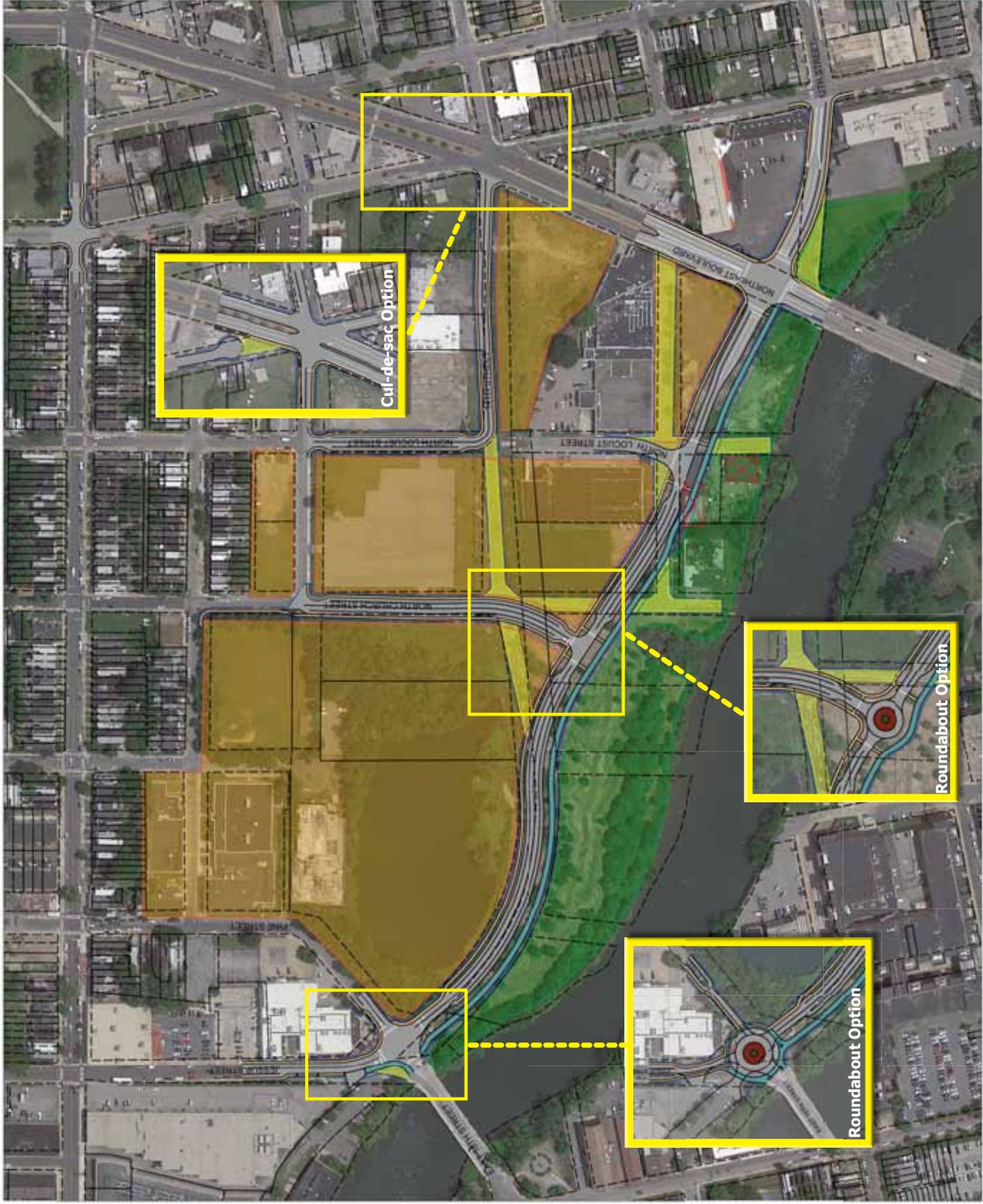


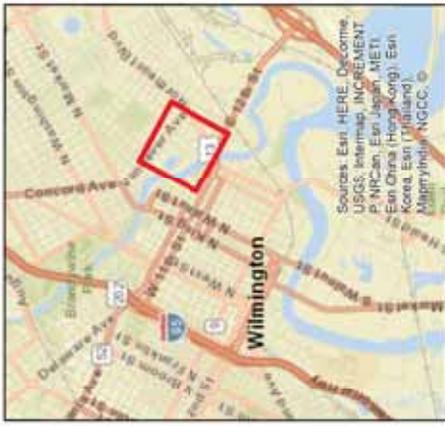


Alternative A 12th Street Connector

- Legend**
- Public Green Space
 - Development Space
 - Building Displacement
 - Crosswalk
 - Parcel Line
 - Limit of Disturbance
 - Roadway
 - Bike Path
 - Sidewalk
 - Pavement Removal

