WILMAPCO

Southbridge Circulation Study

Wilmington, Delaware

September 2008

In Cooperation with:

Rummel, Klepper & Kahl, LLP
Consulting Engineers

SOUTHBRIDGE CIRCULATION STUDY

Prepared For:

WILMAPCO

Wilmington Area Planning Council
850 Library Avenue, Suite 100
Newark, DE 19711

Prepared By:

RK&K

Rummel, Klepper & Kahl, LLP
1206 Forrest Avenue
Dover, DE 19904

In Cooperation With:

September 2008

Wilmington Area Planning Council

850 Library Avenue, Suite 100
Newark, Delaware 19711
302-737-6205; Fax 302-737-9584
From Cecil County: 888-808-7088
e-mail: wilmapco@wilmapco.org
web site: www.wilmapco.org

RESOLUTION

BY THE WILMINGTON AREA PLANNING COUNCIL (WILMAPCO) ADOPTING THE SOUTHBRIDGE CIRCULATION STUDY

WHEREAS, the Wilmington Area Planning Council (WILMAPCO) has been designated the Metropolitan Planning Organization (MPO) for Cecil County, Maryland and New Castle County, Delaware by the Governors of Maryland and Delaware, respectively; and

WHEREAS, WILMAPCO is a member of South Wilmington's Special Area Management Plan (SAMP) Core Group, charged with moving forward the transportation recommendations found within the South Wilmington Neighborhood Plan of July 2006; and

WHEREAS, WILMAPCO has partnered with the Delaware Department of Natural Resources and Environmental Protection (DNREC) to conduct a detailed Circulation Study to measure the feasibility of the above recommendations and make new ones to improve the safety and flow of automotive and pedestrian traffic in Southbridge; and

WHEREAS, WILMAPCO met with and incorporated feedback from the City of Wilmington into the study; and

WHEREAS, the South Wilmington SAMP Core Group approved the study's recommendations on May 30, 2008; and

WHEREAS, after strong public involvement in the development of the study, the Southbridge Civic Association approved the study's recommendations on June 17, 2008;

NOW, THEREFORE, BE IT RESOLVED that the Wilmington Area Planning Council does hereby adopt the final report and recommendations of the Southbridge Circulation Study.

September 11, 2008
Date:

Stephen Kingsberry, Chairperson
Wilmington Area Planning Council

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Executive Summary

The *Southbridge Circulation Study* is a comprehensive evaluation of multi-modal traffic circulation within the Southbridge community in Wilmington, Delaware.

The community-driven *South Wilmington Neighborhood Plan* (hereafter the *Neighborhood Plan*), adopted in July 2006, is the impetus for the present study. Among other recommendations, the *Neighborhood Plan* made several key transportation recommendations to improve the quality of life in Southbridge. The present study is a follow-up to the *Neighborhood Plan*, led by the Wilmington Area Planning Council (WILMAPCO) in partnership with the Delaware Department of Natural Resources and Environmental Control (DNREC), the City of Wilmington, the Delaware Transit Corporation (DTC), and the Delaware Department of Transportation (DelDOT); the private engineering firm of Rummel, Klepper & Kahl (RK&K) was the project consultant. The *Southbridge Circulation Study* addresses the feasibility of the transportation recommendations found in the *Neighborhood Plan* and puts forth many additional recommendations to improve the transportation system in Southbridge.

Southbridge residents have continuously identified many major transportation concerns. These include:

- Heavy truck traffic
- Speeding automobiles
- A need to improve its public transit accessibility and connectivity
- Unsatisfactory non-motorized infrastructure (sidewalks, etc.)

After detailed traffic modeling, field observation and the careful consideration of community feedback, five overall recommendations are made in the *Southbridge Circulation Study*. These are summarized below, in no particular order of priority:

1. As identified in the *Neighborhood Plan*, comprehensive streetscape enhancements and traffic-calming measures should be pursued on New Castle Avenue (SR 9), South Heald Street (U.S. 13) (together, the neighborhood's north-south axis) and A Street (its west-east axis) along with other key streets in Southbridge. These enhancements could include pedestrian-scaled lighting, street trees, and street furniture. Specifically, the study strongly recommends that lane widths be reduced on the three primary streets (New Castle Avenue, South Heald Street, and A Street) with bulb-outs introduced at their intersections in an effort to slow traffic and improve pedestrian safety.

2. Southbridge residents are vocal about their desire to reduce the number of trucks passing through their community. The construction of a bypass to divert trucks around the Southbridge core, as proposed in the *Neighborhood Plan*, is economically unfeasible. With development around Southbridge, however, it could be pursued as a long-term solution. This report proposes a multi-pronged approach to tackle the unwanted truck traffic. Reduced lane widths and other physical improvements, such as bulb-outs, will work to deter trucks from routing through Southbridge. Truck turn restrictions, proposed at key side-street locations, will further deter trucks and help keep them off side-streets. The conversion of Bradford Street (north of Lobdell Street) from a southbound one-way to a northbound one-way will allow lost trucks traveling west on Lobdell Street to more easily re-route north onto Christina Avenue and not through the neighborhood's core. Enhanced truck guide signs just outside Southbridge (along with a follow-up truck signing study for the surrounding area) will help ensure trucks do not become lost en route from the nearby Port of Wilmington or elsewhere and end up in Southbridge. Further, WILMAPCO will meet with local generators of truck traffic and work with them to identify alternate routes around Southbridge their drivers may utilize.

3. Speeding is a problem in Southbridge. While the posted speed limit is 25 mph, average speeds on New Castle Avenue and South Heald Street are 35 mph and 31 mph, respectively. The *Neighborhood Plan* suggests shifting New Castle Avenue and South Heald Street from a one-way pair to two-way streets in an effort to calm traffic. After weighing the pros and cons of this proposed shift, it was determined to keep the streets one-way. The present study proposes two recommendations which will work together to reduce vehicular speed in Southbridge. After some fieldwork, it was discovered that the traffic signals along New Castle Avenue and South Heald Street are incorrectly timed for higher speeds, encouraging drivers to speed. Retiming the signals to a 25 mph progression (already submitted to the City of Wilmington) along with the proposed streetscape and traffic calming enhancements will reduce speeds. Retiming the signals to a 25 mph progression will also lower mobile-source emissions in Southbridge, especially carbon monoxide (CO).

4. A high percentage of Southbridge residents use public transit. Transit riders within Southbridge have expressed concern that they will not be able to reach a new ShopRite supermarket located to the west of the community and said they would like better connectivity to the rest of the city. It is recommended that bus Route 17 be re-routed (already submitted to DTC) to ensure access to the new ShopRite supermarket and the Salvation Army site, and that bus Route 8 be re-routed (already submitted to DTC) to pass through the Southbridge core to provide additional connectivity to the city. Additional bus shelters were proposed by the *Neighborhood Plan* and again at public meetings during the course of the present study. After an analysis of boarding data at the proposed locations, it was found that the DTC benchmark for the provision of new shelters was not met at the identified locations. This study proposes that these additional shelters are added with redevelopment.

5. Non-motorized infrastructure in Southbridge requires improvement to ensure the safest possible conditions for pedestrians and bicyclists. Following the adoption of the *Neighborhood Plan* in the summer of 2006, WILMAPCO conducted a *Walkable Community Workshop* with Southbridge residents. Many pedestrian trouble-spots were uncovered. About two dozen small projects (such as repairing segments of sidewalk and adding crosswalks) were identified and prioritized by the community to improve the neighborhood's walkability. The *Southbridge Circulation Study* recommends that WILMAPCO continue its attempts to secure funding for these improvements and for the additional needed pedestrian improvements uncovered during this study. Cycling conditions within Southbridge should likewise be upgraded. New Castle Avenue and A Street are identified by DelDOT as Bike Route 2. Following the recommendations made by the upcoming Wilmington Bicycle Study, signage along this route and the addition of bicycle travel lanes should be seriously considered.

Community involvement was a high priority throughout the development of the *Southbridge Circulation Study*. Three public meetings were held in coordination with the neighborhood's active civic association. The first was a workshop, publicized through flyers posted throughout Southbridge, where residents were asked to identify their transportation concerns. Updates on the study were given at two later meetings of the civic association, and feedback was gathered. At the June 17, 2008, civic association meeting, Southbridge residents voted unanimously to approve the numbered recommendations summarized above.

In an era of financial uncertainty in the transportation sector, prioritization of projects is important. After approving the study's recommendations, community members prioritized them. Below is a list of the community's transportation priorities. The higher the score, the higher the priority:

- Truck turn restrictions (16 points)
- Re-route bus Route 17 to new ShopRite and Salvation Army (16 points)
- Guide signs for truck traffic (13 points)
- Re-time signals for 25 mph (10 points)
- Provide bike route signage (6 points)
- Reduce lane widths (5 points)
- Streetscape enhancements (5 points)
- Re-route bus Route 8 (4 points)

Funding mechanisms to implement these projects vary. Many, such as re-routing bus routes and re-timing signals, can be completed free of charge by respective government agencies. Others, such as streetscape and traffic calming measures, require tapping creatively into funding streams. These include DelDOT's Transportation Enhancement (TE) and Safe Routes to School (SRTS) Programs. WILMAPCO is committed to assisting in the identification and exploration of these and other programs to realize the recommendations found in the *Southbridge Circulation Study*.

I. Introduction

The Wilmington Area Planning Council (WILMAPCO) has been an active participant in the South Wilmington Special Area Management Plan (SAMP) for a number of years. SAMP is a cooperative effort of community members, business leaders, not-for-profit organizations and government to spur the revitalization of South Wilmington and its residential core, Southbridge.

The SAMP's community-driven *South Wilmington Neighborhood Plan* (hereafter *Neighborhood Plan*), adopted in July 2006, was the impetus for the present circulation study. Among other recommendations, the *Neighborhood Plan* makes several key transportation recommendations to improve the quality of life in Southbridge. The present study is a follow-up to the *Neighborhood Plan*, led by the Wilmington Area Planning Council (WILMAPCO) in partnership with Delaware's Department of Natural Resources and Environmental Control (DNREC), the City of Wilmington, the Delaware Transit Corporation (DTC), and the Delaware Department of Transportation (DelDOT); the private engineering firm of Rummel, Klepper & Kahl (RK&K) was the consultant. The *Southbridge Circulation Study* addresses the feasibility of the transportation recommendations found in the *Neighborhood Plan* and puts forth many additional recommendations to improve the transportation system in Southbridge.

II. Study Area

As shown in **Figures 1** and **2**, the study area is defined as Walnut Street to the west, the Christina River to the north, Wilmington's city boundary to the south, and Christina Avenue and Interstate 495 to the east. The study area also extends to the west to include A Street between Walnut and Market Streets.

South Wilmington is undergoing massive transformation, driven by fresh development along the Christina River. While the possibilities of new development are exciting, parts of South Wilmington face unresolved challenges. These include the presence of brownfields, chronic flooding, gentrification, community character, unemployment, aging infrastructure, poor air quality, and numerous concerns with its transportation system.

Approximately 1,600 people (according to 2000 Census data) call South Wilmington home. Most reside in the tightly-knit, black, working-class neighborhood of Southbridge. Southbridge has long been identified by WILMAPCO as one of our region's significant *Environmental Justice* (EJ) neighborhoods, with its unusually high percentage of low-income and minority individuals. About 39% of households in Southbridge fall below the poverty line, compared to only eight percent at the county level. Non-Hispanic blacks, many second and third generation residents, comprise 82% of its population. Hispanics are the second-largest group at 12%.

The *Neighborhood Plan* calls for the redevelopment of Southbridge.

SOUTHBRIDGE CIRCULATION STUDY

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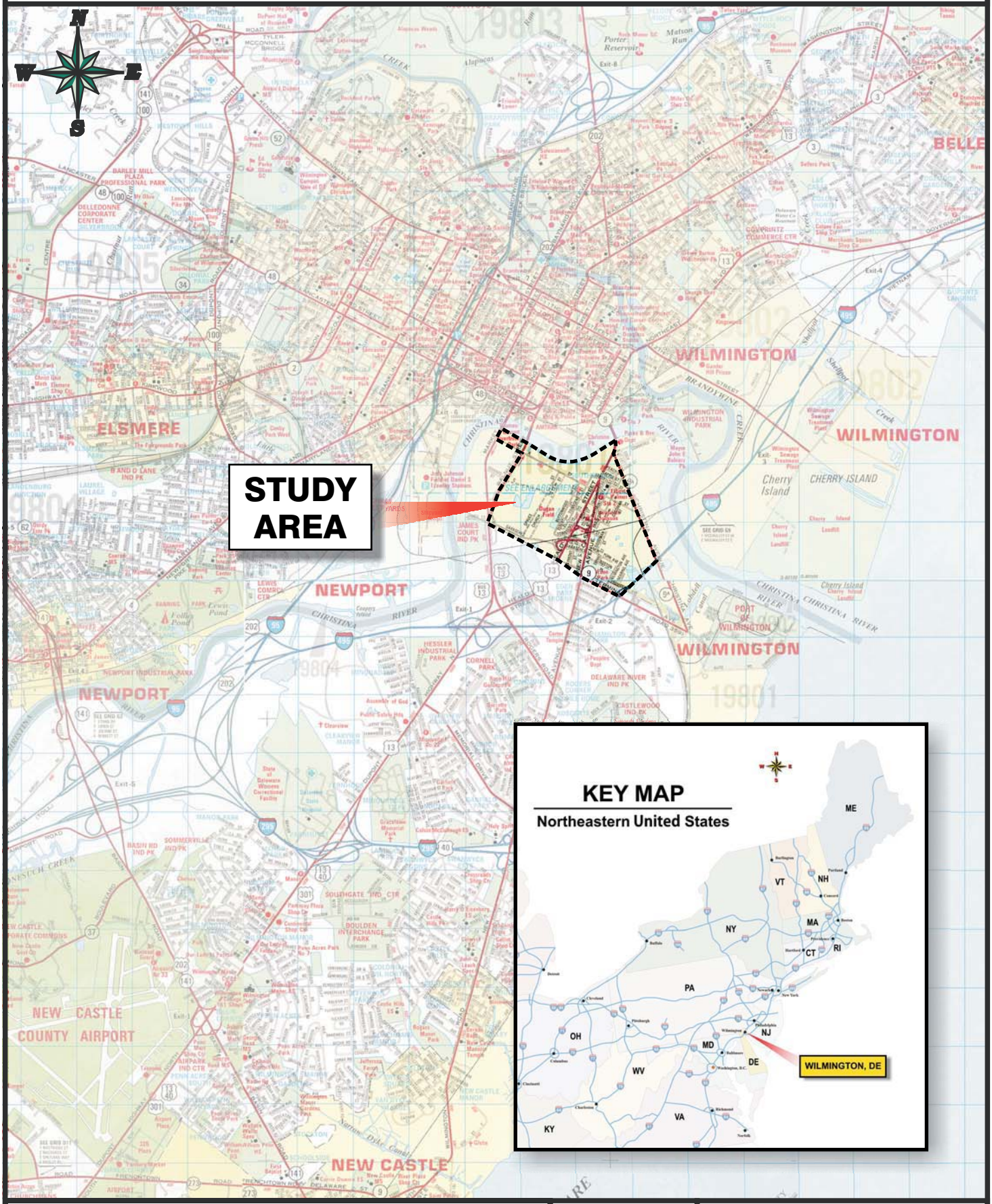

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SOUTHBRIDGE COMMUNITY CIRCULATION STUDY
VICINITY MAP

JULY 2008

FIGURE 1

SOUTHBRIDGE CIRCULATION STUDY

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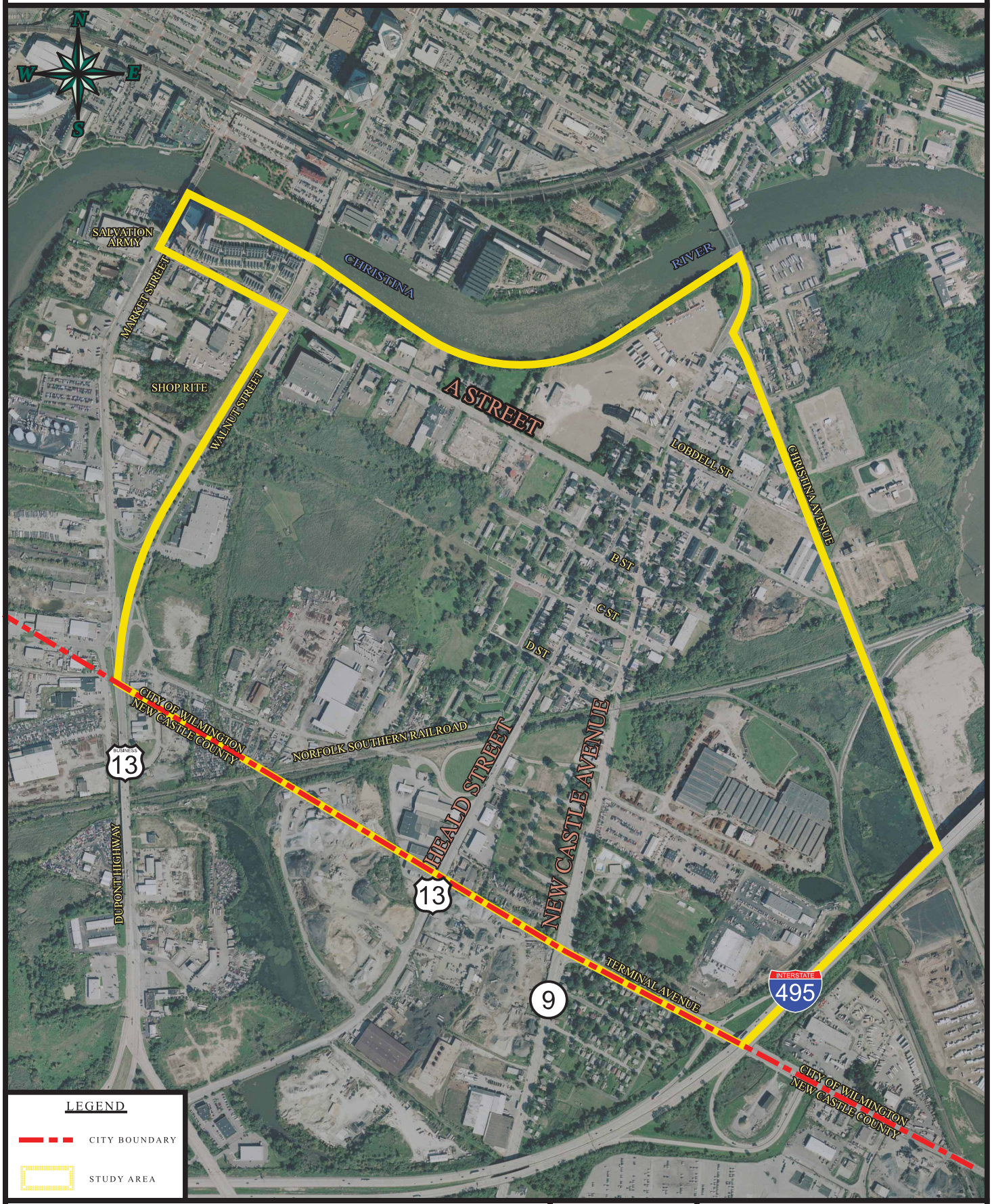

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SOUTHBRIDGE COMMUNITY
CIRCULATION STUDY
STUDY AREA

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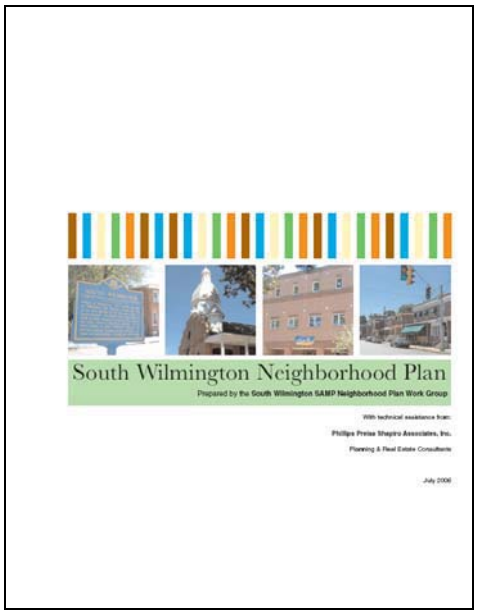
FIGURE 2

III. Background

The *Neighborhood Plan* put forth a number of transportation recommendations. These are summarized below:

- Pursue comprehensive streetscape enhancements and traffic calming measures along South Heald Street and New Castle Avenue (together, the neighborhood's north-south axis) and along A Street (its east-west axis) by adding street trees, pedestrian-scale street lighting and an additional traffic signal on A Street.
- Determine specific pedestrian recommendations at the Walkable Community Workshop.
- Create a bypass starting where D Street intersects New Castle Avenue, eastward to the "paper" street one block east of Bradford Street and up to Christina Avenue. Design this bypass as an attractive boulevard. The bypass also solves the problem of congestion related to the at-grade crossings of the freight railroad line on New Castle Avenue.
- Alternatively, pursue a connector between Terminal Avenue and Christina Avenue, located to create an intersection with the Interstate 495 ramps, redirecting truck traffic.
- Request two-way traffic on South Heald Street and New Castle Avenue from DelDOT, notwithstanding other bypass and traffic calming recommendations.
- Pursue an aggressive tree-planting program that serves both aesthetic and traffic calming objectives throughout Southbridge, starting with all of the residential streets, New Castle Avenue and South Heald Street.
- Create gateway features that enhance approaches to the neighborhood.
- Focus transit transfers at the A Street / South Heald Street business district to bolster the retail economy in that area.
- Lobby for an additional bus at the intersection of South Heald Street and Peach Street and for bus shelters at the following stops: A Street at Buttonwood Street, and South Heald Street at Peach Street. (Please note that a bus stop does not exist at A Street at Buttonwood Street, so the present study considers a shelter at A Street and Townsend Street.)



