New Castle Industrial Track Trail
Phase 4

Delaware Department of Transportation

November 2013

CONCEPT DESIGN REPORT

WHITMAN, REQUARDT & ASSOCIATES, LLP
ENGINEERS · ARCHITECTS · PLANNERS
EST. 1915

Concept Report

Concept Plan

Public Involvement

Heritage Trail
Landscaping Evaluation

Photo Log

CTP Estimates

Environmental Review

Traffic Analysis

Tab 1

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I. PROJECT DESCRIPTION AND PURPOSE

The First State Trail and Pathway Initiative aims to "establish a world class interconnected network of shared use pathways and trails that will support non-motorized travel and recreational trails opportunities within the State of Delaware for Delawareans and visitors alike."

The New Castle Industrial Track Trail is a key element of the Initiative. When complete, the Industrial Track Trail will provide a continuous active transportation connection between downtown Wilmington and the Delaware River in New Castle, a distance of about seven miles. Portions of the Trail are open; others are in various stages of construction, design, and planning. The only remaining element to be studied is between the south end of the New Castle Heritage Trail at the intersection of 8th Street and South Street/ Young Street and Battery Park in New Castle, a distance of about one-third of a mile. The section of the existing New Castle Industrial Track Trail located south of Delaware Street (SR 9) is also known as the New Castle Heritage Trail.

The purpose of this study is to evaluate alternatives to connect the Industrial Track Trail to Battery Park. This study also evaluates the potential for upgrades to the existing Heritage Trail between Delaware Street and 8th Street. See Figure 1 for a location map.

II. ALIGNMENT ALTERNATIVES CONSIDERED

A project kickoff meeting was held on Thursday, February 28, 2013 to provide an overview of the study's goals and limits. The project team identified four potential alignment alternatives. A summary and discussion of each alternative may be found below. An alignment alternative map is provided in Section 2.

Blue Alignment

The blue alignment alternative consists of directing trail users from the Heritage Trail to the center of New Castle using the existing street network. For bicyclists, shared-lane markings, or sharrows, would be installed within the travel lanes on several streets directing bicyclists to and from downtown. Because some of these streets are one-way, different routes are preferred for inbound and outbound routes.

Figure 1: Location Map

Not to Scale

- For inbound cyclists entering the City, this route would consist of the following streets:
  - South Street
  - 7th Street
  - Tremont Street
  - 5th Street
  - Foundry Street
  - 4th Street
  - Delaware Street

  The section along 5th Street is approximately 100 feet long and would require cyclists to go against the flow of vehicular traffic. Additional signage and pavement markings (what is known as a "contraflow" bicycle lane) would need to be provided along this section.
- For outbound cyclists leaving the City, the route would consist of the following:
  - Delaware Street
  - 5th Street
  - Tremont Street
  - 7th Street
  - South Street

Pedestrians would use existing sidewalks. An inventory of the existing sidewalk network shows two missing links the along blue alignment. There is no existing sidewalk on 7th Street, beginning 100 feet east of South Street to Deemer Place, a distance of 400 feet. Also, at the southern end of the Heritage Trail at the corner of 8th Street and Young Street/ South Street, there is a short sidewalk gap in the vicinity of the Norfolk Southern railroad crossing.

One of the project stakeholders, the Historic New Castle Alliance (HNCA), has partnered with the City of New Castle on a wayfinding project within and near Historic New Castle. The project's goals includes placement of "Historic New Castle" cultural interest signs on roadways leading into the City, parking signs to minimize congestion, pedestrian wayfinding signage, and improved business signage. Improved wayfinding is a key recommendation from New Castle's 2000 Main Street Assessment, 2009 City of New Castle Comprehensive Plan, and 2011 Community Wellness Initiative: Walkability and Bikeability Assessment Report. The wayfinding project also has letters of support and project contributions from Delaware Greenways, Bike Delaware, City of New Castle, New Castle Historical Society, Delaware Historical Society, and New Castle Courthouse Museum.

The blue alignment complements these efforts and supports the signage project's goals of providing easily accessible and safe routes into downtown for residents and visitors to participate in the City's cultural, retail, and community activities.

Green Alignment

The green alignment alternative consists of an off-alignment trail through two privately-owned parcels: (1) a parcel just west of South Street between the active Norfolk Southern railroad and 7th Street where a railroad was formerly located, and (2) the former Brosius-Eliason site. A mid-block crossing of 7th Street would be required approximately 200 feet west of South Street.

WR&A met with the Brosius-Eliason owner on April 11, 2013 and he indicated that this property may be redeveloped. Preliminary discussions indicated that he is supportive of the project. Many options exist on how to route the trail through the parcel. Once through this parcel, a short trail segment is needed between 3rd Street and the Battery Park Trail.

WR&A met with the railroad parcel owner on April 16, 2013. Preliminary discussions with the owner indicate support for the trail project is not yet in place.

Traffic counts and a speed study were performed to determine the feasibility of an unsignalized mid-block crossing across 7th Street. The most commonly used reference in evaluating unsignalized crossings is National Cooperative Highway Research Program (NCHRP) Report 562, "Improving Pedestrian Safety at Unsignalized Crossings." NCHRP 562 includes a methodology for selecting appropriate pedestrian crossing treatments based on traffic volumes, traffic speed, pedestrian crossing volume, and other criteria.

The posted speed on 7th Street is 25 mph. The recorded 85th percentile speed is 27 mph. According to DelDOT's 2012 Traffic Summary, an average of 4,516 vehicles travel this portion of 7th Street each day. Traffic counts performed on May 8, 2013 indicate peak hour traffic volumes on 7th Street of 568 vehicles and 632 vehicles during the AM and PM peak hours respectively.

Due to the Industrial Track Trail network's several "missing links", there is no reliable method to estimate future crossing demand once the network is completed. To address this uncertainty, NCHRP 562 was consulted using the existing traffic volumes and speed on 7th Street with a range of potential pedestrian crossing volumes.

It is reasonable to expect a pedestrian crossing volume in the range of 20 persons during the peak hour once the Industrial Track Trail is connected to downtown New Castle and Battery Park. Because 20 persons per hour is the threshold between treatment options, both were considered in detail. See Section 8 of this report for NCHRP worksheets for both options.

i. Option 1: Fewer than 20 pedestrians per hour

Given the roadway and crossing characteristics, the NCHRP methodology calculates that a pedestrian crossing volume of fewer than 20 persons per hour can use standard crosswalk markings and signing. It notes that traffic calming strategies, such as raised medians or curb extensions, should be considered.

ii. Option 2: Greater than 20 pedestrians per hour

NCHRP 562 recommends an "active or enhanced" device for a crossing volume of greater than 20 persons per hour. An "enhanced" device is displayed at all times. Such devices could include:

- Signs and high-visibility markings
- In-street pedestrian crossing signs
- Continuously-operating overhead flashing beacons

An “active” device is displayed when a pedestrian is present. Such devices could include:

- Pedestrian crossing flags
- Pedestrian-actuated overhead flashing beacons, which were installed at the Industrial Track Trail crossing of Boulden Boulevard
- Pedestrian-actuated rapid rectangular flashing beacons (RRFB), which are under construction at the Industrial Track Trail crossing of Delaware Street
- Pedestrian-actuated in-roadway warning lights

The recommended crossing treatment is Option 1 using standard crosswalk markings and signing. A similar mid-block crossing is being installed on 7th Street, approximately 650 feet to the west, as part of the Washington Street Sidewalks project (DelDOT Contract T200201104). Due to the limited right of way width and the close proximity of the existing buildings to the roadway, it may not be feasible to install curb extensions or a median along 7th Street without eliminating the 5-foot shoulder/bicycle lane or impacting existing buildings.

After construction, it is recommended to monitor the trail for demand and safety. If and when trail demand increases, an active or enhanced device should be considered.

Red Alignment, Option A

The red alignment alternative consists of directing trail users between the Heritage Trail and Battery Park via South Street. Similar to the blue alignment, bicyclists would use the street with sharrows installed within the travel lanes.

Heavier traffic volumes exist on the section of South Street between 7th Street and 6th Street. This section serves as a primary route for vehicles travelling to and from State Route 9 and downtown. Traffic counts show that leaving downtown towards State Route 9, a high percentage of outbound vehicles turn right from westbound 6th Street to northbound South Street, and then make an immediate left onto 7th Street. Traffic counts indicate that 83% and 94% of northbound South Street vehicles in the AM and PM peak hours respectively turn left onto westbound 7th Street. This zigzag pattern was also documented in reverse for vehicles entering the center of New Castle.

The intersection configuration at 7th Street and South Street is irregular; the 7th Street legs (east and west legs) of the intersection are offset and the northbound approach is a free movement while all other approaches are STOP controlled.

The traffic flow patterns and irregular intersection operations make bicycle access challenging, especially for southbound cyclists entering New Castle. The feasibility of installing an all-way STOP or a half-signal should be examined at final design. A half-signal would restrict northbound South Street left-turn movements to westbound 7th Street when a cyclist is crossing the west leg of the intersection.

Under this option pedestrians would use sidewalk along the east side of South Street. The connectivity of the sidewalk network varies as follows:

- Beginning at the southern end of the Heritage Trail at the corner of 8th Street and Young Street/ South Street, there is a short sidewalk gap in the vicinity of the Norfolk Southern railroad crossing.
- There is an existing four-foot-wide sidewalk from approximately 30 feet south of the railroad to 7th Street.
- From 7th Street to 3rd Street, the existing sidewalk is being reconstructed as part of the Washington Street Sidewalks project (DelDOT Contract T200201104). Construction began in 2013 and is scheduled to be complete in 2014. The proposed roadway typical section consists of two 11-foot travel lanes and one 11-foot shoulder/parking area along the east side of the roadway.
- There are no pedestrian facilities connecting from 3rd Street into Battery Park. As shown, the red alignment is routed into Battery Park near the existing parking lot at the 3rd Street and South Street intersection. The City of New Castle and the Trustees of New Castle Common are in the process of developing revitalization plans for Battery Park. Any facilities between 3rd Street and the Park should be coordinated to ensure a smooth and consistent connection.

Red Alignment, Option B

Option B is a variation of Option A to avoid the difficult intersection of South Street and 7th Street. This alternative consists of installing a trail within the previously described privately owned parcel situated west of South Street between the active Norfolk Southern railroad and 7th Street. A mid-block crossing would be installed across 7th Street and cyclists would then transition to the bike lane along 7th street, and then to sharrows on South Street. The rest of the route would be identical to Option A.

III. NEW CASTLE HERITAGE TRAIL

The New Castle Heritage Trail is an existing ¼-mile trail segment between Delaware Street and 8th Street that is part of the Industrial Track Trail network. DelDOT completed this section in 2005 under the Transportation Enhancements program (Contract 24-200-11). Since that time, trail guidelines have changed and the rest of the Industrial Track Trail is moving closer to completion.

For those reasons, elements of the existing trail were evaluated to ensure a consistent tie-in with other segments of the trail network. Elements evaluated include geometrics, pavement conditions, drainage, ADA compliance, landscaping, lighting, and trail amenities.

Trail alignment

The trail is eight feet wide. The AASHTO *Guide for the Development of Bicycle Facilities* (4th Edition, 2012) recommends a minimum trail width of ten feet. It notes that in rare circumstances a reduced width may be used, including when:

- Bicycle traffic is expected to be low, even on peak days or during peak hours
- Pedestrian use of the facility is not expected to be more than occasional
- Horizontal and vertical alignments provide frequent, well-designed passing and resting opportunities.
- The path will not be regularly subjected to maintenance vehicle loading conditions that would cause pavement edge damage.

Once the Industrial Track Trail network is complete, user demand is expected to rise. Therefore the above volume-based conditions will not likely apply. Furthermore, the rest of the Industrial Track Trail is designed with a minimum width of ten feet.

Pavement conditions and drainage

The trail consists of a hot-mix surface and field observations indicate the pavement is in fair condition. In several areas, however, localized low points have developed and ponding was observed. Standing water is a safety concern, especially during freezing weather conditions. The trail's stormwater runoff is conveyed through a series of ditches and a closed storm drainage system. Repairing the pavement low spots, regrading several minor side ditches towards the existing storm drain system, and potentially installing new inlets would likely resolve these drainage concerns.

Americans with Disabilities Act (ADA) compliance

Trail cross slopes were field checked at 50-foot increments. The maximum allowable cross slope is 2% per current standards. Cross slopes north of 9th Street were within the allowable tolerance. Several locations between 8th Street and 9th Street exceeded 2%, with a maximum recorded slope of 4.7%. These sections were also where localized ponding was observed as noted above.

Curb ramp slopes were field checked. All existing curb ramps were built per plan. However, due to changes in ADA and DelDOT guidelines since 2005, the curb ramps do not include landing areas as currently required. Cross slopes and taper slopes all fall within current guidelines and all curb ramps have detectable warning truncated domes.

Landscaping

WR&A landscape architecture staff performed a field view on March 29, 2013. Existing plantings were quantified and evaluated for health and location relevant to existing and proposed trail improvements. A landscaping evaluation plan is provided in Section 4 of this report.

Several of the plantings identified as proposed according Contract 24-200-11 no longer exist. The existing canopy and understory trees that do remain appear to be in good health and provide a buffer from Young Street as well as the existing properties that border the trail. The AASHTO *Guide*

for the Development of Bicycle Facilities (4th edition, 2012) recommends a two-foot horizontal clearance between a trail and lateral obstructions such as bushes or trees. Several of the low shrubs along the trail need to be considered for removal or transplantation due to their growth habits and proximity to the trail. During the summer months, these plantings do not provide a sufficient horizontal clearance for trail users.

Additionally, the Euonymus (burning bush) is an invasive species. Although the Euonymus along the Heritage Trail provide a buffer, they have outgrown their intended use and their removal should be considered. Smaller species such as the Ilex verticillata (Winterberry) can remain if the trail width and alignment stays in place. If the trail is widened, further evaluation is needed per individual plants to determine if transplanting or removing the species is required.

Lighting

Twelve light fixtures were installed as part of Contract 24-200-11. Lighting measurements were recorded the evening of January 17, 2013. Light levels were high in the immediate vicinity of each fixture, however dark spots were recorded at locations midway between each fixture. Photometric software was used to model existing and potential proposed light levels. DelDOT's Lighting Design Guidelines recommend an average maintained illuminance value of 2.0 foot-candles (FC) minimum on separated pedestrian ways and bicycle ways. The existing average illuminance on the Heritage Trail is 1.5 FC.

To upgrade lighting to meet current standards, nine new light fixtures are recommended approximately midway between each existing fixture. Also, the existing light fixture heads should be replaced with fixtures specified with a light distribution pattern of Type II or III. This pattern is suitable for trails because it distributes light in a wider, more lateral pattern, rather than the near circular pattern observed, which is consistent with a Type IV or V pattern.

Trail Amenities

The kiosks installed as part of Contract 24-200-11 are no longer in place. The bicycle racks installed are of the "wave" design; however DelDOT's current preferred design is the inverted "U". Also, bollards were installed, but have since been cut and only stubs remain.

IV. PUBLIC INVOLVEMENT

A public workshop was held on Thursday, May 23, 2013 at the New Castle Public Library. Display boards were presented for attendees to review trail alignment alternatives. There were twelve attendees at the workshop and all strongly supported the project. Of the four surveys completed, the following is a tally of the preferred alignment. Of note, some attendees selected more than one alignment, indicating a favorable opinion towards multiple alignments.

- 4 votes - Green Alignment: Alignment through former Brosius-Eliason property if/when it is redeveloped.
- 1 vote - Blue alignment: alignment into downtown consisting of an on-street option for bicyclists and sidewalk upgrades for pedestrians
- 1 vote - Red Alignment: Alignment along South Street consisting of an on-street option for bicyclists and sidewalk upgrades for pedestrians.

Copies of the materials presented at the workshop and a summary of comments are included in Appendix D.

V. ENVIRONMENTAL STUDIES

Natural Resources

On January 31, 2013, an initial site visit was conducted by WR&A environmental staff to identify environmental features that may require permitting as a result of potential trail impacts. During this site visit, two potential wetland areas were identified. See Section 7 of this report for a site location map and technical documentation.

Wetland 1 is located directly adjacent to the existing New Castle Heritage Trail between Delaware Street and 9th Street. The wetland appears to have been formed within a ditch that developed wetland characteristics due to a lack of periodic maintenance. The ditch was constructed within uplands and therefore the ditch and wetlands are not naturally occurring.