Map Updated: 1/2/19



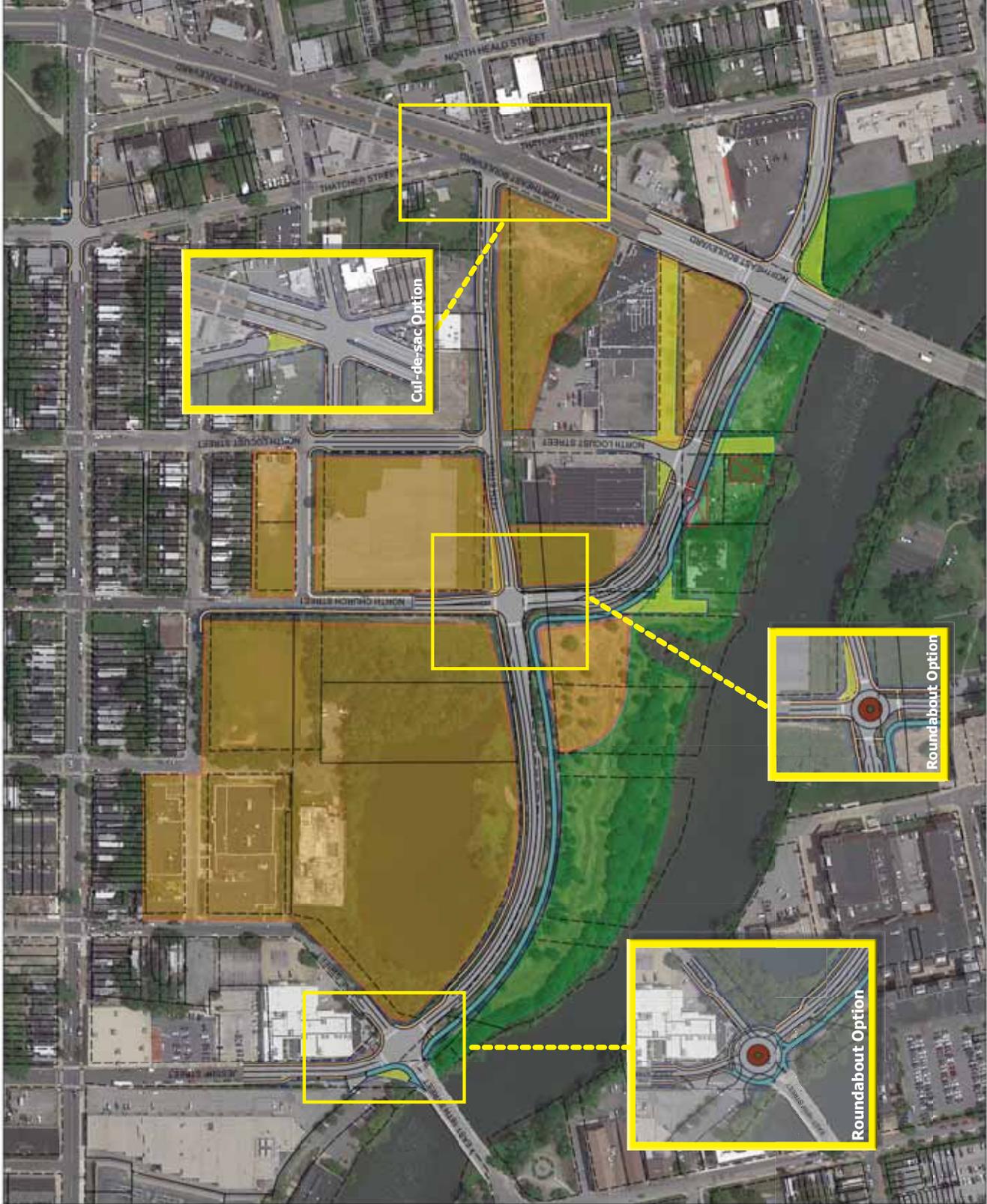


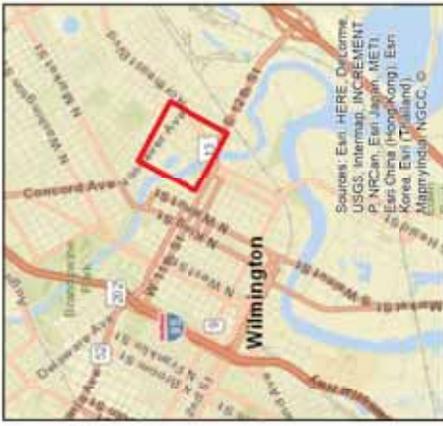
Alternative B 12th Street Connector

- Legend**
- Public Green Space
 - Development Space
 - Building Displacement
 - Crosswalk
 - Parcel Line
 - Limit of Disturbance
 - Roadway
 - Bike Path
 - Sidewalk
 - Pavement Removal



Map Updated: 1/2/19





Alternative C 12th Street Connector

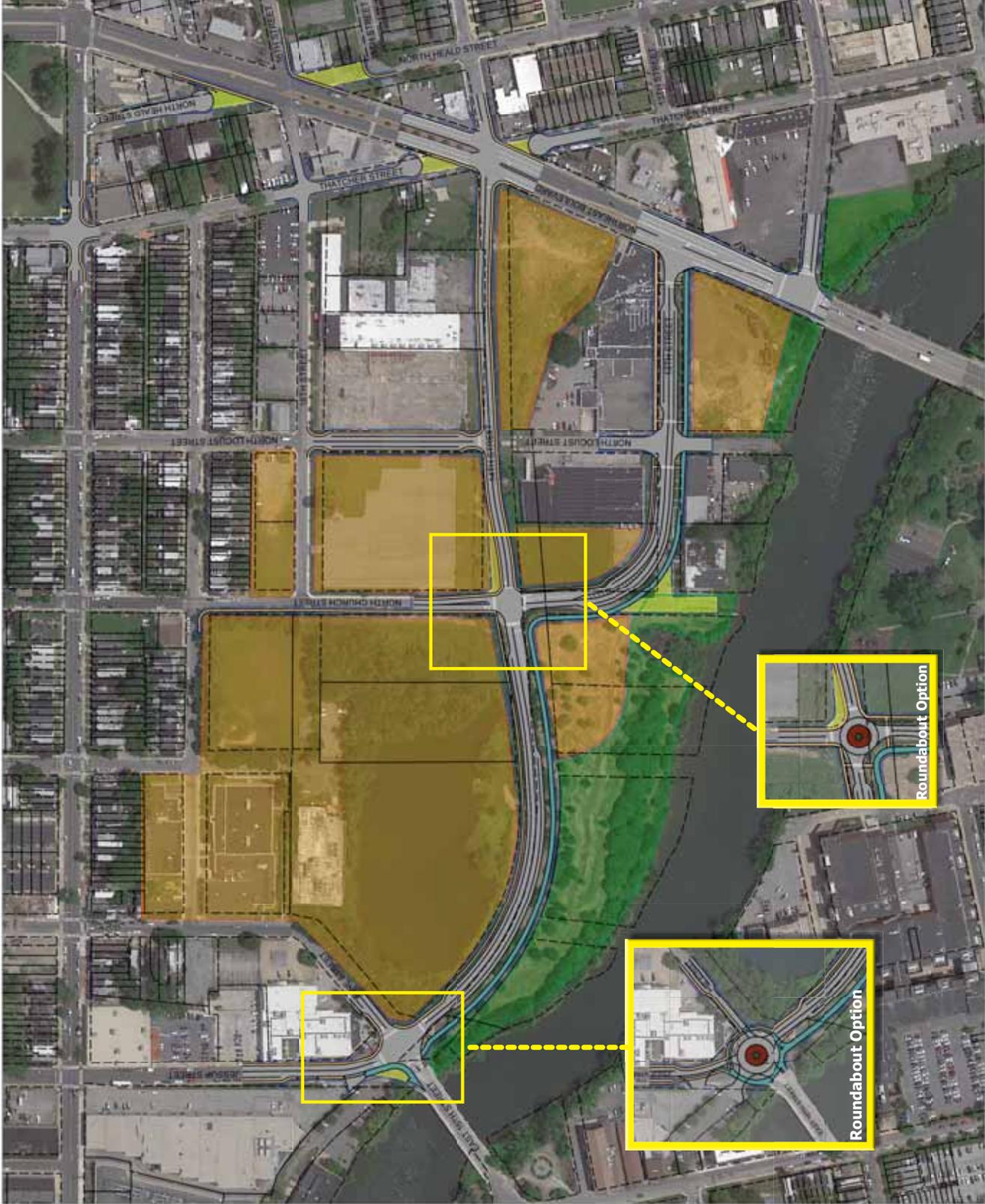
- Legend**
- Public Green Space
 - Development Space
 - Building Displacement
 - Crosswalk
 - Parcel Line
 - Limit of Disturbance
 - Roadway
 - Bike Path
 - Sidewalk
 - Pavement Removal