The community-driven *Neighborhood Plan* was adopted in July 2006.

Following the recommendations from the *Neighborhood Plan*, WILMAPCO conducted a Walkable Community Workshop (WCW) in September 2006. A WCW is a four-hour working session in which planners and community members together identify local pedestrian and bicycle problems. It includes an educational presentation on what makes a community walkable, a walking audit of a specific area, and a mapping session, putting pencils to paper and brainstorming solutions. A number of pedestrian-related improvement projects were identified at the Southbridge WCW. These are can be found listed in **Table 8** and are summarized below:

- Upgrade or install additional crosswalks at 16 intersections.
- Modify or install ADA compliant curb ramps at 6 intersections.
- Install pedestrian signals at 4 intersections; construct sidewalks at 4 locations.

Southbridge residents joined WILMAPCO planners to identify trouble spots during a Walkable Community Workshop.

Pedestrian problems identified include this drainage ditch, which residents use as a sidewalk.

Given this list of community-generated recommendations in the *Neighborhood Plan* and at the WCW, the *Southbridge Circulation Study* evaluates the feasibility of the recommendations, identifies possible solutions and presents a course of action with potential funding sources for implementation.

Table 1: Southbridge Circulation Study—Project Schedule

Date	Project Milestone
February 7, 2008	Notice to Proceed / Kick-off Meeting with WILMAPCO
February 25 to 28	Traffic Counts / Field Reviews
March 18	**First Community Meeting –** Existing Conditions, Community Recommendations from South Wilmington Neighborhood Plan
March 24	WILMAPCO / RK&K staff working session – Recommendations
April 15	**Second Community Meeting** – Alternatives
April 22	WILMAPCO / RK&K staff working session – Recommendations
May 8	WILMAPCO Council: Presentation
May 9	Southbridge Circulation Study Final Report – Initial Draft Submission
May 15	WILMAPCO Technical Advisory Committee: Presentation
May 20	Southbridge Circulation Study Final Report – Second Draft Submission
May 21	Briefing – City of Wilmington Transportation Committee
May 30	SAMP Core Group Meeting
June 17	**Third Community Meeting** – Recommendations
June 26	Southbridge Circulation Study Final Report – Final Draft Submission
July 16	Briefing – City of Wilmington Staff
July 16	Briefing – City of Wilmington Transportation Committee
July 31	Southbridge Circulation Study Final Report – Edited Final Draft Submission
August 11	Briefing – City of Wilmington Economic Cluster Committee
August 21	WILMAPCO Technical Advisory Committee – Endorsement
September 11	**WILMAPCO Council** - Adoption

To pursue this evaluation, a project schedule, outlining the approach to the project and coordination effort, was developed. The project schedule is outlined above in **Table 1**. The present study was built around three community meetings with stakeholder briefings occurring following the second and third community meetings. All three community meetings were held in coordination with Southbridge's active civic association and were each attended by over 30 residents. The first meeting was a workshop, in which feedback on Southbridge's transportation system was gathered. At the second community meeting, residents were presented with potential alternatives and resolutions to the issues that the workshop had uncovered. Additional issues were also raised and discussed. Residents were presented with the study's final recommendations at the third and final community meeting. On June 17, 2008 the Southbridge Civic Association voted unanimously to approve the present study's recommendations.

IV. Community Input

At the first community meeting, a presentation was given on the existing transportation infrastructure in Southbridge. The community was broken into four focus groups. Each was asked to discuss three basic transportation questions. These questions and a summary of the community responses are listed below:

Question 1: Does DART's bus service take you where you would like to go? If not, where would you like to see service added? Would you like Southbridge to be the site of a Transit Hub? How about the frequency of service? Would you like to see additional shelters?

- Would like to see access to the new ShopRite and the Salvation Army site to the west.
- Transit hub is not a high priority. Other things are more important.
- The rising price of gas is a reason to use the bus.
- Need more shelters (New Castle Avenue, Lobdell Street).
- Schedules and electronic scheduling boxes should be posted in shelters.

Question 2: Do you feel comfortable walking around your neighborhood? Does anyone bike and if not, why don't you? How is the lighting at night?

- Require biking information, paths, and markings; roads are not suitable for bike travel.
- Some sidewalk repairs are needed.
- More roadway lighting is needed.
- Walking is fine in the daytime, not so safe at night.

Question 3: What are your top three issues with traffic circulation? For example, do certain signals take too long to change? Would you like any street direction changes? Would you add signals anywhere? Do cars go too fast?

- Benefit of having New Castle Avenue and South Heald Street becoming two-way streets.
- Number one priority was signal timings on South Heald Street and New Castle Avenue.
- Would like gateway ("Welcome to Southbridge") treatments.
- A need for a designated truck route was discussed.
- Lower the speed limit; speeding occurs to make traffic lights in sequence.

Small focus groups discussed transportation problems at the first community meeting.

Initial findings of the study were presented at the second community meeting on April 15, 2008. The conversation was dominated by truck traffic—the most pressing issue for residents. Trucks create unwanted noise, pollution and safety problems on the streets of Southbridge. Our initial analysis of truck traffic focused only on the neighborhood's main streets: A Street, New Castle Avenue and South Heald Street. Community members pointed out, however, that trucks were also a concern on side streets, such as Lobdell Street and B Street. Additional field reviews were performed and recommendations made in accordance with community feedback.

At the final community meeting, the Southbridge Civic Association voted unanimously to endorse the recommendations presented in this report and determined a priority list for the implementation of those recommendations.

During the community involvement process and throughout development of the present study, a website containing information about the study was hosted by WILMAPCO. The website can be found at www.wilmapco.org/Southbridge. In addition to the website, the *Southbridge Circulation Study* was publicized through WILMAPCO's quarterly newsletter, the *Transporter*, and monthly electronic newsletter in an effort to keep interested parties apprised of the efforts underway.

V. Existing Conditions

Four modes of transportation—walking, cycling, transit and vehicular—form the basis for the *Southbridge Circulation Study*. A review of existing conditions within the Southbridge study area was first conducted to gain a sense of the community's transportation network. Data collection focused on identifying existing pedestrian facilities, bicycle facilities and routes, transit facilities and bus routes, and the collection of traffic volume data and information pertaining to the roadway infrastructure.

Pedestrians

Walking is popular in Southbridge. About 15% of Southbridge commuters walk to work, compared to only 3% county-wide. **Figure 3** illustrates the existing pedestrian infrastructure in the community of Southbridge, including its sidewalks, signalized pedestrian crosswalks, and unsignalized pedestrian crosswalks. As expected in an urbanized area, much of the sidewalk system is in place. The *Neighborhood Plan* called for improvements to the non-motorized system and pedestrian access to a planned Riverwalk on the southern bank of the Christina River. Community members identified some broken pieces of sidewalk at the community workshop and said that crime made traveling at night through the neighborhood unsafe.

A solid and highly-used sidewalk system exists in Southbridge.

Bicycle Transportation

Like other parts of Wilmington, few Southbridge residents use bicycles for transport. According to DelDOT's *Bicycle Facility Master Plan*, dated October 2005, one statewide bicycle route and one recreational connector bicycle route traverse Southbridge. Statewide Bicycle Route 2, a 137-mile bicycle route running north-south between Wilmington and Selbyville, cuts through Southbridge from the south via New Castle Avenue, west onto A Street, and north again onto Walnut Street toward the city's downtown. A recreational bicycle route, also identified by DelDOT's *Bicycle Facility Master Plan*, runs along A Street and South Heald Street. Currently, there are no signing or pavement markings identifying bicycle travel lanes or Statewide Bicycle Route 2.

In addition to the bicycle routes, a potential rail-with-trail route has been proposed by DelDOT. This proposed trail is located to the west of Southbridge, south of the A Street corridor. WILMAPCO has also identified several roadways within the community for inclusion in the *New Castle County Greenway Plan*. **Figure 4** illustrates the locations of these bicycle routes, trails and pathways. The *Neighborhood Plan* did not address bicycle transportation. Community members related that cycling was not popular in Southbridge at the community workshop, but said that the addition of bike lanes and signage would make bicycle travel safer.

SOUTHBRIDGE CIRCULATION STUDY

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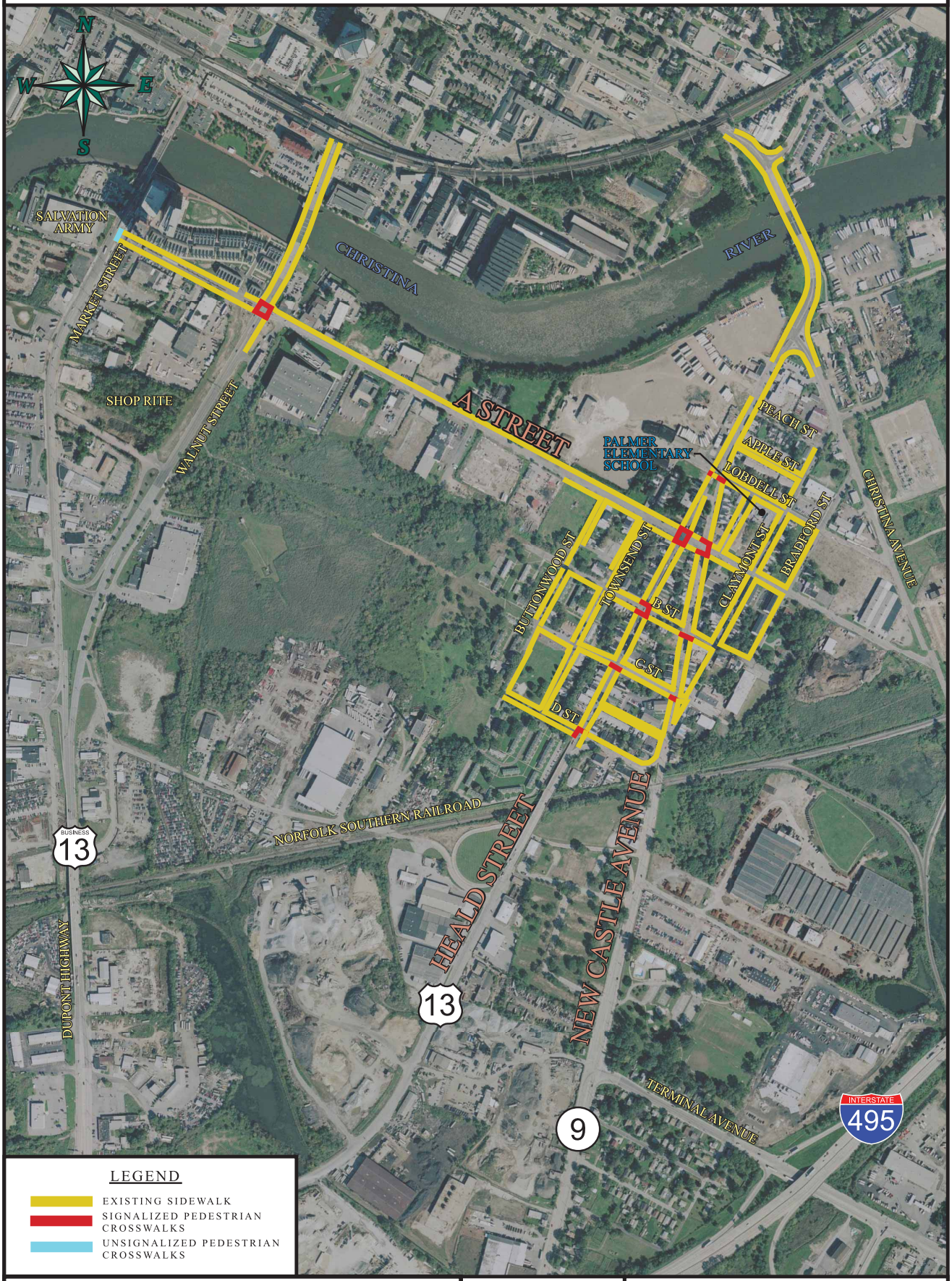

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SOUTHBRIDGE COMMUNITY CIRCULATION STUDY
PEDESTRIAN ISSUES

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FIGURE 3

SOUTHBRIDGE CIRCULATION STUDY

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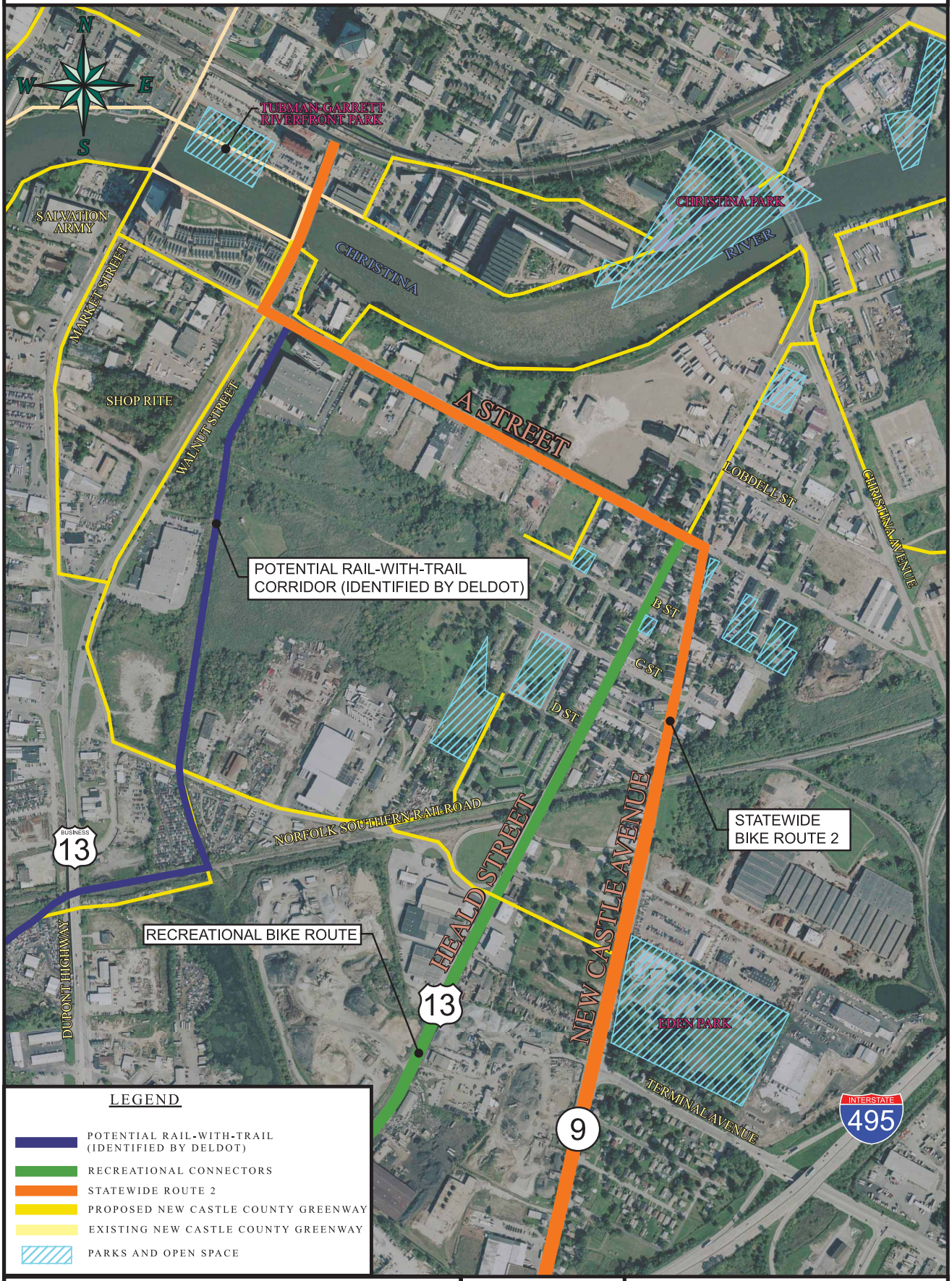

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SOUTHBRIDGE COMMUNITY CIRCULATION STUDY
BICYCLE ISSUES

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FIGURE 4

Transit

Many Southbridge residents do no own cars and rely on the public transit system to reach distant places. Over 24% of commuters in Southbridge take a bus to work, compared to only 4% county-wide.

Figure 5 documents the existing transit infrastructure in Southbridge, including transit routes and bus stop locations with and without shelters. DART bus Routes 8, 15 and 17 service the neighborhood. Route 8 runs between the Port of Wilmington and St. Francis Hospital. It utilizes Christina Avenue and a portion of South Heald Street before crossing the 4th Street Bridge. It makes one stop within Southbridge on Christina Avenue, just south of South Heald Street. Route 15 provides service between the Christiana Mall and Downtown Wilmington. Within Southbridge, Route 15 operates along New Castle Avenue before crossing the 4th Street Bridge and north towards Rodney Square. Heading south from Downtown Wilmington, Route 15 runs along South Heald Street. Residents may catch the Route 15 bus at nine stops within the neighborhood (five inbound and four outbound). Like Route 15, Route 17 also provides transit service between the Christina Mall and Downtown Wilmington. Within Southbridge, Route 17 operates along New Castle Avenue north to A Street, then west along A Street and north onto Walnut Street, heading towards Rodney Square. Moving south from Downtown Wilmington, Route 17 travels east along A Street and then runs south along South Heald Street. Eleven bus stops (five inbound and six outbound) service the Route 17 in Southbridge.