A follow-up site visit was conducted on May 16, 2013 with DelDOT Environmental Studies staff. The group observed the area around Wetland 1, including the upstream portion north of the culvert crossing at Delaware Street. The group agreed that it is likely the wetland and ditch would not be regulated because they lack a significant nexus to regulated Waters of the United States. A Jurisdictional Determination with the U.S. Army Corps of Engineers has not been scheduled to confirm because it was noted that potential upgrades or modifications to the New Castle Heritage Trail, including re-surfacing and/or widening the trail by an additional two feet, could be accomplished without impacting the wetland or ditch. No future action for Wetland 1 is necessary unless potential improvements to the Heritage Trail extend into the wetland area.

Wetland 2 is located within Battery Park and southwest of the former Brosius-Eliason industrial site. It appears that a small portion of the wetland extends into the industrial site where the topography remains flat and ponding is occurring. Access to the industrial site is restricted by a chain-link fence around the parcel's perimeter.

At the follow-up site visit on May 16, 2013, the group agreed that based on the visual observance of hydrophytic vegetation, the wetland likely extends into the fenced area. It was suggested that an insufficient amount of fill was placed when the site was graded and the wetlands continue to encroach. Full access to the site and a delineation of Wetland 2 would be required before a potential proposed trail alignment can be determined. The group agreed that this wetland would likely be regulated due to its close proximity and significant nexus to the Delaware River; however a Jurisdictional Determination with the U.S. Army Corps of Engineers must be conducted to confirm.

Cultural Resources

WR&A reviewed the trail alignments with DelDOT Environmental Studies on March 7, 2013. Concerns with standing structures were not noted. Archaeology studies are anticipated for the red and green alignments. Although archaeological resources are unlikely to impact the feasibility of any alternative, further evaluation of the trail project will be required at the final design stage.

Hazardous Materials

Before Brosius-Eliason occupied the site at 508 South Street, the New Castle Gas Company was situated at this location. This site has been certified as a brownfield by DNREC's Site Investigation and Restoration (SIRS) division (Project No. DE-0167). DNREC has indicated that a remedial investigation at the site is complete and a Final Plan of Remedial Action was issued in February 2013.

The red and blue alignments are not associated with the defined SIRS site.

VI. RECOMMENDATIONS

All alignment options accomplish the goals of the project and effectively complete the southern-most section of the Industrial Track Trail. Due to the relatively short-term implementation timeframe, it is recommended to move forward with both the Blue Alignment and Red Alignment, Option A. These options offer low cost alternatives that utilize much of the existing pedestrian network. When combined, they would allow trail users to navigate to and from various destinations throughout the City from multiple access points.

In the long term, it is recommended to continue development coordination for implementation of the Green alignment trail when the Brosius-Eliason site is redeveloped. This alignment was the chosen alternative at the public workshop. Depending on the final alignment, it could offer scenic views of the wetland ecosystem surrounding Battery Park. This option would provide an excellent opportunity to create a multi-modal asset within this revitalized section of New Castle.

The Green option as shown is dependent on the use of the privately owned parcel between the Norfolk Southern railroad and 7th Street. As the Brosius-Eliason redevelopment continues, this parcel should be re-evaluated for potential trail use. If use of this parcel is found to be infeasible, the Green alignment could be implemented by using the Red Alignment, Option A and then transitioning to inside the Brosius-Eliason site just south of the 7th Street and South Street intersection.

Red Alignment, Option B is not recommended because although it would avoid the difficult intersection at 7th Street and South Street, it also hinges on the use of the privately owned parcel between the Norfolk Southern railroad and 7th Street. If this parcel becomes available for trail use, then all efforts should be directed towards the more desirable Green alignment instead.

Due to its relatively recent construction, it is generally agreed that the New Castle Heritage Trail is in fair condition. The overall Industrial Track Trail network is slated to be either built or under construction by 2016. To ensure consistent signage, light fixtures, and other amenities, it is recommended to wait to upgrade the Heritage Trail to build on the success of other higher profile segments of the network. By deferring upgrades, a larger group of stakeholders will have an opportunity to come to a consensus on overall network aesthetics and amenities.

VII. IMPLEMENTATION PLAN AND COST ESTIMATES

The following scope of work is recommended for each project. Note assumptions of work by others.

Blue and Red Alignments

Approximate Cost: $355,000

- Work with the Historic New Castle Alliance and the City of New Castle to implement wayfinding signage along both routes directing trail users to both downtown (via the existing City streets) and Battery Park (via South Street).
- Install sharrows along both routes. Develop a contraflow signing and striping sketch plan for the one-way section along 5th Street.
- Evaluate the feasibility of installing a half-signal or four-way STOP at the 7th Street and South Street intersection.
- Complete the sidewalk network on 7th Street between South Street and Deemer Place. If sidewalk is found to be undesirable at this location during final design, pedestrians should be directed to the existing sidewalk network on 6th Street or 5th Street instead.
- Fix the sidewalk gap between the southern end of the Heritage Trail at the corner of 8th Street and Young Street/ South Street to just south of the Norfolk Southern railroad.
- Widen the existing four-foot-wide sidewalk to five feet on the east side of South Street from approximately 30 feet south of the railroad to 7th Street.
- Continue coordination with the City of New Castle to ensure the City's revitalization plans for Battery Park include a trail connection between 3rd Street and the Battery Park trail. It is assumed that design and construction of that section will be performed by others.

Green Alignment

Approximate Cost: $130,000

- Construct a hot-mix trail between 8th Street and 7th Street. Remove any remaining remnants of the railroad infrastructure and excess hot-mix pavement.
- When the former Brosius-Eliason site is redeveloped, include plans for a trail within the site between 7th Street and 3rd Street. It is assumed that trail design and construction within the Brosius-Eliason site will be performed by others.
- Install signing and striping for a mid-block crossing at 7th Street. Evaluate the feasibility of installing additional traffic calming, active, or enhanced measures if warranted.
- Install landscaping improvements.
- Continue coordination with the City of New Castle to ensure the City's revitalization plans for Battery Park include a trail connection between 3rd Street and the Battery Park trail. It is assumed that design and construction of that section will be performed by others.

Heritage Trail

Approximate Cost: $360,000

- Widen the trail to ten feet. Resurface and/or patch the pavement as conditions dictate.
- Upgrade curb ramps to current guidelines.
- Evaluate drainage and install additional inlets or re-grade as needed.
- Install additional light poles and change fixture types on the existing light poles to a Type II or III distribution for optimized lighting.
- Provide additional landscaping and remove undesirable landscaping features.

Tab 2

New Castle Heritage Trail
W. 9th Street
Young Street
8th Street
Young Street Park
W. 7th Street
Deemer Place
Tremont Street
Delaware Street
New Castle Public Library
Norfolk Southern RR
South Street
W. 6th Street
Firehouse Alley
Foundry Street
W. 5th Street
Williams Street
W. 7th Street
Brosius-Eliason (former)
Gray Street
Goodwill Fire Company
W. 4th Street
W. 3rd Street
Eric A. Hutt Motors
New Castle Presbyterian Cemetery
New Castle Senior Center
Porter Alley
Penn Street
New Castle Battery Park
Battery Park Trail
Wetlands (approximate)
W. 3rd Street
Delaware River
N
9
9
Legend:
Red Alternative
Green Alternative
Blue Alternative
DelDOT
WR&A
NOTES:
1. Aerial photography is from 2012.
2. Existing Right-of-Way as shown is approximate.
NEW CASTLE INDUSTRIAL TRACK TRAIL, PHASE 4
FEASIBILITY STUDY
0 100' 200'
MAY 2013
SHEET 1 OF 1

Tab 3

Public Involvement

A public workshop was held on Thursday, May 23, 2013 at the New Castle Public Library. Display boards were presented for attendees to review trail alignment alternatives. There were twelve attendees at the workshop and all strongly supported the project. Of the four surveys completed, the following is a tally of the preferred alignment. Of note, some attendees selected more than one alignment, indicating a favorable opinion towards multiple alignments.

- 4 votes - Green Alignment: Alignment through former Brosius-Eliason property if/when it is redeveloped.

- 1 vote - Blue alignment: alignment into downtown consisting of an on-street option for bicyclists and sidewalk upgrades for pedestrians

- 1 vote - Red Alignment: Alignment along South Street consisting of an on-street option for bicyclists and sidewalk upgrades for pedestrians.

Copies of the materials presented at the workshop and a summary of comments are attached.

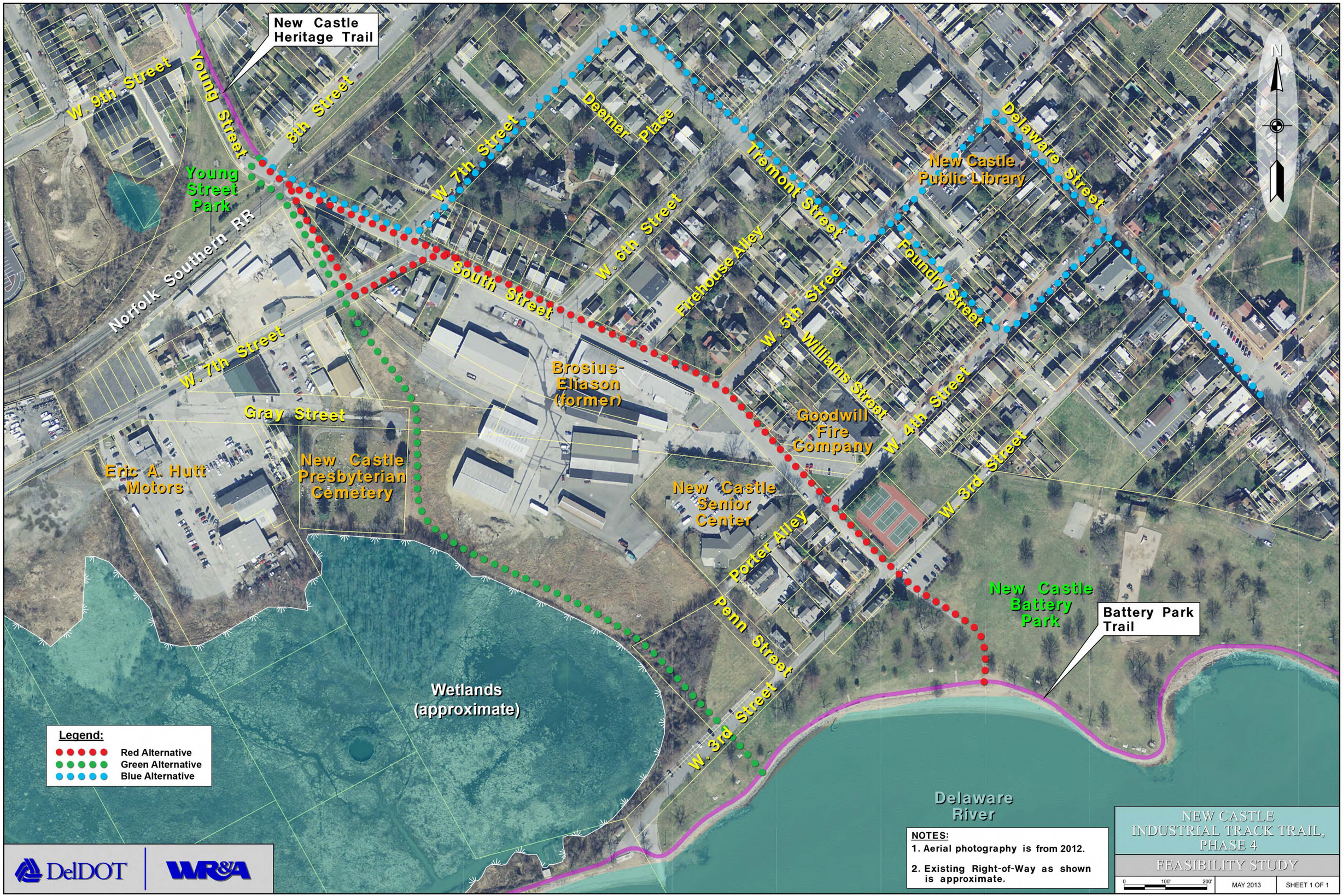
Welcome to the Industrial Track Trail, Phase 4 Workshop

This project is a concept design study to evaluate alignment alternatives for connecting the existing New Castle Heritage Trail to Battery Park.

The proposed trail connection will complete the southern portion of the Industrial Track Trail network. When complete, the Industrial Track Trail will provide a seven-mile continuous walking and biking connection between Old New Castle and downtown Wilmington.

The study will also evaluate the potential of upgrading the New Castle Heritage Trail to the same width as the remaining network and review the need for landscaping maintenance.

Based on the results of the study, one or more alignments will be chosen as the preferred alternative. The study will summarize impacts and cost, including right-of-way, final design, and construction. This is a study only; final design and construction are not funded or scheduled.


New Castle Heritage Trail
W. 9th Street
Young Street
8th Street
Young Street Park
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W. 7th Street
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Goodwill Fire Company
W. 4th Street
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New Castle Presbyterian Cemetery
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Penn Street
New Castle Battery Park
Battery Park Trail
Wetlands (approximate)
W. 3rd Street
Delaware River
N
Legend:
Red Alternative
Green Alternative
Blue Alternative
DelDOT
WR&A
NOTES:
1. Aerial photography is from 2012.
2. Existing Right-of-Way as shown is approximate.
NEW CASTLE INDUSTRIAL TRACK TRAIL, PHASE 4
FEASIBILITY STUDY
0 100' 200'
MAY 2013
SHEET 1 OF 1

Route 13 crossing: tunnel under the highway
0.2 miles
FUNDED AND UNDER DESIGN
Construction by DelDOT in 2013-2014
To be maintained by DelDOT

I-295 crossing: tunnel under the highway and trail connection to Route 13
0.5 miles
FUNDED AND UNDER DESIGN
Construction by the Delaware River and Bay Authority in 2014-2016
To be maintained by DRBA

Phase 1: near Route 273 to Suburban Little League
1.8 miles
COMPLETE AND OPEN
Constructed by DelDOT
Maintained by New Castle County

Phase 3: Christina River to the DuPont Environmental Education Center
1.1 miles
FEASIBILITY STUDY COMPLETE

Wilmington Riverwalk: DuPont Environmental Education Center to downtown Wilmington
1.2 miles
COMPLETE AND OPEN
Maintained by the Riverfront Development Corporation

Phase 2: north of I-295 to the Christina River
1.4 miles
FUNDED AND UNDER CONSTRUCTION
Being constructed by New Castle County
To be maintained by New Castle County

Route 273 crossing: at-grade crossing with median
0.1 miles
FUNDED AND UNDER DESIGN
Construction by DelDOT in 2013-2014
To be maintained by DelDOT

Phase 4: Battery Park to 8th Street
0.4 miles
STUDY UNDERWAY

Heritage Greenway Trail: 8th Street to near Route 273
0.2 miles
COMPLETE AND OPEN
Constructed by DelDOT
Maintained by the City of New Castle

Newport
Elsmere
New Castle
Wilmington
Russell Peterson Wildlife Refuge
Frawley Stadium
BATTERY PARK
BAYLOR BOULEVARD
BOULDEN BOULEVARD
NORTH DUPONT HIGHWAY
CHRISTINA RIVER
DELAWARE RIVER
MARKET STREET
WALNUT STREET
ROUTE 273 PATHWAY - FUNDED AND UNDER DESIGN
13
273
141
4
9
95
495
295

DelDOT | WR&A

NEW CASTLE INDUSTRIAL TRACK TRAIL, PHASE 4

STATUS MAP

0 1000' 2000'

MAY 2013

SHEET 1 OF 1

STATE OF DELAWARE
Department of Transportation

Industrial Track Trail, Phase 4 Study

New Castle Public Library, May 23, 2013

	NAME (PLEASE PRINT)	STREET ADDRESS	CITY	STATE	ZIP	PHONE
1	Lauren Brown	3136 Bellview Rd	Schnecksville	PA	18078	6107396568
2	Marion Hull	1628 JFK Blvd, Ste 1600 Phila 19103	Phila	PA	19147	215 300 3309
3	Linda Ratchford	24 The Strand	New Castle	DE	19720	3028933677
4	Kathy MacDonnell	201 Delaware St.	"	"	"	302 322-2809
5	Owen Robatino	NCC	New Castle	DE		
6	Andrew Taylor	For Trustees of New Castle Common				302 984-3812
7	Chris Castagno	19 E 5th St.	New Castle	DE		302-545-8479
8	Janet Wurtzel	54 W 3rd St	NC	DE		302-757-0669
9	Kathy Tidball	44 W. 4th St	NC	DE	"	302 328 2532
10	Amy Wilburn	2617 Newell Dr.	Wilm	DE	19808	302-995-2985
11	Florence Smith	6 Booker Circle	New Castle	DE	19720	
12	Jonathan Justice	158 E 2nd St.	New Castle	DE	19720	302-325-2481
13						
14						
15						

31745-017

Industrial Track Trail, Phase 4 Study
New Castle Library
Thursday, May 23, 2013

Public Workshop Survey

Our goal at DelDOT is to keep the public informed of transportation projects and programs. One of the ways we do this is through public workshops like the one you are attending this evening. By filling out this survey and dropping it in the COMMENTS box, or mailing it to DelDOT at the address listed on the reverse side of this survey, you will greatly assist us in evaluating our community outreach efforts. Thank you.

