New Castle
Community Wellness Initiative

Walkability and Bikeability Assessment Report

Claire Beck, University of Delaware Institute of Public Administration
Andrea Trabelsi, Delaware Greenways

May 2011

CONTENTS

INTRODUCTION

The City of New Castle began its Community Wellness Initiative in late 2010 with the goal of improving the health of community members by making it easier to live a healthy lifestyle. The Initiative is a multi-sector community effort to identify opportunities and impediments to achieving a healthy lifestyle, and to address those issues through developing and implementing a plan of action. The assessments of opportunities and impediments focus on existing policies, environmental conditions, and systems. Information from the assessments form the basis for developing a Wellness Action Plan of goals, objectives, and action steps, which will guide further efforts across all sectors of the community to enable people to live healthier lives.

A prime area of focus for the Wellness Initiative is to examine the ease with which community members are able or encouraged to be active by walking, bicycling, or engaging in any other form of physical activity for recreation or as a mode of transportation. Understanding the factors in the community that either promote or inhibit peoples' ability and likelihood to be active is the first step toward making changes across the community, which will reduce illness and mortality due to highly preventable causes. This walkability and bikeability assessment looks at the current conditions of infrastructure and community design through both technical, computer-based work and qualitative, field-based work to determine why people are or are not encouraged/enabled to engage in active forms of transportation or recreation.

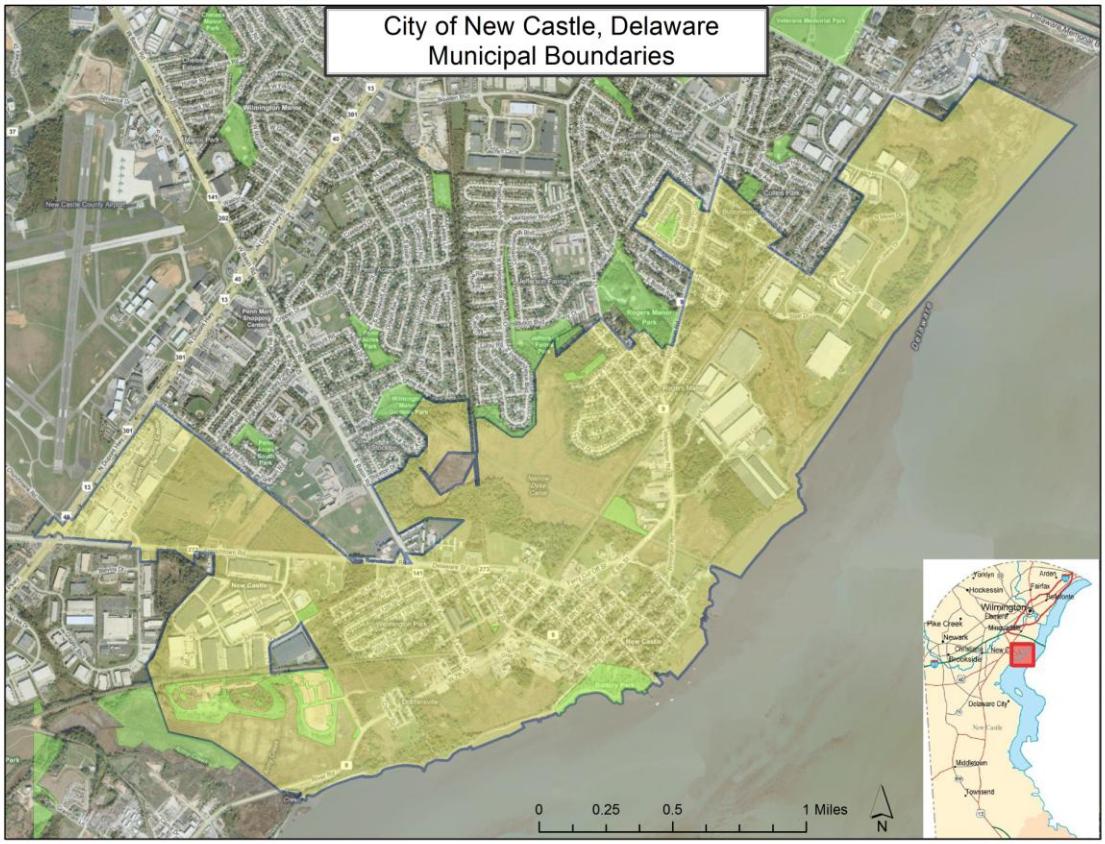
The study area considered for this assessment and the Wellness Initiative overall is, approximately, the area bounded by Route 295 to the north, Route 13/40 to the west, the Delaware River to the east, and the southern municipal boundary (see Map 1). The study area covers approximately nine square miles and has a population of approximately 8,000.[1]

[1] Census 2000.

Map 1

Community Context

The incorporated city of New Castle is located in the southeastern portion of the study area and covers approximately three square miles along the Delaware River (see Map 2). The Wellness Initiative emphasizes the incorporated city, shown in Map 2 below. The city of New Castle is home to roughly 5,000 people.



Map 2

Established in the late 1600's, New Castle is well-known and loved for its historic character, including its brick sidewalks, the town square and park, and colonial architecture. While the town was established on a grid pattern and the walkable/bikeable, mixed-use downtown, with pedestrian oriented building fronts remains the hallmark of New Castle, modern suburban style development typical of the 1950's is also part of the city design. The landscape emanating from the historic center features a number of industrial parks, strip mall developments, and single family residential neighborhoods with density averaging about 4-8 units per acre. The historic center is connected to these developments by the major arterial roadway, Route 9, which runs roughly parallel to the Delaware River. Two other main arterial roads that run through the community are Route 273, which runs west out of the historic center of New Castle, and Route 141, which branches off from Route 273 to the northwest. The contrasting development patterns in New Castle represent the juxtaposition of a bikeable, walkable community and an auto-dominant community all within the city bounds. Figures 1 and 2 show these contrasting areas of the community.

Figure 1: Walkable historic New Castle

Figure 2: Auto-oriented Route 9

Contrasts extend beyond the physical design and characteristics of the city into demographics. The population of the historic center of the city is, on average, older than the wider study area population with above average incomes. In contrast, residents outside the historic center are lower-income and the 19720 zip code (which includes the full study area) had the highest foreclosure rates in Delaware during 2010.[2] These variations in income are important to take into consideration for creating equitable, relevant, and functional improvements and enhancements to bicycling and walking infrastructure for all in the community.

Development patterns of the city and study area have been dictated in great part due to the natural geography of the landscape. The low-lying, flat land is interspersed with marshland, inlets, and canals, which serve to define the boundaries of many neighborhoods and influence the alignment of roads, trails, and other travel routes and recreational areas.

While known for its riverfront Battery Park, the City of New Castle contains six other municipal parks (Dobbinsville, Susi, Van Dyke, Bull Hill, Penn Valley, and Buttonwood). The wider study area contains an additional 7 parks as well as numerous other designated open spaces. Parks and open space are important to the walkability and bikeability analysis because they tend to attract recreational activity and provide space to be used for both formal and informal non-motorized linkages between destinations.

Figure 3: Historic New Castle

[2] Delaware State Housing Authority.

Summary of Methods

In order to get a comprehensive assessment of opportunities and impediments to walking and biking in the New Castle community study area, both a technical, quantitative analysis and a qualitative, in-the-field analysis were conducted. These two methods allowed us to explore various scales of development, connectivity, and detail of the community infrastructure, which all contribute to the ability and likelihood of people walking and bicycling.

The technical analysis involved using Geographic Information System (GIS) technology to analyze land use patterns and pedestrian/bicycle linkages on community-level scales (i.e. distances of approximately half-mile or greater, versus a few blocks).

The qualitative analysis involved an in-the-field assessment of bicycling/walking routes and infrastructure as well as communication with community members through a focus group meeting, informal interviews, a survey, and a number of other opportunities for community members to share feedback.

Key Findings and Recommendations

At the community scale, walkability and bikeability of New Castle are generally the product of land use patterns and transportation infrastructure. By reviewing past and existing community planning documents and looking at the larger picture of the land use/transportation system through geographic information software (GIS), two general observations can be made:

- Overall, land use patterns in New Castle present very dispersed trip origins and destinations, which make many utilitarian trips too long or dangerous to be completed without a car. An effort should be made to ensure that important destinations and services, such as grocery stores and pharmacies, are accessible to residents by multiple transportation modes.
- Though New Castle boasts a good amount of sidewalk infrastructure and several nice trail facilities, these paths are not always connected or well-advertised. As the city moves forward with pedestrian and bicycle improvements, the ultimate goal should be a logically-connected system of bicycle and pedestrian facilities that are easily accessed by residents as well as visitors.

This particular Walkability/Bikeability assessment focused on the areas around Route 273/Heritage Trail and Route 9 north of New Castle. The general findings and recommendations for these areas include:

- Additional bicycle and pedestrian infrastructure (striped lanes and sidewalks) is needed in both areas in order to provide uninterrupted connections between roads, trails, and key destinations.
- Crosswalks should be installed at signalized intersections along Route 9 (none currently exist) and at important intersections along Route 273.
- Bus stops should provide better signage and improved amenities to increase visibility, access, and use.
- Linkages to historic New Castle and parks/trails should be communicated to pedestrians/bicyclists through wayfinding signs.

EXISTING PLANS

Sidewalks, trails, bicycle routes and other pedestrian and bicycle concerns have been addressed in past and recent plans for the New Castle community. These existing plans are summarized below and highlight historic and current issues, the status of pedestrian/bike-related projects, and timelines for key projects. These plans also identify some of the issues of concern for different groups and sectors in the community.