The Route 15 is pictured moving north along New Castle Avenue through Southbridge.

The *Neighborhood Plan* made a number of transit-specific recommendations. These relate to measures to improve the neighborhood's economic vitality and to better connect residents with jobs at the Port of Wilmington, Downtown Wilmington, and warehousing/distribution jobs south of the city. Transit recommendations in the Neighborhood Plan are:

- Focus bus transfers in the A Street and South Heald Street business district in an effort to support economic vitality.
- Provide a bus stop and shelter at the intersection of South Heald Street and Peach Street.
- Provide a bus shelter at the existing bus stop at the intersection of A and [Townsend] Streets.

At the community workshop, transit issues were discussed extensively. The community expressed an interest in transit access to the Salvation Army and new ShopRite supermarket located to the west of Southbridge and in the addition of new shelters with schedules and electronic scheduling boxes.

SOUTHBRIDGE CIRCULATION STUDY

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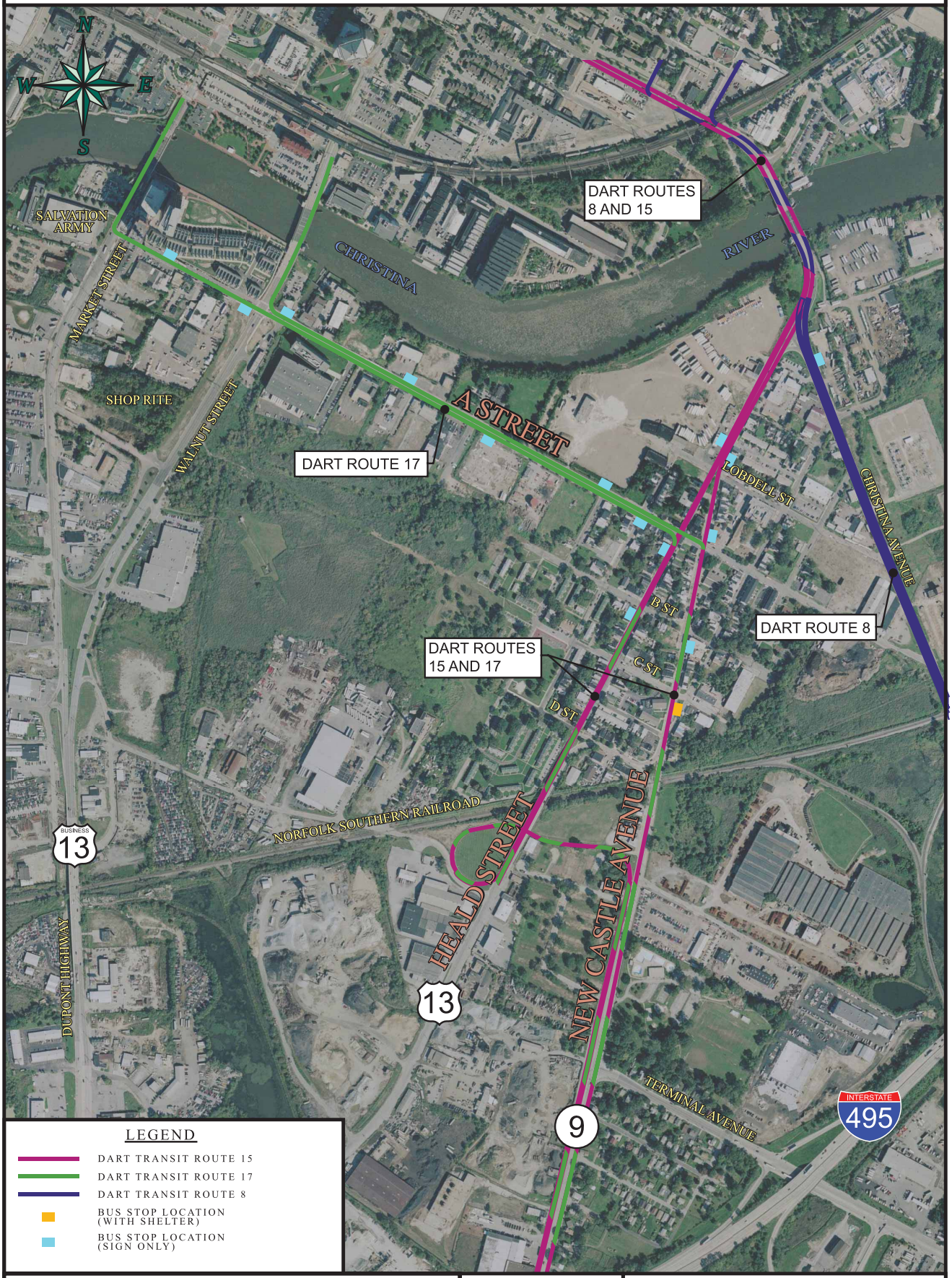

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SOUTHBRIDGE COMMUNITY CIRCULATION STUDY TRANSIT ISSUES

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FIGURE 5

Vehicular Transportation

The dominant form of transportation in Southbridge is vehicular. Most residents use an automobile to travel to work (60%) and to reach destinations outside their community.

Major vehicular transport issues identified within the *Neighborhood Plan* are as follows:

- Streetscape enhancements and traffic calming measures along South Heald Street, New Castle Avenue and A Street.
- A bypass to divert truck traffic around the community.
- Conversion of New Castle Avenue and South Heald Street from one-way pairs to two-way traffic on each roadway.

During the community workshop, residents requested that the following issues also be evaluated:

- Lack of pavement markings on C Street between South Heald Street and New Castle Avenue. C Street is a two-way roadway; however, the lack of striping and incorrect signal head placement cause some motorists to believe that the street is one-way in the northbound direction.
- Motorists are speeding in order to get through each signalized intersection on South Heald Street and New Castle Avenue, indicating that the proper signal progression is not provided on these corridors.
- Evaluate the feasibility of rerouting truck traffic onto other roadways through the use of a dedicated truck route and/or truck restrictions within the Southbridge community.

In order to evaluate these recommended improvements and determine the need for other types of improvements, we collected the following data:

- Traffic volume and vehicle classification.
- Locations of existing signalized intersections, and the signal timings and phasing for those intersections.
- Direction of one-way streets within the study area.
- Determination of existing intersection or roadway capacity deficiencies.

These data were analyzed and presented on display boards at the community meetings. **Figure 6** documents the existing traffic conditions in the Southbridge community, including the directional flow of traffic on the streets in the study area, existing signalized intersections, traffic volumes and Levels of Service (LOS).

Traffic Data

Two types of traffic data collection were conducted for this study: turning movement counts at the critical intersections in Southbridge, and 24-hour roadway traffic counts utilizing Automatic Traffic Recorders (ATRs) to determine 24-hour vehicular traffic volumes, vehicle classification and vehicle speeds within the study area. Locations of the turning movement counts and ATRs are shown in **Figure 7**.

SOUTHBRIDGE CIRCULATION STUDY

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SOUTHBRIDGE COMMUNITY CIRCULATION STUDY
TRANSPORTATION ISSUES

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FIGURE 6

SOUTHBRIDGE CIRCULATION STUDY

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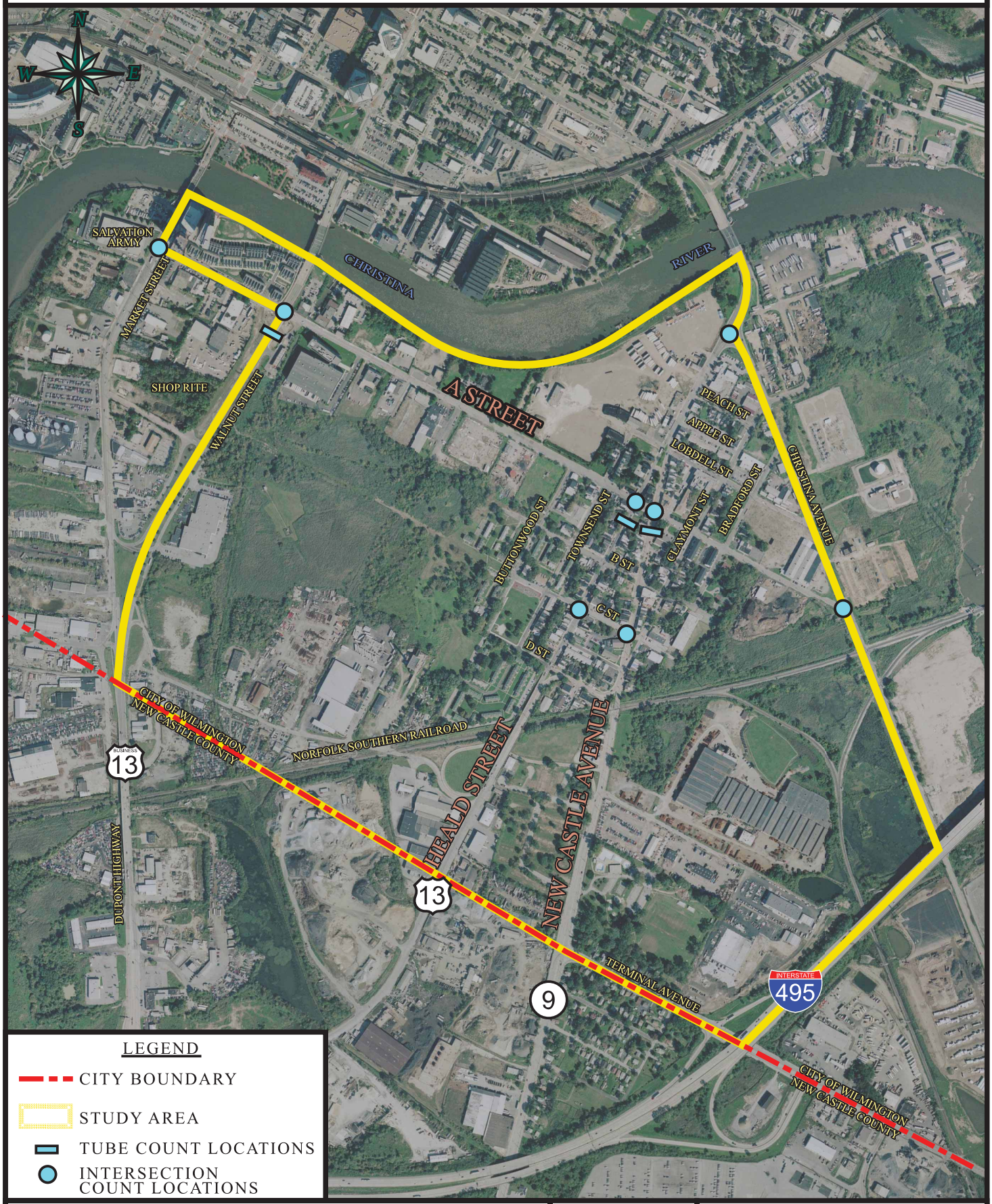

LEGEND

- CITY BOUNDARY
- STUDY AREA
- TUBE COUNT LOCATIONS
- INTERSECTION COUNT LOCATIONS

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CIRCULATION STUDY
INTERSECTION AND TUBE COUNT LOCATIONS

JULY 2008

FIGURE 7

Turning Movement Counts

Turning movement counts were completed at the following eight intersections within Southbridge (see **Figure 7**):

Intersection	Type of Traffic Control
New Castle Avenue @ C Street	Signalized
New Castle Avenue @ A Street	Signalized
South Heald Street @ A Street	Signalized
South Heald Street @ C Street	Signalized
South Heald Street @ Christina Avenue	Signalized
Christina Avenue @ A Street	Unsignalized
Walnut Street @ A Street	Signalized
Market Street @ A Street	Unsignalized

Turning movement counts were completed at each of the above intersections between the hours of 6:30 to 9:00 a.m. during the morning peak period and between the hours of 3:00 to 6:00 p.m. during the afternoon peak period. The turning movement counts were obtained in order to determine the amount of traffic traveling through each major intersection within the study area. These counts were then used to evaluate intersection operations and to determine if any capacity deficiencies existed within Southbridge.

Turning movement counts were collected at several intersections.

Results of the traffic counts show that the area-wide AM and PM peak hours occur between 7:30 to 8:30 a.m. and from 4:30 to 5:30 p.m., respectively. A diagram showing the AM and PM peak hour turning movements for each of the intersections is provided in **Figure 8**. **Figure 8** also shows interpolated traffic volumes for the intersection of South Heald Street and Lobdell Street, and the B Street and D Street intersections with New Castle Avenue and South Heald Street.

24-Hour Roadway Traffic Data

Twenty-four hour roadway traffic counts were completed in Southbridge between 3:00 PM on February 25, 2008 and 11:00 AM on March 3, 2008. These counts were conducted in order to determine the amount of hourly traffic traveling on the major roadways within the study area, vehicular speeds on these roadways, and the classification of vehicles traveling on the roadways. The 24-hour roadway traffic counts were conducted using ATRs placed in the roadway. The ATRs consist of a computerized box with pneumatic tubes attached. The tubes are stretched across the roadway; when a vehicle crosses the tube, the box records it as a counted vehicle. The ATRs were placed in the following three locations within the study area (see Figure 7):

- Location 1 – Walnut Street, south of the A Street intersection
- Location 2 – South Heald Street, south of the A Street intersection
- Location 3 – New Castle Avenue, south of the A Street intersection

The data from the 24-hour roadway traffic counts were utilized to determine the amount of hourly traffic traveling on Walnut Street, New Castle Avenue and South Heald Street during a typical weekday. The results were used to develop the Average Daily Traffic (ADT) volume for each of the roadways. **Figure 9** shows a comparison of an average day's hourly traffic volume for each of the three roadways. The ADT volume for each of the roadways is as follows:

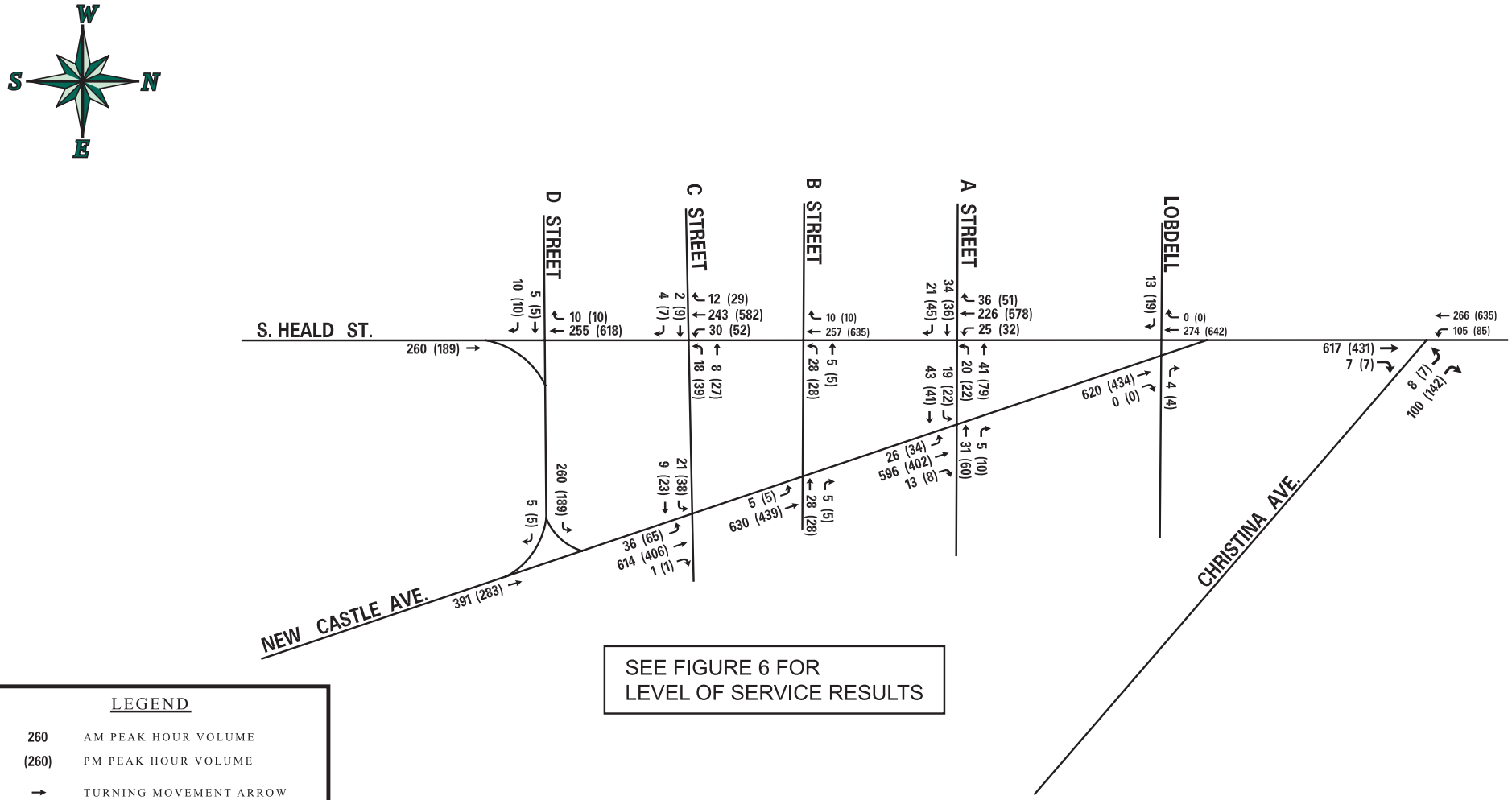
Roadway	ADT Volume
Walnut Street	15,265 vpd
New Castle Avenue	4,670 vpd
South Heald Street	4,321 vpd

About 4,300 vehicles were found to travel along South Heald Street in a given day.

The ADT volumes indicate that the majority of traffic traveling through the study area occurs on Walnut Street, which would be expected since Walnut Street operates as a principal arterial providing direct access to the Wilmington Central Business District (CBD) from the US Route 13 corridor. Traffic on Walnut Street typically peaks during the AM peak period with a rush of commuters north into the CBD along its one-way northbound direction. New Castle Avenue and South Heald Street operate as minor arterials. These roadways provide alternate routes into and out of the CBD. Traffic on New Castle Avenue is higher than that of South Heald Street during the AM peak period. During the PM peak period, the traffic on New Castle Avenue and South Heald Street is about equal, except during the 4 to 6 p.m. time period, when South Heald Street traffic exceeds that on New Castle Avenue.