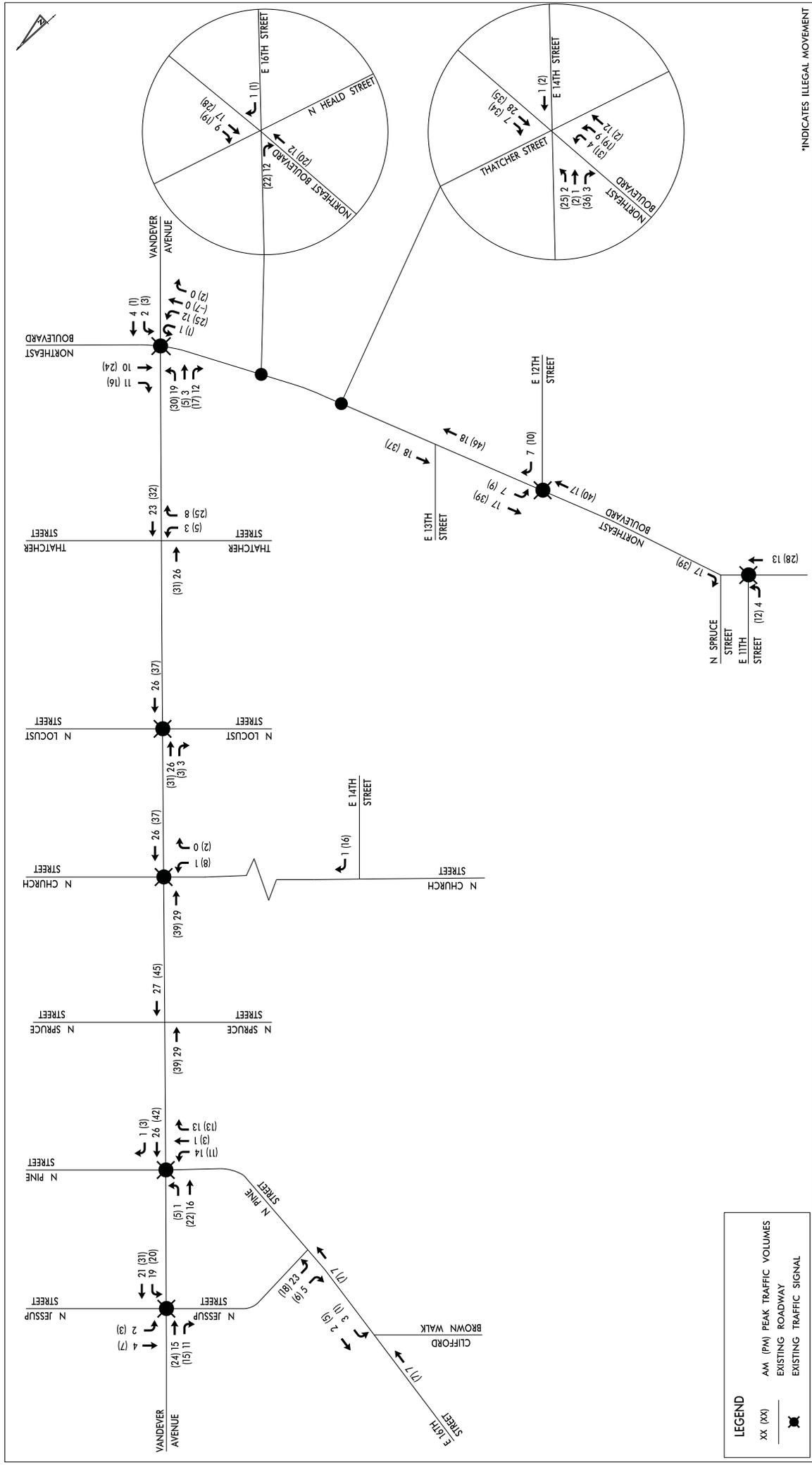





Map Updated: 1/2/19

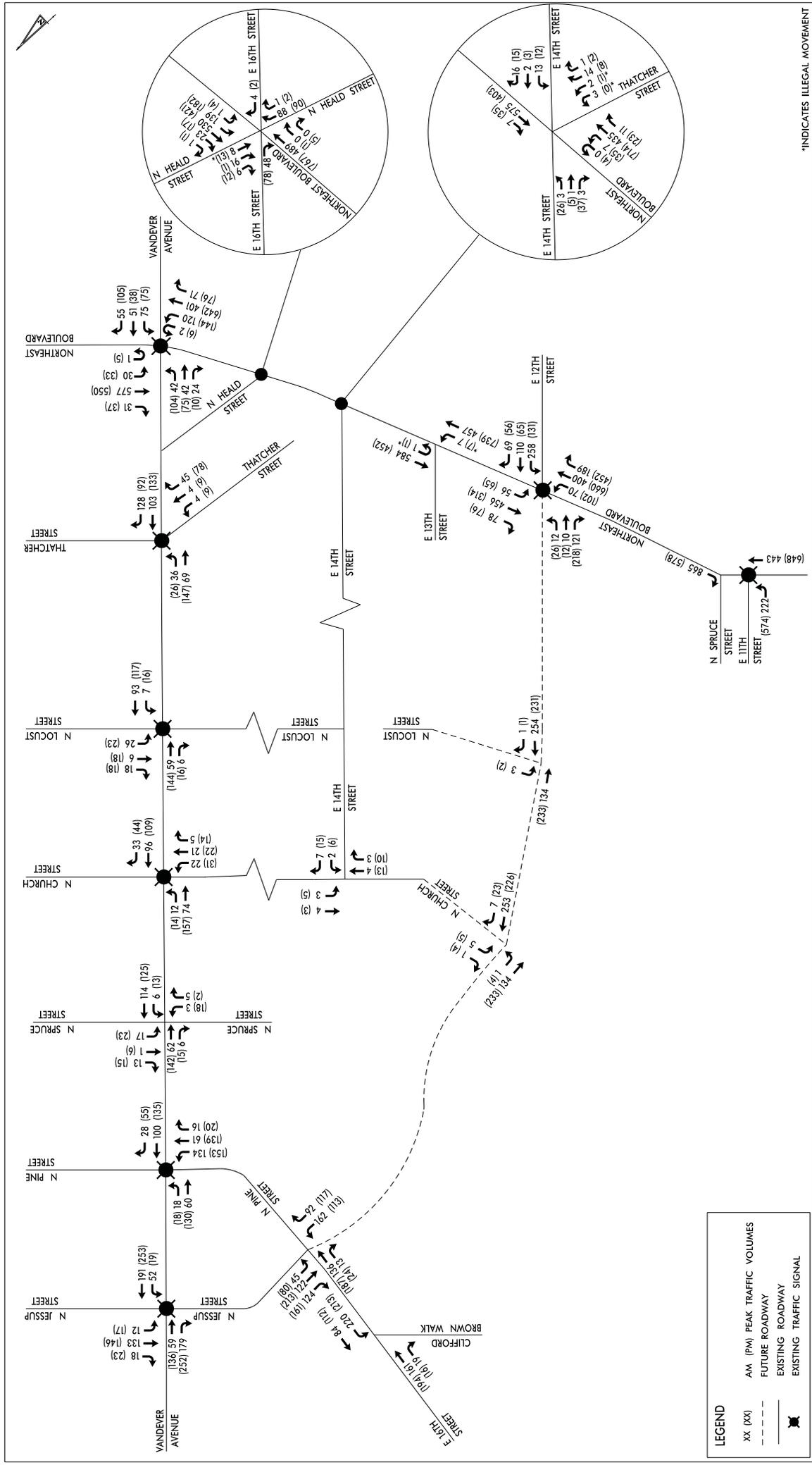






FUTURE PROJECTED DEVELOPMENT TRIP ASSIGNMENTS

12TH STREET CONNECTOR
CITY OF WILMINGTON
NEW CASTLE COUNTY, DELAWARE



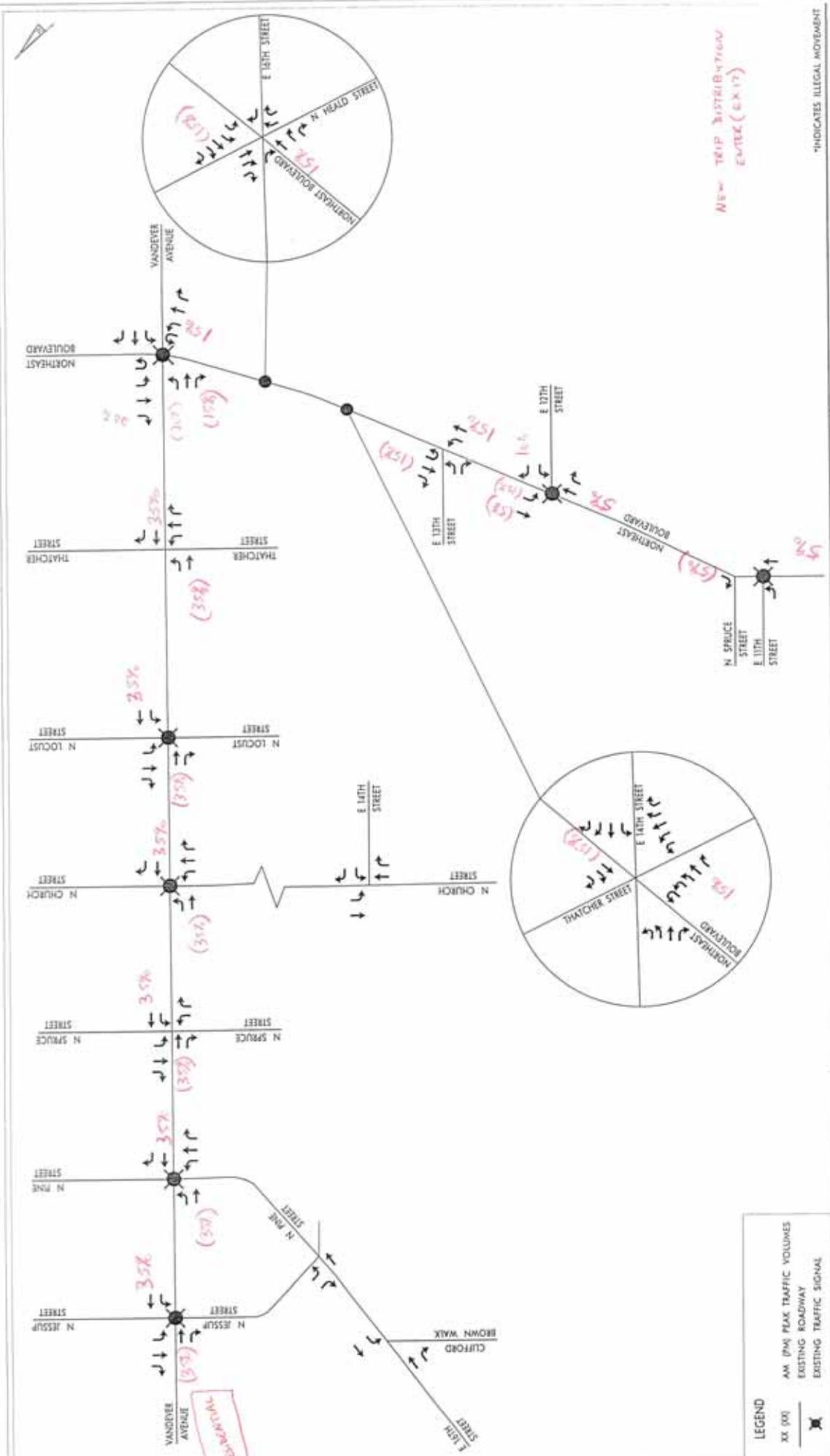
**2040 PROJECTED ALTERNATIVE A
PEAK HOUR VOLUMES**

12TH STREET CONNECTOR
CITY OF WILMINGTON
NEW CASTLE COUNTY, DELAWARE

FUTURE DEVELOPMENT TRIP GENERATION												
LAND USE	ITE CODE	UNITS	WEEKDAY 24-HOUR	Weekday 24-Hour		ENTER	AM PEAK		TOTAL	PM PEAK		TOTAL
				WEEKDAY 24-HOUR	Non-motor		EXIT	ENTER		EXIT	ENTER	
Supermarket	850	18.0 KSF	1,922	961	961	41	28	69	85	81	166	
						21	14	35	43	41	84	
						0	0	0	15	14	29	
						20	14	34	27	26	53	
High-Turnover (Sit-Down) Restaurant	932	12.0 KSF	1,346	673	673	65	54	119	73	44	117	
						33	27	60	37	22	59	
						0	0	0	15	9	24	
						32	27	59	21	13	34	
Shopping Center Located along Northeast Blvd.	820	41.0 KSF	3,279	1,640	1,640	24	15	39	135	146	281	
						12	8	20	68	73	141	
						0	0	0	23	25	48	
						12	7	19	44	48	92	
Shopping Center Located along N. Market St	820	44.0 KSF	3,440	1,720	1,720	25	16	41	142	154	296	
						13	8	21	71	77	148	
						0	0	0	24	26	50	
						12	8	20	47	51	98	
Hotel	310	100.0 Rooms	836	418	418	27	18	45	25	24	49	
						14	9	23	13	12	25	
						0	0	0	0	0	0	
						13	9	22	12	12	24	
Multifamily Housing (Mid-Rise) Located along Hutton St.	221	150.0 Units	816	408	408	14	40	54	40	26	66	
						7	20	27	20	13	33	
						0	0	0	0	0	0	
						7	20	27	20	13	33	
						4	10	14	10	6	16	
						0	0	0	0	0	0	
						3	9	12	10	6	16	
						99	94	193	181	169	350	