CITY OF NEW CASTLE 2009 COMPREHENSIVE PLAN UPDATE

The City of New Castle's Comprehensive Plan 2009 Update mentions several areas, both on- and off-street, that would benefit from bicycle and pedestrian improvements. These suggested improvements are thoroughly listed in the Transportation Plan but also addressed in the Open Space and Recreation Plan. In general, the Transportation Plan notes that New Castle boasts a fairly extensive network of sidewalks, but that almost no dedicated on-street bike lanes exist.[3] Additionally, the pedestrian and bicycle infrastructure (both on- and off-street) in New Castle is concentrated in the historic downtown and riverfront area while lacking in the residential and business areas beyond. The first goal in the Transportation Plan of New Castle Comprehensive Plan is to "expand bike and pedestrian facilities and connections throughout the City."[4] The table below lists all of the bicycle and pedestrian improvements suggested in the New Castle Comprehensive Plan.[5]

[3] p. 31—City of New Castle Comprehensive Plan Update, 2009.
[4] P.32—Ibid.
[5] Adapted from table 18, p. 36—Ibid.

Project/Location	Description	Status
Pedestrian and bike improvements along Route 9 from 6th St. north to city limits	Add sidewalks, paint crosswalks, bike lane stencils	No designated bike-lanes No crosswalks (until Buttonwood Ave.) Discontinuous sidewalks
Pedestrian and bike improvements along Route 273 from US Route 13 to Delaware Street	Not specified	Off street multi-use trails currently being planned for north side of Route 273 from Route 13 to Route 141 Additional sidewalk enhancements and bicycle lanes are proposed for Route 273 Transportation Enhancements project from Route 141 to Delaware Street*
Streetscape, traffic calming on Washington St. from 7th St. to Rt. 273	Narrow lanes, add sidewalks, trees, lighting, crosswalks, curb extensions, stripe parking, bike lanes	Washington and 7th Street intersection currently in final design stages; likely to be constructed during summer of 2013; initial construction might not include street trees
Streetscape Ferry Cut-off from Delaware St. to 6th St. Intersection improvements at Delaware St. and 6th St.	Narrow lanes, add sidewalks, bike lanes, trees, lighting. Reconfigure intersections to right-angle meetings, improve pedestrian crossings	Delaware Street intersection reconfiguration currently in preliminary design phase; Indeterminate timeline for listed improvements
Pedestrian crossing, streetscape, traffic calming on 7th St. through Dobbinsville	Narrow lanes, add sidewalks, trees, lighting, crosswalks, curb extensions, stripe parking, bike lanes	Project is in planning, but no improvements implemented to date. The City has established a "Gateway" zoning district, which will encourage/enable enhancement of the streetscape for residents and visitors entering the city by auto, bike, or on foot
Pedestrian and bicycle improvements along South St. from 3rd St. to 8th St.	Not specified	Sidewalks exist, but no apparent improvements since 2009 comp plan published
Off street pedestrian and bicycle improvements along School Lane from Rt. 273 to US Rt. 13	Not specified	Multi-use trail design moving into final phases and expected to be constructed by 2013
Off street pedestrian and bicycle improvements connecting School Lane to	Not specified	See above

athletic fields at William Penn High School		
Off street pedestrian and bicycle improvements connecting the athletic fields at William Penn High School to proposed path along former railbed	Not specified	See above
Create bike path along former railbed from Rt. 273 north past City limits to Boulden Blvd.	Paved path to connect neighborhoods with Battery Park and future East Coast Greenway	"Industrial Track Greenway" complete and open as multi-use trail
Off street pedestrian and bicycle Improvements through ballfield area from Rt. 273 to intersection of W 14th St. and Oak Street	Not specified	No changes
Off street pedestrian and bicycle improvements from the Chestnut St. terminus to the river bank to 2nd St. to Glebe Ln.	Not specified	Informal trail exists
Off street pedestrian and bicycle improvements along river at the southernmost City boundary south of River Rd.	Not specified	No changes
Traffic calming on 6th St. from South St. to Chestnut St.	Narrow lanes, crosswalk treatments, curb extensions, stripe parking, and bike lanes	No changes

* Route 273 trails/bike lanes being considered for the East Coast Greenway (bike route that will eventually traverse the east coast of the U.S., from Maine to Florida)

Several of the improvements listed in the Comprehensive Plan align with the focus areas of this Wellness Initiative, including: pedestrian and bicycle improvements along Route 9 from the historic area north to the City limits; safety, pedestrian and bicycle improvements to the Ferry Cut-off area; intersection realignment and improvements to the Ferry Cut-off/6th St./Delaware St. intersections; pedestrian and bicycle improvements along Route 273; and pedestrian and bicycle improvements along South St. from 8th St. to 3rd St. (the main road connection from the Heritage Trail to Battery Park). The New Castle Comprehensive Plan also notes the need for better signage

to route through-traffic away from local roads.[6] This need was also identified in the walkability and bikeability assessment conducted in-the-field during March 2010 (addressed later in this report), as it would make the downtown and residential streets safer and more attractive for pedestrians and bicyclists.

In terms of recreational paths, the Open Space and Recreation section of the Comprehensive Plan notes that the community expressed "a general desire for more biking and walking trails – especially where they would inter-connect neighborhoods and improve pedestrian accessibility to the riverfront."[7] These concerns were also expressed by residents in current communication and during the in-the-field walkability and bikeability assessment. The Industrial Track Trail group focused on the connections between the Industrial Track Trail, Heritage Trail, Battery Park on the riverfront, and the historic downtown area. The Route 9 group focused on the connections between the neighborhoods along Route 9, the historic downtown, and the riverfront. However, the New Castle Comprehensive Plan does not address the gap between the Industrial Track Trail and the Heritage Trail, a major focus of the Walkability Assessment performed as part of this Wellness Initiative.

APRIL 2005 WALKABLE COMMUNITIES WORKSHOP

In 2005 WILMAPCO conducted a Walkable Communities Workshop with members of the New Castle community. The participants in this workshop identified several issue areas and possible recommendations. One of the first identified issues in this report is the missing link between the Industrial Track Trail and Heritage Trail. The connection between these two trails is broken both by Route 273 (which lacks a pedestrian crossing) and a steep grassy hill, which is also noted in this Walkability Assessment report. The WILMAPCO Walkable Communities Workshop report recommends that the Heritage Trail should connect to the south side of Route 273 with the installation of a ramp using land at the end of the 11th street cul-de-sac. In order to cross Route 273 to the rest of the Industrial Track Trail and schools on the north side of Route 273, the document recommends consideration of a bridge or tunnel across the road. (Current and past consideration of both recommended configurations pose significant engineering challenges and neither are likely solutions, according to contacts at the Delaware Department of Transportation. A pedestrian bridge would be too expensive and sufficient vertical clearance is lacking to tunnel beneath 273. A new feasibility study by DelDOT Planning will be commenced shortly to re-investigate this crossing/connection. Results are preliminarily expected by mid-Fall 2011.)

The Walkable Communities Workshop report also identifies Route 273 as an issue area due to its lack of pedestrian facilities along and across the road. In essence, Route 273 functions as a barrier separating the schools, neighborhoods, and greenway on the north side from the neighborhoods, Heritage Trail, and Battery Park on the south side. The report recommends realigning and adding

[6] pp. 33-34—Ibid.

[7] P.61—Ibid.

crosswalks to the intersections along Route 273 between 9th and 10th streets. Additionally, it is recommended that the crosswalk connecting to the New Castle School be widened and ADA curb ramps installed at intersections along this route. As part of the previously mentioned feasibility study, the function and appropriateness of existing crosswalks between the railroad tracks and Rt. 141 will be investigated. There may be an opportunity to consolidate some of them to the proposed New Castle Industrial Track/Heritage Greenway midblock crossing. Coordination with Colonial SD and DelDOT Traffic will be necessary.

The final three issue areas identified in WILMAPCO's Walkable Communities Workshop are very similar to issues and improvements suggested in the Comprehensive Plan. These include: realignment and streetscaping of the Ferry Cut-off/Delaware Street intersection; traffic calming along 6th St; and streetscaping improvements along South St. to more clearly direct people to Battery Park.

Waterfront Access and Parking Plan

The City applied for a grant through WILMAPCO in early 2011 to create a Waterfront Access and Parking Plan. The grant was not awarded, but the City and community members still aim to better capitalize on New Castle's riverfront area, one of its greatest assets. Part of the efforts surrounding riverfront access include emphasis on better recreational opportunities for cyclists and pedestrians as well as overall increased non-motorized connections between the waterfront, historic New Castle, larger regional bicycle and trail systems, and even across the river to New Jersey. Discussion has touched on exploring opportunities for a bicycle ferry route between Delaware City and Wilmington, with a stop in New Castle. While the specific bicycle and pedestrian recommendations that may come from a waterfront access and parking plan are not yet available, it is likely that better connections between the Industrial Track Trail, the Heritage Trail, Battery Park, and the historic area will be highlighted as ways to increase the vibrancy of the New Castle waterfront and its relation to the greater region.

City of New Castle Transportation Plan

In December 1999 The City of New Castle, with sponsorship from WILMAPCO and DelDOT, published a Transportation Plan that aimed to establish a vision and plan to balance the pressures of regional growth and transportation demands, with the need to preserve and enhance the traditional urban fabric of New Castle. A central tenet of the plan was the identified need to protect and promote walking, bicycling, transit, and traffic calming as an important method of accommodating increased growth and traffic, as much as adding/expanding roads.

Non-motorized transportation issues and opportunities identified in the plan include: traffic calming measures through redesign and reconfiguration; improving the sidewalk network, especially through improved enforcement of maintenance; and providing bicycle roadway markers,

such as painted lanes, along the Route 9 corridor north of the historic center, which is the only connection from the northern neighborhoods south to the city center.

Other Pedestrian and Bicycle Related Projects

Route 273 Transportation Enhancements projects include a number of improvements to bicycle and pedestrian infrastructure, and expansion of trail routes. These projects have all been identified in previous planning documents. Currently, most projects are expected to be implemented in the coming 2-5 years. The projects are listed and described below:

Route 273 Improvements: This project is in the design phase. Plans include a number of improvements to pedestrian and bicycle infrastructure along Route 273 from Route 13 (at Hare's Corner) to Route 141, and possibly beyond. An off-road trail with amenities, such as trees and lighting, is under consideration. The multi-use trail will be located on the north side of Route 273.