SOUTHBRIDGE CIRCULATION STUDY

WILMAPCO



SEE FIGURE 6 FOR
LEVEL OF SERVICE RESULTS

LEGEND

260	AM PEAK HOUR VOLUME
(260)	PM PEAK HOUR VOLUME
→	TURNING MOVEMENT ARROW

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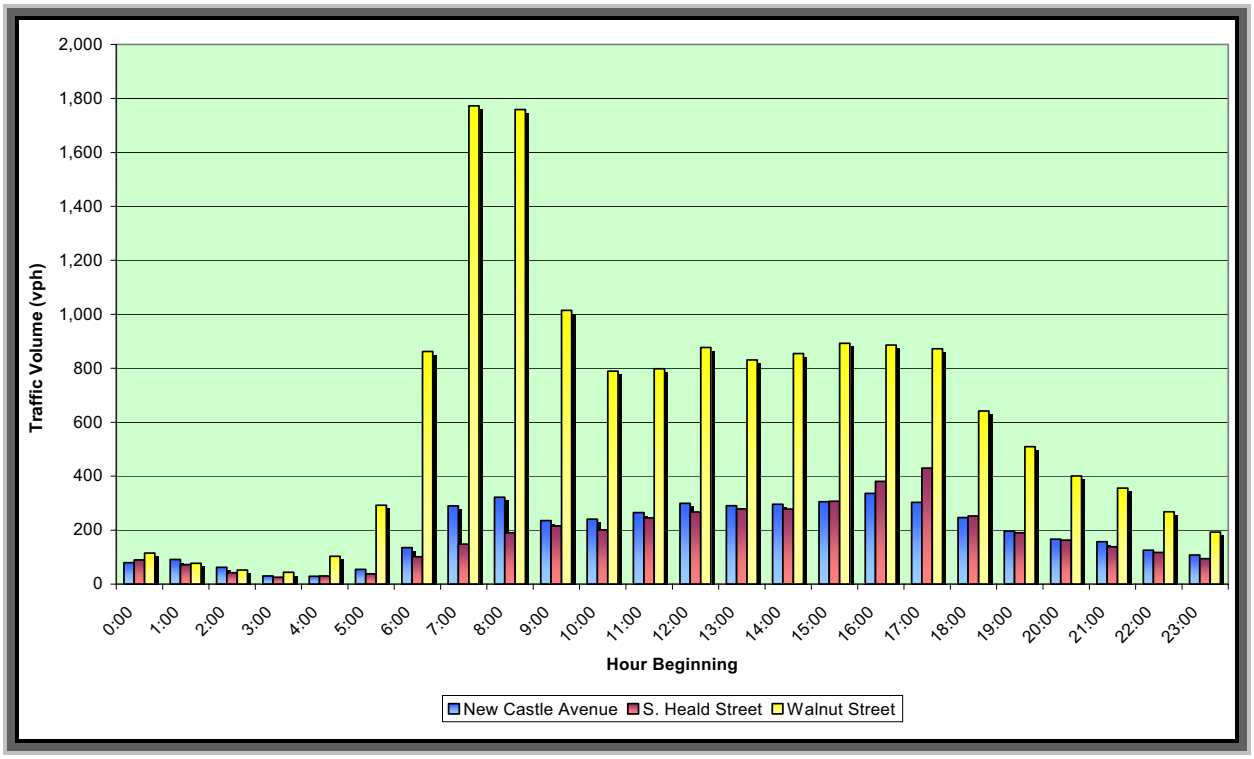
SOUTHBRIDGE COMMUNITY
CIRCULATION STUDY
TURNING MOVEMENT COUNT DIAGRAM

JULY 2008

FIGURE 8

Figure 9: Hourly Traffic Volumes – North/South Roadways



In addition to the traffic volume data collection feature of an ATR, classifications of individual vehicles can be collected. As part of this study, the ATR devices were used to collect vehicle classification data at each of the three count locations. Vehicles can be classified based on the number of axles and axle spacing. Vehicles are classified into 13 different classifications according to the Federal Highway Administration (FHWA) vehicle classification guidelines, which are summarized in **Table 2**, below:

Table 2: FHWA Vehicle Classifications

Class	Type of Vehicle
1	Motorcycles
2	Passenger Cars
3	Pick-up Trucks/SUVs
4	Buses
5	2 Axles, Single Unit Truck
6	3 Axles, Single Unit Truck
7	≥ 4 Axles, Single Unit Truck
8	≤ 4 Axles, Truck with Single Trailer
9	5 Axles, Truck with Single Trailer
10	≥ 6 Axles, Truck with Single Trailer
11	≤ 5 Axles, Truck with Multiple Trailers
12	6 Axles, Truck with Multiple Trailers
13	≥ 7 Axles, Truck with Multiple Trailers

The primary purpose of our vehicle classification count was to determine to what extent tractor-trailers and other heavy vehicles move through Southbridge.

Figures 10-12 show the distribution of vehicle types on New Castle Avenue, South Heald Street and Walnut Street. These data show that approximately 6% of the ADT on New Castle Avenue and 7% of the ADT on South Heald Street and Walnut Street is comprised of truck traffic. This equates to approximately 275 trucks on New Castle Avenue and 300 trucks on South Heald Street on the average day. The majority of trucks traveling through the study area are single unit trucks such as dump trucks, delivery trucks and buses. Less than 1% (approximately 85 trucks) of the ADT are vehicles consisting of more than three axles.

Based on WILMAPCO regional freight data, traffic on the average minor arterial in New Castle County is comprised of 5.7% trucks with 1.6% tractor-trailer type vehicles. The percentage of trucks within Southbridge on New Castle Avenue and South Heald Street is consistent with other minor arterials county-wide while the number of tractor-trailers on New Castle Avenue and South Heald Street are lower than the county-wide rates.

Figure 10: Vehicle Classification – New Castle Avenue

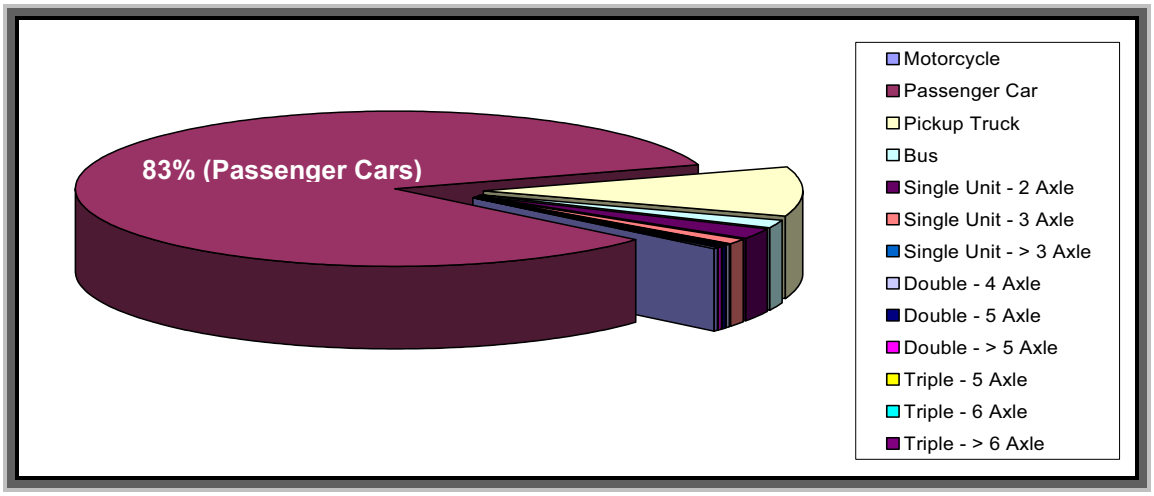


Figure 11: Vehicle Classification – South Heald Street

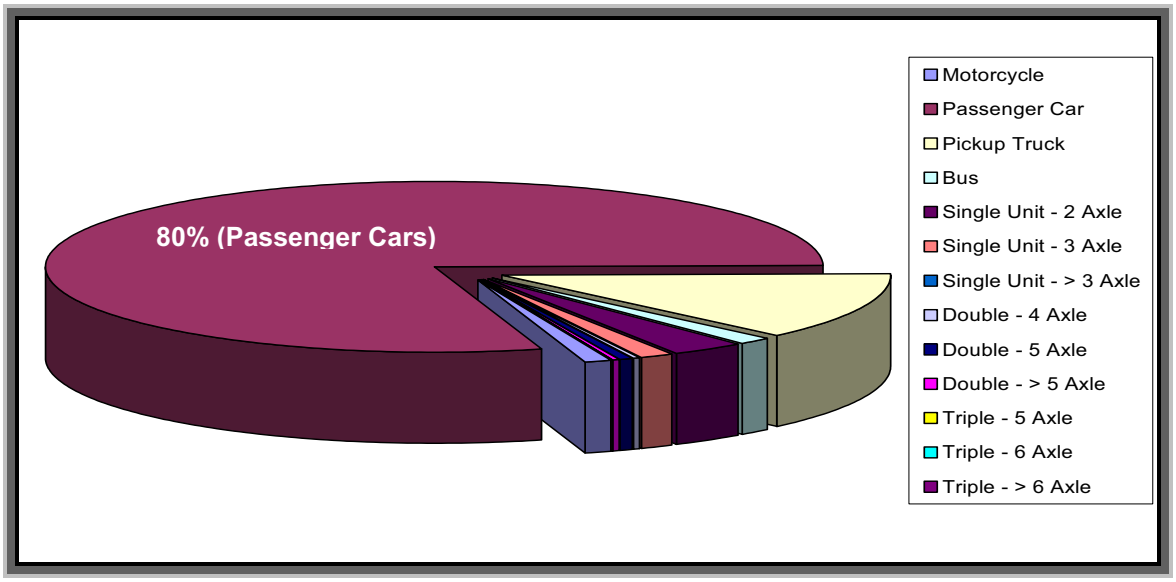
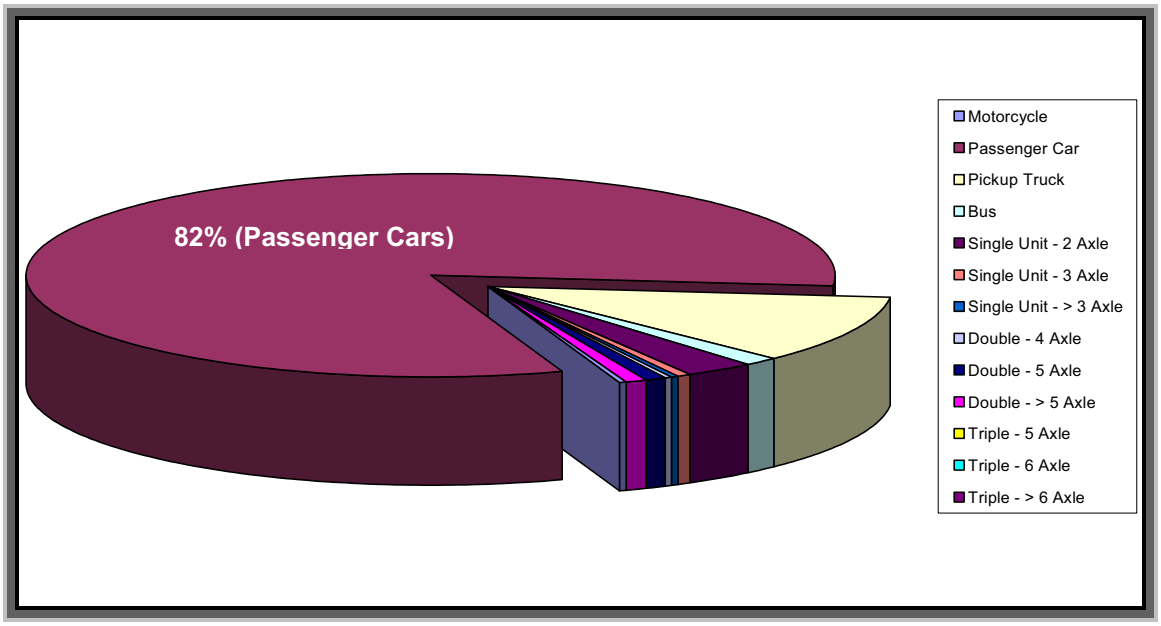


Figure 12: Vehicle Classification – Walnut Street



The last piece of data that was collected using the ATR devices was vehicle travel speeds. Vehicle travel speed data was used to determine the average travel speed on New Castle Avenue, South Heald Street and Walnut Street and to determine if a speeding problem exists in the community.

The existing speed limit on New Castle Avenue and South Heald Street is posted at 25 MPH. The speed data collected for New Castle Avenue and South Heald Street shows that the average travel speed on these roadways is 35 MPH and 31 MPH, respectively. Ninety-eight percent of the vehicles traveling on New Castle Avenue and 86% of vehicles traveling on South Heald Street are traveling at speeds greater than the 25 MPH speed limit. The existing speed limit on Walnut Street is posted at 35 MPH. The speed data collected for Walnut Street shows that the average travel speed is approximately 48 MPH, with 98% of all vehicles traveling over 35 MPH.

Existing Intersection Capacity

The software package SYNCHRO and SimTraffic was utilized to perform capacity analyses and traffic simulation modeling for Southbridge. Capacity analyses are needed in order to determine where deficiencies exist in intersection operations within the study area. Where deficiencies exist, improvements can be tested and recommended to determine the level of benefit achieved with each type of improvement.

SYNCHRO is a traffic analysis tool that utilizes methods from the Year 2000 edition of the Highway Capacity Manual to determine capacity for intersections (unsignalized and signalized). SYNCHRO is also an excellent tool for evaluating the affects of different signal timing and phasing plans and is useful for evaluating signal progression on a given corridor of coordinated traffic signals. SimTraffic is a microscopic traffic simulation program that utilizes information entered into the SYNCHRO program to build a model of traffic conditions for a given area. SimTraffic is beneficial when evaluating traffic operations within a corridor of signalized intersections because it is powerful enough to show how traffic operations at one intersection affect operations at upstream and downstream intersections. Both SYNCHRO and SimTraffic measure traffic operations based on average stop delay and Level of Service (LOS). Intersection capacity is measured in terms of LOS and delay for both unsignalized and signalized intersections. LOS is represented by a range of letter grades (A through F) which describe the quality of traffic flow. LOS A generally represents free flowing conditions with very little delay for

motorists. Conversely, LOS F represents congested conditions, corresponding with traffic that has reached or exceeded available capacity, resulting in relatively high average delay per vehicle and a breakdown in the flow of traffic. Stop delay is the amount of delay associated with vehicles stopping at a stop sign or traffic signal. **Tables 3** and **4** show the LOS and corresponding ranges of average control delay, measured in seconds per vehicle, for signalized and unsignalized intersections, respectively.

Table 3: LOS Criteria for Signalized Intersections

Level of Service	Control Delay per Vehicle (seconds/vehicle)
A	≤ 10
B	> 10 - 20
C	> 20 - 35
D	> 35 - 55
E	> 55 - 80
F	> 80

Table 4: LOS Criteria for Unsignalized Intersections

Level of Service	Control Delay per Vehicle (seconds/vehicle)
A	≤ 10
B	> 10 - 15
C	> 15 - 25
D	> 25 - 35
E	> 35 - 50
F	> 50

Tables 5 and **6** show the results of the capacity analyses for the AM and PM peak hours, respectively, for each of the eight intersections that were counted as part of this study. Typically, for an urban area, LOS D or better is ideal for expected traffic operations; however, given the congested nature of an urban area, LOS E is sometimes acceptable.

During the AM and PM peak hours, traffic operations in Southbridge operate at LOS D or better. The LOS and delay values shown in **Tables 5** and **6** for the signalized intersections are for the overall operations of the intersection, while the LOS and delay values shown for the unsignalized intersections are for the stop-controlled approach only. The New Castle Avenue and South Heald Street intersections with C Street operate at LOS D with approximately 36 seconds per vehicle of delay during the AM peak hour.

Table 5: Existing Level of Service and Delay – AM Peak Hour

Intersection	Type of Control	Level of Service	Delay (sec/veh)
Market Street @ A Street	Stop Sign	C	18.6
Walnut Street @ A Street	Traffic Signal	B	12.7
S. Heald Street @ A Street	Traffic Signal	C	22.3
New Castle Avenue @ A Street	Traffic Signal	C	28.2
Christina Avenue @ A Street	Stop Sign	A	9.9
S. Heald Street @ Christina Avenue	Traffic Signal	A	7.9
S. Heald Street @ C Street	Traffic Signal	D	36.1
New Castle Avenue @ C Street	Traffic Signal	D	36.1

During the PM peak hour, increased traffic due to motorists leaving the CBD causes increased delays at several outbound intersections (Market Street and South Heald Street). While each of the intersections within the study area operate at LOS D or better, delays could be reduced through the implementation of improved signal timings to maximize the capacity at each intersection.

Table 6: Existing Level of Service and Delay – PM Peak Hour

Intersection	Type of Control	Level of Service	Delay (sec/veh)
Market Street @ A Street	Stop Sign	D	29.9
Walnut Street @ A Street	Traffic Signal	B	12.2
S. Heald Street @ A Street	Traffic Signal	D	44.3
New Castle Avenue @ A Street	Traffic Signal	B	18.1
Christina Avenue @ A Street	Stop Sign	A	6.3
S. Heald Street @ Christina Avenue	Traffic Signal	A	7.9
S. Heald Street @ C Street	Traffic Signal	D	41.1
New Castle Avenue @ C Street	Traffic Signal	C	28.8

Vehicle Emissions

Air emissions from industrial land uses and automobiles in and around Southbridge have long been a health and quality of life concern. This study evaluates whether improvements to the traffic signal system could also improve air quality within the community.

The combustion of transportation fuels releases several contaminants into the atmosphere. These include Hydrocarbons (HC), Carbon Monoxide (CO) and Nitrogen Oxide (NOx). HC emissions result from the incomplete combustion of fuel. NOx emissions and HCs can cause photochemical smog when the two chemicals react in the presence of sunlight. CO is produced from vehicular exhaust as a direct result of the combustion engine. Vehicle emissions are related to several factors, including the vehicle type and age, ambient temperatures, and altitude. The operating cycle, which consists of starts and stops, speed changes and idling time, is also an important factor. CO emissions generally decrease as speed increases, whereas NOx emissions generally increase with greater speed. HC emissions typically decrease as speeds increase up to 30 to 40 MPH and then increase at higher speeds thereafter.

These emissions can cause health problems in heavy concentrations. Research has shown that CO can cause slow operating reactions, nausea, headaches and dizziness. In large concentrations, the chemical can cause death by reacting with blood hemoglobin. NOx are the major component in smog and can cause very serious breathing problems when concentrations are high. Finally, HC, when mixed with NOx, produces the ozone component of smog that can cause eye, nose, throat and lung irritation and can damage vegetation.

The operating cycle of the vehicle is influenced by traffic signal operations. The traffic model that is being used for the traffic analysis portion of this study (SYNCHRO/SimTraffic) measures vehicular emissions for HCs, CO and NOx as these emissions relate to stopping, idling and starting/accelerating. **Table 7** shows the total amount of current emissions (in grams) for HCs, CO and NOx at each of the signalized intersections along New Castle Avenue and South Heald Street. The data provided is for the AM and PM peak traffic periods.

Table 7: Existing Signalized Intersection Emissions Data

Intersection	Hydrocarbon (HC) Emissions (g/hr)	Carbon Monoxide (CO) Emissions (g/hr)	Nitrogen Oxide (NOx) Emissions (g/hr)
South Heald Street @ A Street	12 (12)	3,123 (3,596)	33 (37)
New Castle Avenue @ A Street	7 (5)	1,767 (1,471)	20 (15)
New Castle Avenue @ C Street	5 (4)	1,750 (1,297)	15 (11)
South Heald Street @ C Street	3 (3)	902 (1,119)	8 (10)
South Heald Street @ Christina Avenue	14 (8)	2,946 (2,099)	38 (24)
South Heald Street @ D Street	4 (3)	1,093 (1,459)	11 (12)
South Heald Street @ Lobdell Street	12 (11)	3,867 (4,547)	34 (32)
South Heald Street @ B Street	5 (5)	1,368 (1,701)	14 (16)
New Castle Avenue @ B Street	6 (5)	1,373 (1,161)	16 (13)

XX (XX) = AM Peak (PM Peak).