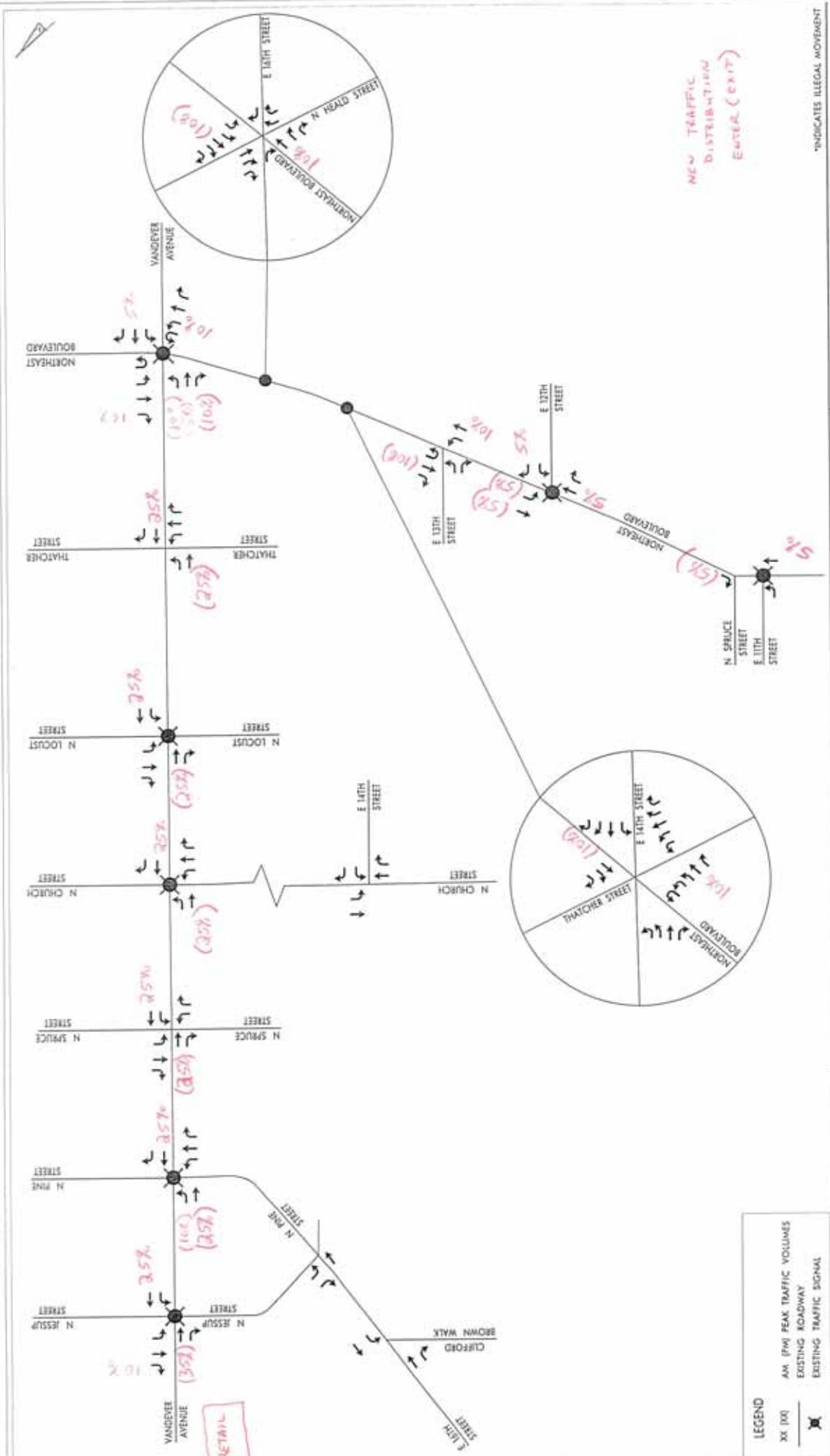
Notes

1. Trip generation was developed using methodologies set forth in the ITE Trip Generation Manual 10th Edition and Trip Generation Handbook 3rd Edition.
2. Trips generated were reduced by 50% to account for the non-motor trips (trips from those walking, bicycling, or utilizing transit).
3. Pass-by percentage of 36% (PW) used for Supermarket was obtained from the ITE Trip Generation Handbook 3rd Edition.
4. Pass-by percentage of 43% (PW) used for High-Turnover (Sit-Down) Restaurant was obtained from the ITE Trip Generation Handbook 3rd Edition.
5. Pass-by percentage of 34% (PW) used for Shopping Center was obtained from the ITE Trip Generation Handbook 3rd Edition.