Industrial Track Trail and Heritage Trail Crossing: This project is a high priority, due to the broad benefits it will provide once complete. Configuring a broadly acceptable crossing at this intersection, however, is difficult due to a number of environmental conditions and surrounding infrastructure: The high water table and underground utilities pose problems for establishing an underpass and surrounding historic features and roadways put limitations on constructing a ramped Heritage trail directly up to Route 273 to align with the Industrial Track Trail. While the long-term goals for this crossing are to provide a direct link between the Industrial Track and Heritage Trails, a more immediate solution to enable safe crossing, which has been proposed, is to bring the Heritage Trail up 10th street and establish the primary crossing closer to the New Castle School (slightly east of the Industrial Track Trail entrance. This project is in design stages and is expected to begin construction in the coming five years.

Washington Street Improvements: Enhancements will include: improved crosswalks and sidewalks at Route 273 and Washington Street; improved sidewalks along Washington Street from Route 273 to Route 9; and ADA sidewalk connections from the southern terminus of the Heritage Trail to Battery Park. This project is nearing construction phases and is expected to be constructed in the next two years.

Route 9 Intersection Improvements: This project is currently in the design phase and community meetings are underway (as of May 2011). The purpose of the project is to reduce cut-through traffic in the historic center of New Castle. Components of the project currently include: modification of the Route 9 and Delaware Street intersection to remove the signal and to only permit right-hand turn movements; to install a signal at the Route 9 and Harmony Street intersection; removal of the Route 9 and Chestnut Street intersection; and the intersection of Route 9 and Wilmington Road will be restricted to right-hand turns. All projects will include unspecified pedestrian enhancements.

The Broad Dyke Marsh, located just north of the Route 273/ Ferry Cutoff area and shopping center is another location where hike and bike trails are currently being designed and constructed. The marsh area is over 100 acres and will have trails following the dry/high elevations. Due to the geography and nature of the landscape, the trails will be serpentine, rather than straight, making them less-suitable as efficient transit routes; however, one goal for these trails is to provide off-road connections for bicyclists and pedestrians from the neighborhoods north to the industrial track trail and the historic center of town.

The Industrial Track Greenway, also known as the New Castle to Wilmington Bicycle Highway, currently begins on the north side of Route 273 approximately at the northern terminus of 11th Street. This trail continues north across Boulden Boulevard, where it terminates just north of the little league facilities. The trail will ultimately continue all the way to Wilmington. The next link of the trail from Boulden Boulevard to the Christina River at Route 13 and Route 295 interchange and I-95 is in late stages of design and is expected to be constructed in the coming 3-5 years. The final phase to establish the link into Wilmington is currently in the design phase. The trail configuration will be determined in the summer of 2011, and construction is expected in the next 5-10 years. The completion of the New Castle to Wilmington Bicycle Highway will eventually provide a significant regional, off-road route for bicycle commuters and serve as a recreational amenity for many communities that are located along and nearby the trail.

An informal hiking trail also exists along the Delaware River to the north of the historic downtown. There have been discussions and suggestions among various stakeholders about possible expansion and/or enhancements to that trail, though no formal action has been taken yet.

TECHNICAL ASSESSMENT

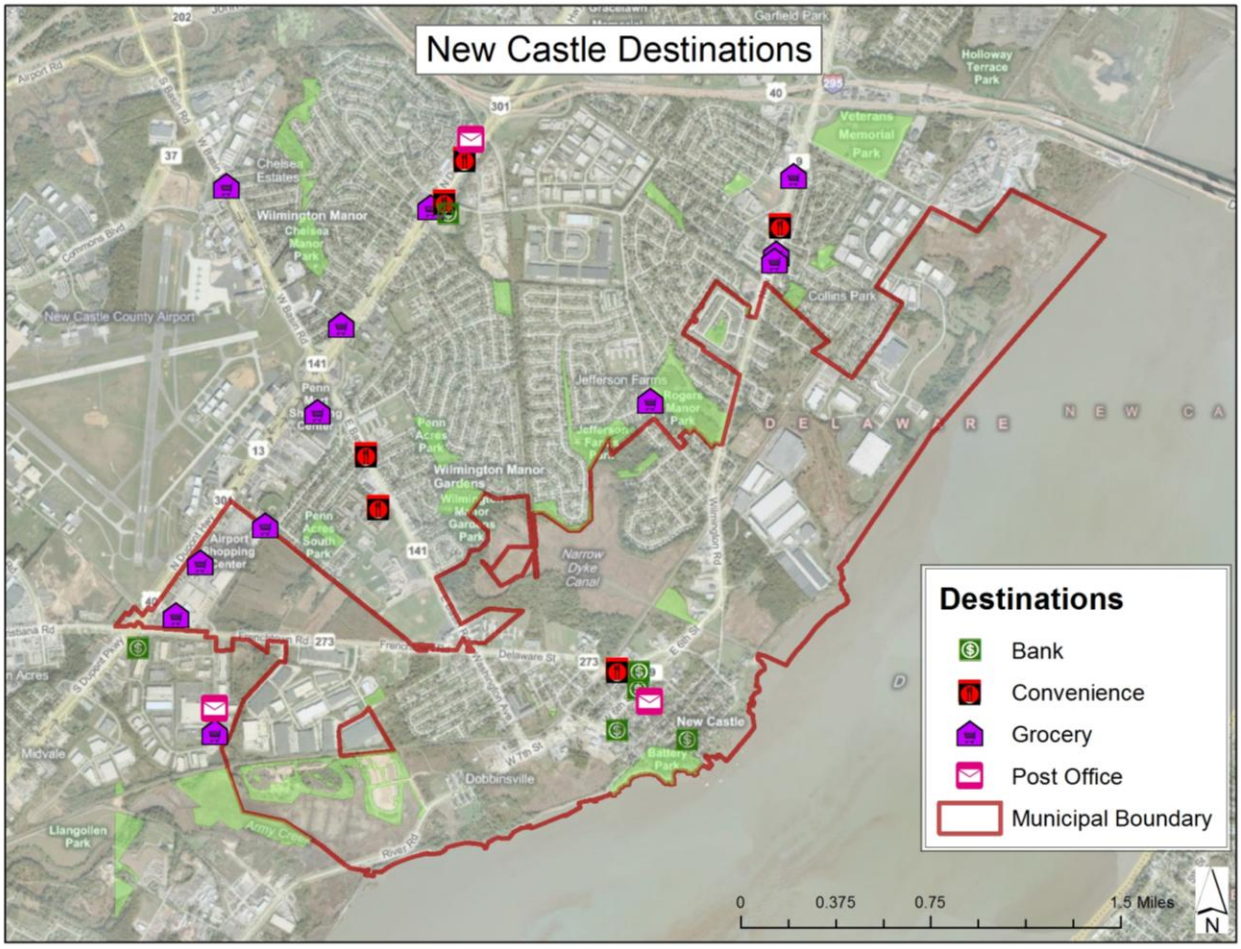
In order to understand the larger picture of transportation options within New Castle, geographic information software (GIS) was used to analyze general land use patterns, origin/destination distribution, the overall transportation network, and recreational trails within and around the city.

GENERAL LAYOUT OF ORIGINS AND DESTINATIONS:

The geographic distribution of common destinations within and immediately surrounding New Castle was assessed using GIS. For this analysis, "destinations" were conceived of as places that most residents would need to access on a regular basis, and these places include grocery stores, banks, post offices, and convenience stores (such as Wawa and Rite-Aid). The destinations considered in this analysis were located using Google Maps and transferred to GIS. The list of

destinations is not intended to be comprehensive, but rather to present a representative sample of the geographic locations of places that New Castle residents would access frequently. Also note that schools were not included as destinations in this analysis, as access to schools, especially for young children, is an important but complex subject worthy of a separate study.