While the numbers presented above in **Table 7** are not directly connected to intersection capacity calculations, these figures would be much higher if delays were higher. As delay increases, idling increases, which is when the majority of vehicular emissions are produced. Thus, reducing delay at intersections could reduce emissions. Additionally, poor traffic signal progression can lead to increased starting and stopping, which also increase emissions. Improving signal progression should also reduce vehicular emissions.

Traffic signal progression influences vehicular emissions.

VI. Alternatives

Issues identified by the community at the kickoff workshop were added to the list of recommendations from the *Neighborhood Plan*. An evaluation of all transportation issues was then initiated to develop a series of recommended improvements, discussed below.

At the meeting, one transportation concern was the lack of pavement markings on C Street between South Heald Street and New Castle Avenue. Motorists on C Street were sometimes treating the roadway as a one-way street. A field review of the traffic operations on C Street showed that the signal heads for the C Street approach at the intersection with New Castle Avenue were improperly aligned. This could lead motorists to believe that C Street was one-way. A call to the City of Wilmington, which is responsible for the traffic signals, was responded to immediately and the signal heads were adjusted. The City has also agreed to provide a double yellow centerline on C Street to further make clear that C Street is two-way. Before and after photos, showing the signal head alignment, are found below as **Figures 13** and **14**.

Figure 13: New Castle Ave @ C Street Before Traffic Signal Shift

Figure 14: New Castle Ave @ C Street After Traffic Signal Shift

The following alternatives related to pedestrians, bicycles, transit and vehicular transportation were evaluated and offered at the next two community meetings.

Pedestrians

Pedestrian improvements have been identified and prioritized by WILMAPCO and the Southbridge community as part of the Walkable Community Workshop held in the Fall of 2006. These improvements include the provision of additional crosswalks at signalized intersections within the community, the upgrading of existing curb ramps to be compliant with the current Americans with Disabilities Act (ADA) guidelines and the provision of pedestrian signals where warranted. The proposed improvements are shown below in **Table 8** along with the prioritization of each improvement. A map of these proposed projects is in the appendix. Prioritization scores are based on WILMAPCO's regional Pedestrian Prioritization Network (featured in the 2030 Regional Transportation Plan) and community input.

In addition, RK&K identified other pedestrian-infrastructure-related improvements through the comprehensive field review and comments received by the community, as shown in **Figure 15**:

- Repair the sidewalk on the south side of A Street between New Castle Avenue and Claymont Street.
- Provide pedestrian-scale street lighting on C Street and Buttonwood Street.

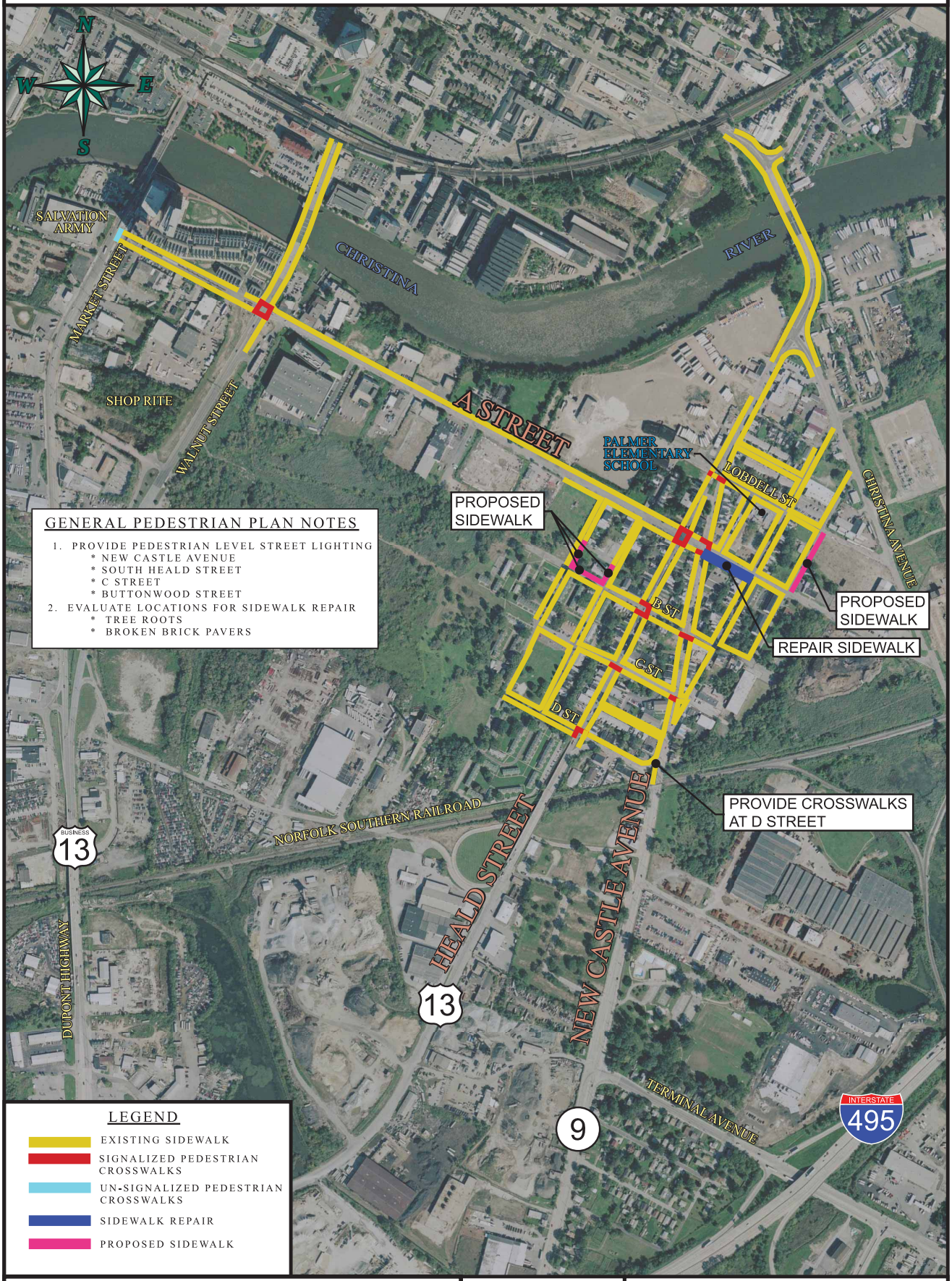
- Evaluate additional locations for sidewalk repair as a result of tree root and broken brick paver damage.
- Provide a sidewalk on the east side of the 400 block of Bradford Street, near the Pack and Process property.
- Provide a sidewalk on the east side of Buttonwood Street, north of B Street; on the west side of Townsend Street, north of B Street; and on the north side of B Street between Buttonwood Street and Townsend Street

Table 8: Previously Identified and Ranked Pedestrian Improvements

Proposed Pedestrian Improvements				
Rank	**Recommendation**	**Location**	**Rationale**	**Score**
1	Crosswalks	A St and Chapel St	Safety Concern	21
2	Crosswalks and Curb Cut	NC Ave and B St	Safety Concern, ADA requirements	21
3	Street Lighting	Park at NC Ave and A St	Safety Concern	16
4	Crosswalks, Curb Cut, Ped. Signal	Chapel St and Lobdell St	Safety Concern	15
5	Crosswalks and Curb Cut	B St and Claymont St	Safety Concern	15
6	Crosswalks, Curb Cut, Ped. Signal	Claymont St and A St	Safety Concern	14
7	Replace Sidewalk	Chapel St b/t Lobdell and A	Gap in Sidewalk	13
8	Crosswalks, Curb Cut, Ped. Signal	A St and NC Ave	Safety Concern, ADA requirements	13
9	Replace Sidewalk	A St b/t Chapel and Claymont	Uneven Sidewalk; Safety Concern	13
10	Crosswalks and Pedestrian Signal	NC Ave and Lobdell St	Safety Concern, ADA requirements	13
11	Crosswalks	C St and NC Ave	Safety Concern, ADA requirements	13
12	Crosswalks	NC Ave and D St	Safety Concern	13
13	Landscaping	Heald St and NC Ave	To enhance gateway	12
14	Replace Sidewalk	NC Ave at NS Rail	Safety Concern	12
15	Add Sidewalk	Island at Heald St and NC Ave	Sidewalk ends	11
16	Crosswalks	Lobdell St and Claymont St	Safety Concern	11
17	Crosswalks	A St and Townsend St	Access to bus stops across Townsend	11
18	Crosswalks	NC Ave and Pearl St	Safety Concern	11
19	Crosswalks	B St and Heald St	Safety Concern	10
20	Crosswalks	S Heald St and Lobdell St	Safety Concern	9
21	Crosswalks	C St and Townsend St	Safety Concern, Park Access	9
22	Crosswalks	C St and Heald St	Safety Concern	8

SOUTHBRIDGE CIRCULATION STUDY

WILMAPCO



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SOUTHBRIDGE COMMUNITY CIRCULATION STUDY
ADDITIONAL PEDESTRIAN IMPROVEMENTS

0 200' 400' 600'

JULY 2008

FIGURE 15

Bicycle Transportation

During the first community meeting, those in attendance indicated that bicycle usage was not common in Southbridge and was unimportant relative to other transportation issues. Similarly, the *Neighborhood Plan* made no recommendations regarding provisions for bicycle transportation infrastructure. However, the upcoming *Wilmington Bicycle Plan* will seek to address bike infrastructure and policy issues at a citywide scale, and will include recommendations for Southbridge.

While bicycle transportation was not a significant issue for the Southbridge community, **Figure 16** documents bicycle-related alternatives presented at the second community meeting on April 15. The provision of bicycle facilities within the community could promote the use of the bicycle as an alternate means of transportation. Recommended facilities include the provision of bicycle-oriented signing, where necessary, and the restriping of New Castle Avenue and parts of A Street to accommodate Statewide Bike Route 2. Both bicycle-oriented signing and the addition of bicycle lanes within Southbridge will be included as part of the comprehensive signing and bicycle lane scheme developed by the upcoming *Wilmington Bike Plan*. Potential bike lanes will be discussed in greater detail later.

The addition of bicycle lanes would make for safer bicycle travel in Southbridge.

Connections to a proposed Riverwalk along the southern bank of the Christina River could be provided from A Street and South Heald Street as shown in **Figure 16**. These access points will need to be coordinated with the proposed street changes that are associated with the *South Walnut Street Urban Renewal Plan*, adopted as part of the City of Wilmington's Comprehensive Plan. It is anticipated that as properties along the Christina River are redeveloped, those developers will be responsible for implementing the proposed street changes in the *South Walnut Street Urban Renewal Plan* and subsequently will responsible for building a Riverwalk and providing connections from A Street and South Heald Street for bicyclists and pedestrians.

Transit

Recommendations for improving transit infrastructure have been put forth by the *Neighborhood Plan* and at community meetings. These recommendations include additional bus shelters, focusing bus transfers at the South Heald Street and A Street intersection and the rerouting of transit routes to provide better access to certain destinations. An additional bus stop was also requested at the South Heald Street intersection with Lobdell Street. Based on the field inventory of existing bus stops conducted for this study, that bus stop currently exists for Route 15. **Figure 17** documents the additional transit-related improvement alternatives presented at the second community meeting.

Southbridge residents would like to see additional bus shelters, like this one.

Bus shelters are provided at locations where the number of boardings meets a determined threshold which has been set by DART First State. The number of boardings required for a bus shelter to be warranted at a particular stop is 40 boardings per day. **Table 9** shows the number of boardings per day, based on May 2007 Ridecheck information, for the three stops in question and whether or not those stops meet the warrant threshold for a bus shelter.

Table 9: Boarding Data for Proposed Bus Shelter Locations

Bus Stop	Number of Boardings	Warrant Threshold	Warrant Met?
A Street @ Townsend Street (inbound)	3	40	No
A Street @ Townsend Street (outbound)	1	40	No
South Heald Street @ Peach Street	5	40	No
New Castle Avenue @ Lobdell Street	17	40	No

Based on this data, boardings at these stops are significantly lower than the warrant threshold for providing a bus shelter. However, consideration should be given to providing shelters at these locations if the areas redevelop, especially along the A Street corridor.

SOUTHBRIDGE CIRCULATION STUDY

WILMAPCO

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SOUTHBRIDGE COMMUNITY CIRCULATION STUDY
BICYCLE IMPROVEMENTS

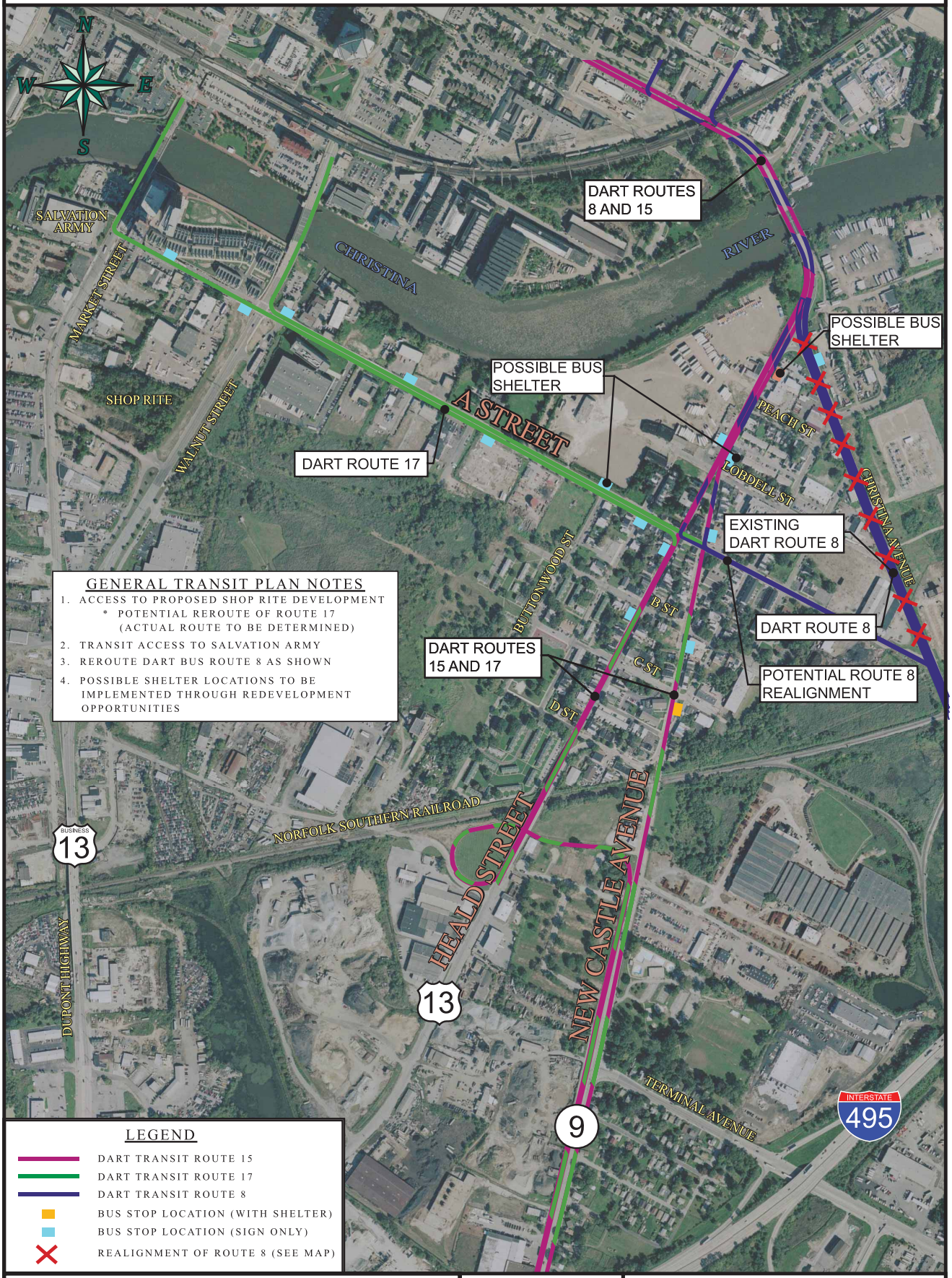
0 200' 400' 600'

JULY 2008

FIGURE 16

SOUTHBRIDGE CIRCULATION STUDY

WILMAPCO



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SOUTHBRIDGE COMMUNITY CIRCULATION STUDY
ADDITIONAL TRANSIT IMPROVEMENTS

0 200' 400' 600'

JULY 2008

FIGURE 17

Two bus route realignments have also been proposed as part of this study. We propose that Route 17 is realigned to provide access to the new ShopRite supermarket, and that Route 8 is realigned to travel along A Street between Christina Avenue and New Castle Avenue in an effort to provide better connectivity with the rest of the City. The proposed route changes for both Route 17 and Route 8 are shown in **Figure 17**. These route realignment proposals have been submitted to DART and they are being considered for implementation as part of the overall schedule changes to occur in December 2008. Public hearings will be held on these route changes and comments received from the public will be factored into DART's final decision.

Vehicular Transportation

The *Neighborhood Plan* made a number of vehicular-related recommendations. These included the addition of a bypass to funnel truck traffic around Southbridge, as well as streetscape and traffic calming improvements to slow traffic through the neighborhood. These recommendations were echoed by the community at the March workshop.

While an in-depth analysis was not conducted for a bypass east of Southbridge, the issues behind the request for a bypass (truck traffic, flow of traffic on South Heald Street and New Castle Avenue, etc.) were evaluated. A bypass would need to be a long term solution given the lack of public funding for a project of that magnitude and the fact that a project development effort on a bypass, including preparation of environmental documentation, design, right-of-way acquisition, etc. could take ten years, at a minimum. There are currently several large tracts of land along Christina Avenue with the potential for development. If a large-scale project is planned for these parcels, the developer could be required to contribute funds toward a bypass project if a Traffic Impact Study (TIS) shows it to be necessary. It was also apparent that some of the issues driving the need for a bypass could be addressed with other, more easily implemented projects. These include improvement of the signal timings on New Castle Avenue and South Heald Street and streetscape improvements, including bulb-outs and restriping of lanes, to improve the flow of traffic and deter trucks from entering Southbridge. In addition, implementation of additional truck route signage to guide truck traffic around the community is another alternative that could preclude the need for a bypass. A bypass could also have a detrimental impact on Southbridge's plans for economic redevelopment by routing potential retail customers away from the community. At the second community meeting, the community concurred with this evaluation.

Analyses regarding the conversion of South Heald Street and New Castle Avenue from one-way pairs to two-way pairs and corrections to signal progression and signal timings were conducted and also presented at the second community meeting. Traffic calming treatments, streetscape enhancements as a means of improving safety and aesthetics within the neighborhood, and issues regarding truck traffic were also discussed.