12TH STREET CONNECTOR
 CITY OF WILMINGTON
 NEW CASTLE COUNTY, DELAWARE

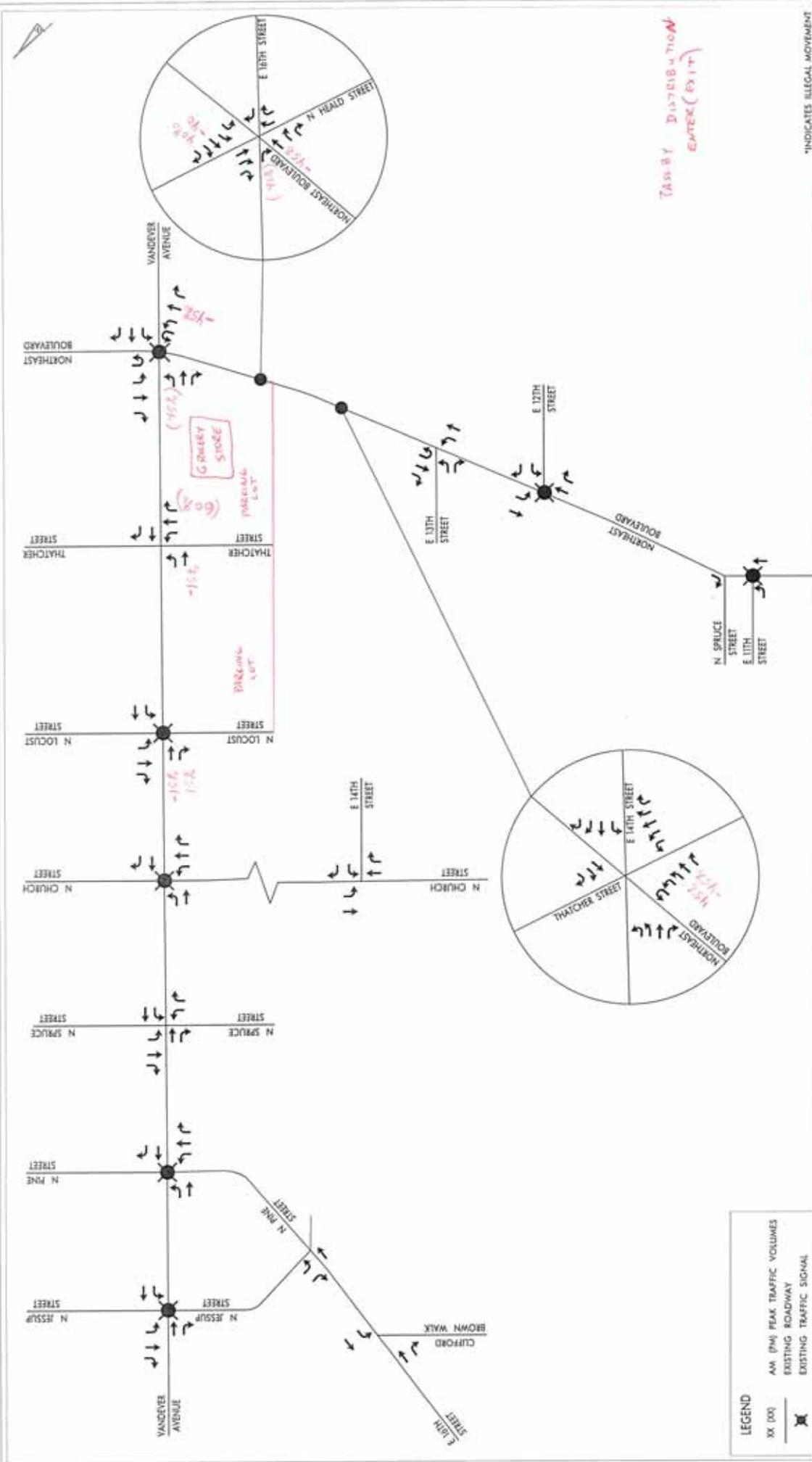




12TH STREET CONNECTOR
 CITY OF WILMINGTON
 NEW CASTLE COUNTY, DELAWARE

N.T.S. FIGURE - SEPT 2018





18,000 SP SuccessMarket

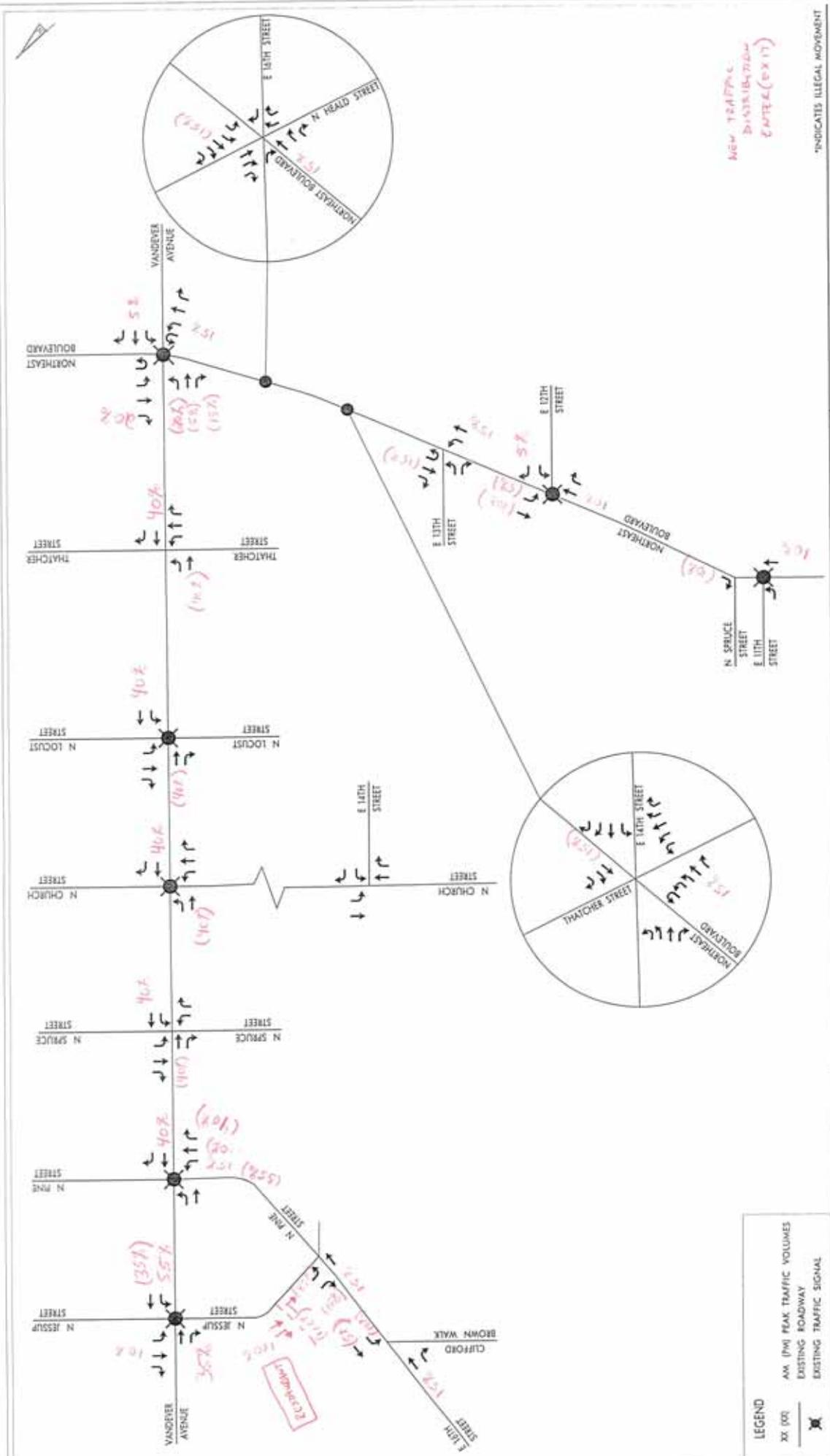
2018 EXISTING TRAFFIC PEAK HOUR VOLUMES

12TH STREET CONNECTOR
CITY OF WILMINGTON
NEW CASTLE COUNTY, DELAWARE

N.T.S. FIGURE - SEPT 2018

- LEGEND**