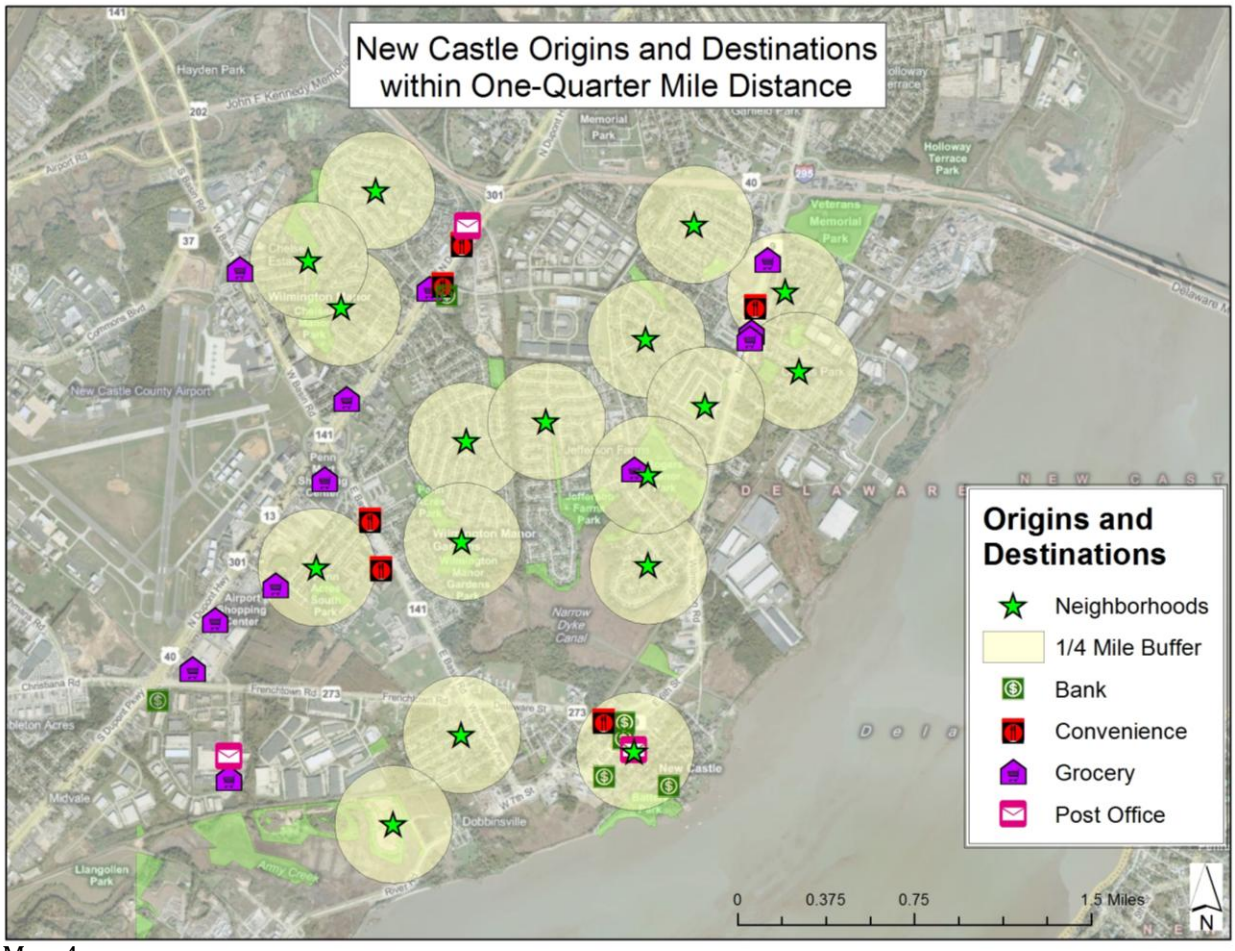
Map 3 shows the location of destinations in the New Castle general study area. Two general conclusions can be drawn from this map. First, most of the destinations are technically located outside of the corporate limits of New Castle. Second, the majority of destinations are clustered around major arterial roadways like Route 273, Route 13, and Route 9. These types of roadways are primarily automobile-oriented and less accessible to pedestrians and bicyclists.



Map 3

Another type of GIS analysis shows the distribution of destinations in relation to "origins," defined here as official New Castle County neighborhoods. Map 4 shows the same destinations as the map above, with the addition of neighborhoods represented by green stars. A ¼ mile buffer was created around each neighborhood (origin) in order to coarsely visualize the proximity of residential origins to important destinations. The distance of ¼ mile was chosen because it is a commonly

accepted distance that the average person is willing to walk to get to a destination. The buffers around origins in the map below show that the majority of neighborhoods are not within ¼ mile straight-line distance of any key destinations.



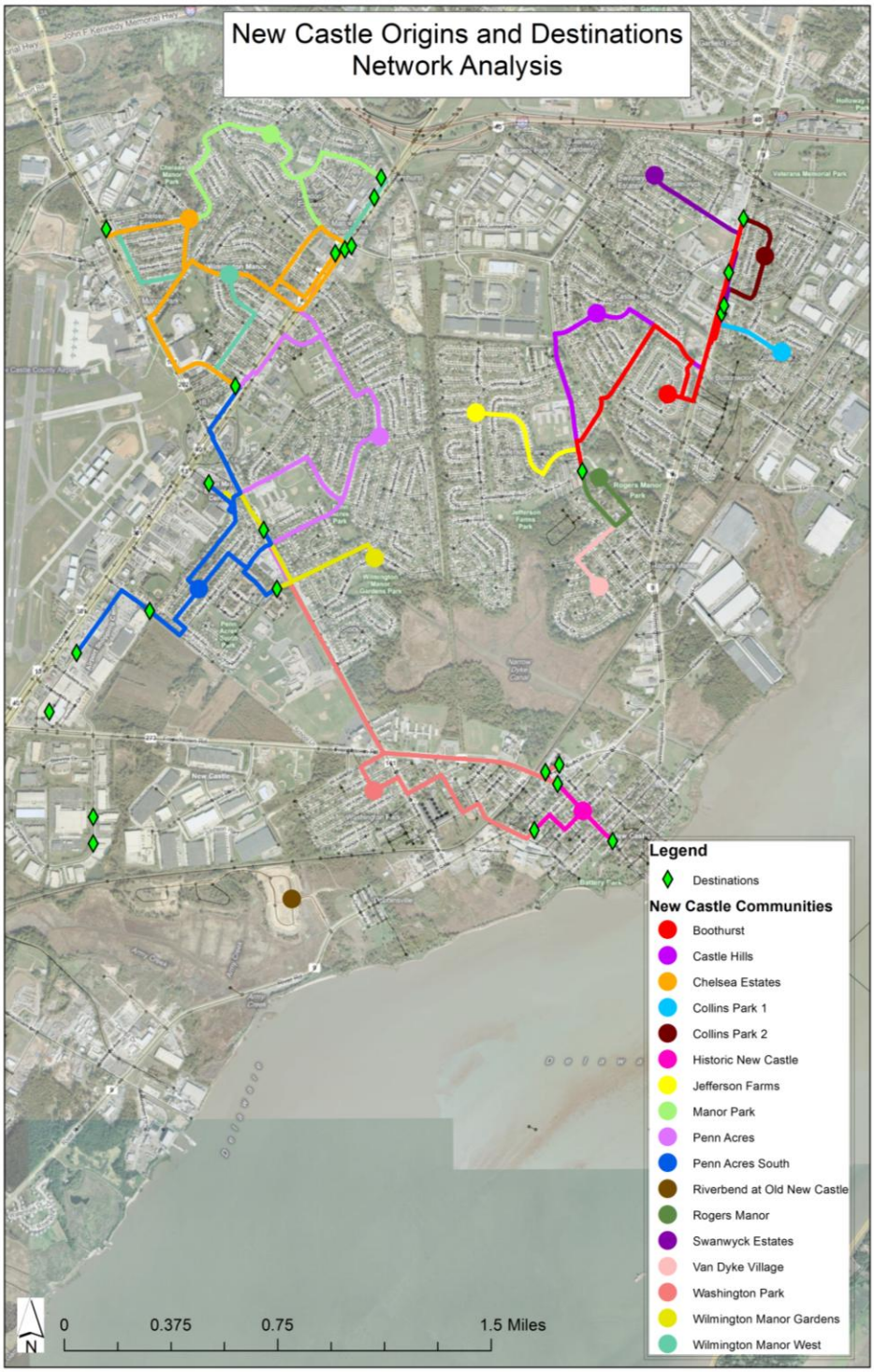
Map 4

Network Analysis of Origins and Destinations

A tool within GIS called "network analyst" is able to measure distances along an existing network (the street system) in order to find destinations that are within a certain distance of specific origins. This type of analysis is more robust than the "one-quarter mile" analysis shown in Map 4 above, as people generally travel on the street network rather than "as the crow flies."

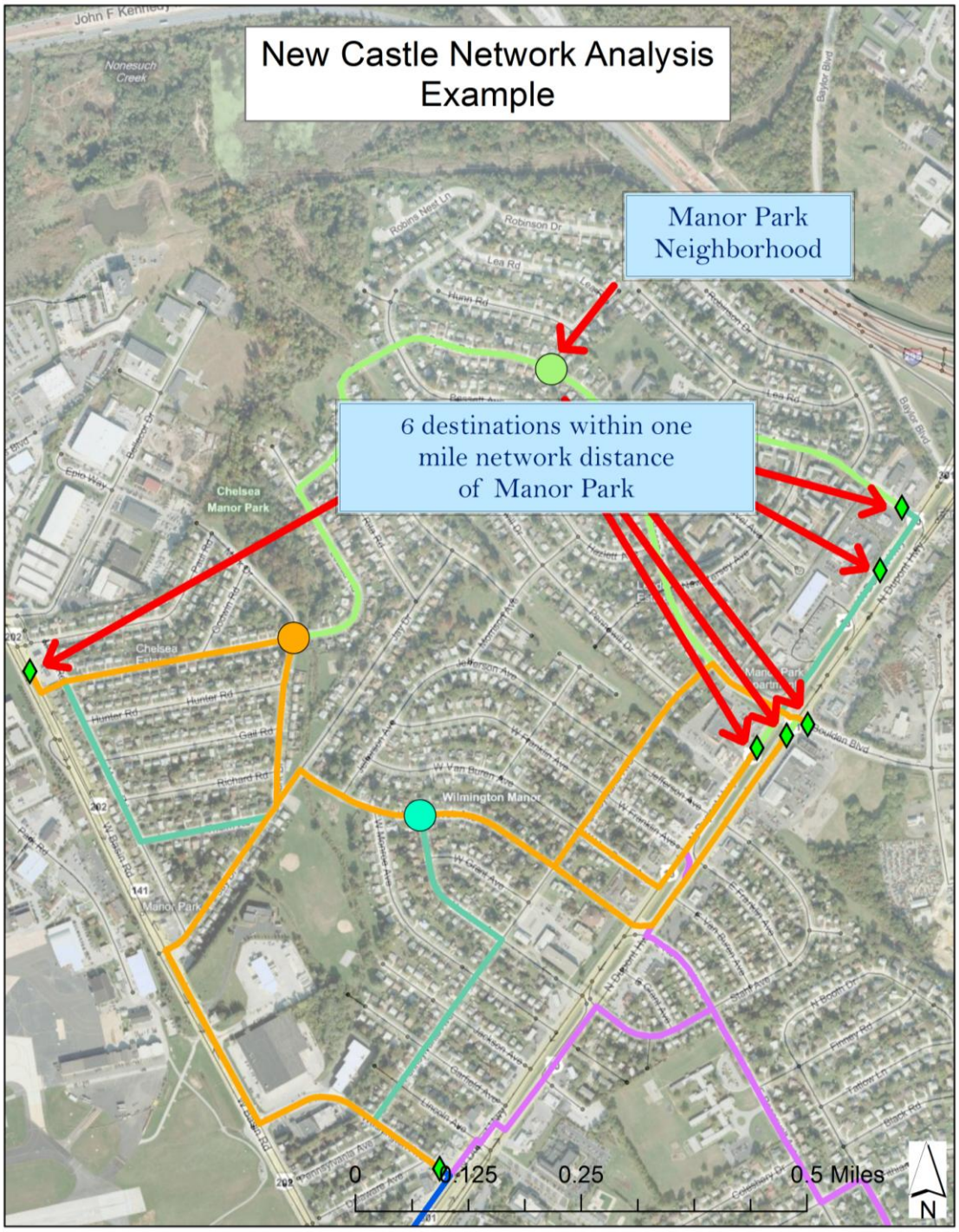
Using the same origins (neighborhoods) and destinations identified in the maps above, a network analysis was performed to find the number of destinations that are within a one-mile network distance of each origin. Though ¼ mile is often used as a measure of "convenient" walking distance,