Please print your responses to the following questions. If you would prefer not to answer a question, simply leave the question blank. We appreciate any comments you may have.

Do you have any general comments or suggestions about the Industrial Track Trail, Phase 4 Study?

I think having trails is great recreation and will have a positive economic impact on the town. I already use the completed section between Route 273 & Boulder Blvd. I look forward to it being completed!

Please indicate your preferred conceptual alignment alternative(s) for the Industrial Track Trail, Phase 4 Study:

- ☐ Blue Alignment: Alignment into downtown consisting of an on-street option for bicyclists and sidewalk upgrades for pedestrians.
- ☐ Red Alignment: Alignment along South Street consisting of an on-street option for bicyclists and sidewalk upgrades for pedestrians.
- ☒ Green Alignment: Alignment through former Brosius-Eliason property if/when it is redeveloped

Why?

- True trail rather than street competing with traffic
- Other street routes already exist as alternates

GENERAL INFORMATION

1) How would you describe yourself and/or your affiliation? (check as many as apply)

✓ Resident
✓ Community/civic organization
____ Media
____ Other (please explain) _____
____ Adjacent property owner
____ Institution (church, school, other)
____ Business owner

2) How did you hear about this workshop?

✓ Neighborhood/friend
____ Website Announcement
____ Newspaper/Newsletter
____ Blue road sign

3) How helpful and informative were the DelDOT facilitators?

✓ Very helpful
____ Not at all helpful
____ Moderately helpful
____ No opinion

4) How effective were the display materials at explaining the project?

✓ Very effective
____ Not at all effective
____ Moderately effective
____ No opinion

5) If you have any additional comments relating to tonight's workshop please include them here:

If you would like to stay informed on project status and upcoming workshops for the Industrial Track Trail, Phase 4 project please provide the following:

Name: Janet Wurtzel

Address: 54 W 3rd Street

City/state/zip: New Castle, DE 19720

Phone (optional): 302-757-0669 E-mail (optional): jwurtzel543@gmail.com

Your comments and opinions are very important. All information you provide on this form will be carefully reviewed by the Delaware Department of Transportation. Under state law, this survey form is public domain, and if requested, a copy of it must be provided to the public or media. Thank you for your participation and contributions to this important transportation project.

Please return this survey to the COMMENTS box, or mail to:

Delaware Department of Transportation
Attention: Marco Boyce, Division of Planning
P O Box 778
Dover, Delaware 19903
(302) 760-2128

DelDOT
Delaware Department of Transportation

Industrial Track Trail, Phase 4 Study
New Castle Library
Thursday, May 23, 2013

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Please print your responses to the following questions. If you would prefer not to answer a question, simply leave the question blank. We appreciate any comments you may have.

Do you have any general comments or suggestions about the Industrial Track Trail, Phase 4 Study?

I am pleased w/ progress to connect w/ Wilm. Riverfront - good to see so many agencies to work for common goal.

Please indicate your preferred conceptual alignment alternative(s) for the Industrial Track Trail, Phase 4 Study:

(2) ☐ Blue Alignment: Alignment into downtown consisting of an on-street option for bicyclists and sidewalk upgrades for pedestrians.

(3) ☐ Red Alignment: Alignment along South Street consisting of an on-street option for bicyclists and sidewalk upgrades for pedestrians.

(1) ☒ Green Alignment: Alignment through former Brosius-Eliason property if/when it is redeveloped

Why?

(1) This is the safest route for connecting Freeway to Battery Park Trail

(2) This is a good option for getting people to the historic center & is safer than the Red Trail

(3) This is very close to park trail, but intersection is not safe!

GENERAL INFORMATION

1) How would you describe yourself and/or your affiliation? (check as many as apply)

✓ Resident
✓ Community/civic organization
_____ Media
_____ Other (please explain) _____
_____ Adjacent property owner
_____ Institution (church, school, other)
_____ Business owner

2) How did you hear about this workshop?

_____ Neighborhood/friend
_____ Website Announcement
_____ Newspaper/Newsletter
_____ Blue road sign
e-mail

3) How helpful and informative were the DelDOT facilitators?

✓ Very helpful
_____ Not at all helpful
_____ Moderately helpful
_____ No opinion

4) How effective were the display materials at explaining the project?

✓ Very effective
_____ Not at all effective
_____ Moderately effective
_____ No opinion

5) If you have any additional comments relating to tonight's workshop please include them here:
Should have sent reminder e-mails - I almost missed it

If you would like to stay informed on project status and upcoming workshops for the Industrial Track Trail, Phase 4 project please provide the following:

Name: Kathy Tidball

Address: _____

City/state/zip: _____

Phone (optional): _____ E-mail (optional): kathytidball@hotmail.com

Your comments and opinions are very important. All information you provide on this form will be carefully reviewed by the Delaware Department of Transportation. Under state law, this survey form is public domain, and if requested, a copy of it must be provided to the public or media. Thank you for your participation and contributions to this important transportation project.

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Please print your responses to the following questions. If you would prefer not to answer a question, simply leave the question blank. We appreciate any comments you may have.

Do you have any general comments or suggestions about the Industrial Track Trail, Phase 4 Study?

Would like to see action —
Great connection for New Castle

Please indicate your preferred conceptual alignment alternative(s) for the Industrial Track Trail, Phase 4 Study:

- ☐ Blue Alignment: Alignment into downtown consisting of an on-street option for bicyclists and sidewalk upgrades for pedestrians.
- ☐ Red Alignment: Alignment along South Street consisting of an on-street option for bicyclists and sidewalk upgrades for pedestrians.
- ☑ Green Alignment: Alignment through former Brosius-Eliason property if/when it is redeveloped

Why?

Green — mostly off-road, better scenery, Avoids Route 9/S / South St intersection — very busy!
Should always allow for signage to point towards Town — could be multiple locations
Blue / Red could be interim — one to park + one to historic center

GENERAL INFORMATION

1) How would you describe yourself and/or your affiliation? (check as many as apply)

✓ Resident
✓ Community/civic organization
____ Media
____ Other (please explain) _____
____ Adjacent property owner
____ Institution (church, school, other)
____ Business owner

2) How did you hear about this workshop?

✓ Neighborhood/friend
____ Website Announcement
____ Newspaper/Newsletter
____ Blue road sign

3) How helpful and informative were the DelDOT facilitators?

✓ Very helpful
____ Not at all helpful
____ Moderately helpful
____ No opinion

4) How effective were the display materials at explaining the project?

✓ Very effective
____ Not at all effective
____ Moderately effective
____ No opinion

5) If you have any additional comments relating to tonight's workshop please include them here:

After green done still keep signage to point towards historic center

If you would like to stay informed on project status and upcoming workshops for the Industrial Track Trail, Phase 4 project please provide the following:

Name: Linda Ratchford

Address: 24 The Strand

City/state/zip: New Castle DE 19720

Phone (optional): 302 893 3672 E-mail (optional): lratchford@mac.com

Your comments and opinions are very important. All information you provide on this form will be carefully reviewed by the Delaware Department of Transportation. Under state law, this survey form is public domain, and if requested, a copy of it must be provided to the public or media. Thank you for your participation and contributions to this important transportation project.

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Industrial Track Trail, Phase 4 Study
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Please print your responses to the following questions. If you would prefer not to answer a question, simply leave the question blank. We appreciate any comments you may have.

Do you have any general comments or suggestions about the Industrial Track Trail, Phase 4 Study?

It can't get built soon enough, as far as I'm concerned. I am very much looking forward to being able to bike into Wilmington that way!

Please indicate your preferred conceptual alignment alternative(s) for the Industrial Track Trail, Phase 4 Study:

- [x] Blue Alignment: Alignment into downtown consisting of an on-street option for bicyclists and sidewalk upgrades for pedestrians.
- [x] Red Alignment: Alignment along South Street consisting of an on-street option for bicyclists and sidewalk upgrades for pedestrians.
- [x] Green Alignment: Alignment through former Brosius-Eliason property if/when it is redeveloped

Why?

Green is great for long term connection to River Rd. But for now, blue and red are both good. If you go with blue only, though, you should also include the bit of red on 7th St., to provide the connection to River Rd.

GENERAL INFORMATION

1) How would you describe yourself and/or your affiliation? (check as many as apply)

_____ Resident
_____ Community/civic organization
_____ Media
_____ Other (please explain) _____
_____ Adjacent property owner
_____ Institution (church, school, other)
_____ Business owner

2) How did you hear about this workshop?

_____ Neighborhood/friend
_____ Website Announcement
_____ Newspaper/Newsletter
_____ Blue road sign

3) How helpful and informative were the DelDOT facilitators?

_____ Very helpful
_____ Not at all helpful
_____ Moderately helpful
_____ No opinion

4) How effective were the display materials at explaining the project?

_____ Very effective
_____ Not at all effective
_____ Moderately effective
_____ No opinion

5) If you have any additional comments relating to tonight's workshop please include them here:

_____

_____

_____

If you would like to stay informed on project status and upcoming workshops for the Industrial Track Trail, Phase 4 project please provide the following:

Name: _____

Address: _____

City/state/zip: _____

Phone (optional): _____ E-mail (optional): _____

Your comments and opinions are very important. All information you provide on this form will be carefully reviewed by the Delaware Department of Transportation. Under state law, this survey form is public domain, and if requested, a copy of it must be provided to the public or media. Thank you for your participation and contributions to this important transportation project.

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DelDOT
Delaware Department of Transportation

Tab 4

Heritage Trail Landscaping Evaluation

WR&A landscape architecture staff performed a field view on March 29, 2013. Existing plantings were quantified and evaluated for health and location relevant to existing and proposed trail improvements. A landscaping evaluation plan follows this description.

Several of the plantings identified as proposed according Contract 24-200-11 no longer exist. The existing canopy and understory trees that do remain appear to be in good health and provide a buffer from Young Street as well as the existing properties that border the trail. The AASHTO *Guide for the Development of Bicycle Facilities* (4th edition, 2012) recommends a two-foot horizontal clearance between a trail and lateral obstructions such as bushes or trees. Several of the low shrubs along the trail need to be considered for removal or transplantation due to their growth habits and proximity to the trail. During the summer months, these plantings do not provide a sufficient horizontal clearance for trail users.

Additionally, the Euonymus (burning bush) is an invasive species. Although the Euonymus along the Heritage Trail provide a buffer, they have outgrown their intended use and their removal should be considered. Smaller species such as the Ilex verticillata (Winterberry) can remain if the trail width and alignment stays in place. If the trail is widened, further evaluation is needed per individual plants to determine if transplanting or removing the species is required.

CONTRACT	COUNTY	F.A.P. NO.	SHEET NO	TOTAL SHTS
24-200-11			24	28

LANDSCAPE PLANS

0 10 20 30 40
FEET

NEW CASTLE TO CHRISTINA RIVERFRONT HERITAGE TRAIL, PHASE I

REVISIONS

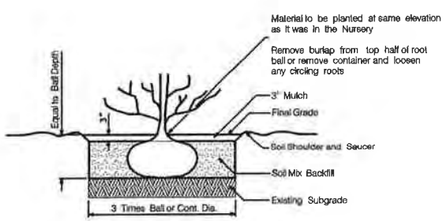
Master Plant Schedule

Key	Qty	Botanical Name / Common Name	Size and Root Condition / Spacing	Quantity/Sheet Sheet 1	Sheet 2	Sheet 3
Ac	24	Amelanchier canadensis Shadblow Serviceberry	5' Height CG Space 8' OC	4	7	13
Ar	5	Acer rubrum 'Red Sunset' Red Maple	2" Cal B&B Space as shown on plans	0	2	3
Cc	14	Cercis canadensis Eastern Redbud	5' Height CG Space 8' OC	4	4	6
Ea	60	Euonymus alata 'Compacta' Burning Bush	18" Height CG Space 4' OC	4	34	22
Hem	300	Hemerocallis x hybrida 'Stella de Oro' Hybrid Daylilies	1 Gallon CG Space 18" OC	50	150	100
Io	12	Ilex opaca 'Miss Helen' American Holly	6' Height B&B or CG Space 12' OC	1	7	4
Iv	63	Ilex verticillata 'Winter Red' Winterberry	18" Height CG Space 4' OC	9	27	27
Mg	2	Magnolia grandiflora Southern Magnolia	8' Height B&B or CG Space as shown on plans	0	0	2
Mp	23	Myrica pensylvanica Northern Bayberry	18" Height CG Space 4' OC	0	14	9
Ms	18	Miscanthus sinensis 'Purpurascens' Maiden Grass	1 Gallon CG Space 18" OC	0	0	18
Ps	16	Pinus strobus White Pine	6' Height B&B or CG Space 12' OC	3	8	5
Pt	11	Pinus thunbergiana Black Pine	6' Height B&B or CG Space 12' OC	0	5	6
Qp	8	Quercus phellos Willow Oak	2" Cal. B&B or CG Space as shown on plans	3	4	1
Rf	125	Rudbeckia fulgida var. Goldsturm Black-Eyed Susan	1 Gallon CG Space 18" OC	25	50	50
Sn	119	Spiraea nipponica 'Snowmound' Snowmound Spirea	18" Height CG Space 4' OC	32	32	55
Vp	12	Viburnum prunifolium Blackhaw Viburnum	5' Height B&B or CG Space 8' OC	4	6	2
syM	1530	Square Yards of chopped pine bark Mulch, 3" Depth	Continuous bed extending a minimum of 1-1/2' from center of plant with gently meandering edge line	190	600	740

Notes

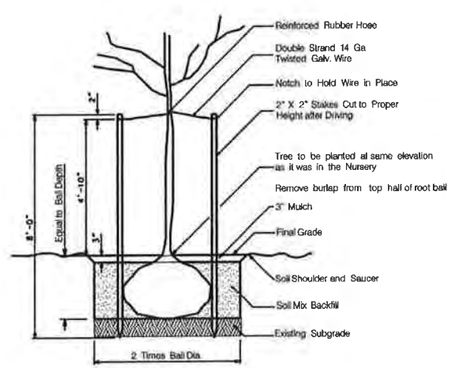
All plants shall be a minimum of 3' from the edge of bike trail pavement.

All plants shall be mulched in a continuous mulched bed. Edge of mulched bed shall meander gently along the alignment of the trail.