- XX (00) AM (PM) PEAK TRAFFIC VOLUMES
 - EXISTING ROADWAY
 - ⊗ EXISTING TRAFFIC SIGNAL

*INDICATES ILLEGAL MOVEMENT



12,000 SF HIGH-TRAFFIC (KIT-DUMM) RESTAURANT

12TH STREET CONNECTOR
CITY OF WILMINGTON
NEW CASTLE COUNTY, DELAWARE

2018 EXISTING TRAFFIC PEAK HOUR VOLUMES



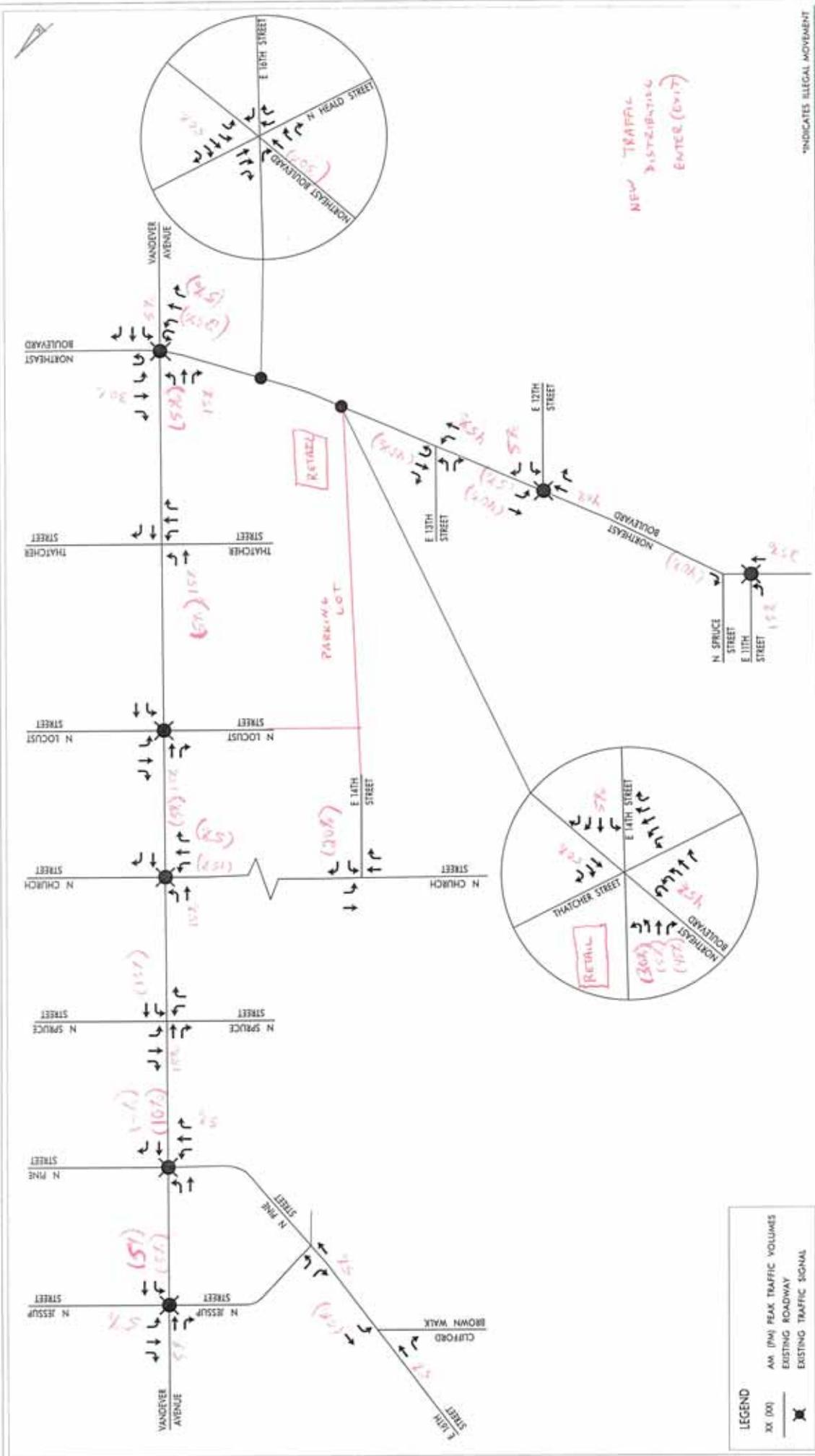
LEGEND
 XX (XX) AM (PM) PEAK TRAFFIC VOLUMES
 ——— EXISTING ROADWAY
 [X] EXISTING TRAFFIC SIGNAL

*INDICATES ILLEGAL MOVEMENT

N.T.S.