one mile is considered the maximum walking distance for pedestrian transportation purposes. Map 5 shows the results of using the GIS Network Analyst tool in New Castle. The green diamonds on this map represent destinations and the various-colored dots represent neighborhoods. The network routes between each origin and destination are represented by lines whose colors match the origin (neighborhood) color.



Map 5

The network analysis map above can be somewhat confusing because it shows all origins, destinations, and routes. To clarify the results of GIS network analysis, Map 6 below shows an example of just a portion of the above map and highlights one neighborhood. As shown on this map, the Manor Park neighborhood (represented in light green) is within one mile or less of six destinations.



Map 6

To more clearly illustrate the results of this network analysis, Figure 4 is a table showing the number of destinations within one mile of each neighborhood as well as the number of destinations within one-quarter mile of each neighborhood (a more reasonable walking distance). This table also shows what types of destinations are near each neighborhood, which is an important consideration. For example, the Historic New Castle area has six destinations within a one-mile distance, but four of these destinations are banks. The variety and utility of destination types near each neighborhood is important to the overall "walkability" of an area for non-recreation trip purposes.

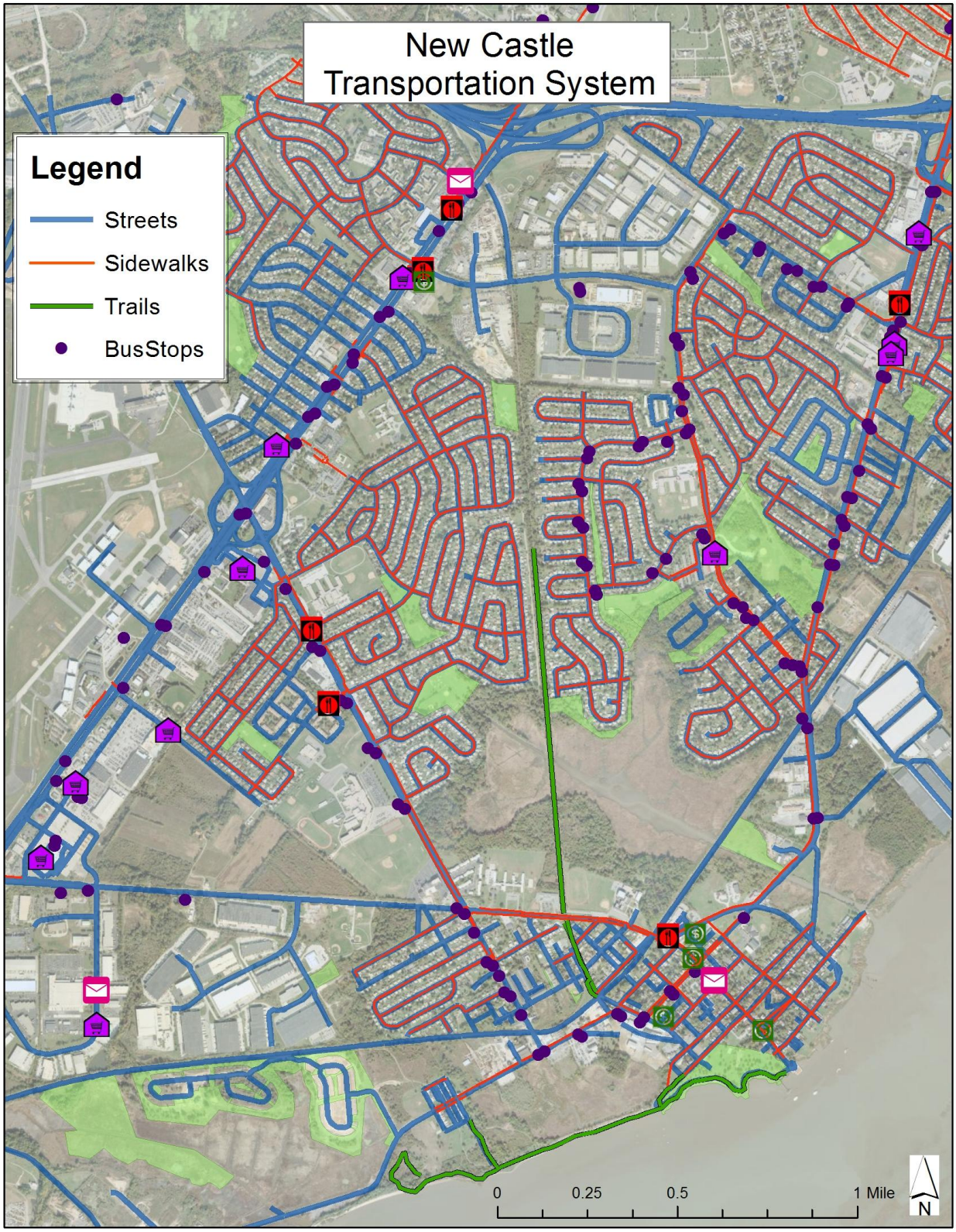
Neighborhood	Destinations within 1 mile Walking Distance	Destinations within 1/4 mile Walking Distance	Destination Types
Boothurst	5	0	Grocery (4); Convenience (1)
Castle Hills	4	0	Grocery (3); Convenience (1)
Chelsea Estates	5	1	Grocery (3); Convenience (1); Bank (1)
Collins Park 1	4	0	Grocery (3); Convenience (1)
Collins Park 2	4	1	Grocery (3); Convenience (1)
Historic New Castle	6	6	Convenience (1); Bank (4); Post Office (1)
Jefferson Farms	1	0	Grocery (1)
Manor Park	6	0	Grocery (2); Convenience (2); Bank (1); Post Office (1)
Penn Acres	7	0	Grocery (3); Convenience (3); Bank (1)
Penn Acres South	6	0	Grocery (4); Convenience (2)
Riverbend at Old New Castle	0	0	
Rogers Manor	1	0	Grocery (1)
Swanwyck Estates	4	0	Grocery (3); Convenience (1)
Van Dyke Village	1	0	Grocery (1)
Washington Park	5	0	Convenience (2); Bank (3)
Wilmington Manor Gardens	3	0	Grocery (1); Convenience (2)
Wilmington Manor West	7	0	Grocery (3); Convenience (2); Bank (1); Post Office (1)

Figure 4: New Castle GIS Network Analysis Results

Transportation Options within New Castle

Other than geographic proximity, another measure of walkability and bikeability within a city is simply to look at the transportation infrastructure and services provided. Transportation infrastructure includes streets, sidewalks, bike lanes, and off-road trails. Transportation services generally include any type of transit, which in New Castle is mostly limited to DART bus service.

The map below shows the streets, sidewalks, trails, and bus stops within New Castle. The locations of the previously-identified destinations are also shown for reference. There are a few important limitations to this map that should be noted: First, the sidewalk data are several years old and not verified. Therefore there may be some existing sidewalks that are not represented on this map. Additionally, this map does not represent where bicycle lanes or wide shoulders are present because the data are not available. This type of information would be important for measures of larger-scale bikeability. This map also shows bus stops serviced by DART within and around New Castle but does not represent the actual bus routes.


New Castle
Transportation System
Legend
Streets
Sidewalks
Trails
BusStops
0
0.25
0.5
1 Mile
N
Map 7

A few simple observations can be made from this map. First, there appears to be a relatively good supply of sidewalk infrastructure in New Castle. However, many of the places without consistent sidewalks, such as Route 141 and Route 273, are the arterial roadways with most of the destinations—places where the potential for conflict between autos and pedestrians/bicyclists is highest. Second, this map illustrates the disconnected nature of the trails in New Castle, which are not always accessible or connected by a sidewalk. For example, there is a gap in sidewalk infrastructure between the southern terminus of the Heritage Trail and Battery Park. This issue is explored further in the "Qualitative Assessment" portion of this report.

Finally, this map represents a decent number of bus stops throughout New Castle. DART bus Route 15 provides service between the Christiana Mall and Downtown Wilmington via New Castle. This route provides service to the neighborhoods along New Castle Ave. (Route 9) as well as the Historic New Castle area around the Ferry Cut-Off. Weekday service is provided roughly every 30 minutes (until about 10 PM) and weekend service is provided roughly every 60 minutes during daytime hours.

Bus routes 25, 27, and 17 also pass through various parts of New Castle, though they do not provide much circulation within the city itself. In terms of destinations, bus routes 27 and 15 provide the best service to the concentration of commercial destinations (such as grocery stores) along Route 9, Route 273, Route 141, and DuPont Highway/Route 13.