One-Way Traffic vs. Two-Way Traffic

The SYNCHRO model used to evaluate the existing capacity at intersections was also used to evaluate the conversion of New Castle Avenue and South Heald Street to two-way operation. If two-way traffic was provided on New Castle Avenue, the conversion would extend from D Street to just south of Lobdell Street. South Heald Street would be converted to two-way traffic flow from D Street (where it currently changes to one-way in the southbound direction) through the entire community to Lobdell Street, where two-way traffic currently starts again. An additional connection between New Castle Avenue and South Heald Street, south of Lobdell Street, would have to be constructed in order to allow traffic to move from one roadway to the other.

There are some advantages to providing two-way traffic operation on South Heald Street and New Castle Avenue:

- Given the volume of traffic on the two roadways, it is assumed that traffic would be divided somewhat equally between the two roadways, resulting in increased vehicular capacity through the study area.

- Modeling results show that capacity at each of the intersections is improved by providing two-way operation.
- Two-way traffic could cause motorists to drive slower through the community since there are two directions of travel instead of one (opposing traffic on the streets may cause drivers to be more cautions than the presence of traffic traveling only in the same direction).
- Having two parallel, two-way roadways could provide additional alternative routes for emergency equipment and during emergency road closures.

There are also some disadvantages to consider:

- Providing coordination between traffic signals can be more difficult on two-way roadways compared to one-way roadways because signal offsets would have to be balanced for two directions of travel instead of one.
- Pedestrian crossings at intersections are more difficult, because pedestrians must address cars coming from both directions rather than one direction.
- Two parallel, two-way streets could invite additional traffic into the community since capacity would be increased.
- The tie-in point at Lobdell Street would also cause some operational problems.
- Finally, parking on New Castle Avenue is only provided on the eastern side of the roadway. If two-way operation was provided on New Castle Avenue, a parking lane could not be added to the western side of the roadway, making parking operations for vehicles traveling southbound more difficult.

After weighing the advantages and disadvantages, it was recommended to keep New Castle Avenue and South Heald Street one-way pairs. This conclusion was presented to the community at the second community meeting on April 15, and the attendees concurred.

Traffic Signal Progression

At the workshop in March, community members indicated that vehicles speed to try and make it through signals on both New Castle Avenue and South Heald Street without having to stop. Data collected and modeled from the ATR devices showed that this was very much the case.

The average travel speed through the community is approximately 35 miles per hour (MPH) on New Castle Avenue and 31 MPH on South Heald Street, while the posted speed limit on both roadways is 25 MPH. Signal progression for both New Castle Avenue and South Heald Street was reviewed with the SYNCHRO model. A review of the time-space diagrams for each corridor showed that the existing offsets (amount of time between one signal turning green and the next signal turning green) were actually greater than what is necessary for the corridor. Using the existing offsets with average speeds of 25 MPH shows that vehicles would have to stop more frequently at signals within each corridor, causing additional delays.

Changing the offsets to be more reflective of a 25 MPH speed limit could reduce speeds through the community, allow more vehicles to get through the community, provide additional time for side street traffic, and lower mobile-source air emissions. A more coordinated signal system helps reduce the amount of hydrocarbons (HC), carbon monoxide (CO) and nitrogen oxide (NOx) emitted from vehicles. **Figures 18** - **20** show the reduction of HC, CO and NOx emissions achieved through new offsets at each of the signalized intersections on New Castle Avenue and South Heald Street. A more detailed intersection-by-intersection emissions comparison is available in the appendix.

Figure 18: Hydrocarbon (HC) Emissions Comparison

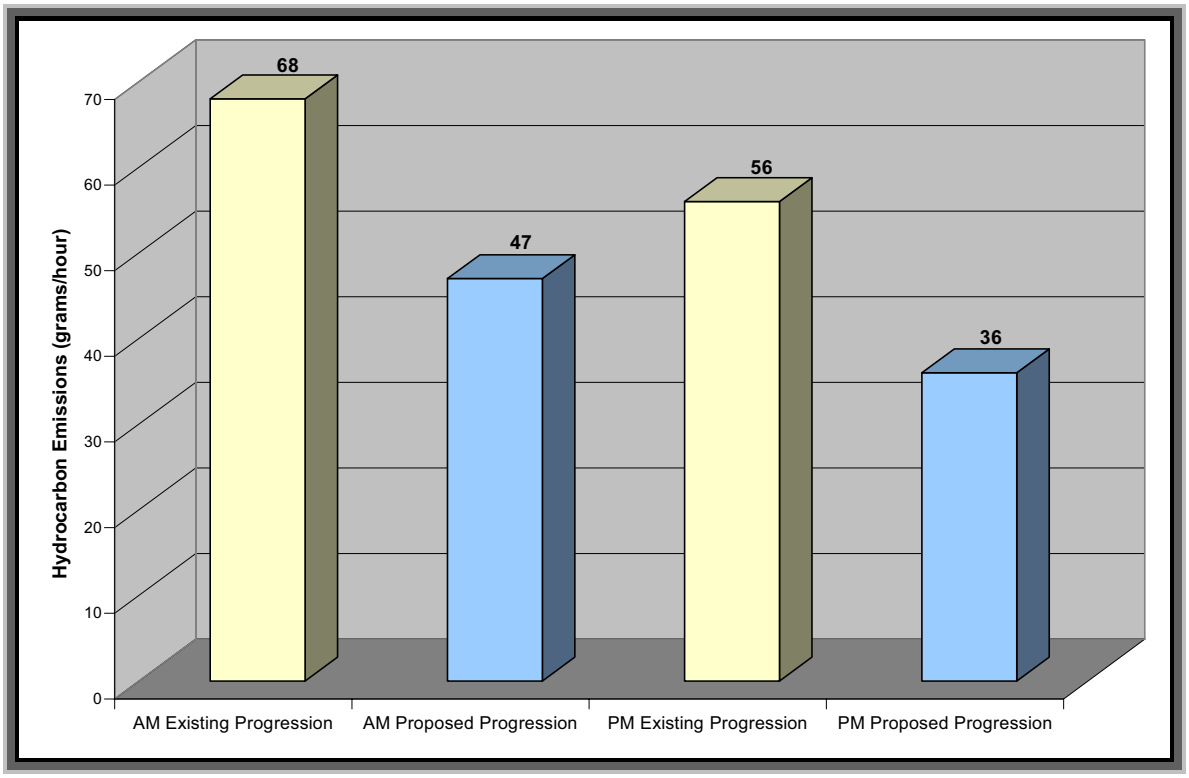


Figure 19: Carbon Monoxide (CO) Emissions Comparison

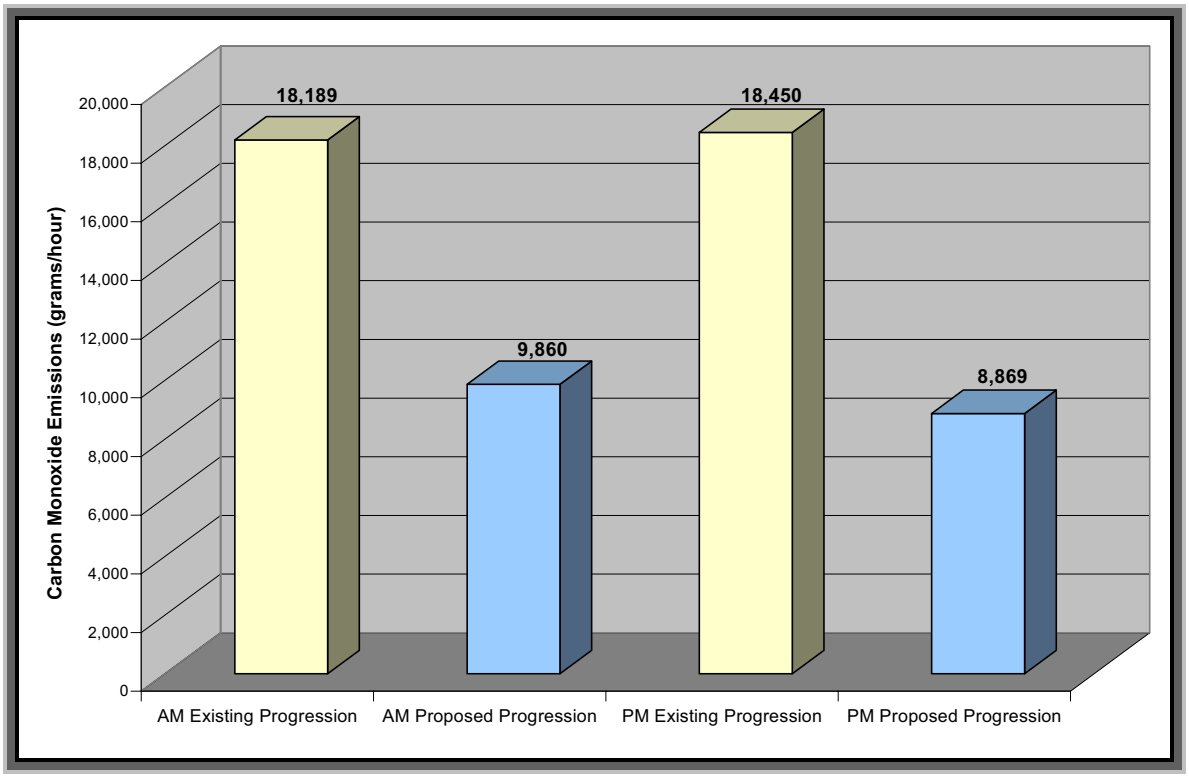
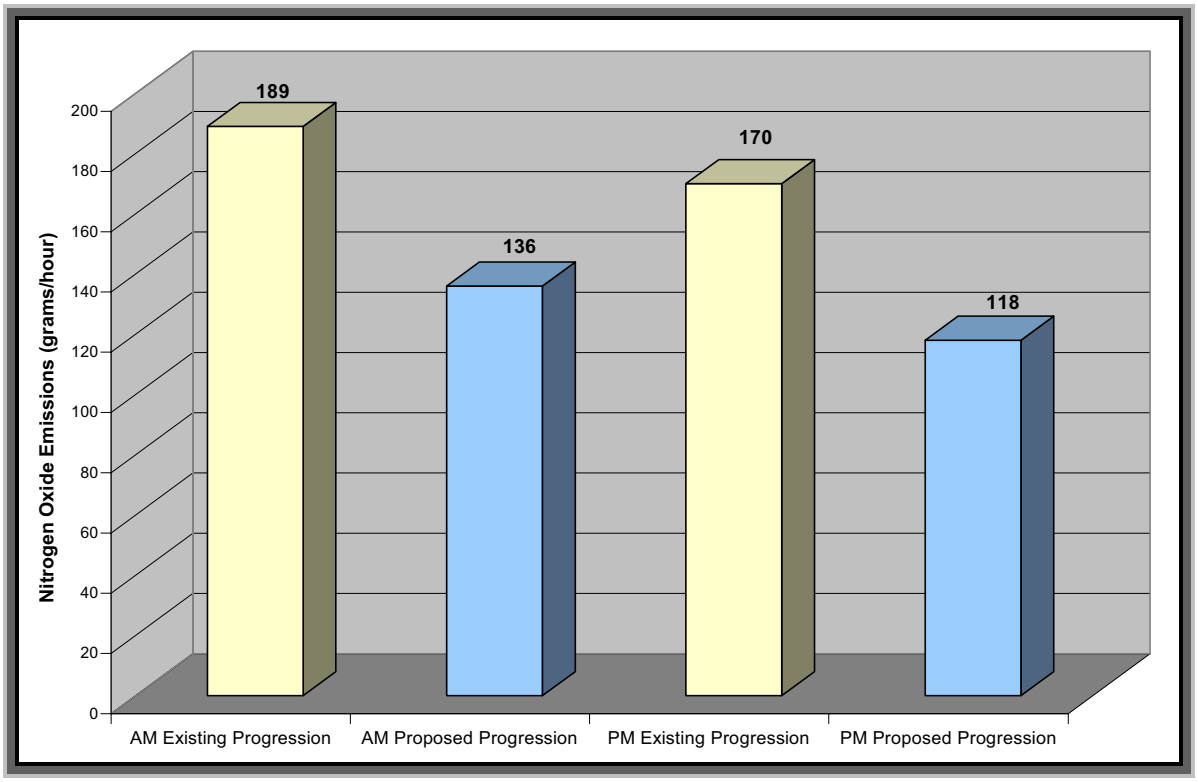


Figure 20: Nitrogen Oxide (NOx) Emissions Comparison



It can be concluded through this emissions analysis that a major reduction in CO emissions can be achieved with the recommended signal progression on New Castle Avenue and South Heald Street. Additionally, small decreases in HC and NOx emissions can also be achieved through this adjustment. It is recommended to retime the traffic signals to better reflect an operating speed of 25 MPH through the community. A new timing plan was prepared and provided to the City of Wilmington for implementation.

Truck Traffic within Southbridge

As noted previously, approximately 6% of the daily traffic on New Castle Avenue and 7% of the daily traffic on both South Heald Street and Walnut Street is comprised of heavy vehicles. This amounts to about 575 trucks per day traveling along New Castle Avenue and South Heald Street through the neighborhood core. Less than 1% of the daily traffic on all three roadways consists of trucks with three or more axles (about 85 trucks). This means that the majority of trucks traveling on these roadways are single unit vehicles such as dump trucks, delivery trucks and buses.

Given the designation of these roadways and the surrounding land uses, it should be expected that some truck traffic would utilize New Castle Avenue and South Heald Street. In addition, truck traffic should also be expected on Christina Avenue as it connects to the Port of Wilmington and to other nearby truck-generating industrial land uses.

It initially appeared that community issues with truck traffic were only related to movement along South Heald Street and New Castle Avenue. The idea of providing blanket truck restrictions for these roadways was evaluated and presented at the second community meeting on April 15. A blanket truck restriction would restrict trucks consisting of two or more axles from traveling through the community, except for local deliveries. While it was determined that neither roadway was listed as part of the National Highway System, allowing truck restrictions to be implemented, previous experience has shown that providing truck restrictions does not work without

enforcement. It was determined that proper enforcement of a truck restriction for New Castle Avenue and/or South Heald Street would most likely not be achieved due to other issues that require police attention within the community. In addition, the definition of a "local delivery" is very vague, and previous experience has shown that it is difficult to define a local delivery area, especially in an environment such as Southbridge. Therefore, it was recommended at the second community meeting to not implement a truck restriction along South Heald Street and New Castle Avenue as a primary deterrent for trucks. Instead, it was recommended that a signing study be conducted within a broader study area to determine the need for additional directional guide signs in an effort to divert trucks around the Southbridge core. This proposed study area should be bordered by the Christina River to the north, Interstate 295 to the south, US 13 to the west and Interstate 495 to the east.

After further discussion at the second community meeting, it was discovered that concerns with truck traffic are also related to movement along side-streets. Specifically, trucks traveling on Lobdell Street and B Street are not welcomed by the community. Additionally, the community requested that signing be evaluated near the Port of Wilmington to determine whether or not trucks can be routed around Southbridge to reach US Route 13.

Trucks create noise, pollution and safety concerns in Southbridge.

Following this community feedback, fresh field reviews of both Lobdell Street and B Street were conducted. During the course of the field review, no truck traffic was observed on B Street, and it does not appear that there are any land uses along B Street that would generate any truck traffic. However, at the corner of Lobdell Street and Christina Avenue, there is a warehouse that generates truck traffic. Tractor-trailers have been observed parked on Lobdell Street in the vicinity of the property. The tractor-trailers face west towards New Castle Avenue and it is assumed that when the tractor-trailers leave the property, they travel west on Lobdell Street and then turn north onto New Castle Avenue. The property is bordered to the north by Bradford Street, which is restricted to one-way travel in the southbound direction. If Bradford Street were converted to one-way in the northbound direction then trucks could turn north onto Bradford Street to access Christina Avenue and away from Southbridge. Truck turn restrictions at the intersection of Lobdell Street and Bradford Street for the westbound through movement and northbound left-turn movement would have to be applied to force truck traffic to use Bradford Street between Lobdell and Christina Avenue.

Based on the review of truck traffic issues within the Southbridge community, the following list of recommendations will begin addressing unwanted truck traffic:

- Complete a guide sign evaluation within a study area larger than the Southbridge community study area. The study area should include Terminal Avenue, Interstate 495, the Port of Wilmington, US Route 13 between Interstate 295 and the City of Wilmington and DE Route 9 between Interstate 295 and the City of Wilmington. The guide sign evaluation should provide recommendations on locations for enhanced guide signs to provide truck drivers with better guidance on which routes to take to get to certain truck-specific destinations, such as the Port of Wilmington, Interstate highways, and locations within Downtown Wilmington.
- Locations have already been identified that require improved truck signage: Christina Avenue at Heald Street, New Castle Avenue at Terminal Avenue, and Port on Terminal Avenue.
- The City of Wilmington should provide truck turning restrictions at the following locations:
    - The westbound Lobdell Street through movement at the intersection with Bradford Street.
    - The northbound left-turn movement from Bradford Street onto Lobdell Street.
    - The northbound right-turn movement from New Castle Avenue onto Lobdell Street.
    - The westbound right-turn movement from A Street onto Bradford Street.
- The City of Wilmington should change the one-way street direction of Bradford Street between Lobdell Street and Christina Avenue from one-way in the southbound direction to one-way in the northbound direction.
- Complete the traffic calming and streetscape improvements, outlined in the section below, to further deter trucks from entering the Southbridge core.

In addition to the above recommendations, WILMAPCO proposes to meet with local generators of truck traffic to discuss the possibility of rerouting trucks to reduce the impact of truck traffic on the surrounding community.

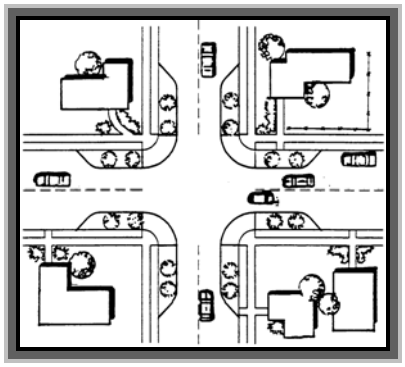
The *Circulation Study* aims to reduce truck movement through the Southbridge core.

Traffic Calming and Streetscape Enhancements

Traffic calming and streetscape enhancements could work to deter speeding and truck traffic and to improve walking and biking conditions within Southbridge.

Providing bulb-outs at each signalized intersection on New Castle Avenue and South Heald Street was discussed and graphically depicted (see **Figure 22**) at community meetings. Bulb-outs reduce the curb-to-curb width of the roadway, resulting in lower speeds as the driver perceives that the roadway is narrowing. Bulb-outs also reduce the length of pedestrian crossing from curb to curb. An example of a bulb-out application at an intersection is provided in **Figure 21**. When this type of improvement is coupled with street trees and pedestrian-scaled lighting, sidewalks with brick ornamentation and decorative traffic signal hardware, the feel of the streets as local, rather than as through streets, can be achieved.