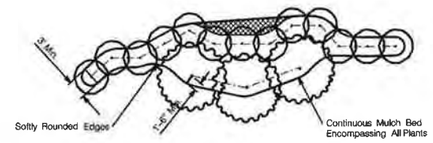
1 Shrub and Perennial Planting Detail

Not to Scale



2 Tree Planting and Staking Detail

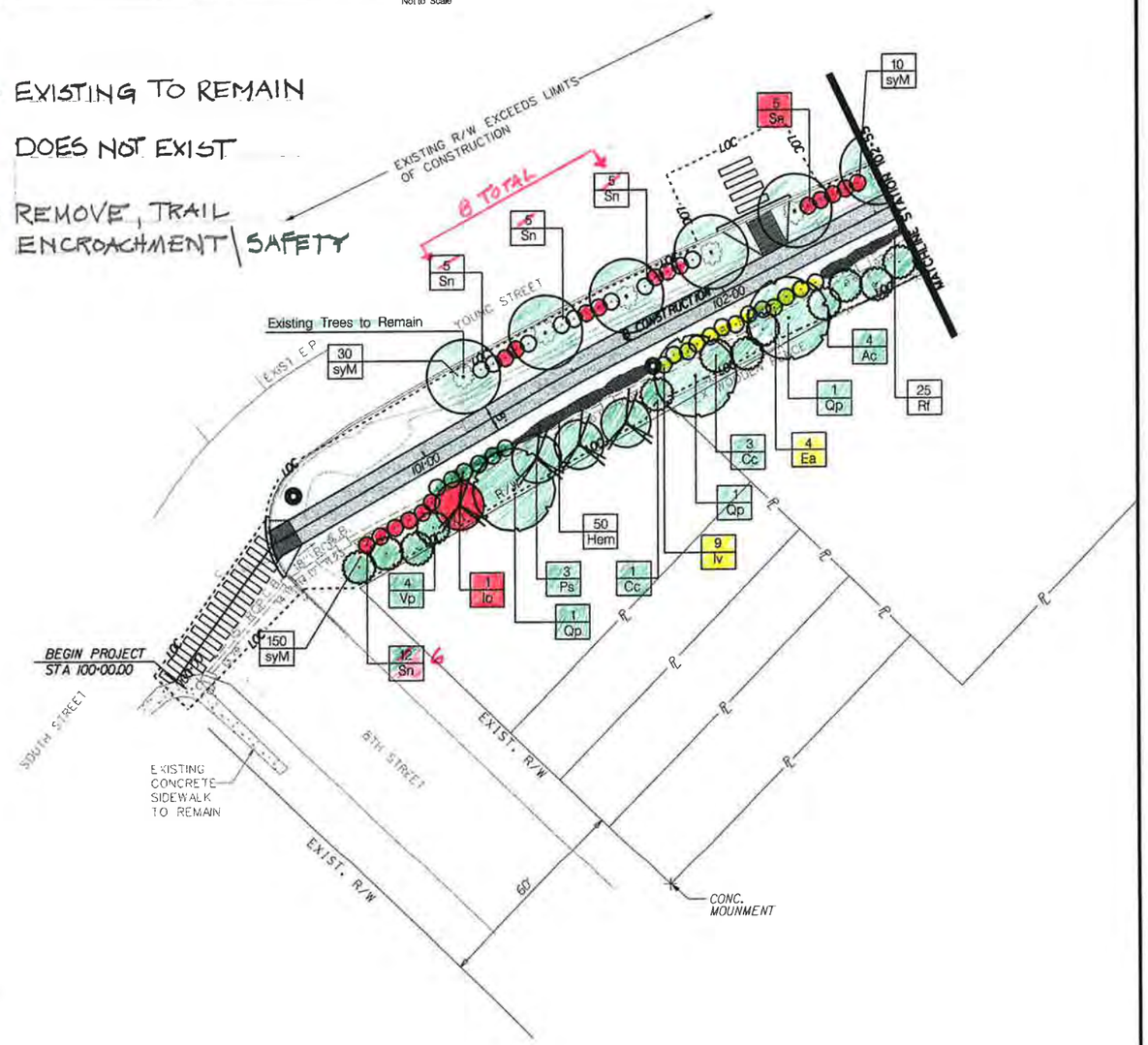
Not to Scale



3 Typical Mulch Bed Line Layout Detail

Not to Scale

- EXISTING TO REMAIN
- DOES NOT EXIST
- REMOVE, TRAIL ENCROACHMENT\SAFETY



PRELIM. TRACING ____ DESIGN ____ CHKD. ____

CONTRACT	COUNTY	F.A.P. NO.	SHEET NO	TOTAL SHTS
24-200-11			25	28

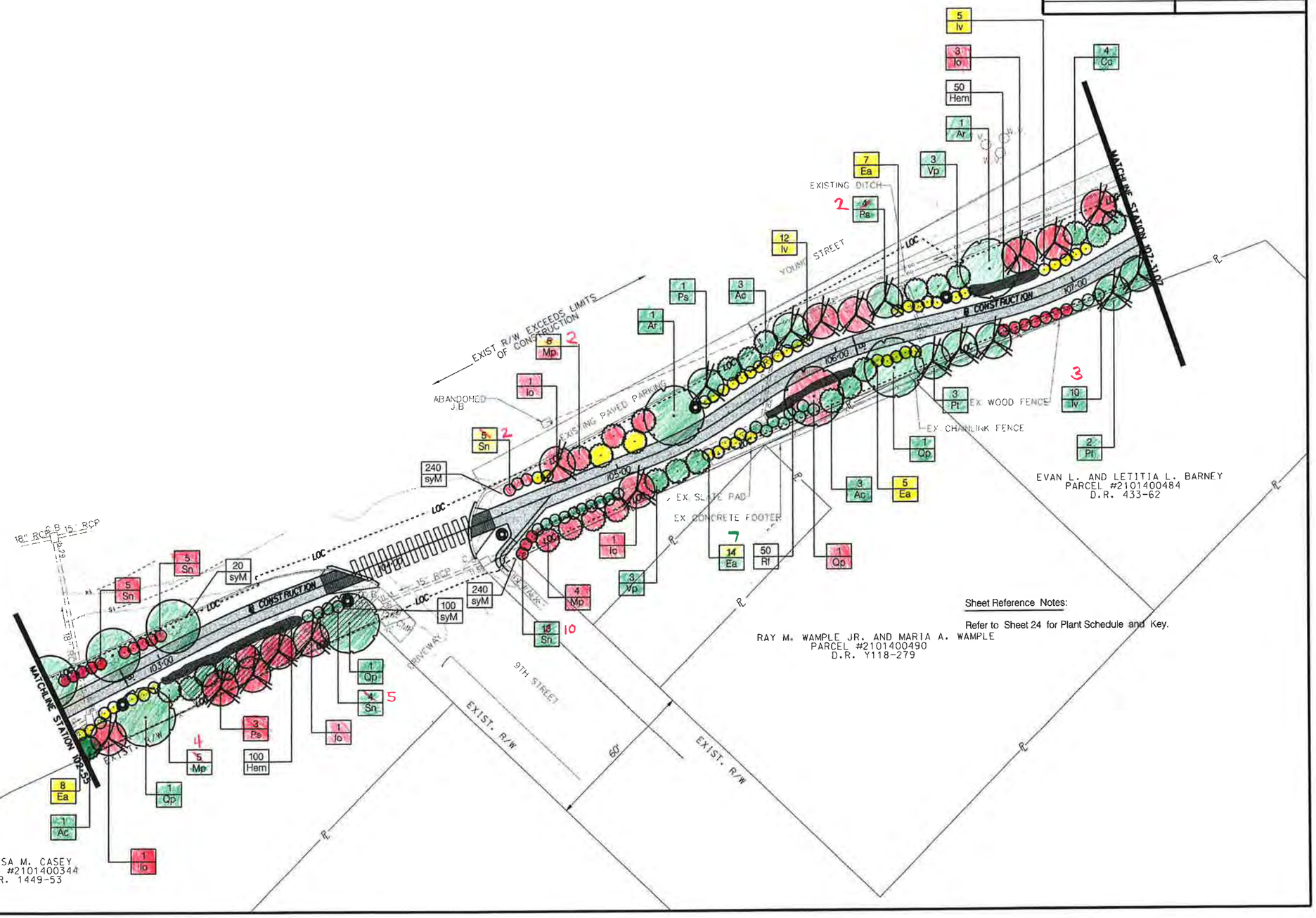
LANDSCAPE PLANS

0 10 20 30 40
FEET

N

NEW CASTLE TO CHRISTINA RIVERFRONT HERITAGE TRAIL, PHASE I

REVISIONS



Sheet Reference Notes:

Refer to Sheet 24 for Plant Schedule and Key.

PREL TRACING DESIGN CHKD

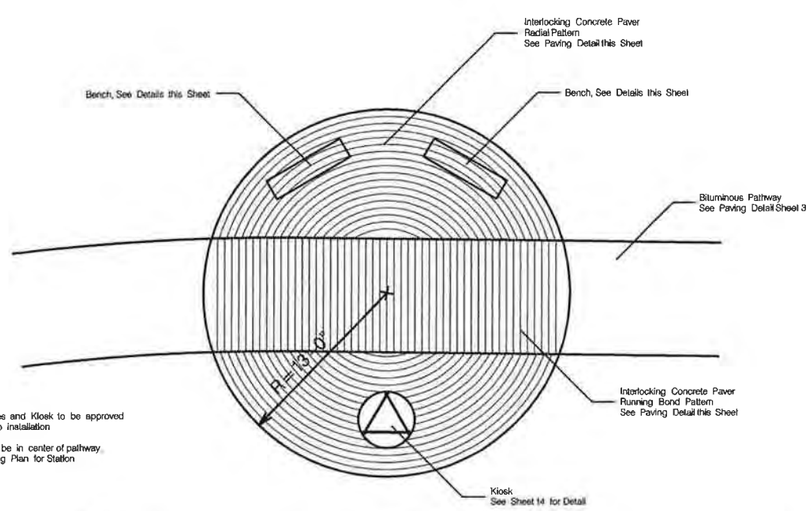
CONTRACT	COUNTY	F.A.P. NO.	SHEET NO	TOTAL SHTS
24-200-11			26	28

NEW CASTLE TO CHRISTINA RIVERFRONT HERITAGE TRAIL, PHASE I

REVISIONS

LANDSCAPE PLANS

0 10 20 30 40
FEET



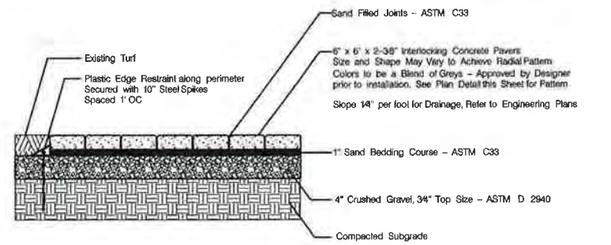
Note:

Location of Benches and Kiosk to be approved by Engineer prior to installation

Center of Circle to be in center of pathway. Refer to Engineering Plan for Station

4 Circle Detail
Paving Patterns and Site Furnishing Layout

Not to Scale

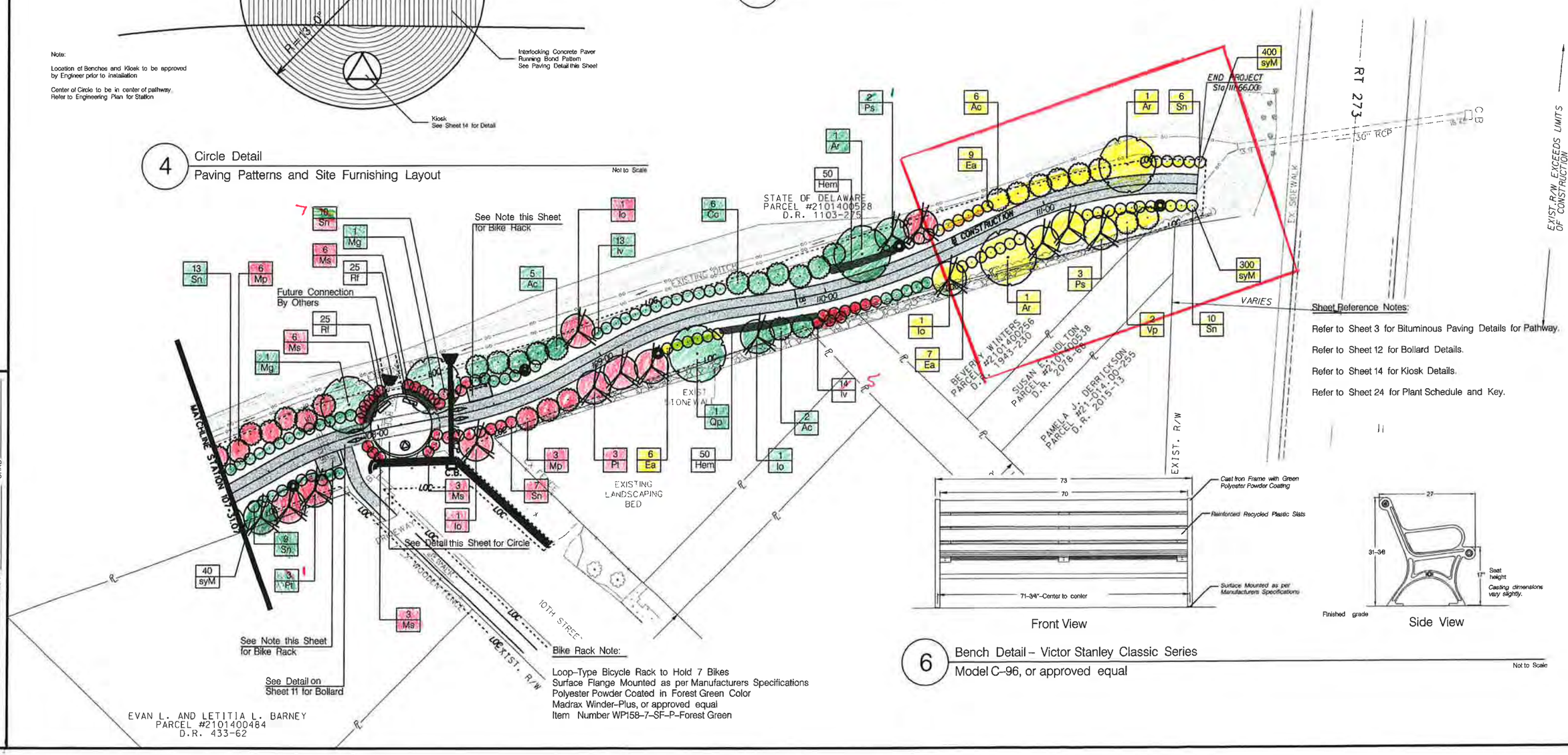


Note:

Paver Manufacturer and Paver Color Selections to be approved by Engineer prior to installation.

5 Paving Detail – Interlocking Concrete Pavers

Not to Scale



Bike Rack Note:

Loop-Type Bicycle Rack to Hold 7 Bikes
Surface Flange Mounted as per Manufacturers Specifications
Polyester Powder Coated in Forest Green Color
Madrax Winder-Plus, or approved equal
Item Number WP158-7-SF-P-Forest Green

Sheet Reference Notes:

Refer to Sheet 3 for Bituminous Paving Details for Pathway.

Refer to Sheet 12 for Bollard Details.

Refer to Sheet 14 for Kiosk Details.

Refer to Sheet 24 for Plant Schedule and Key.

Front View

Side View

6 Bench Detail – Victor Stanley Classic Series
Model C-96, or approved equal

Not to Scale

DESIGN
CHKD
PREL. TRACING

Tab 5

Photo 1: Facing south at end of Heritage Trail

Photo 2: Facing north at Norfolk Southern Railroad

Photo 3: Red Alignment - South Street, between 7th Street and 8th Street

Photo 4: Red Alignment - South Street, between 7th Street and 8th Street

Photo 5: Red Alignment - South Street at 7th Street

Photo 6: Red Alignment - South Street at 6th Street

Photo 7: Red Alignment - South Street, between 6th Street and 7th Street

Photo 8: Red Alignment - South Street, between 6th Street and 7th Street

Photo 9: Red Alignment - South Street, between 5th Street and 6th Street

Photo 10: Red Alignment - South Street at 5th Street

Photo 11: Red Alignment - South Street at 5th Street

Photo 12: Red Alignment - South Street at Goodwill Fire Company

Photo 13: Red Alignment - South Street at 4th Street

Photo 14: Red Alignment - South Street at 3rd Street

Photo 15: Red Alignment – Battery Park

Photo 16: Green Alignment - Former railroad, facing north at 7th Street

Photo 17: Green Alignment - Former railroad crossing at 7th Street, facing north

Photo 18: Green Alignment - Former railroad crossing at 7th Street, facing south

Photo 19: Green Alignment - Former railroad crossing at 7th Street, facing south

Photo 20: Green Alignment - Former Brosius-Eliason site

Photo 21: Green Alignment - Former Brosius-Eliason site

Photo 22: Green Alignment – Battery Park

Photo 23: Blue Alignment – 7th Street at Clayton Street

Photo 24: Blue Alignment – 7th Street, between Clayton Street and Tremont Street

Photo 25: Blue Alignment –Tremont Street, between 6th Street and 5th Street

Photo 26: Blue Alignment – 5th Street at Tremont Street

Photo 27: Blue Alignment - 5th Street at Foundry Street

Photo 28: Blue Alignment - Foundry Street, facing south

Photo 29: New Castle Heritage Trail

Photo 30: New Castle Heritage Trail

Photo 31: New Castle Heritage Trail

Photo 32: New Castle Heritage Trail

Tab 6

SECTION 6A

CAPITAL TRANSPORTATION PROGRAM COST ESTIMATE

RED AND BLUE ALIGNMENTS

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

1. NAME OF PROJECT Industrial Track Trail, Phase 4, Blue and Red Alignments (Subdivision or Road Name) — New Castle (County)

2. LIMITS

Street Name or Road Number	From	To	Length
South Street	8th Street	3rd Street	1,850 feet
W. 7th Street	South Street	Deemer Place	700 feet
Various roadways within New Castle	8th Street & South Street	Delaware St & 3rd St	2,600 feet

3. ESTIMATE REQUESTED BY: Marco Boyce (Name) for (check one) ☐ Project initiation ☑ Estimate only — Section or Legis. Dist.

4. DESCRIPTION OF IMPROVEMENT:

This project proposes to complete the southern portion of the Industrial Track Trail via a series of multi-modal upgrades within the City of New Castle's existing street network. Sidewalk improvements will be performed on 7th Street and South Street. The intersection of 7th Street and South Street will receive bicycle and pedestrian upgrades. Signing and striping upgrades will be provided on South Street, 7th Street, Tremont Street, 5th Street, Delaware Street, and Foundry Street. See Concept Report for maps of the Blue and Red alignments.