Though New Castle is relatively well-served by DART bus routes and stops, it is important to note that many bus stops are located in areas without sidewalk infrastructure and with very few amenities (such as benches and shelters). While the convenience and frequency of bus service is perhaps the most important factor determining use, the pedestrian (and bicycle) access to bus service is extremely important because all transit riders are also pedestrians (or bicyclists) for a portion of their trip. More concerted effort should be made to ensure that bus stops adequately accommodate pedestrians and bicyclists.

The GIS analysis exercises discussed in the previous paragraphs show that, while there appears to be a good amount of pedestrian facilities in New Castle, most origins and destinations are too far apart to be easily accessible to pedestrians, and furthermore that sidewalk and trail facilities are not laid out in a way that provide convenient, uninterrupted connections between origins and destinations.

QUALITATIVE ASSESSMENT

Another component of analysis was qualitative assessment, which is integral to a comprehensive analysis and complementary to findings from the technical assessment. An in-the-field walkability/bikeability assessment was conducted with members of the community and pedestrian/bicycle planning professionals; members of the community were also contacted for informal interviews and discussion about conditions for bicyclists and pedestrians. Documenting

and discussing the conditions with members of the community offered insight into details about community behavior, needs, and desires—aspects that are not captured with GIS mapping analysis.

WALKABILITY ASSESSMENT

The walkability/bikeability assessment was conducted on Saturday, March 26, 2011 from 9:00-11:00am. Two important community travel routes were addressed: the Route 9 corridor heading north out of the historic city center, and from the city's historic center to the Industrial Track Greenway/Heritage Trail and back toward the city center (see Map 8 below). Two teams of community volunteers divided up to review and document conditions for bicyclists and walkers/joggers along the routes.

While a number of issues were identified by both groups, the good news is that both of these areas/transportation routes are great candidates for utilitarian and recreational pedestrian/bicycle activity. Both of the assessment areas provide at least some existing infrastructure and amenities that create connections between residential, commercial, recreational, and institutional uses. With a small number of improvements identified by this assessment (some underway or in design phase already), non-motorized transportation in these areas will be more convenient and enjoyable for New Castle's residents and visitors.

Map 8

Route 9 Group:

The Route 9 group, led by B.J. DeCoursey and Claire Beck from the University of Delaware's Institute for Public Administration, walked from the historic center of town out 4th Street to Route 9, heading north. The group walked through a few of the neighborhoods bordering Route 9, then turned back south to return to the historic center just before reaching the Buttonwood neighborhood. Map 9 shows the specific path taken.

Map 9

In general, this section of Route 9 is not a very pedestrian-friendly environment, as it is lined with automobile-oriented businesses and mainly serves as a through-route to Wilmington. There are not many destinations on this particular section of Route 9 that would be desirable for pedestrians or bicyclists, but this stretch of roadway does serve as an important link between the neighborhoods in northern New Castle and the historic center of town. The Route 9 assessment group walked from the historic center to neighborhoods along Route 9 in order to experience what

it would be like to take this route as a pedestrian or cyclist. Route 9 has wide shoulders along the entire length assessed, which present an opportunity for designated bicycling/pedestrian space. However, in its current condition, the group found this walking route to be relatively unpleasant and inconvenient for pedestrian trips. The key findings of this walkability assessment are briefly listed below.

Key findings:

- Heading north on Route 9 from the Ferry Cut-Off there are no marked pedestrian crosswalks across Route 9 until you reach Buttonwood Avenue—a total of 1.5 miles without safe crossing opportunities.
- Bus stops along Route 9 generally had no amenities and insufficient signage.
- Despite no safe crossings, sidewalk facilities exist only intermittently on one side of Route 9 or the other, but they are not consistent on either side of the roadway.
- There is no convenient pedestrian access to food shopping in the historic center or the nearby portion of Route 9.
- Some crosswalk markings in the historic center are faded.
- The majority of both sides of Route 9 from the Ferry cut-off, north to roughly the Boothurst Neighborhood have wide shoulders that would accommodate bicyclists quite well if they were marked for bicyclists and kept in good repair. However, some of this shoulder space is used as on-street parking, and in locations where the shoulder narrows or disappears, appropriate bicycle signage would need to be implemented.
- The median on Route 9 from I-295 to the Ferry Cut-off is asphalted over making the road look wider and encouraging higher traffic speeds. Planting a hardy perennial in the median would serve as a traffic calming mechanism and also provide visual appeal to an area that is abundant with asphalt and concrete.

FIGURE 5: END OF SIDEWALK ON ROUTE 9 NORTHBOUND

FIGURE 6: PAVED MEDIAN AND ON-STREET PARKING IN SHOULDER

- 4th Street (which turns into Wilmington Rd.) could provide a convenient connection between the historic center and Route 9. However, the sidewalks on this connecting street are experiencing maintenance issues and are missing in some locations. This route is actually quite scenic, passing through a historic neighborhood and crossing over wetlands and the Narrow Dyke Canal. The provision of improved pedestrian and bicycle facilities along 4th Street and Wilmington Road would make this a pleasant north-south connection for bicyclists and pedestrians.
- Glebe Road off of Route 9 connects to the Industrial Park and could make a nice recreational bike route.
- The portion of the northbound side of Route 9 that currently lacks a sidewalk may possibly have room in the right-of-way for a multi-use path.

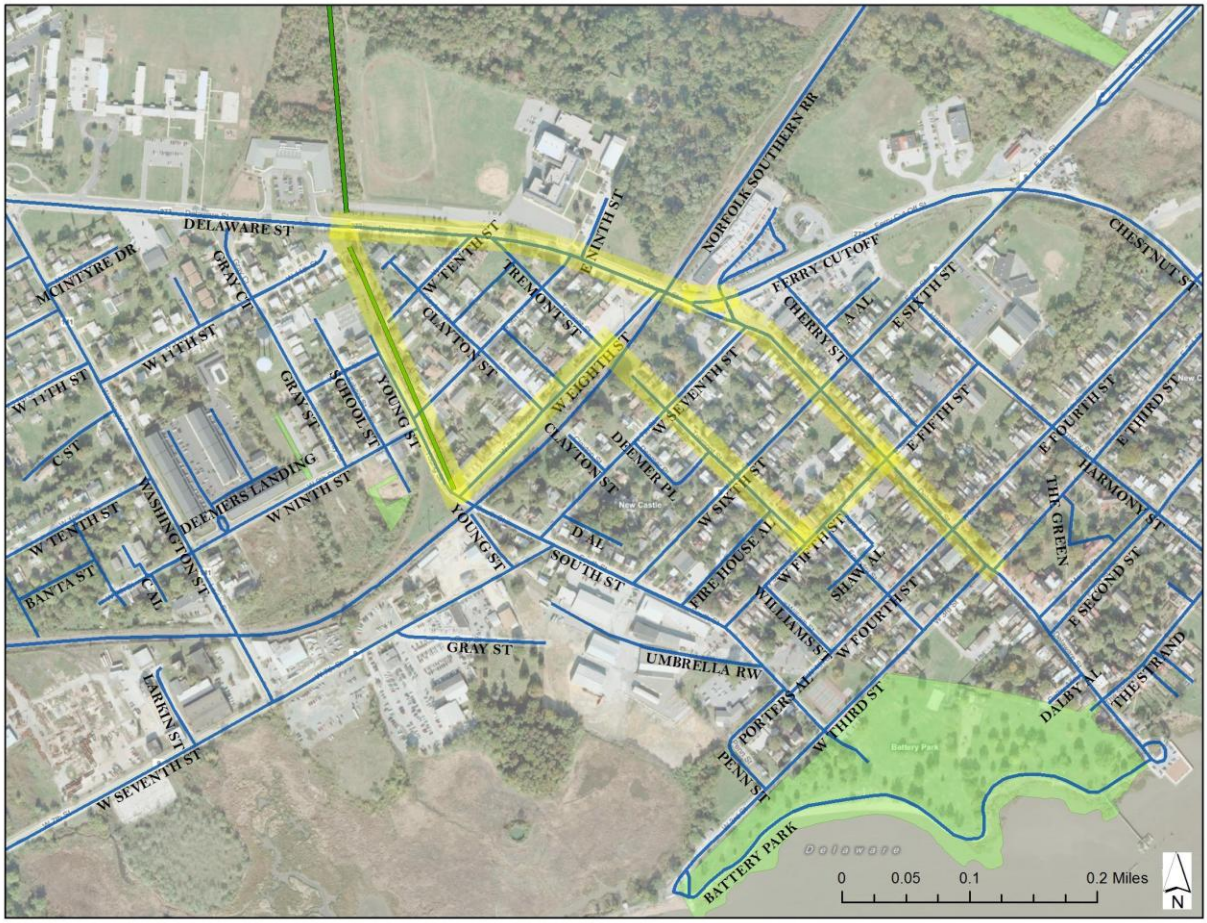
FIGURE 7: ACCESS TO INDUSTRIAL PARK CURRENTLY USED BY WILMINGTON TRAIL CLUB

FIGURE 8: SPACE IN ROW FOR MULTI-USE PATH ON RT. 9 NORTHBOUND

Route 273 Group:

This group was led by Jeff Riegner (Whitman, Requardt & Associates) and Andrea Trabelsi (Delaware Greenways). The team walked from Delaware Street and 3rd Street to the Industrial Track Trail on Route 273/Ferry Cut-off, crossed to the Heritage Trail and meandered back to

Delaware Street. The specific route taken is highlighted in Map 10 below. This route covered a number of likely travel routes for bicyclists and pedestrians, including: getting from the historic center of town to the pharmacy and strip mall along Ferry Cut-off; crossing Route 273 at the southern terminus of the Industrial Track Greenway; and traveling from the Heritage Trail into the historic center of town. Conditions which impact pedestrians and bicyclists were fair, overall. While sidewalks or paths were available through most of the route, crossing Route 273/Ferry Cut-off posed the greatest challenge. Specific findings from the assessment address infrastructure details as well as broad connection issues, and are explained below.