Figure 21: Schematic Example of Intersection Bulb-Outs

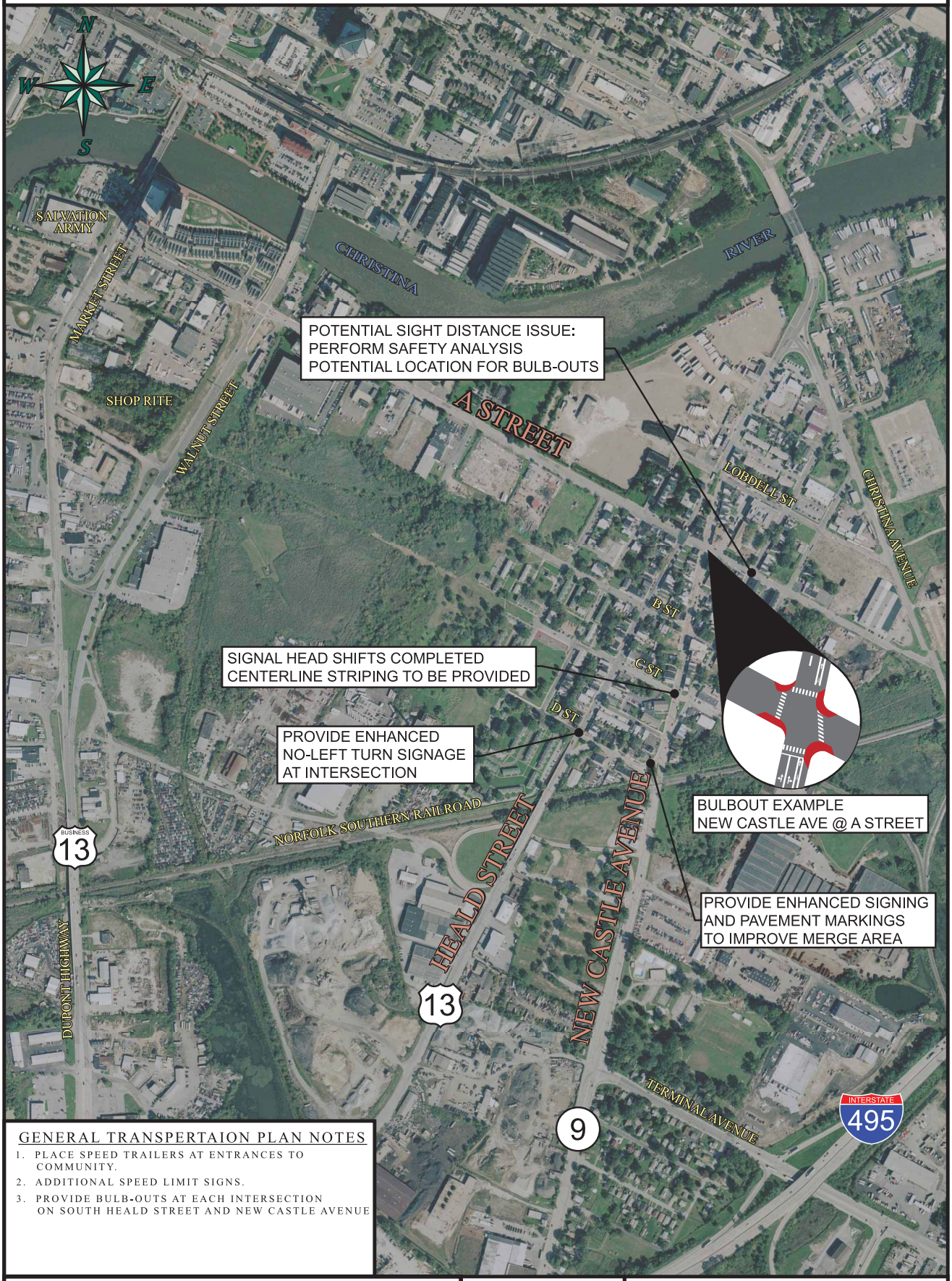


Bulb-outs, such as this one on 13th Street at Walnut Street in Wilmington, help slow traffic and improve pedestrian safety.

New Castle Avenue, South Heald Street, A Street, C Street, Buttonwood Street and the other residential streets should be upgraded with streetscape enhancements to improve the overall aesthetic nature of the community. These enhancements should included pedestrian-scaled lighting, street furniture, street trees, flowers, upgrading the existing traffic signal equipment to provide decorative mast arms, enhanced signing and pavement markings, gateway signage at the north and south approaches to Southbridge, and other decorations that work toward creating an outward expression of community.

SOUTHBRIDGE CIRCULATION STUDY

WILMAPCO



GENERAL TRANSPERTAION PLAN NOTES

1. PLACE SPEED TRAILERS AT ENTRANCES TO COMMUNITY.
2. ADDITIONAL SPEED LIMIT SIGNS.
3. PROVIDE BULB-OUTS AT EACH INTERSECTION ON SOUTH HEALD STREET AND NEW CASTLE AVENUE

IN COOPERATION WITH

DelDOT

RK&K

RUMMEL KLEPPER & KAHL, LLP

SOUTHBRIDGE COMMUNITY
CIRCULATION STUDY
TRANSPORTATION IMPROVEMENTS

0 200' 400' 600'

JULY 2008

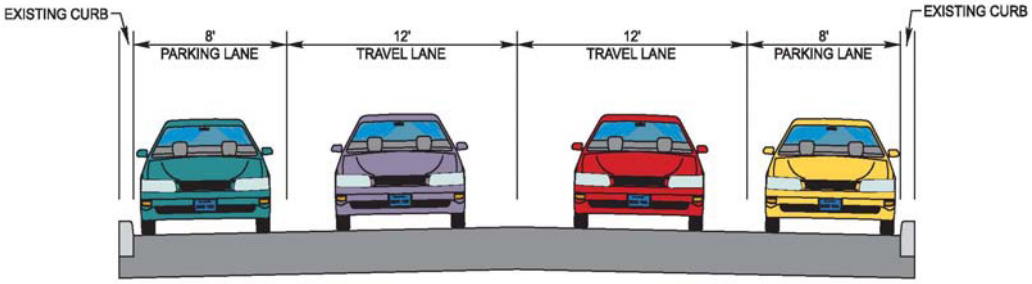
FIGURE 22

It is further recommended that physical traffic-calming techniques are applied to South Heald Street, New Castle Avenue and A Street.

South Heald Street Improvements

The feasibility of providing bicycle lane pavement markings on both South Heald Street and New Castle Avenue were evaluated as traffic-calming techniques. The minimum width for a typical bicycle lane is five feet. The current width of South Heald Street is approximately 40 feet from curb to curb. Currently, the existing cross-section of South Heald Street accommodates two travel lanes and a parking lane adjacent to both curb lines (see **Figure 23**).

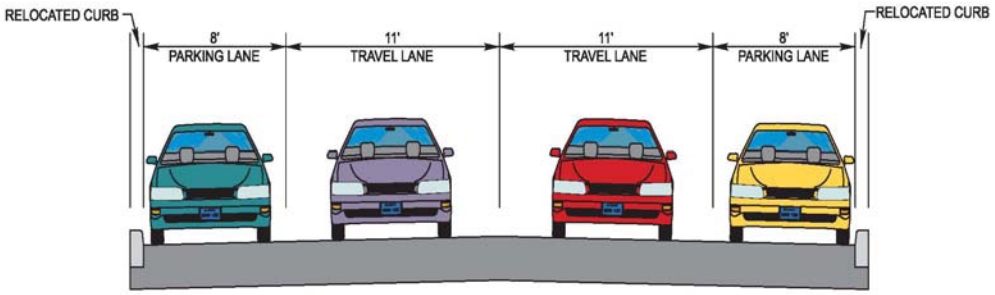
Figure 23: Existing Typical Section – South Heald Street



Given the existing typical section on South Heald Street, providing a five foot wide dedicated bicycle lane is not feasible, even if the width of the travel lanes were reduced. Removing one lane of parking and shifting the travel lanes over to accommodate that bicycle lane is not recommended since parking within the community is already limited. Bicyclists could ride on South Heald Street if desired, but would have to do so utilizing the existing travel lanes.

Since bicycle lanes cannot be provided on South Heald Street, narrowing of the travel lanes by moving the curb line toward the travel lane by one foot on both sides of the roadway could provide some traffic calming benefit by narrowing the travel lane widths to 11 feet (see **Figure 24**), even though an improvement of this nature could be cost prohibitive. At a minimum, it would be feasible and is recommended to restripe South Heald Street with two 11-foot wide travel lanes and two 9-foot wide parking lanes.

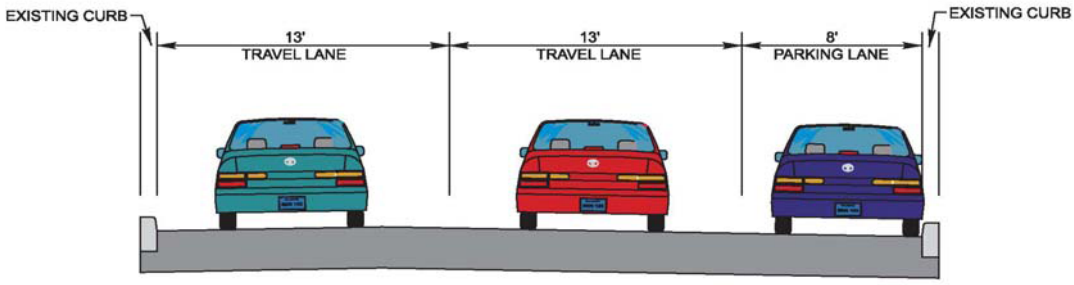
Figure 24: Proposed Typical Section – South Heald Street



New Castle Avenue Improvements

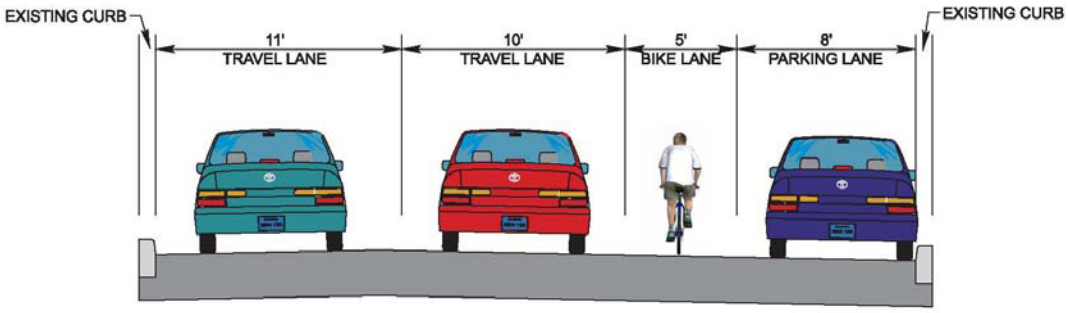
Figure 25 shows the existing typical section for New Castle Avenue through Southbridge. The width of New Castle Avenue is approximately 34 feet from curb to curb, and this section currently accommodates two travel lanes and one on-street parking lane.

Figure 25: Existing Typical Section – New Castle Avenue



Given the existing typical section for New Castle Avenue, shown above, the two travel lanes can be reduced in width in order to provide the needed five feet for a dedicated bicycle lane to run along DelDOT's identified Bicycle Route 2. The resulting typical section is shown in **Figure 26**, below. This improvement would not require adjusting the existing curb line.

Figure 26: Proposed Typical Section – New Castle Avenue



It should be noted that the outside, or right-hand, travel lane width is reduced to 10 feet. A Policy on Geometric Design of Highways and Streets (Green Book), published by the American Association of State Highway and Transportation Officials (AASHTO), provides guidance on appropriate lane widths for roadways. The Green Book states "Lanes 10 ft. wide are acceptable on low-speed facilities." In the case of New Castle Avenue, the goal of providing more narrow travel lanes is to reduce travel speeds to be more closely reflective of the existing 25 MPH speed limit. Reducing the right-hand travel lane to ten feet would achieve this goal and would be allowable based on the guidance provided in the Green Book. Additionally, DART buses are capable of negotiating a ten-foot travel lane.

The upcoming *Wilmington Bicycle Plan* will address policy and recommendations for bicycle facilities within the City of Wilmington. This improvement option for New Castle Avenue shows how a bike lane could be added on this segment of roadway if called for by the *Wilmington Bicycle Plan*. One issue associated with a bicycle lane on New Castle Avenue is the interaction between bicycles and the adjacent on-street parking lane. Bicyclists could be struck by car doors being opened into the bicycle lane. However, this design was taken from DelDOT's *Bicycle Master Plan* and has been adopted in other parts of the country. A project to restripe New Castle Avenue could be undertaken as part of a larger streetscape enhancement project. In addition to providing a dedicated, striped bicycle lane on New Castle Avenue, it is recommended to provide bicycle route signage to identify New Castle Avenue as State Bicycle Route 2. If a bicycle lane is not deemed feasible, it is recommended that New Castle Avenue be restriped to reduce both travel lanes to 11 feet.

A Street Improvements

The current typical section of A Street between Walnut Street and South Heald Street consists of two 11-foot wide travel lanes with 11-foot wide shoulders (see **Figure 27**). Improvements along the A Street corridor between Walnut Street and Townsend Street have been proposed as part of the *South Walnut Street Urban Renewal Plan*, prepared for the City of Wilmington and the Riverfront Development Corporation of Delaware. These improvements include widening the roadway in certain sections to provide for a uniform 84-feet-wide right-of-way. The section will consist of two 12-foot-wide travel lanes (one in each direction) separated by a 14-foot-wide grass median/bio-swale. Adjacent to each travel lane on the outside of the roadway will be a bicycle lane and a parking lane. **Figure 28** depicts the proposed typical section as outlined in the *South Walnut Street Urban Renewal Plan*.

Figure 27: Existing Typical Section – A Street

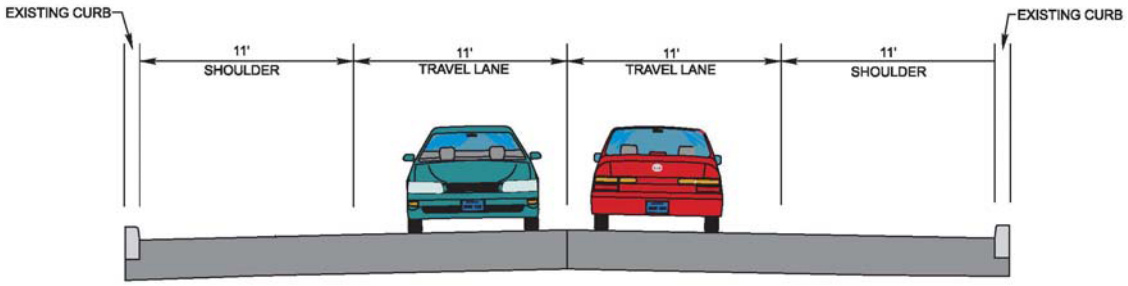
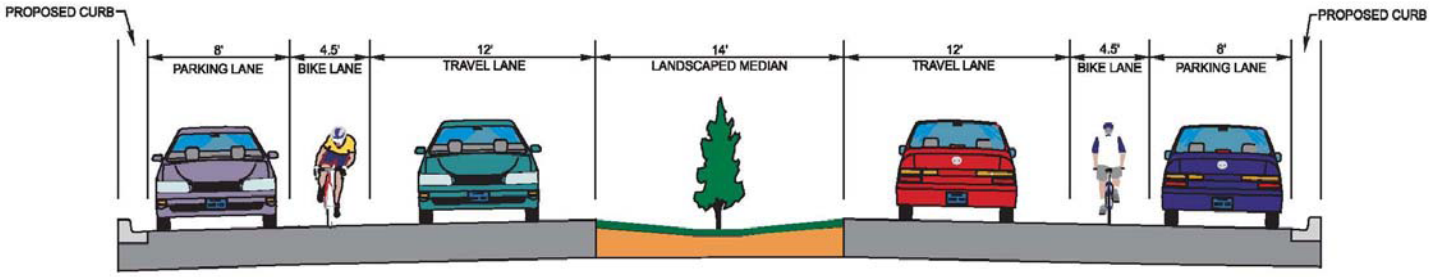


Figure 28: Proposed Typical Section
A Street (between Walnut Street and Townsend Street)



Approaching the Southbridge community along A Street, east of Townsend Street, the section proposed under the *South Walnut Street Urban Renewal Plan* will not fit within the existing pavement width of approximately 44 feet. Further, given the location of existing buildings, it would not feasible to widen A Street in the heart of Southbridge to accommodate the proposed cross-section shown in **Figure 28**.

Therefore, this study develops proposed sections for A Street, east of Townsend Street, to provide traffic calming and gateway treatments. Two typical sections are being proposed for A Street. One is between Townsend Street and New Castle Avenue and another between New Castle Avenue and Christina Avenue.

The section between Townsend Street and New Castle Avenue (see **Figure 29**) should consist of two travel lanes separated by a landscaped median and a bicycle lane on either side of the roadway to carry Bicycle Route 2 between New Castle Avenue and the section of A Street west of Townsend Street. This section may require the elimination of some on-street parking.

Figure 29: Proposed Typical Section
A Street (between Townsend Street and New Castle Avenue)

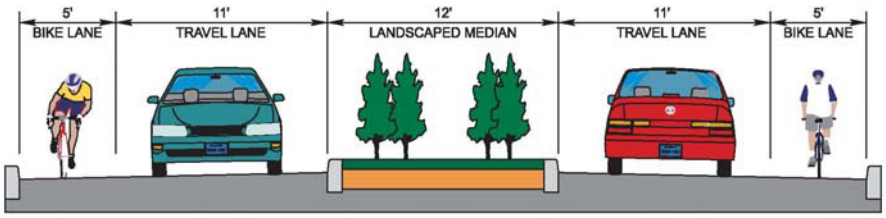
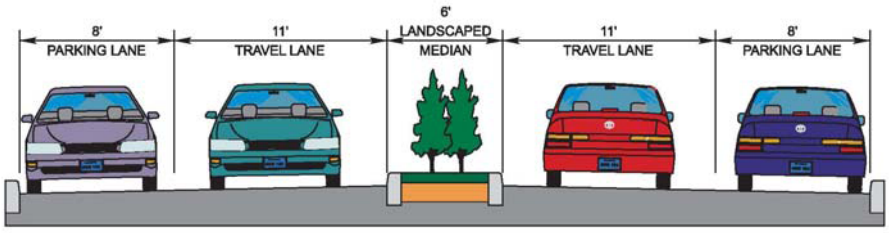
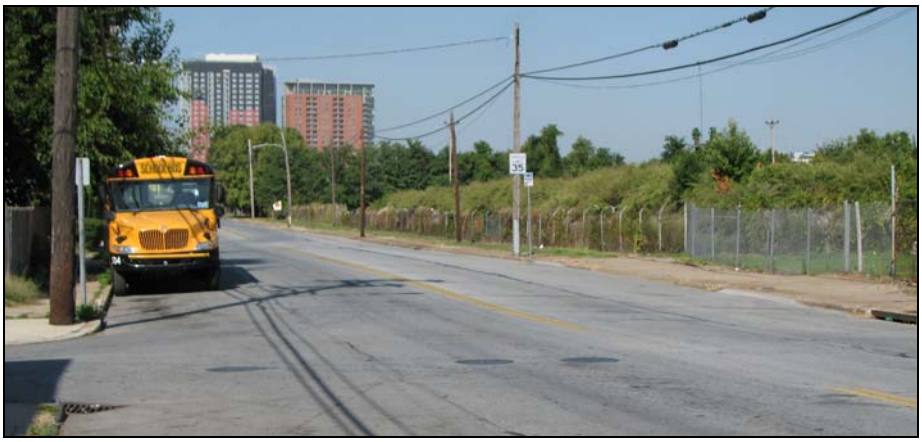


Figure 30 depicts the proposed typical section for A Street between New Castle Avenue and Christina Avenue. This section consists of two travel lanes separated by a narrower landscaped median with parking lanes on both sides of the roadway. It is imperative that this section include parking lanes due to the residential and commercial land uses along this segment of A Street.