4. PROJECT IN C.I.P. Yes ☐ No ☑ If "Yes", indicate year F.Y. _____

5. TYPICAL SECTION

South Street is a two-lane street with 11-foot travel lanes and a 11-foot shoulder on the east side. 7th Street is a two-lane street with parking. The proposed sidewalk will be 5 feet wide and will be aligned on the east side of South Street between 8th Street and 7th Street, and on the south side of 7th Street between South Street and Deemer Place.

6. STATE MAINTAINED ☐ CITY MAINTAINED ☑ PRIVATE ☐ OTHER ☐ (specify) _____

7. COST ESTIMATE:

		from C.I.P. estimate form	Estimate prepared by:	Date:
a. Location and Environmental Studies (Part I to be included only for class "I" and "III" projects)	$0	Part I	WR&A	10/03/13
b. Preliminary Engineering	$88,000	Part II	WR&A	10/03/13
c. Real Estate	$0	Part III	WR&A	10/03/13
d. Construction *	$266,090	Part IV	WR&A	10/03/13
e. TOTAL ESTIMATED PROJECT COST	$354,090			

* Includes Utilities, Traffic, and C.E.

APPROVED

Valid thru _____ (Date) _____ (Assistant Director, M&O/Transportation Solutions/Planning) _____ (Date)

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Contract No. T201330007 Project Title: Industrial Track Trail, Phase 4, Blue and Red Alignments

PART I - LOCATION & ENVIRONMENTAL STUDIES (N/A)

(Part I to be included only for class "I" & "III" projects)

A. ENGINEERING (Includes NEPA)		**E. HISTORIC**	$0
B. ARCHAEOLOGY	$0	1. Phase 1 (study)	
1. Phase I (study)		2. Phase 2 (study)	
2. Phase 2 (study)		3. Mitigation (by loc./env.)	
3. Phase 3 (mitigation)		4. Mitigation (by design)	yes ☐ no ☐
C. WETLANDS	$0	**F. NOISE**	$0
1. Delineation (study)		1. Studies	
2. Permit preparation		2. Mitigation (by design)	yes ☐ no ☐
3. Mitigation (design)		**G. OTHER**	$0
D. HAZARDOUS MATERIAL	$0	1.	
1. Phase 1 (study)		2.	
2. Phase 2 (study)			
3. Phase 3 (remediation)			

TOTAL COSTS FOR PART I (A thru G) ROUNDED $0

CONTINGENCY COSTS $0
(normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL LOCATION AND ENVIRONMENTAL STUDIES COSTS $0
(also total for Construction Project Estimate form line 7a)

Estimator: WR&A Date: 10/03/13

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Contract No. T201330007 Project Title: Industrial Track Trail, Phase 4, Blue and Red Alignments

PART II - PRELIMINARY ENGINEERING

A. SURVEYS	$15,000
1. Inhouse	
2. Consultant	$15,000
B. DESIGN ENGINEERING	$65,000
1. Design	$65,000
a. Inhouse	
b. Consultant	$65,000
2. Traffic	$0
a. Inhouse	
b. Consultant	$0
3. Real Estate Plan Preparation	$0
a. Inhouse	
b. Consultant	
4. Utilities	$0
a. Inhouse	
b. Consultant	
c. Test Holes	
d. Utility Company	
5. Materials & Research	
6. Borings	
7. Pile Load Tests	
8. Subdivision	$0
a. Inhouse	
b. Consultant	
c. Railroad P.E.	
9. Other (specify)	$0
a.	
b.	
C. ENVIRON. ASSESSMENT (use for class "II" projects only)	$0
1. Wetlands	
2. Hazardous Materials	
3. Noise	
4. Historic	
5. Archaeology	
6. Other	
a.	
b.	
Loc/Environ Estimator: Date:	
D. CONTRACT ADMINISTRATION	
Cont/Admin Estimator: Date:	

TOTAL COSTS FOR PART II (A thru D) ROUNDED		$80,000
CONTINGENCY COSTS (normally 5% for large projects and 10% for small projects - to be approved by section head)	10% (% used)	$8,000
TOTAL PRELIMINARY ENGINEERING (also total for Construction Project Estimate form line 7b)		$88,000

Estimator: WR&A Date: 10/03/13

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Contract No. T201330007 Project Title: Industrial Track Trail, Phase 4, Blue and Red Alignments

PART III - REAL ESTATE

A. REAL PROPERTY	$0	**C. ASBESTOS PROGRAM**	$0
1. Total acquisitions		1. Testing	
2. Partial acquisitions		2. Abatement	
3. Permanent easements		**D. DEMOLITION**	
4. Temporary easements		**E. APPRAISAL FEES**	
5. Wetland mitigation		**F. STAFF**	
Other (specify)			
6.		**G. SETTLEMENT**	
7.		**H. REAL ESTATE ENG.**	$0
B. RELOCATION	$0	1. Consultant survey	
1. Residential		2. As acquired plans	
2. Business		**I. CONDEMNATION**	
Other (specify)			
3.		**J. OTHER (specify)**	$0
4.		1.	
		2.	

TOTAL COSTS FOR PART III (A thru J) ROUNDED $0

CONTINGENCY COSTS _____ $0
(normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL REAL ESTATE COSTS $0
(also total for Construction Project Estimate form line 7c)

Estimator: WR&A Date: 10/03/13

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Contract No. T201330007

Project Title Industrial Track Trail, Phase 4, Blue and Red Alignments

PART IV -CONSTRUCTION

A. ROADWAY/APPROACH CONSTRUCTION	$45,600
1. Grading	
a. Excavation (includes SWM pond)	$2,000
b. Borrow	$500
2. Drainage	$0
3. Pavement	
a. Surface	$500
b. Base	$600
c. Subbase	$3,000
4. Erosion/Sed. Cont.	$3,000
5. Miscellaneous	
a. Curb/Gutter	$3,500
b. Sidewalk	$22,000
c. Guardrail	$0
d. C.P.M. Schedule	$0
e. Clear/Grubb	$5,000
f. Field Office	$0
Other (specify)	
g. Topsoil, Seed, Mulch	$1,500
h. Removal of concrete	$4,000
i.	
j.	
k.	
l.	
m.	

B. STRUCTURE CONSTRUCTION	$0
1. New Bridge	
a. Type	
b. Size	
c. $/s.f.	
2. Old Structure Rem.	
a. Type	
b. Size	
c. $/c.y.	
3. Retaining Wall	
a. Type	
b. Size	
c. $/c.y.	
4. Box Culvert	
a. Type	
b. Size	
c. $/s.f.	
C. LANDSCAPING	$0
1. Beautification	
2. Noise Mitigation	
3. Visual Mitigation	
4. Tree Mitigation	
D. MAINTENANCE OF TRAFFIC	$15,000

(refer to Capital Improvement Project form, Part IV - Continued)

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Contract No. T201330007 Project Title Industrial Track Trail, Phase 4, Blue and Red Alignments

PART IV -CONSTRUCTION (CONTINUED)

E. PROJECT TRAFFIC ITEMS	$8,000
1. Signing Structures	
a. Overhead Bridges	$0
b. Cantilever Supports	$0
2. Roadway Lighting	$0
3. Pavement Markings	$8,000
Other (specify)	
4.	
F. WETLAND MITIGATION	
G. UTILITY RELOC. IN CONTRACT	$0
1. Water	
2. Sanitary Sewer	
Other (specify)	
3.	
H. SUBTOTAL (A thru G) ROUNDED	$69,000
I. MISC. ITEMS	$13,800
(15% of H for large projects and 20% for small)	
(At SF submission use 10% and 5%)	
20% (% used)	
J. CONTRACTOR'S CONST. ENG.	$3,450
(normally 5% of H) 5% (% used)	
K. INITIAL EXPENSE	$3,450
(normally 5% of H) 5% (% used)	
L. CONSTRUCTION CONTINGENCY	$6,900
(normally 10% of H) 10% (% used)	

P. REIMBURSABLE UTILITY RELOCATIONS BY OTHERS	$0
(Enter on PNR funding line 7)	
1. Water	
2. Sanitary Sewer	
3. Electric	
4. Telephone	
5. Gas	
6. CATV	
Other (specify)	
7.	
8.	
Utilities Estimator: Date:	

Q. TRAFFIC SECTION ITEMS	$155,000
(Enter on PNR funding line 6)	
1. Signing	$5,000
2. Signals	$150,000
3. Detour Signing	
4. DelTrac	
Other (specify)	
5.	
Traffic Estimator: Date:	

M. TOTAL CONSTRUCTION COSTS (H thru L) (Enter on PNR funding line 5)		$96,600
N. CONSTRUCTION ENGINEERING (normally 15% of construction costs) (Enter on PNR funding line 4)	15% (% used)	$14,490
O. TOTAL CONSTRUCTION COSTS (Construction Costs + Construction Engineering) (use this total + Q + P for Construction Project Estimate from line 7d)		$111,090

Estimator: WR&A Date: 10/03/13

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars) Part V of V

Contract No. T201330007 Project Title: Industrial Track Trail, Phase 4, Blue and Red Alignments

SUMMARY

PART I - LOCATION AND ENVIRONMENTAL STUDIES (Part I to be included only for class "I" and "III" projects)	$0
PART II - PRELIMINARY ENGINEERING	$88,000
PART III - REAL ESTATE	$0
PART IV - CONSTRUCTION	$266,090
TOTAL ESTIMATED PROJECT COSTS (also total for Construction Project Estimate from line 7c)	$354,090

Date: _____

Project Manager

REVIEWED & CONCURRED IN:

Date: _____

Section Head

NOTE: Concurring section heads are to forward the original estimate copy to the Director of Transportation Solutions with one estimate copy each to the Assistant Director of Project Development, Assistant Director of Design Support, and the Cost Estimate Engineer.

SECTION 6B

CAPITAL TRANSPORTATION PROGRAM COST ESTIMATE

GREEN ALIGNMENT

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

1. NAME OF PROJECT Industrial Track Trail, Phase 4, Green Alignment (Subdivision or Road Name) — New Castle (County)

2. LIMITS

Street Name or Road Number	From	To	Length
Off-alignment trail	8th Street & South Street	7th Street	450 feet

3. ESTIMATE REQUESTED BY: Marco Boyce (Name) for (check one) ☐ Project initiation ☑ Estimate only — Section or Legis. Dist.

4. DESCRIPTION OF IMPROVEMENT:

This project proposes to complete the southern portion of the Industrial Track Trail via an off-alignment trail through a future re-developed industrial site within the City of New Castle. A trail will begin at the southern end of the Heritage Trail and continue to 7th Street. A mid-block crossing with be installed at 7th Street. This estimate does NOT include the trail south of 7th Street, which would be built by the developer of the property.

4. PROJECT IN C.I.P. Yes ☐ No ☑ If "Yes", indicate year F.Y. _____

5. TYPICAL SECTION

The proposed trail will be 10 feet wide and consist of a hot-mix surface.

6. STATE MAINTAINED ☐ CITY MAINTAINED ☑ PRIVATE ☐ OTHER ☐ (specify) _____

7. COST ESTIMATE:

		from C.I.P. estimate form	Estimate prepared by:	Date:
a. Location and Environmental Studies (Part I to be included only for class "I" and "III" projects)	$0	Part I	WR&A	10/03/13
b. Preliminary Engineering	$33,000	Part II	WR&A	10/03/13
c. Real Estate	$0	Part III	WR&A	10/03/13
d. Construction *	$96,770	Part IV	WR&A	10/03/13
e. TOTAL ESTIMATED PROJECT COST	$129,770			

* Includes Utilities, Traffic, and C.E.

APPROVED

Valid thru _____ (Date) _____ (Assistant Director, M&O/Transportation Solutions/Planning) _____ (Date)

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Contract No. T201330007 Project Title: Industrial Track Trail, Phase 4, Green Alignment

PART I - LOCATION & ENVIRONMENTAL STUDIES (N/A)

(Part I to be included only for class "I" & "III" projects)

A. ENGINEERING (Includes NEPA)		**E. HISTORIC**	$0
B. ARCHAEOLOGY	$0	1. Phase 1 (study)	
1. Phase I (study)		2. Phase 2 (study)	
2. Phase 2 (study)		3. Mitigation (by loc./env.)	
3. Phase 3 (mitigation)		4. Mitigation (by design)	yes ☐ no ☐
C. WETLANDS	$0	**F. NOISE**	$0
1. Delineation (study)		1. Studies	
2. Permit preparation		2. Mitigation (by design)	yes ☐ no ☐
3. Mitigation (design)		**G. OTHER**	$0
D. HAZARDOUS MATERIAL	$0	1.	
1. Phase 1 (study)		2.	
2. Phase 2 (study)			
3. Phase 3 (remediation)			

TOTAL COSTS FOR PART I (A thru G) ROUNDED $0

CONTINGENCY COSTS $0
(normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL LOCATION AND ENVIRONMENTAL STUDIES COSTS $0
(also total for Construction Project Estimate form line 7a)

Estimator: WR&A Date: 10/03/13

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Contract No. T201330007 Project Title: Industrial Track Trail, Phase 4, Green Alignment

PART II - PRELIMINARY ENGINEERING

A. SURVEYS	$10,000
1. Inhouse	
2. Consultant	$10,000
B. DESIGN ENGINEERING	$20,000
1. Design	$20,000
a. Inhouse	
b. Consultant	$20,000
2. Traffic	$0
a. Inhouse	
b. Consultant	$0
3. Real Estate Plan Preparation	$0
a. Inhouse	
b. Consultant	
4. Utilities	$0
a. Inhouse	
b. Consultant	
c. Test Holes	
d. Utility Company	
5. Materials & Research	
6. Borings	
7. Pile Load Tests	
8. Subdivision	$0
a. Inhouse	
b. Consultant	
c. Railroad P.E.	
9. Other (specify)	$0
a.	
b.	
C. ENVIRON. ASSESSMENT (use for class "II" projects only)	$0
1. Wetlands	
2. Hazardous Materials	
3. Noise	
4. Historic	
5. Archaeology	
6. Other	
a.	
b.	
Loc/Environ Estimator: Date:	
D. CONTRACT ADMINISTRATION	
Cont/Admin Estimator: Date:	

TOTAL COSTS FOR PART II (A thru D) ROUNDED		$30,000
CONTINGENCY COSTS (normally 5% for large projects and 10% for small projects - to be approved by section head)	10% (% used)	$3,000
TOTAL PRELIMINARY ENGINEERING (also total for Construction Project Estimate form line 7b)		$33,000

Estimator: WR&A Date: 10/03/13

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Contract No. T201330007 Project Title: Industrial Track Trail, Phase 4, Green Alignment

PART III - REAL ESTATE

A. REAL PROPERTY	$0	**C. ASBESTOS PROGRAM**	$0
1. Total acquisitions		1. Testing	
2. Partial acquisitions		2. Abatement	
3. Permanent easements		**D. DEMOLITION**	
4. Temporary easements		**E. APPRAISAL FEES**	
5. Wetland mitigation		**F. STAFF**	
Other (specify)			
6.		**G. SETTLEMENT**	
7.		**H. REAL ESTATE ENG.**	$0
B. RELOCATION	$0	1. Consultant survey	
1. Residential		2. As acquired plans	
2. Business		**I. CONDEMNATION**	
Other (specify)			
3.		**J. OTHER (specify)**	$0
4.		1.	
		2.	

TOTAL COSTS FOR PART III (A thru J) ROUNDED $0

CONTINGENCY COSTS _____ $0
(normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL REAL ESTATE COSTS $0
(also total for Construction Project Estimate form line 7c)

Estimator: WR&A Date: 10/03/13

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Contract No. T201330007 Project Title Industrial Track Trail, Phase 4, Green Alignment

PART IV -CONSTRUCTION

A. ROADWAY/APPROACH CONSTRUCTION	$39,500
1. Grading	
a. Excavation (includes SWM pond)	$7,500
b. Borrow	$6,500
2. Drainage	$0
3. Pavement	
a. Surface	$4,000
b. Base	$500
c. Subbase	$3,500
4. Erosion/Sed. Cont.	$2,000
5. Miscellaneous	
a. Curb/Gutter	$3,000
b. Sidewalk	$1,500
c. Guardrail	$0
d. C.P.M. Schedule	$0
e. Clear/Grubb	$5,000
f. Field Office	$0
Other (specify)	
g. Topsoil, Seed, Mulch	$5,000
h. Removal of concrete	$1,000
i.	
j.	
k.	
l.	
m.	