FIGURE -

SEPT 2018



LEGEND
 XX (00) AM (PM) PEAK TRAFFIC VOLUMES
 ——— EXISTING ROADWAY
 [Symbol] EXISTING TRAFFIC SIGNAL

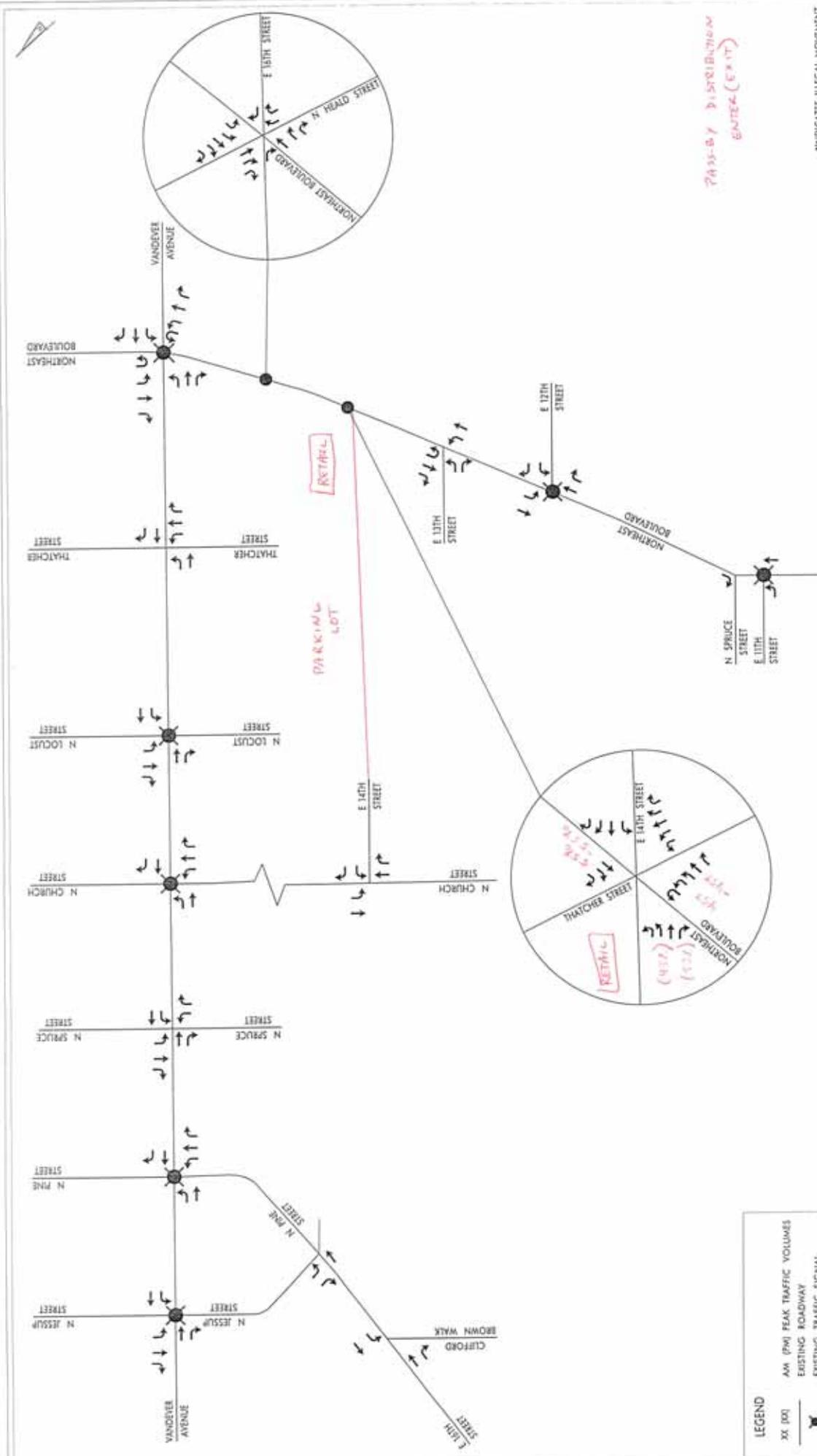
*INDICATES ILLEGAL MOVEMENT

12TH STREET CONNECTOR
 CITY OF WILMINGTON
 NEW CASTLE COUNTY, DELAWARE

41,000 SF SHOPPING CENTER
 2018 EXISTING TRAFFIC PEAK HOUR VOLUMES

N.T.S. FIGURE - SEPT 2018





41,000 SF SHOPPING CENTER
 2018 EXISTING TRAFFIC PEAK HOUR VOLUMES

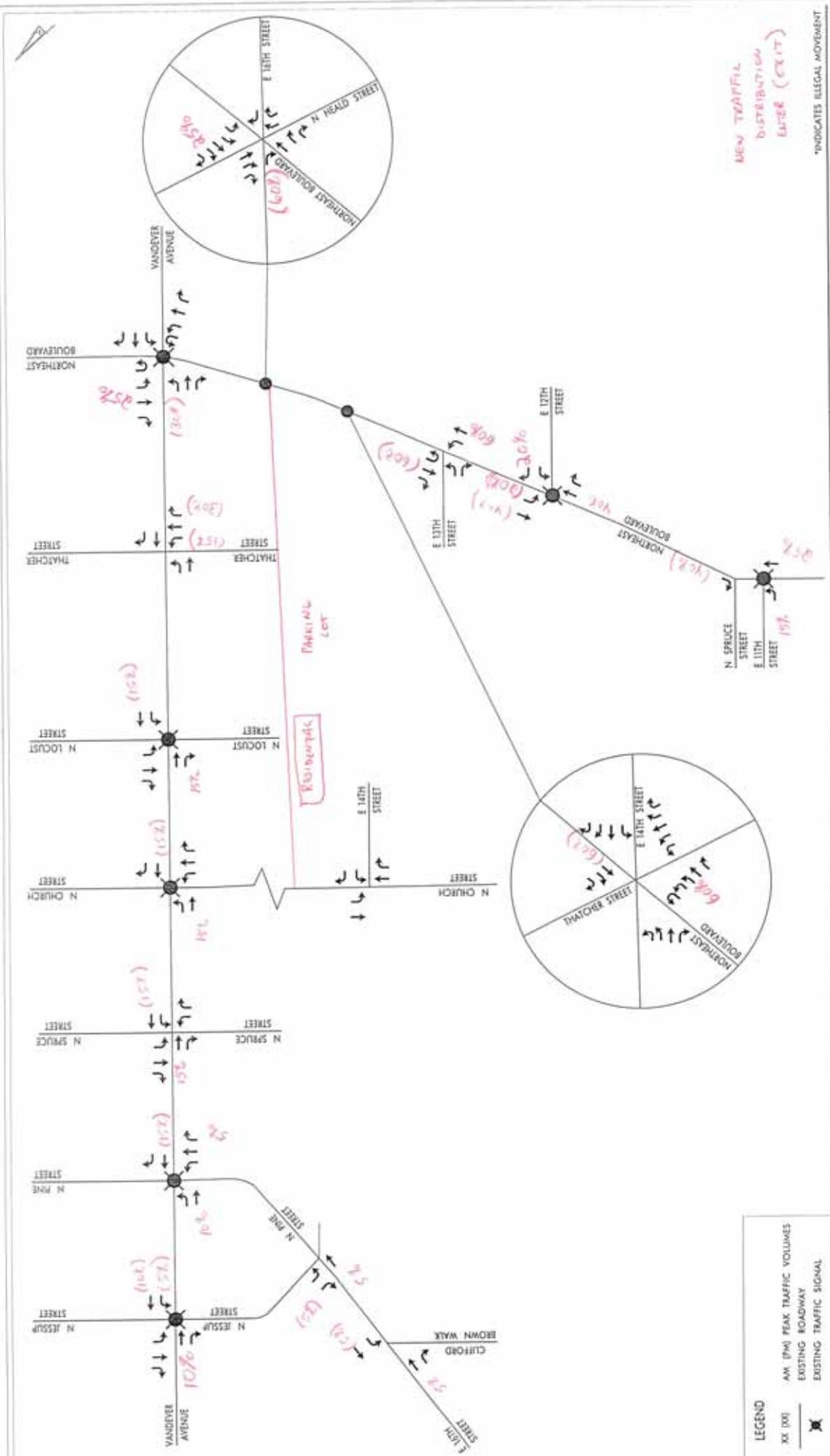
12TH STREET CONNECTOR
 CITY OF WILMINGTON
 NEW CASTLE COUNTY, DELAWARE

N.T.S. FIGURE - SEPT 2018



LEGEND
 XX (XX) AM (PM) PEAK TRAFFIC VOLUMES
 — EXISTING ROADWAY
 ⊗ EXISTING TRAFFIC SIGNAL

*INDICATES ILLEGAL MOVEMENT



12TH STREET CONNECTOR
 CITY OF WILMINGTON
 NEW CASTLE COUNTY, DELAWARE

N.T.S. FIGURE - SEPT 2018





12th Street Connector Preferred Alternative

Legend

- Public Green Space
- Redevelopable Area
- Building Displacement
- Crosswalk
- Parcel Line
- Limit of Disturbance
- Roadway
- Bike Path
- Sidewalk
- Pavement Removal



Map Updated: 3/4/19