Map 10

Key Findings:

- While the historic center of town provides an overall pleasant and comfortable experience for a pedestrian/bicyclist, a number of key destinations, such as a grocery store, are not accessible.

- Crosswalks along Delaware Street—the main road into the historic downtown—are faded.

- The traffic signal at 6th Street and Delaware Street does not have a pedestrian signal, and a pedestrian cannot easily see the traffic signal.

- Pedestrian scale lighting is not present on Delaware Street, between 7th Street and Ferry Cut-off, despite the route serving as a main gateway to the city and prime pedestrian route between the historic center of town and the nearest pharmacy.

- Restaurant parking along Delaware Street at the Ferry Cut-off intersection is hazardous for pedestrians/bicyclists. Improvements could include: relocating the sidewalk between the front of the cars and outdoor seating area; relocating the parking area; painting a bike lane on the road; differentiating the pedestrian way from the parking spaces with a different paving material/texture; and relocating the pedestrian way to be closer to the parking spaces so drivers can more easily see pedestrians.

- Delaware Street at 7th Street is very difficult to cross, as the traffic veers onto Delaware Street from Route 273/Ferry Cut-off; cars typically are going fast around the slight curve. While designs for reconfiguring the Delaware Street/Ferry Cut-off intersection exist, which would change the dynamics and pedestrian/bike needs at this intersection from what they are currently and likely at a minimum reduce this concern, other options for solving this problem include installing a speed table with crosswalk and placing one or more speed limit reduction warning signs for cars rounding the corner from Route 273/Ferry Cut-off.

FIGURE 9: INTERSECTION OF 6TH STREET AND DELAWARE STREET

FIGURE 10: RESTAURANT PARKING CONFIGURATION ALONG DELAWARE STREET AT ROUTE 273 POSES HAZARDS FOR PEDESTRIANS AND BICYCLISTS

FIGURE 11: LOOKING DOWN 7TH STREET AT

- Crossing Ferry Cut-off at Delaware Street is difficult, due to the short length of the pedestrian signal. This route is one that is used by older residents of the historic center of town who are trying to get to the Happy Harry's pharmacy.

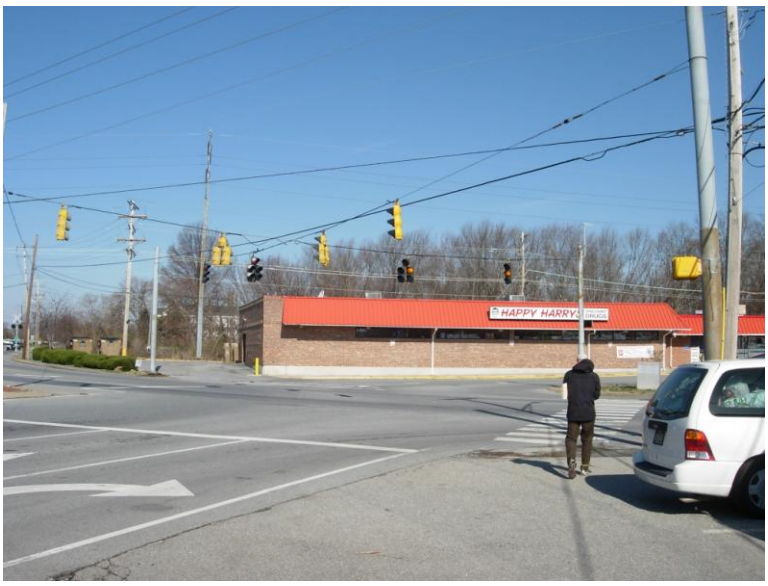


FIGURE 12: FERRY CUT-OFF AND DELAWARE ST. INTERSECTION PROVIDES LIMITED PED/BIKE CROSSING ABILITY

- Crossing Route 273 safely anywhere between the Ferry Cut-off intersection all the way to route 141 is difficult. There are a few crosswalks and signs at the schools, but none seem to be located in the areas of highest demand. Connecting a pathway from 11th Street to the sidewalk on Route 273, and re-routing the Family Foundations crossing to align with a much needed crossing at the Industrial Track Greenway crossing seems to be a good possible solution.

- Crossing at the entrance/driveway in front of Happy Harry's is very difficult, as there is no crossing signal and a blind corner coming from the rear delivery accessway.

- The pathway along Route 273 at the railroad tracks/8th Street is in disrepair and quite narrow as it is crowded out by overgrown shrubs, making walking for those with a stroller or walker difficult.

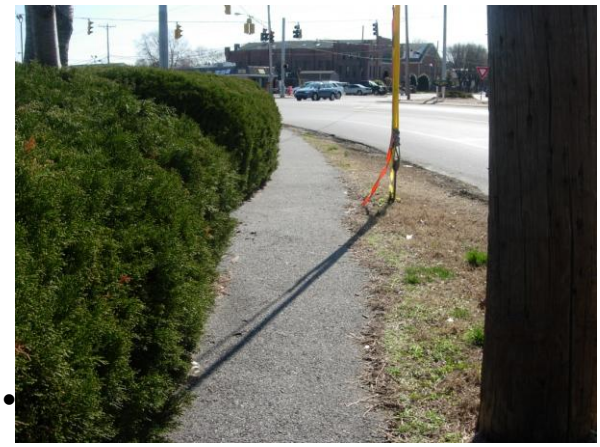


FIGURE 13: ENCROACHMENT OF NARROW PATH ALONG ROUTE 273 BY OVERGROWN SHRUBS

FIGURE 14: GATE AT INDUSTRIAL TRACK TRAIL, LIMITING ACCESS (HAS BEEN OPENED AS OF MAY 2011)

- The Industrial Track Greenway is a valuable asset to the community, but it is not easy to access or even notice: a gate is closed and locked preventing access from the New Castle School property (as of mid-May 2011 this problem has apparently been rectified); there is a ditch and trees limiting access and visibility along Route 273; and the Family

Foundations Academy side is muddy and has a fence blocking it off. This is likely one reason that the trail is not even known to some residents living nearby.

- The Heritage Trail (parallel to Young Street) is another great paved, off-road pedestrian/bike link in the community. The trail, however, only travels five blocks. Moreover, the trail does not start or end at any significant landmark or destination, but rather starts in a nondescript area at South Street and 8th Street and terminates in a steep embankment at Route 273. With no sense of route or location at either end, a pedestrian or bicyclist either feels lost, isolated, or just unmotivated. Overall, the trail has pleasant landscaping (though a bit overgrown) and nice amenities—such as lantern lighting, bike racks, a blank kiosk, and benches. Some of these amenities are a bit worn from weather and vandalism. The city administrator explains that the trail is currently maintained by a full-time seasonal city employee. The kiosk, if used for signage or a map provides the base for some much needed way-finding and information.

FIGURE 15: (LEFT) HERITAGE TRAIL KIOSK COVERED IN GRAFFITI; (RIGHT) RAVINE FROM ROUTE 273 DOWN TO HERITAGE TRAIL

- The streetscape leading from the southern terminus of the Heritage Trail to Battery Park is not appealing and does not draw a person toward the park. Moreover, sidewalks are not consistent on both sides of the road and are not in satisfactory condition, which is a deterrent that prevents users from continuing on to Battery Park. The condition of the sidewalks also poses an extra challenge for less agile users, such as the elderly or parents with children. Notably, the New Castle Senior Center is located a few blocks down South Street from the 8th Street intersection.

FIGURE 16: SOUTHERN TERMINUS OF HERITAGE TRAIL

Other Community Input:

Other information about pedestrian and walking conditions were gathered from other members of the community and are summarized below:

- Students walk along the railroad tracks that run parallel to Route 9 (west side) to travel to/from school and other destinations

- Crosswalks at the New Castle School are underutilized, as the school has a small student body and not many children are walking.

- Local residents of the Buttonwood/Boothhurst neighborhoods report that residents of the Jefferson Farms and other nearby neighborhoods walk to their jobs in the two industrial/business parks on the east side of Route 9. These residents also reported that with higher gas prices and challenging economy, residents are seen walking more and driving less to get groceries and do other errands. A survey/assessment of employees of those businesses would be worthwhile, as there are a significant number of workers at the industries that also live nearby in the community.

- Crossing guards are located along Route 9 at Buttonwood Avenue, May Avenue, and Landers Lane for schoolchildren. Elementary school children are reportedly the most likely to walk to school.

- Local residents report that they are not familiar with the Industrial Track Trail.

- On a non-scientific survey distributed to the community on election day, over 80 percent of respondents reported that they walk, jog, and/or bicycle for recreation or transportation. Survey respondents were also asked about what factors would increase their likelihood or frequency of walking, bicycling, or jogging. Over 50% of respondents indicated that they would do those activities more frequently if there were more trails, and almost 40% said they would be more likely to do those activities if the trails/sidewalks/paths led to a grocery or convenience store. Nearly 50% of respondents also indicated that they would be more likely to walk/jog/bike if there was better lighting, they felt safer (from crime/auto vehicles), and if bicycle lanes were more clearly marked.

- General perspective is that most people in these communities drive if they can. If a car is broken down or gas prices get too high, then you will see more walkers, bicyclists, and bus users. Nonetheless, there are plenty of walkers/bicyclists along Route 9.

- A group of youth was observed walking along Route 9 one afternoon, and given there was no sidewalk, they were walking along the road shoulder (this was along the stretch toward the Rite Aid (just north of Boothhurst).

- New Castle Police have a summer bike patrol person in Battery Park.