B. STRUCTURE CONSTRUCTION	$0
1. New Bridge	
a. Type	
b. Size	
c. $/s.f.	
2. Old Structure Rem.	
a. Type	
b. Size	
c. $/c.y.	
3. Retaining Wall	
a. Type	
b. Size	
c. $/c.y.	
4. Box Culvert	
a. Type	
b. Size	
c. $/s.f.	
C. LANDSCAPING	$5,000
1. Beautification	$5,000
2. Noise Mitigation	
3. Visual Mitigation	
4. Tree Mitigation	
D. MAINTENANCE OF TRAFFIC	$10,000

(refer to Capital Improvement Project form, Part IV - Continued)

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Contract No. T201330007 Project Title Industrial Track Trail, Phase 4, Green Alignment

PART IV -CONSTRUCTION (CONTINUED)

E. PROJECT TRAFFIC ITEMS	$2,000
1. Signing Structures	
a. Overhead Bridges	$0
b. Cantilever Supports	$0
2. Roadway Lighting	$0
3. Pavement Markings	$2,000
Other (specify)	
4.	
F. WETLAND MITIGATION	
G. UTILITY RELOC. IN CONTRACT	$0
1. Water	
2. Sanitary Sewer	
Other (specify)	
3.	
H. SUBTOTAL (A thru G) ROUNDED	$57,000
I. MISC. ITEMS	$11,400
(15% of H for large projects and 20% for small)	
(At SF submission use 10% and 5%)	
20% (% used)	
J. CONTRACTOR'S CONST. ENG.	$2,850
(normally 5% of H) 5% (% used)	
K. INITIAL EXPENSE	$2,850
(normally 5% of H) 5% (% used)	
L. CONSTRUCTION CONTINGENCY	$5,700
(normally 10% of H) 10% (% used)	

P. REIMBURSABLE UTILITY RELOCATIONS BY OTHERS	$0
(Enter on PNR funding line 7)	
1. Water	
2. Sanitary Sewer	
3. Electric	
4. Telephone	
5. Gas	
6. CATV	
Other (specify)	
7.	
8.	
Utilities Estimator: Date:	

Q. TRAFFIC SECTION ITEMS	$5,000
(Enter on PNR funding line 6)	
1. Signing	$5,000
2. Signals	
3. Detour Signing	
4. DelTrac	
Other (specify)	
5.	
Traffic Estimator: Date:	

M. TOTAL CONSTRUCTION COSTS (H thru L) $79,800
(Enter on PNR funding line 5)

N. CONSTRUCTION ENGINEERING (normally 15% of construction costs) 15% (% used) $11,970
(Enter on PNR funding line 4)

O. TOTAL CONSTRUCTION COSTS (Construction Costs + Construction Engineering) $91,770
(use this total + Q + P for Construction Project Estimate from line 7d)

Estimator: WR&A Date: 10/03/13

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars) Part V of V

Contract No. T201330007 Project Title: Industrial Track Trail, Phase 4, Green Alignment

SUMMARY

PART I - LOCATION AND ENVIRONMENTAL STUDIES (Part I to be included only for class "I" and "III" projects)	$0
PART II - PRELIMINARY ENGINEERING	$33,000
PART III - REAL ESTATE	$0
PART IV - CONSTRUCTION	$96,770
TOTAL ESTIMATED PROJECT COSTS (also total for Construction Project Estimate from line 7c)	$129,770

Date: _____

Project Manager

REVIEWED & CONCURRED IN:

Date: _____

Section Head

NOTE: Concurring section heads are to forward the original estimate copy to the Director of Transportation Solutions with one estimate copy each to the Assistant Director of Project Development, Assistant Director of Design Support, and the Cost Estimate Engineer.

SECTION 6C

CAPITAL TRANSPORTATION PROGRAM COST ESTIMATE

HERITAGE TRAIL IMPROVEMENTS

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

1. NAME OF PROJECT Heritage Trail Improvements (Subdivision or Road Name) New Castle (County)

2. LIMITS

Street Name or Road Number	From	To	Length
South Street	Delaware Street	8th Street	1,000 feet

3. ESTIMATE REQUESTED BY: Marco Boyce (Name) for (check one) ☐ Project initiation ☑ Estimate only _____ (Section or Legis. Dist.)

4. DESCRIPTION OF IMPROVEMENT:

This project proposes to construct improvements along the existing Heritage Trail. The trail will be widened to 10 feet and resurfaced. Curb ramps will be reconstructed and drainage will be improved. Lighting and landscaping will be improved.

4. PROJECT IN C.I.P. Yes ☐ No ☑ If "Yes", indicate year F.Y. _____

5. TYPICAL SECTION

The Heritage Trail is an 8-foot-wide hot-mix path that will be widened to 10 feet.

6. STATE MAINTAINED ☐ CITY MAINTAINED ☑ PRIVATE ☐ OTHER ☐ (specify) _____

7. COST ESTIMATE:

		from C.I.P. estimate form	Estimate prepared by:	Date:
a. Location and Environmental Studies (Part I to be included only for class "I" and "III" projects)	$0	Part I	WR&A	10/03/13
b. Preliminary Engineering	$66,000	Part II	WR&A	10/03/13
c. Real Estate	$0	Part III	WR&A	10/03/13
d. Construction *	$293,190	Part IV	WR&A	10/03/13
e. TOTAL ESTIMATED PROJECT COST	$359,190			

* Includes Utilities, Traffic, and C.E.

APPROVED

Valid thru _____ (Date) _____ (Assistant Director, M&O/Transportation Solutions/Planning) _____ (Date)

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Contract No. T201330007 Project Title: Heritage Trail Improvements

PART I - LOCATION & ENVIRONMENTAL STUDIES (N/A)

(Part I to be included only for class "I" & "III" projects)

A. ENGINEERING (Includes NEPA)		**E. HISTORIC**	$0
B. ARCHAEOLOGY	$0	1. Phase 1 (study)	
1. Phase I (study)		2. Phase 2 (study)	
2. Phase 2 (study)		3. Mitigation (by loc./env.)	
3. Phase 3 (mitigation)		4. Mitigation (by design)	yes ☐ no ☐
C. WETLANDS	$0	**F. NOISE**	$0
1. Delineation (study)		1. Studies	
2. Permit preparation		2. Mitigation (by design)	yes ☐ no ☐
3. Mitigation (design)		**G. OTHER**	$0
D. HAZARDOUS MATERIAL	$0	1.	
1. Phase 1 (study)		2.	
2. Phase 2 (study)			
3. Phase 3 (remediation)			

TOTAL COSTS FOR PART I (A thru G) ROUNDED $0

CONTINGENCY COSTS $0
(normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL LOCATION AND ENVIRONMENTAL STUDIES COSTS $0
(also total for Construction Project Estimate form line 7a)

Estimator: WR&A Date: 10/03/13

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Contract No. T201330007 Project Title: Heritage Trail Improvements

PART II - PRELIMINARY ENGINEERING

A. SURVEYS	$15,000
1. Inhouse	
2. Consultant	$15,000
B. DESIGN ENGINEERING	$45,000
1. Design	$45,000
a. Inhouse	
b. Consultant	$45,000
2. Traffic	$0
a. Inhouse	
b. Consultant	
3. Real Estate Plan Preparation	$0
a. Inhouse	
b. Consultant	
4. Utilities	$0
a. Inhouse	
b. Consultant	
c. Test Holes	
d. Utility Company	
5. Materials & Research	
6. Borings	
7. Pile Load Tests	
8. Subdivision	$0
a. Inhouse	
b. Consultant	
c. Railroad P.E.	
9. Other (specify)	$0
a.	
b.	
C. ENVIRON. ASSESSMENT (use for class "II" projects only)	$0
1. Wetlands	
2. Hazardous Materials	
3. Noise	
4. Historic	
5. Archaeology	
6. Other	
a.	
b.	
Loc/Environ Estimator: Date:	
D. CONTRACT ADMINISTRATION	
Cont/Admin Estimator: Date:	

TOTAL COSTS FOR PART II (A thru D) ROUNDED		$60,000
CONTINGENCY COSTS (normally 5% for large projects and 10% for small projects - to be approved by section head)	10% (% used)	$6,000
TOTAL PRELIMINARY ENGINEERING (also total for Construction Project Estimate form line 7b)		$66,000

Estimator: WR&A Date: 10/03/13

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Contract No. T201330007 Project Title: Heritage Trail Improvements

PART III - REAL ESTATE

A. REAL PROPERTY	$0	**C. ASBESTOS PROGRAM**	$0
1. Total acquisitions		1. Testing	
2. Partial acquisitions		2. Abatement	
3. Permanent easements		**D. DEMOLITION**	
4. Temporary easements		**E. APPRAISAL FEES**	
5. Wetland mitigation		**F. STAFF**	
Other (specify)			
6.		**G. SETTLEMENT**	
7.		**H. REAL ESTATE ENG.**	$0
B. RELOCATION	$0	1. Consultant survey	
1. Residential		2. As acquired plans	
2. Business		**I. CONDEMNATION**	
Other (specify)			
3.		**J. OTHER (specify)**	$0
4.		1.	
		2.	

TOTAL COSTS FOR PART III (A thru J) ROUNDED $0

CONTINGENCY COSTS _____ $0
(normally 5% for large projects and 10% for small projects - to be approved by section head) (% used)

TOTAL REAL ESTATE COSTS $0
(also total for Construction Project Estimate form line 7c)

Estimator: WR&A Date: 10/03/13

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Contract No. T201330007 Project Title Heritage Trail Improvements

PART IV -CONSTRUCTION

A. ROADWAY/APPROACH CONSTRUCTION	$77,000
1. Grading	
a. Excavation (includes SWM pond)	$5,000
b. Borrow	$500
2. Drainage	$20,000
3. Pavement	
a. Surface	$12,000
b. Base	$500
c. Subbase	$11,000
4. Erosion/Sed. Cont.	$7,000
5. Miscellaneous	
a. Curb/Gutter	$2,500
b. Sidewalk	$1,500
c. Guardrail	$0
d. C.P.M. Schedule	$0
e. Clear/Grubb	$10,000
f. Field Office	$0
Other (specify)	
g. Topsoil, Seed, Mulch	$3,500
h. Removal of concrete	$1,000
i. Trail Amenities	$2,500
j.	
k.	
l.	
m.	

B. STRUCTURE CONSTRUCTION	$0
1. New Bridge	
a. Type	
b. Size	
c. $/s.f.	
2. Old Structure Rem.	
a. Type	
b. Size	
c. $/c.y.	
3. Retaining Wall	
a. Type	
b. Size	
c. $/c.y.	
4. Box Culvert	
a. Type	
b. Size	
c. $/s.f.	
C. LANDSCAPING	$5,000
1. Beautification	$5,000
2. Noise Mitigation	
3. Visual Mitigation	
4. Tree Mitigation	
D. MAINTENANCE OF TRAFFIC	$7,500

(refer to Capital Improvement Project form, Part IV - Continued)

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars)

Contract No. T201330007 Project Title Heritage Trail Improvements

PART IV -CONSTRUCTION (CONTINUED)

E. PROJECT TRAFFIC ITEMS	$89,000
1. Signing Structures	
a. Overhead Bridges	$0
b. Cantilever Supports	$0
2. Roadway Lighting	$87,000
3. Pavement Markings	$2,000
Other (specify)	
4.	
F. WETLAND MITIGATION	
G. UTILITY RELOC. IN CONTRACT	$0
1. Water	
2. Sanitary Sewer	
Other (specify)	
3.	
H. SUBTOTAL (A thru G) ROUNDED	$179,000
I. MISC. ITEMS	$35,800
(15% of H for large projects and 20% for small)	
(At SF submission use 10% and 5%)	
20% (% used)	
J. CONTRACTOR'S CONST. ENG.	$8,950
(normally 5% of H) 5% (% used)	
K. INITIAL EXPENSE	$8,950
(normally 5% of H) 5% (% used)	
L. CONSTRUCTION CONTINGENCY	$17,900
(normally 10% of H) 10% (% used)	

P. REIMBURSABLE UTILITY RELOCATIONS BY OTHERS	$0
(Enter on PNR funding line 7)	
1. Water	
2. Sanitary Sewer	
3. Electric	
4. Telephone	
5. Gas	
6. CATV	
Other (specify)	
7.	
8.	
Utilities Estimator: Date:	

Q. TRAFFIC SECTION ITEMS	$5,000
(Enter on PNR funding line 6)	
1. Signing	$5,000
2. Signals	
3. Detour Signing	
4. DelTrac	
Other (specify)	
5.	
Traffic Estimator: Date:	

M. TOTAL CONSTRUCTION COSTS (H thru L) (Enter on PNR funding line 5)		$250,600
N. CONSTRUCTION ENGINEERING (normally 15% of construction costs) (Enter on PNR funding line 4)	15% (% used)	$37,590
O. TOTAL CONSTRUCTION COSTS (Construction Costs + Construction Engineering) (use this total + Q + P for Construction Project Estimate from line 7d)		$288,190

Estimator: WR&A Date: 10/03/13

CAPITAL TRANSPORTATION PROJECT COST ESTIMATE

(Current Dollars) Part V of V

Contract No. T201330007 Project Title: Heritage Trail Improvements

SUMMARY

PART I - LOCATION AND ENVIRONMENTAL STUDIES (Part I to be included only for class "I" and "III" projects)	$0
PART II - PRELIMINARY ENGINEERING	$66,000
PART III - REAL ESTATE	$0
PART IV - CONSTRUCTION	$293,190
TOTAL ESTIMATED PROJECT COSTS (also total for Construction Project Estimate from line 7c)	$359,190

Project Manager Date:

REVIEWED & CONCURRED IN:

Section Head Date:

NOTE: Concurring section heads are to forward the original estimate copy to the Director of Transportation Solutions with one estimate copy each to the Assistant Director of Project Development, Assistant Director of Design Support, and the Cost Estimate Engineer.

Tab 7

MEMORANDUM

Date: February 11, 2013

To: David Duszak, WR&A

From: Laura Callens, WR&A

Subject: Environmental Site Features

CC: Bob Siegfried, WR&A

Work Order Number: 31745-017

Project: DelDOT: Industrial Track Trail, Phase IV Concept Design

This memorandum provides a summary of the existing natural resources issues associated with the site. A field visit was conducted on January 31, 2013 by WR&A to visually identify any environmental features that may require federal and/or state permitting, including jurisdictional non-tidal wetlands and waterways specifically in the areas of the proposed trail route alternatives connecting the southern end of the New Castle Heritage Trail to Battery Park in the City of New Castle. No survey, flagging, precise delineation, or preparation of CADD products were included and these findings are based on best professional judgment and should used for planning purposes only. The study area contains two wetlands and an ephemeral ditch.

Wetland 1 and Ditch

One linear non-tidal palustrine emergent (PEM) wetland was identified along the northern portion of the alignment adjacent to the existing New Castle Heritage Trail. This wetland was previously identified as "Wetland 1" during the SR 273 Trail study. The hand auger was used to examine the soils for indicators of hydric soil, which were found to be present. A dark muck surface overlaid 6" of hydric soil above a hard pan of fill and gravel. Primary indicators of wetland hydrology observed were Surface Water (A1), Saturation (A3), and Thin Muck Surface (C7). Vegetation observed in the wetland consisted of soft rush (*Juncus effuses*, FACW), swamp smartweed (*polygonum hydropiperoides*, OBL), and narrow-leaf cat-tail (*Typha angustifolia*, OBL). The wetland parallels the Heritage Trail for approximately 300 feet and discontinues just north of 10th street, where the water flows into a 3' wide man-made ephemeral ditch for approximately 250' and then enters the storm drain system approximately 2,500 feet from the Delaware River. The exact limits of the wetland should be determined through a thorough wetland delineation. It appears that this wetland formed within a ditch that developed wetland characteristics due to a lack of periodic maintenance. The ditch was constructed within uplands and therefore the ditch and wetlands are not naturally occurring. We believe that this wetland and ditch would not be regulated because they lack a significant nexus to regulated Waters of the U.S.; however a Jurisdictional Determination with the U.S. Army Corps of Engineer must be conducted to confirm.

Wetland 2

Another PEM wetland was identified within Battery Park, just south of the New Castle Presbyterian Cemetery and southwest of the industrial buildings along South Street. A hand auger was used to examine the soils within the wetland for indicators of hydric soil, which were found to be present. The soil profile was comprised of 12" of soil with matrix color of 10YR4/2 (90%) with redox features of color 5YR5/8 (10%). The soil texture was a silt loam, with an abundance of roots throughout. This soil profile satisfies the Depleted Matrix (F3) hydric soil indicator. Primary indicators of wetland hydrology observed were Surface Water (A1), Saturation (A3). Vegetation observed in the wetland consisted of narrow leaf cattail (*Typha angustifolia*; OBL) and common reed (*Phragmites australis*; FACW), with sweetgum (*Liquidambar styraciflua*; FAC) and silky dogwood (*Cornus amomum*; FACW) along the fringe. All

three wetland parameters were met, confirming the presence of a wetland. It appears that a small portion of the wetland continues into the adjacent industrial property within the fence line, where topography remains flat and ponding is occurring. The exact limits of the wetland should be determined through a thorough wetland delineation. We believe that this wetland would be regulated due to its close proximity and significant nexus to the Delaware River; however a Jurisdictional Determination with the U.S. Army Corps of Engineer must be conducted to confirm.