Figure 30: Proposed Typical Section
A Street (between New Castle Avenue and Christina Avenue)



The improvements to A Street depicted in **Figures 29** and **30** could be implemented over time as redevelopment occurs. These improvements could also be implemented as larger scale transportation improvement projects; however, a project of this nature would need capital funds, requiring it to compete with other projects throughout New Castle County.



A landscaped median is proposed for A Street.

VII. Recommendations

Based on the analysis documented above and the reaction of those in attendance at the community meetings, the following recommendations are made in no particular order of priority:

1) Implement the pedestrian recommendations from WILMAPCO's Walkable Community Workshop with the Southbridge Community (**see pages 25 and 26)**. Those recommendations are as follows:

   - **Upgrade or install additional crosswalks at the following intersections:**

     Townsend Street @ A Street
     Townsend Street @ C Street
     South Heald Street @ B Street
     South Heald Street @ C Street
     South Heald Street @ Lobdell Street
     New Castle Avenue @ A Street
     New Castle Avenue @ B Street
     New Castle Avenue @ C Street
     New Castle Avenue @ D Street
     New Castle Avenue @ Peach Street
     New Castle Avenue @ Lobdell Street
     A Street @ Chapel Street
     Chapel Street @ Lobdell Street
     S. Claymont Avenue @ A Street
     S. Claymont Avenue @ B Street
     S. Claymont Avenue @ Lobdell Street

   - **Modify or install ADA-compliant curb ramps at the following intersections:**

     New Castle Avenue @ A Street
     New Castle Avenue @ B Street
     New Castle Avenue @ C Street
     S. Claymont Avenue @ A Street
     S. Claymont Avenue @ B Street
     Chapel Street @ Lobdell Street

   - **Install pedestrian signals at the following intersections:**

     New Castle Avenue @ A Street
     New Castle Avenue @ Lobdell Street
     S. Claymont Street @ A Street
     Chapel Street @ Lobdell Street

   - **Construct sidewalks at the following locations:**

     A Street between Chapel Street and Lobdell Street (north side)
     Chapel Street between A Street and Lobdell Street (west side)
     New Castle Avenue south of the railroad crossing (west side)
     New Castle Avenue / South Heald Street (fill in the gaps)

2) Repair the sidewalk on the south side of A Street between New Castle Avenue and Claymont Street (**see page 25**).

3) Provide sidewalks on the east side of Buttonwood Street, north of B Street, on the west side of Townsend Street, north of B Street and on the north side of B Street between Buttonwood Street and Townsend Street (**see page 26**).

4) Provide pedestrian-scale street lighting on C Street and Buttonwood Street (**see page 25**).

5) Evaluate additional locations for sidewalk repair as a result of tree root and broken brick paver damage (**see page 26**).

6) Provide a sidewalk on the east side of the 400 block of Bradford Street, near the Pack and Process property (**see page 26**).

7) As development occurs along the south side of the Christina River, work with the developers to assure public access and pedestrian connections from A Street and South Heald Street to the Riverwalk (**see Figure 15**).

8) Provide bicycle-oriented signing within the Southbridge community. This will be accomplished through the more comprehensive Wilmington Bike Plan (**see page 28**).

9) Address bicycle travel on New Castle Avenue by reducing the lane widths as shown in Figure 26 to accommodate a five-foot bicycle lane adjacent to the existing parking lane. This could be completed in conjunction with a transportation enhancements project or through the implementation of the Wilmington Bike Plan (**see pages 41-42**).

10) Re-route DART Routes 17 and 8 to provide the community with access to the Salvation Army and the new ShopRite store and add better connectivity to other areas in Wilmington. These recommendations were presented to DTC through the WILMPACO Technical Advisory Committee on May 15, 2008 (**see page 32**).

11) As development increases on vacant parcels within Southbridge and as new businesses move into Southbridge, reevaluate the need for additional bus shelters on South Heald Street, New Castle Avenue and A Street (**see page 29**).

12) Do not pursue a bypass at this time. Allow the other recommended improvements to proceed, and continue to monitor traffic to determine whether these improvements have helped to relieve the need for a bypass. Monitor development plans in the area for potential traffic generators that could impact the community (**see page 32**).

13) Retain both South Heald Street and New Castle Avenue as one-way streets. Retime the signals to better reflect an operating speed of 25 MPH through the community (this recommendation is currently in progress) (**see pages 32-33**).

14) Complete a guide sign evaluation within a study area larger than the Southbridge study area. The study area should include Terminal Avenue, Interstate 495, the Port of Wilmington, US Route 13 between Interstate 295 and the City of Wilmington, and DE Route 9 between Interstate 295 and the City of Wilmington. The guide sign evaluation should provide recommendations on locations for enhanced guide signs to provide truck drivers with better guidance on which routes to take to access certain truck-specific destinations such as the Port of Wilmington, Interstate highways and locations within Downtown Wilmington. Locations that require signage will include: Christina Avenue at Heald Street, New Castle Avenue at Terminal Avenue, and Port on Terminal Avenue (**see pages 35-37**).

15) The City of Wilmington should provide truck turning restrictions at the following locations (**see pages 35-37**):

    a. The westbound Lobdell Street through movement at the intersection with Bradford Street.

    b. The northbound left-turn movement from Bradford Street onto Lobdell Street.

    c. The northbound right-turn movement from New Castle Avenue onto Lobdell Street.

    d. The westbound right-turn movement from A Street onto Bradford Street.

16) The City of Wilmington should change the one-way street direction of Bradford Street between Lobdell Street and Christina Avenue from one-way in the southbound direction to one-way in the northbound direction (**see pages 36-37**).

17) Pursue a comprehensive streetscape enhancement program, including traffic calming measures such as bulb-outs, along South Heald Street from Christina Avenue to D Street. Improvements should include pedestrian-scale lighting, bulb-outs at each intersection, street trees, upgrading the existing traffic signal equipment to provide

decorative mast arms, and the provision of enhanced signing and pavement markings. Gateway features should be provided on the north and south approaches to the Southbridge neighborhood. Consideration should be given to reducing the travel lane widths on South Heald Street from the present 12-foot-wide lanes to 11-foot-wide lanes. Additional funding should be sought through partnerships with the City of Wilmington and through development opportunities (**see page 38**).

18) Pursue a comprehensive streetscape enhancement program, including traffic calming measures, along New Castle Avenue from Christina Avenue to D Street by adding pedestrian-scale lighting, bump outs and street trees, replacing the present signal system with new mast arm pole signals, and enhancing signage and striping. Create gateway features on the north and south approaches to the Southbridge neighborhood. Seek additional funding through partnerships with City agencies and development opportunities (**see page 38**).

19) Implement the proposed typical section along A Street (see Figure 28) between Walnut Street and Townsend Street as part of the South Walnut Street Urban Renewal Plan. In addition, implement the proposed typical sections between Townsend Street and Christina Avenue as shown in Figures 29 and 30. Improvements along A Street should also include pedestrian-scale lighting, street trees, decorative sidewalks and decorative traffic signal equipment where appropriate. All improvements should be developer-funded as the Urban Renewal Plan is put into affect (**see page 38**).

20) Pursue a comprehensive streetscape enhancement program along C Street and Buttonwood Street by adding pedestrian-scale lighting and street trees, repairing sidewalks, or placing sidewalks where none currently exists. Seek additional funding through partnerships with City agencies and development opportunities (**see page 38**).

21) Continue to pursue additional streetscape enhancement programs throughout the remainder of Southbridge, beginning with the remainder of the residential streets, by adding street trees and repairing sidewalks (or adding sidewalks where none exists), to improve aesthetics and achieve traffic calming. Seek additional funding through partnerships with City agencies and development opportunities (**see page 38**).

22) Provide enhanced pavement markings to address the merge condition where D Street merges with New Castle Avenue (**see Figure 22**).

23) Provide enhanced No Left Turn signage at the intersection of South Heald Street and D Street (**see Figure 22**).

24) Perform a separate traffic study to evaluate the safety at the intersection of A Street and Claymont Street. At a minimum, consider the placement of bulb-outs at the intersection to improve intersection sight distance (**see Figure 21**).

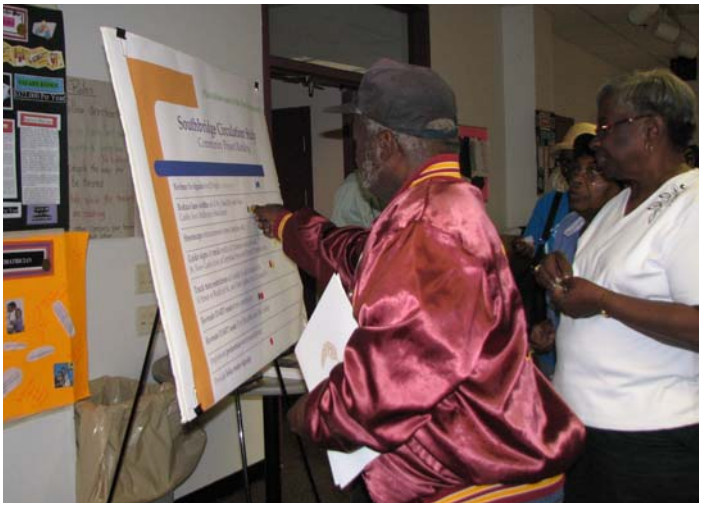
25) Monitor traffic in the Southbridge Study Area to measure the effects of the study recommendations as they are implemented. Monitoring should occur within three years of the implementation of the above improvements.

VIII. Prioritization, Funding Mechanisms and Implementation

After unanimously approving the recommendations found within this study on June 17, 2008, the Southbridge community prioritized its primary proposals. Community members received three stickers and were asked to place one sticker next to the recommendation that they felt deserved the highest priority, the second highest priority, and the third highest priority. There were two identical display boards listing each of the improvements. The results from each display board were added together to obtain the total score for each recommendation. The results are shown in **Table 10** below.

Table 10: Prioritization of Recommended Improvements

Recommendation	Board 1	Board 2	Total Score
Truck turn restrictions at Lobdell St. and Bradford St.; A St. at Bradford St.; and New Castle Ave. at Lobdell St.	6	10	16
Re-route DART route 17 to ShopRite and Salvation Army	11	5	16
Guide signs for truck traffic at Christina Ave. at Heald St.; New Castle Ave. at Terminal Ave.; and Port on Terminal Ave.	8	5	13
Re-time Signals for 25 mph	3	7	10
Provide bike route signage	1	5	6
Reduce lane widths on A St., Heald St. and New Castle Ave. (bulb-outs, bike lanes)	2	3	5
Streetscape Enhancements (trees, benches, etc.)	2	3	5
Re-route DART route 8 into community	1	3	4
Implement pedestrian recommendations	0	0	0



Southbridge residents prioritized the primary recommendations of the *Circulation Study*.

The pedestrian-related recommendations likely received a score of zero (0) because the implementation for these improvements was already underway.

Funding Mechanisms

The following provides some direction regarding funding mechanisms and implementation strategies for the recommendations listed in above.

A review of DelDOT's current Capital Transportation Program (CTP) indicates very little latitude in the availability of Federal funds for Fiscal Years 2010 and 2011. Should a decision be made in Congress to relax the Federal tax on gasoline this summer or later in the year to provide some relief from the increasing gas prices, DelDOT's ability to spend their Federal apportionment of Highway funds will be reduced. This will further tighten the availability of Federal funding for any DelDOT projects. Therefore, to the greatest extent possible, the recommendations from this study should be developed in ways that would allow them to be directed into existing programs.

Transportation Enhancement Program funding for streetscape and pedestrian-related improvements continues to be a source of funding, but the current DelDOT CTP only authorizes $3.4M in Federal funding per year, and competition for those funds is significant. Legislative support and a source for matching funds are required for a project to be considered under the Transportation Enhancement Program. The maximum amount that a project is allowed is $1M. The project match is on a descending scale from 20% for a $1M project to 2% for a project costing less than $100,000.00. DelDOT also has funds for traffic calming, which may be a source of funding for the bulb-outs on New Castle Avenue and South Heald Street.

The Southbridge community, with assistance from WILMAPCO, should continue to pursue the Safe Routes to School Program. This program is designed to decrease traffic and pollution and improve the health of children and the community. The program promotes walking and biking to school through education and incentives that show how much fun it can be. The program also addresses the safety concerns of parents by encouraging greater enforcement of traffic laws, educating the public, and exploring ways to create safer streets. The program is administered by the Delaware Department of Transportation, Division of Planning. The amount of $990,000 has been authorized for FY 2009 in DelDOT's current Capital Transportation Plan.

Where possible, any improvements which can be tied to redevelopment projects, particularly along the Riverfront, and would utilize private funding to accomplish the improvements should be actively pursued by the Southbridge community and the City of Wilmington.

Implementation Strategies

As indicated earlier, signing and striping modifications should be developed in ways that would allow them to be incorporated into various signing and striping programs annually funded and implemented by both DelDOT and the City of Wilmington. Specifically, the truck turn restrictions that the community noted as their highest priority and the guide signs for trucks, which they ranked third, can be developed and completed through existing programs.

The proposed changes to DART Routes 8 and 17 have already been submitted to DART and could be implemented during the next service change in December 2008. Similarly, the information needed for the retiming of the signals on New Castle Avenue and South Heald Street was submitted to the City of Wilmington on June 20, 2008, and will be completed as part of the City's program of maintaining the traffic signals under their jurisdiction.

The provision of bike route signage should be developed in conjunction with the lane width reduction, creation of a bike lane, and bulb-outs on New Castle Avenue. A project to bring sidewalks and crosswalks into compliance with the Americans with Disabilities Act (ADA) could be developed to be incorporated into programs already being developed and implemented by DelDOT. Finally, a project or projects to develop streetscape enhancements and pedestrian improvements in the Southbridge community, which would compete for Transportation Enhancement Program funds, will need legislative support and a funding match in order for the project(s) to move forward.

IX. References

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X. Appendix

Figure A1: Proposed WILMAPCO Pedestrian Improvements

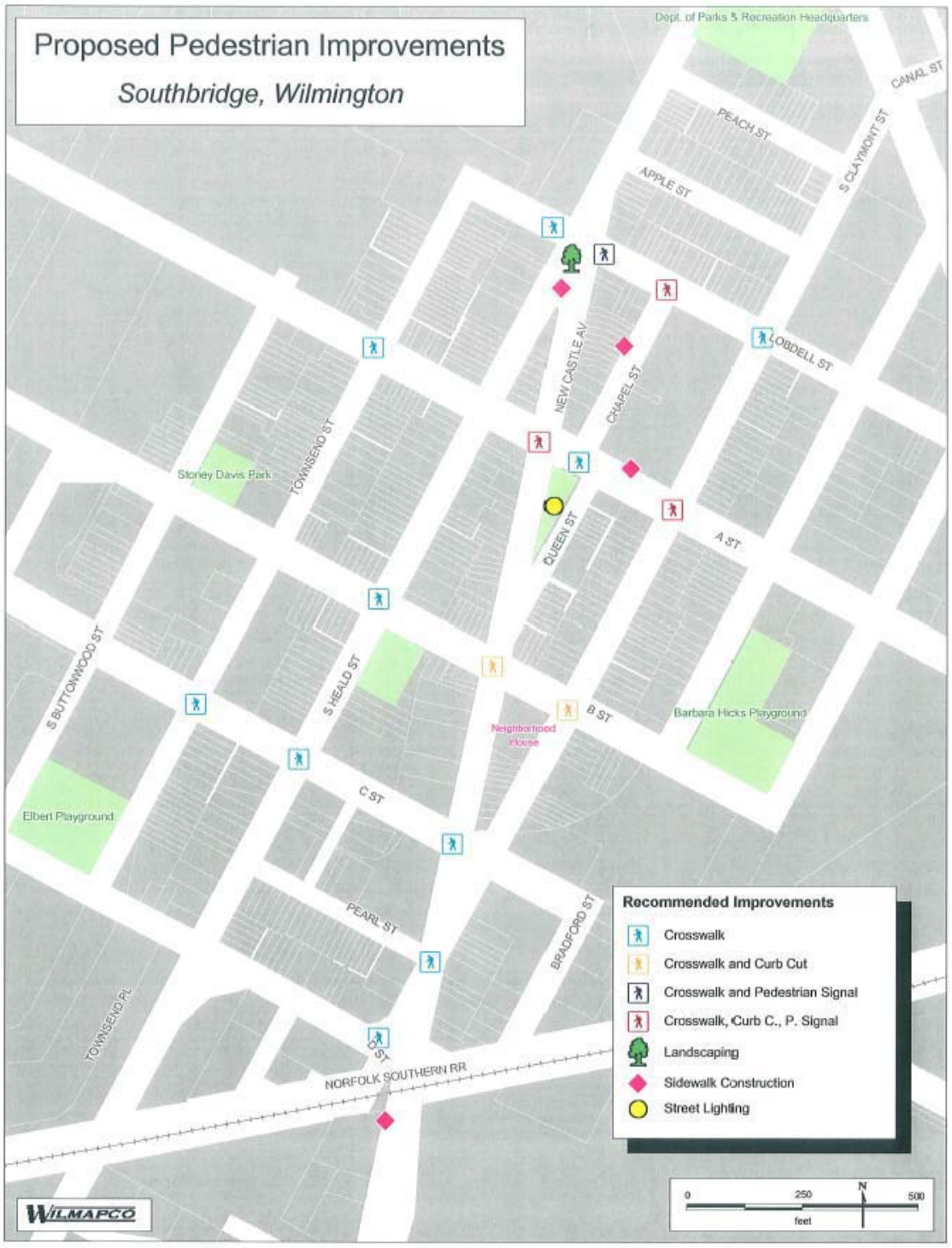

Table A1: Vehicle Emissions Based on New Signal Progression

Intersection	Hydrocarbon (HC) Emissions (g/hr)		Carbon Monoxide (CO) Emissions (g/hr)		Nitrogen Oxide (NOx) Emissions (g/hr)	
	Existing Progression	Proposed Progression	Existing Progression	Proposed Progression	Existing Progression	Proposed Progression
South Heald Street @ A Street	12 (12)	11 (10)	3,123 (3,596)	2,364 (2,407)	33 (37)	30 (31)
New Castle Avenue @ A Street	7 (5)	5 (3)	1,767 (1,471)	1,015 (870)	20 (15)	14 (11)
New Castle Avenue @ C Street	5 (4)	3 (2)	1,750 (1,297)	758 (635)	15 (11)	9 (7)
South Heald Street @ C Street	3 (3)	1 (2)	902 (1,119)	363 (529)	8 (10)	4 (7)
South Heald Street @ Christina Avenue	14 (8)	13 (6)	2,946 (2,099)	2,328 (1,375)	38 (24)	36 (20)
South Heald Street @ D Street	4 (3)	2 (2)	1,093 (1,459)	467 (455)	11 (12)	7 (6)
South Heald Street @ Lobdell Street	12 (11)	6 (5)	3,867 (4,547)	1,267 (1,233)	34 (32)	18 (17)
South Heald Street @ B Street	5 (5)	3 (3)	1,368 (1,701)	652 (804)	14 (16)	9 (11)
New Castle Avenue @ B Street	6 (5)	3 (3)	1,373 (1,161)	646 (561)	16 (13)	9 (8)

XX (XX) = AM Peak Hour (PM Peak Hour)