RECOMMENDATIONS

COMMUNITY-WIDE LAND USE AND CIRCULATION ROUTES

Neighborhood-scale commercial services:

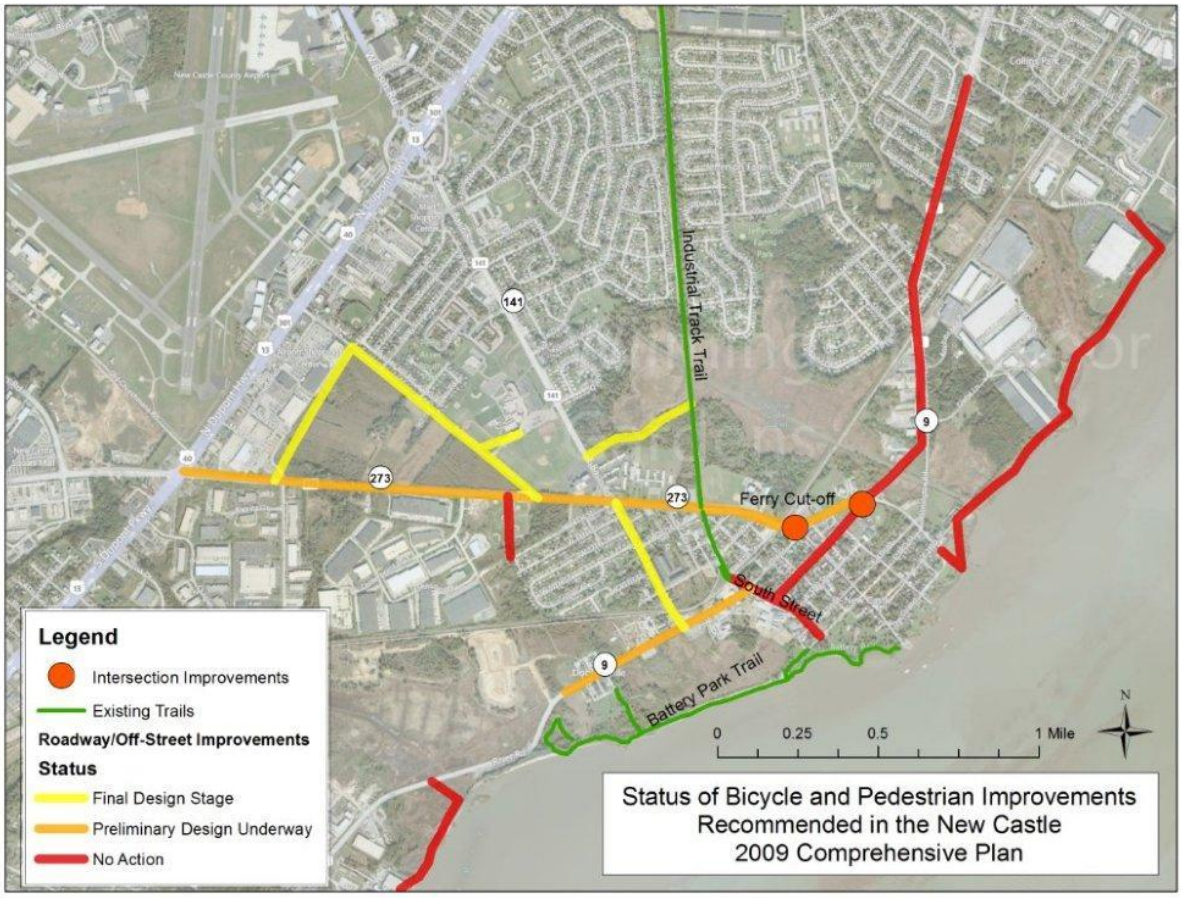
One of the main impediments to walking and bicycling for utilitarian trips is the distance between origins and destinations. This prohibitive distance (illustrated earlier in this report with GIS analysis) is largely due to land use patterns that separate residential and commercial land uses. The City of New Castle, community members, and New Castle County should work together to explore mechanisms to encourage mixed use development and target specific uses in certain areas. Possible mechanisms include: county and municipal zoning codes that encourage and/or incentivize mixed-use zones and development in appropriate places, and small area planning beyond the municipal boundaries to coordinate the municipal and County zoning.

The City of New Castle could work with New Castle County to develop "Mixed-Use" and "Traditional Neighborhood" development zones that would allow and encourage land use patterns that foster non-motorized transportation. For example, small neighborhood-scale grocery stores can be located near (or within) residential areas in order to provide convenient food access that does not require the use of a car. In many cases, the establishment of such businesses may require financial incentives to gain momentum (such as Pennsylvania's Fresh Food Financing Initiative). However, neighborhood grocers are often local businesses, and these establishments typically meaningfully give back to the local economy and community more so than large chain businesses.

Complete non-motorized transportation linkages:

Map 11, below, shows the status of the majority of local, major pedestrian/bike route enhancement projects. (Project details can be found in the section describing the City's 2009 Comprehensive Plan update.) In green are the completed routes, which are the City's main trails; in yellow are projects that are nearing construction; in orange are the routes that are in intermediate design phases; and in red are projects that have been identified, but for which no progress has been made. From this map one can see where interconnected non-motorized routes will exist in the future, and where there are gaps that need to be considered in upcoming planning. By knowing where non-motorized transportation routes will exist in the future, the city and/or other entities can make an effort to plan for smaller connector trails to these larger "main-line" routes. Additionally, stakeholders can promote certain development along these routes, such as a grocery store, that would benefit from the traffic and also be useful to the many community members seeking a grocery store accessible on foot or bike. Patterns on the map also suggest that greater effort needs to be placed on improving pedestrian/bicycle access to the northern parts of the community and along Route 9. A final takeaway from the map is that while the industrial track trail travels through an abundance of residential neighborhoods, there are only one or two informal access points between the 3 miles of

trail from Boulden Boulevard to Route 273. In order to increase usage and benefits to the community, additional trail access points need to be developed.



Map 11

Route 9 (Infrastructure and Amenities)

Route 9 serves as an important connection between the historic center of New Castle and residential communities to the north. While this roadway currently meets the demand for automobile trips, the north-south movement of pedestrians, bicyclists, and transit users is inhibited by the lack of infrastructure and amenities along Route 9. Providing non-automobile options for travel between the historic New Castle area and the neighborhoods along Route 9 is important for encouraging healthier lifestyles, economic development, and an overall greater sense of community.

Additional infrastructure that should be considered along the route between historic New Castle and the intersection of Route 9 and Buttonwood Ave. include:

- Consistent sidewalks (or trails) on both sides of Route 9

- Striped pedestrian crossings at each signalized intersection along Route 9
- Signed designation of bike lanes and/or bike routes along Route 9
- Improved sidewalks on 4th St./Wilmington Rd. (this could just be along one side of the street)

Additional amenities that should be considered along this route:

- Signage for pedestrians and bicyclists to navigate between northern New Castle and the historic center
- Larger/more prominent bus stop signs; provision of schedule information and benches at stops would also increase visibility and use
- Landscaping on Route 9 median for traffic calming and beautification purposes

Route 273/Industrial Track and Heritage Trail (Infrastructure and amenities)

The streets and trails connecting historic New Castle, Route 273, and Battery Park show great promise as a pleasant area for pedestrians and bicyclists. With the existing Industrial Track and Heritage Greenways for off-street pedestrian/bicycle use, the area examined in this walkability audit is poised to become a well-connected and highly-used non-motorized transportation corridor. The following recommendations for this area should be considered:

- From the southern terminus of the Heritage Greenway, paint a bike lane or route indicator on the pavement and install directional signage to Battery Park (straight ahead) and to the downtown (left along 8th Street) to make pedestrians and cyclists more comfortable.
- With the aim of connecting the southern end of the Heritage Greenway to Battery Park, the City should pursue opportunities to create an off-road connection through the recently closed B & E lumberyard property as a future development proposals come through.

FIGURE 17: COMPACTED GRASS AND DIRT INDICATE THAT THIS ROUTE IS ALREADY AN INFORMAL CROSSING FOR PEDESTRIANS.

- Paint bike lanes on pavement along Route 273 to designate a space for bikes.
- Make sure sidewalks exist and are in good repair on both sides of the street into Battery Park.
- Designate 8th Street as a bicycle boulevard to get to downtown, with the route crossing the Railroad tracks at Tremont Street. While developing pedestrian crossings at active railroads are often challenging, it is apparent that this route is already used by pedestrians (see Figure 17).

- Improve connection between the Washington Park neighborhood and the 8th Street/South Street intersection; install signage to direct people to the downtown.

Conclusions and Suggestions for Further Analysis

Given the feedback received from the community with regard to opportunities and needs for improvement, the following projects are recommended for further study and follow-up as they have the potential to impact the community at large:

- **Analysis of pedestrian/bicycle access to area schools**. This walkability/bikeability analysis provided preliminary insight into the needs and opportunities for enabling our kids to walk to/from school in a safe and direct manner. Further study focusing on safe routes to and from schools is merited and should be conducted with members of the community, including schools, parents, and youth. A study of this kind could also be done concurrently and as part of Delaware's Safe Routes to School Program, an annual program that will next accept applications during fall 2011.
- **Survey and assessment of walking/bicycling habits of employees of local businesses.** Local residents indicate that there are a substantial number of workers at local businesses--especially at the local business/industrial parks--who live within walking/biking distance in nearby neighborhoods. A focused assessment of both workers and employers with regard to walking/bicycling habits and policies would shed light on further opportunities for increasing the number of people choosing active transportation modes. Such an assessment could include looking at: the numbers of workers that walk/bicycle; any employer accommodations or incentives provided; specific opportunities/barriers identified by employees or employers; and more.

Given the small physical size and inherent natural features of New Castle, the city is well-positioned to become a walkable and bikeable community with numerous recreational opportunities and a strong sense of place. The specific recommendations put forth in this report should be pursued by the City of New Castle as well as other entities, but it is also important that community members get behind these various initiatives. Furthermore, as illustrated in Map 11, above, the different improvements to on- and off-street bicycle and pedestrian facilities throughout the New Castle area should be planned and implemented with the overall goal of connectivity, accessibility, and convenience. The provision of useful and enjoyable non-motorized transportation and recreational opportunities will contribute significantly to the overall health of New Castle's residents and visitors.