Permitting Considerations

Impacts to any jurisdictional waters, including tidal and non-tidal wetlands, require submission of a Nationwide Permit to the U.S. Army Corps of Engineers. Impacts to jurisdictional waters, including tidal wetlands, require submission of a Subaqueous Lands Permit to the Delaware Department of Natural Resources and Environmental Control (DNREC). DNREC does not regulate non-tidal wetlands. The limits of the wetlands on-site should be determined through a thorough wetland delineation. The wetland delineation may be verified by the U.S. Army Corps of Engineers through a Jurisdictional Determination which establishes the legally accepted boundary upon which all permits and enforcement activities would be based.

If more detail and documentation of the findings is required, or if there are any questions about the contents of this technical memorandum, please contact me at 443-224-1633, email lcallens@wrallp.com

Laura Callens

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Laura C. Callens, CFM
Environmental Scientist

MEMORANDUM of MEETING

Date: May 20, 2013

Date of Meeting: May 16, 2013
Time of Meeting: 10:00 am
Meeting Location: Project site

Work Order Number: 31745-017

Project: New Castle Industrial Track Trail, Phase IV, Concept Design

Meeting Description: Field Review of Environmental Features

CC:
Marco Boyce DelDOT
Joy Ford, DelDOT
Amanda Baxter, WR&A
Bob Siegfried, WR&A

Participants:

Name	Company	Phone	Email
Ken Dunne	DelDOT	302-760-2130	Ken.Dunne@state.de.us
Laura Callens	WR&A	443-224-1633	lcallens@wrallp.com
Dave Duszak	WR&A	302-571-9001	dduszak@wrallp.com

A field review of the environmental site features for the New Castle Industrial Track Trail, Phase IV, Concept Design project was conducted by WR&A and DelDOT Environmental staff. The purpose of the project is to evaluate trail alignment alternatives to connect the New Castle Industrial Track Trail to Battery Park. The section of the existing New Castle Industrial Track Trail located south of SR 273 is also known as the New Castle Heritage Trail.

As part of the work scope, WR&A is also evaluating the condition of the existing New Castle Heritage Trail. Elements being evaluated include pavement conditions, drainage, geometrics, ADA-compliance, landscaping, and lighting.

A map of the existing trails and wetlands is attached. A summary of discussions regarding Wetland 1 and Wetland 2 is below:

<u>Wetland 1</u>

Wetland 1 is located directly adjacent to the existing New Castle Heritage Trail between SR 273 and 9th Street. The group observed the area around Wetland 1, including the upstream portion north of the culvert crossing at SR 273. Ms. Callens felt that Wetland 1 and associated ditch would not be considered jurisdictional because the wetland appears to have been formed within a ditch that developed wetland characteristics due to a lack of periodic maintenance. The ditch was constructed within uplands and therefore the ditch and wetlands were not naturally occurring. Also, the wetland and ditch would not be regulated because they lack a significant nexus to regulated Waters of the U.S. Mr. Dunne recommended that paper soil survey maps be consulted to determine if a black line historic stream appears in the location of the ditch. If that is the case, Mr. Dunne agrees with Ms. Callens regarding

the jurisdictional status for similar reasons as stated. The issue of the jurisdictional status may be a moot point because Mr. Duszak believes that any potential upgrades or modifications to the New Castle Heritage Trail, including re-surfacing and/or widening the trail by an additional 2-feet, can be accomplished without impacting the wetland or ditch.

Wetland 2

Wetland 2 is located southwest of the former Brosius-Eliason industrial site. One potential trail alignment to connect the New Castle Heritage Trail to Battery Park consists of a trail through the former Brosius-Eliason site if/when the property is re-developed.

The group walked the potential trail alignment and viewed Wetland 2 from the New Castle Presbyterian Cemetery. Access within the former Brosius-Eliason site is restricted and a chain-link fence is located around the parcel's perimeter. Mr. Dunne and Ms. Callens agreed that access within the fence and a full delineation of Wetland 2 would be required before a proposed trail alignment can be determined. It is likely that based on the visual observance of hydrophytic vegetation that the wetland extends into the fenced area. Mr. Dunne suggested that it is possible that an insufficient amount of fill was placed when the site was graded and the wetlands continue to encroach. Mr. Duszak stated that DelDOT and WR&A met with the property owner in April 2013 and the owner confirmed that a trail through the parcel was likely a feasible option when the site is re-developed, although the timeline for re-development is uncertain at this time.

Follow-up

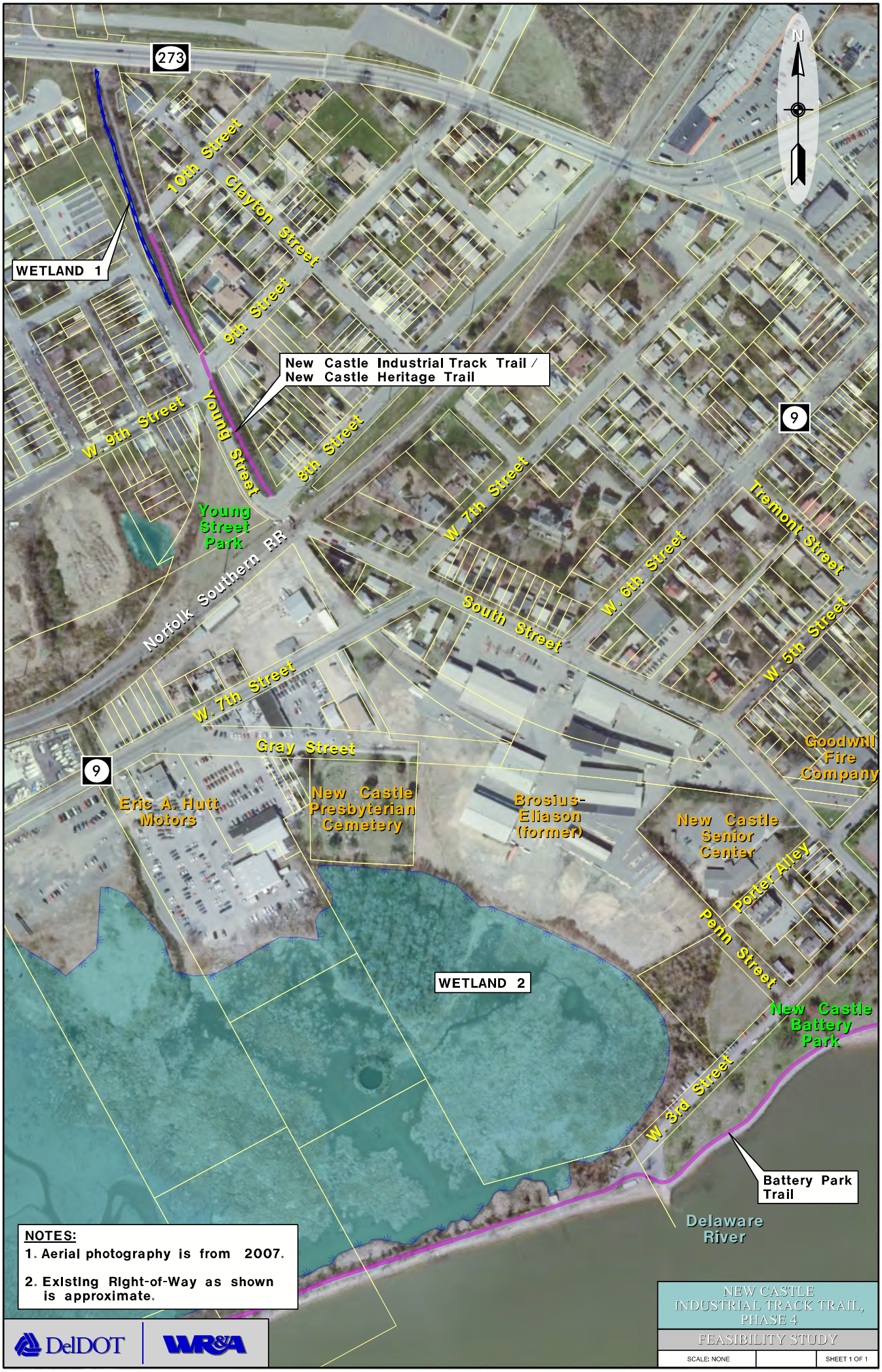
Ms. Callens confirmed that no historic black line stream is located where Wetland 1 exists today. Only a historic railroad line is shown in this location. Attached is a copy of the New Castle County 1970 Soil Survey showing the location of Wetland 1.

The above is a memorandum of understanding between the parties regarding the topics discussed and the decisions reached. Any participants desiring to add to, or otherwise amend the minutes, are requested to put their comments in writing to the writer within seven (7) days; otherwise, the minutes will stand as written.

Laura Callens

_____

Laura Callens
Environmental Scientist



NOTES:

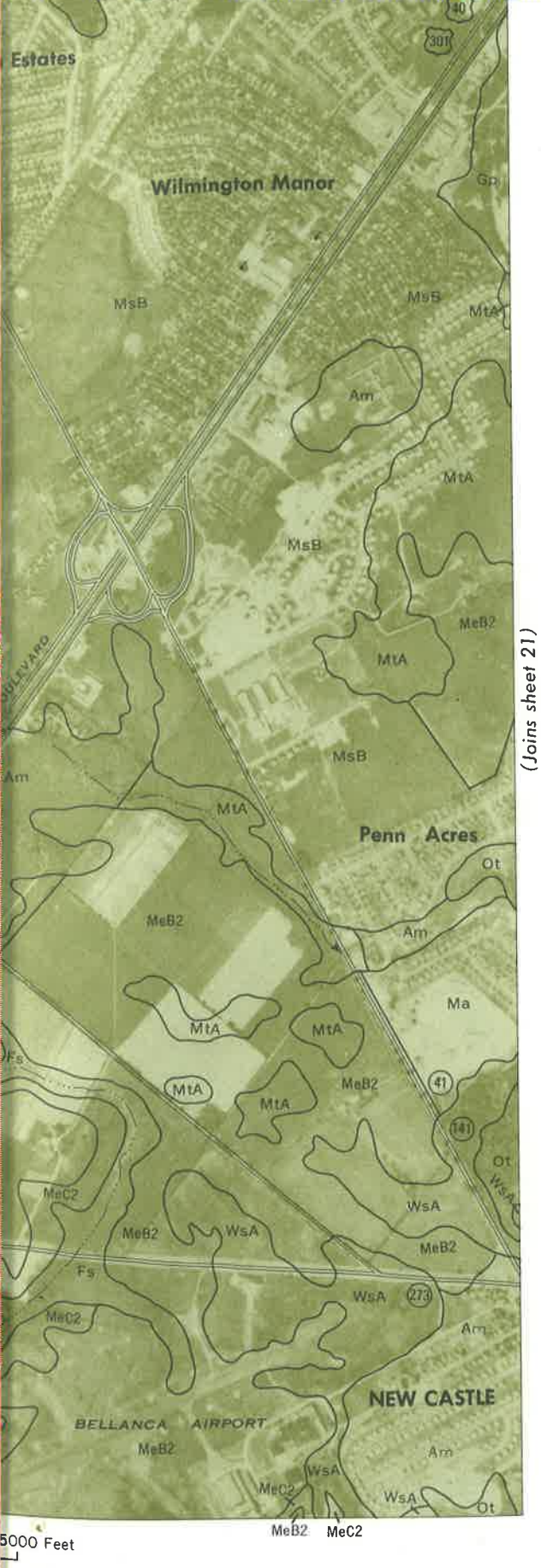
1. Aerial photography is from 2007.
2. Existing Right-of-Way as shown is approximate.

DelDOT | WRSA

NEW CASTLE INDUSTRIAL TRACK TRAIL, PHASE 4

FEASIBILITY STUDY

SCALE: NONE | SHEET 1 OF 1



NEW CASTLE COUNTY, DELAWARE NO. 20
NEW CASTLE COUNTY, DELAWARE NO. 21

Tab 8

Option 1: Mid-block Crossing at 7th Street, Less than 20 pedestrians/hour

GUIDELINES FOR PEDESTRIAN CROSSING TREATMENTS

This spreadsheet combines Worksheet 1 and Worksheet 2 (Appendix A, pages 69-70) of TCRP Report 112/NCHRP Report 562 (*Improving Pedestrian Safety at Unsignalized Intersections*) into an electronic format. This spreadsheet should be used in conjunction with, and not independent of, Appendix A documentation.

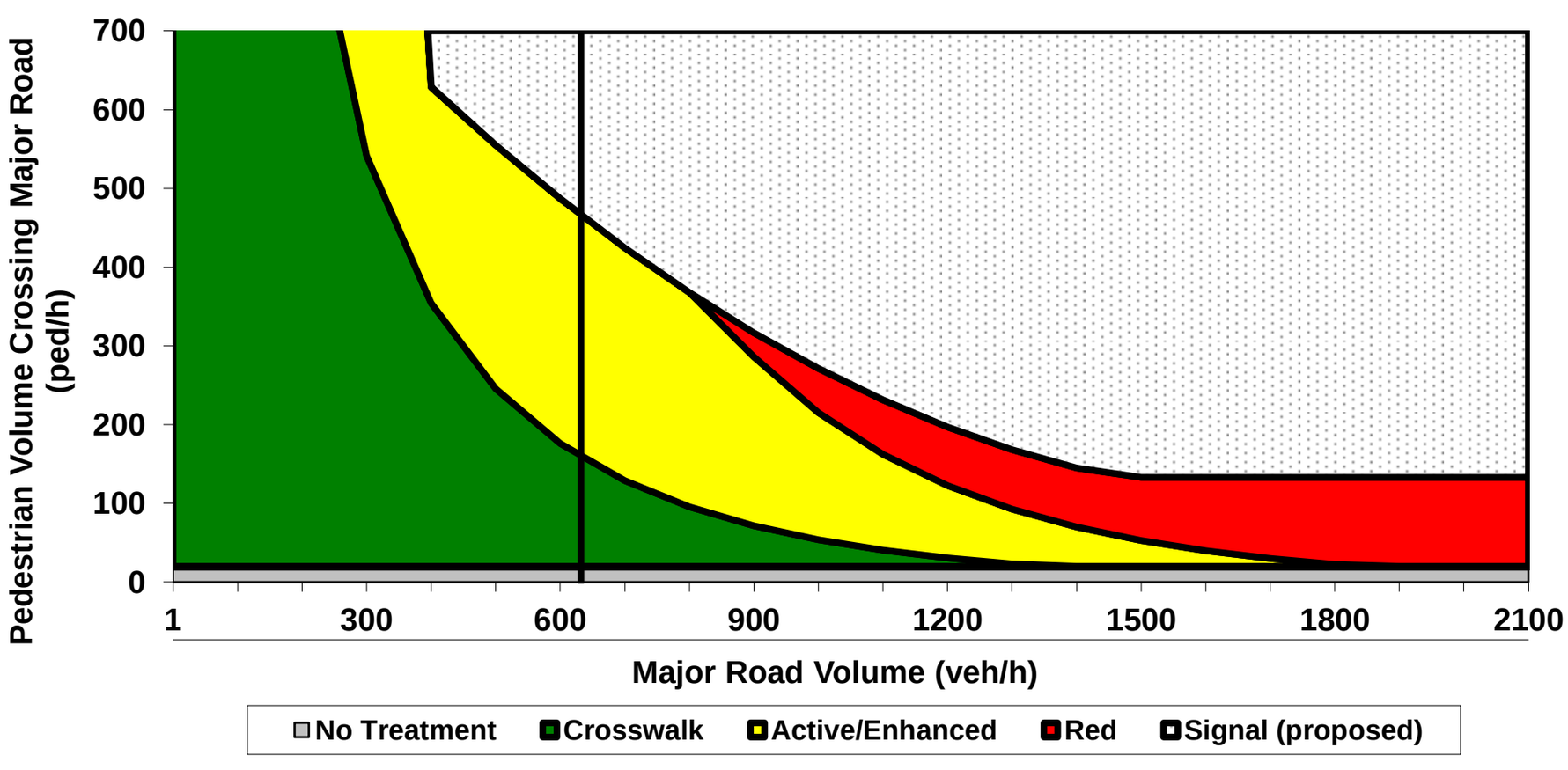
This spreadsheet is still under development, please inform TTI if errors are identified.

Key

- Blue fields contain descriptive information.
- Green fields are required and must be completed.
- Tan fields are adjustments that are filled out only under certain conditions (follow instructions to the left of the cell).
- Gray fields are automatically calculated and should not be edited.

Analyst and Site Information			
Analyst	WR&A	Major Street	7th Street (SR 9), New Castle
Analysis Date	May 24, 2013	Minor Street or Location	Industrial Track Trail, Phase IV
Data Collection Date	May 8, 2013	Peak Hour	4:45 - 5:45 pm

Step 1: Select worksheet:		
Posted or statutory speed limit (or 85th percentile speed) on the major street (mph)	*1a*	27
Is the population of the surrounding area <10,000? (enter ***YES*** or ***NO***)	*1b*	YES
Step 2: Does the crossing meet minimum pedestrian volumes to be considered for a traffic control device?		
Peak-hour pedestrian volume (ped/h), V_p	*2a*	19
Result: Consider raised median islands, curb extensions, traffic calming, etc. as feasible.		
Step 3: Does the crossing meet the pedestrian warrant for a traffic signal?		
Major road volume, total of both approaches during peak hour (veh/h), V_{maj-s}	*3a*	632
[Calculated automatically] Preliminary (before min. threshold) peak hour pedestrian volume to meet warrant	*3b*	217
[Calculated automatically] Minimum required peak hour pedestrian volume to meet traffic signal warrant	*3c*	217
Is 15th percentile crossing speed of pedestrians less than 3.5 ft/s (1.1 m/s)? (enter ***YES*** or ***NO***)	*3d*	NO
If 15th percentile crossing speed of pedestrians is less than 3.5 ft/s (1.1 m/s), then reduce *3c* by up to 50%. — % rate of reduction for *3c* (up to 50%)	*3e*	
If 15th percentile crossing speed of pedestrians is less than 3.5 ft/s (1.1 m/s), then reduce *3c* by up to 50%. — Reduced value or *3c*	*3f*	217
Result:		
Step 4: Estimate pedestrian delay.		
Pedestrian crossing distance, curb to curb (ft), L	*4a*	32
Pedestrian walking speed (ft/s), S_p (suggested speed = 3.5 ft/s)	*4b*	3.5
Pedestrian start-up time and end clearance time (s), t_s (suggested start-up time = 3 sec)	*4c*	3
[Calculated automatically] Critical gap required for crossing pedestrian (s), t_c	*4d*	12
Major road volume, total both approaches OR approach being crossed if raised median island is present, during peak hour (veh/h), V_{maj-d}	*4e*	632
Major road flow rate (veh/s), v	*4f*	0.25
Average pedestrian delay (s/person), d_p	*4g*	67
Total pedestrian delay (h), D_p The value in 4h is the calculated estimated delay for all pedestrians crossing the major roadway without a crossing treatment (assumes 0% compliance).	*4h*	0.4
If the actual total pedestrian delay has been measured at the site, that value can be entered in 4i to replace the calculated value in 4h.	*4i*	
Step 5: Select treatment based up on total pedestrian delay and expected motorist compliance.		
Expected motorist compliance at pedestrian crossings in region: enter ***HIGH for High Compliance*** or ***LOW for Low Compliance***	*5a*	low
Treatment Category:	**Consider raised median islands, curb extensions, traffic calming, etc. as feasible.**	



This worksheet provides general recommendations on pedestrian crossing treatments to consider at unsignalized intersections; in all cases, engineering judgment should be used in selecting a specific treatment for installation. This worksheet does not apply to school crossings. In addition to the results provided by this worksheet, users should consider whether a pedestrian treatment could present an increased safety risk to pedestrians, such as where there is poor sight distance, complex geometrics, or nearby traffic signals.

Option2: Mid-block Crossing at 7th Street, 20 pedestrians/hour or greater

GUIDELINES FOR PEDESTRIAN CROSSING TREATMENTS

This spreadsheet combines Worksheet 1 and Worksheet 2 (Appendix A, pages 69-70) of TCRP Report 112/NCHRP Report 562 (*Improving Pedestrian Safety at Unsignalized Intersections*) into an electronic format. This spreadsheet should be used in conjunction with, and not independent of, Appendix A documentation.

This spreadsheet is still under development, please inform TTI if errors are identified.

Key

- Blue fields contain descriptive information.
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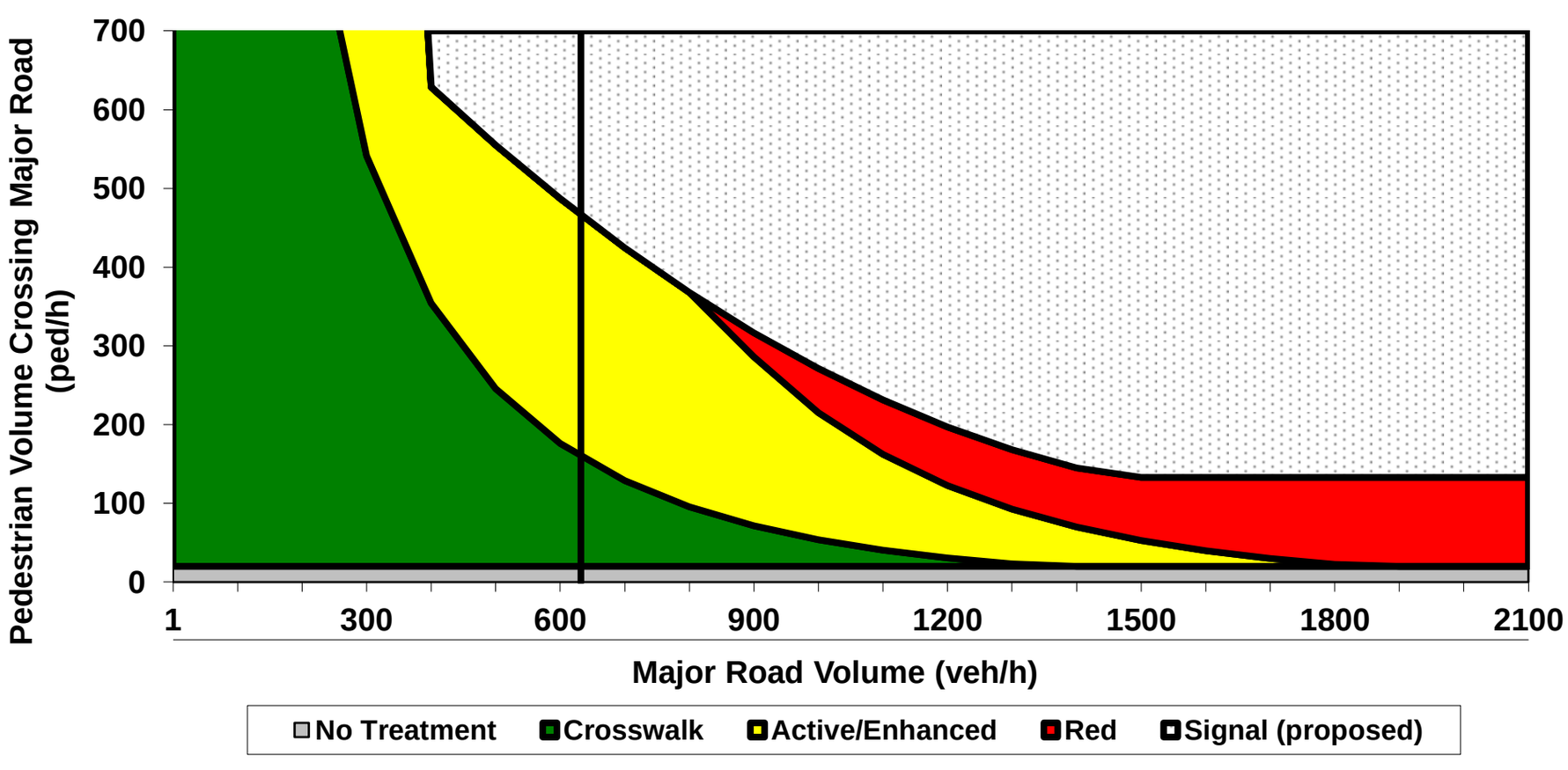
- Tan fields are adjustments that are filled out only under certain conditions (follow instructions to the left of the cell).
- Gray fields are automatically calculated and should not be edited.

Analyst and Site Information			
Analyst	WR&A	Major Street	7th Street (SR 9), New Castle
Analysis Date	May 24, 2013	Minor Street or Location	Industrial Track Trail, Phase IV
Data Collection Date	May 8, 2013	Peak Hour	4:45 - 5:45 pm

Step 1: Select worksheet:		
Posted or statutory speed limit (or 85th percentile speed) on the major street (mph)	*1a*	27
Is the population of the surrounding area <10,000? (enter ***YES*** or ***NO***)	*1b*	YES
Step 2: Does the crossing meet minimum pedestrian volumes to be considered for a traffic control device?		
Peak-hour pedestrian volume (ped/h), V_p	*2a*	20
Result: Go to step 3.		
Step 3: Does the crossing meet the pedestrian warrant for a traffic signal?		
Major road volume, total of both approaches during peak hour (veh/h), V_{maj-s}	*3a*	632
[Calculated automatically] Preliminary (before min. threshold) peak hour pedestrian volume to meet warrant	*3b*	217
[Calculated automatically] Minimum required peak hour pedestrian volume to meet traffic signal warrant	*3c*	217
Is 15th percentile crossing speed of pedestrians less than 3.5 ft/s (1.1 m/s)? (enter ***YES*** or ***NO***)	*3d*	NO
If 15th percentile crossing speed of pedestrians is less than 3.5 ft/s (1.1 m/s), then reduce *3c* by up to 50%. — % rate of reduction for *3c* (up to 50%)	*3e*	
If 15th percentile crossing speed of pedestrians is less than 3.5 ft/s (1.1 m/s), then reduce *3c* by up to 50%. — Reduced value or *3c*	*3f*	217
Result: The signal warrant is not met. Go to step 4.		
Step 4: Estimate pedestrian delay.		
Pedestrian crossing distance, curb to curb (ft), L	*4a*	32
Pedestrian walking speed (ft/s), S_p (suggested speed = 3.5 ft/s)	*4b*	3.5
Pedestrian start-up time and end clearance time (s), t_s (suggested start-up time = 3 sec)	*4c*	3
[Calculated automatically] Critical gap required for crossing pedestrian (s), t_c	*4d*	12
Major road volume, total both approaches OR approach being crossed if raised median island is present, during peak hour (veh/h), V_{maj-d}	*4e*	632
Major road flow rate (veh/s), v	*4f*	0.25
Average pedestrian delay (s/person), d_p	*4g*	67
Total pedestrian delay (h), D_p The value in 4h is the calculated estimated delay for all pedestrians crossing the major roadway without a crossing treatment (assumes 0% compliance).	*4h*	0.4
If the actual total pedestrian delay has been measured at the site, that value can be entered in 4i to replace the calculated value in 4h.	*4i*	
Step 5: Select treatment based up on total pedestrian delay and expected motorist compliance.		
Expected motorist compliance at pedestrian crossings in region: enter ***HIGH for High Compliance*** or ***LOW for Low Compliance***	*5a*	low
Treatment Category:	**ACTIVE OR ENHANCED**	



This worksheet provides general recommendations on pedestrian crossing treatments to consider at unsignalized intersections; in all cases, engineering judgment should be used in selecting a specific treatment for installation. This worksheet does not apply to school crossings. In addition to the results provided by this worksheet, users should consider whether a pedestrian treatment could present an increased safety risk to pedestrians, such as where there is poor sight distance, complex geometrics, or nearby traffic signals.

Whitman, Requardt and Associates, LLP
Radar Speed Study
Quantitative Summary

Description:

Route: **W. 7th Street**

Direction: **Eastbound**

Location: **500 feet west of South Street**

County: **New Castle**

Posted Speed Limit: **25**

Date: 5/2/2013

Time: 4:00 - 5:00 pm

Weather: 60 degrees

WRA W.O.#: 31745-017

Recorder(s): Gunyuzlu

File Name: Speed study - 7th Street

Results:

85th %-ile Speed = **27 mph**

Modal Speed = **26 mph**

Mean Speed = **24 mph**

% Exceeding Speed Limit = **20%**

Speed (mph)	Number Vehicles	Cumul. Vehicles	% of Total	% Accum.
15	0	0	0%	0%
16	0	0	0%	0%
17	0	0	0%	0%
18	1	1	7%	7%
19	0	1	0%	7%
20	2	3	13%	20%
21	1	4	7%	27%
22	1	5	7%	33%
23	0	5	0%	33%
24	2	7	13%	47%
25	2	9	13%	60%
26	3	12	20%	80%
27	2	14	13%	93%
28	0	14	0%	93%
29	0	14	0%	93%
30	1	15	7%	100%
31	0	15	0%	100%
32	0	15	0%	100%
33	0	15	0%	100%
34	0	15	0%	100%
35	0	15	0%	100%
36	0	15	0%	100%
37	0	15	0%	100%
38	0	15	0%	100%
39	0	15	0%	100%
40	0	15	0%	100%
41	0	15	0%	100%
42	0	15	0%	100%
43	0	15	0%	100%
44	0	15	0%	100%
45	0	15	0%	100%
46	0	15	0%	100%
47	0	15	0%	100%
48	0	15	0%	100%
49	0	15	0%	100%
50	0	15	0%	100%
51	0	15	0%	100%
52	0	15	0%	100%
53	0	15	0%	100%
54	0	15	0%	100%
55	0	15	0%	100%
56	0	15	0%	100%
57	0	15	0%	100%
58	0	15	0%	100%
59	0	15	0%	100%
60	0	15	0%	100%

Whitman, Requardt and Associates, LLP
Radar Speed Study
Quantitative Summary

Description:

Route: **W. 7th Street**

Direction: **Westbound**

Location: **500 feet west of South Street**

County: **New Castle**

Posted Speed Limit: **25**

Date: 5/2/2013

Time: 4:00 - 5:00 pm

Weather: 60 degrees

WRA W.O.#: 31745-017

Recorder(s): Gunyuzlu

File Name: Speed study - 7th Street

Results:

85th %-ile Speed = **25 mph**

Modal Speed = **22 mph**

Mean Speed = **22 mph**

% Exceeding Speed Limit = **12%**

Speed (mph)	Number Vehicles	Cumul. Vehicles	% of Total	% Accum.
15	0	0	0%	0%
16	0	0	0%	0%
17	2	2	8%	8%
18	2	4	8%	16%
19	4	8	16%	32%
20	3	11	12%	44%
21	1	12	4%	48%
22	4	16	16%	64%
23	3	19	12%	76%
24	0	19	0%	76%
25	2	21	8%	84%
26	1	22	4%	88%
27	1	23	4%	92%
28	0	23	0%	92%
29	1	24	4%	96%
30	1	25	4%	100%
31	0	25	0%	100%
32	0	25	0%	100%
33	0	25	0%	100%
34	0	25	0%	100%
35	0	25	0%	100%
36	0	25	0%	100%
37	0	25	0%	100%
38	0	25	0%	100%
39	0	25	0%	100%
40	0	25	0%	100%
41	0	25	0%	100%
42	0	25	0%	100%
43	0	25	0%	100%
44	0	25	0%	100%
45	0	25	0%	100%
46	0	25	0%	100%
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54	0	25	0%	100%
55	0	25	0%	100%
56	0	25	0%	100%
57	0	25	0%	100%
58	0	25	0%	100%
59	0	25	0%	100%
60	0	25	0%	100%

Whitman, Requardt and Associates, LLP
Radar Speed Study
Quantitative Summary

Description:

Route: **South Street**

Direction: **Northbound**

Location: **W. 6th Street**

County: **New Castle**

Posted Speed Limit: **25**

Date: 5/2/2013

Time: 4:00 - 5:00 pm

Weather: 60 degrees

WRA W.O.#: 31745-017

Recorder(s): Gunyuzlu

File Name: Speed study - South Street

Results:

85th %-ile Speed = **23 mph**

Modal Speed = **19 mph**

Mean Speed = **20 mph**

% Exceeding Speed Limit = **5%**

Speed (mph)	Number Vehicles	Cumul. Vehicles	% of Total	% Accum.
15	1	1	3%	3%
16	4	5	10%	13%
17	3	8	8%	20%
18	5	13	13%	33%
19	7	20	18%	50%
20	5	25	13%	63%
21	2	27	5%	68%
22	5	32	13%	80%
23	3	35	8%	88%
24	1	36	3%	90%
25	2	38	5%	95%
26	2	40	5%	100%
27	0	40	0%	100%
28	0	40	0%	100%
29	0	40	0%	100%
30	0	40	0%	100%
31	0	40	0%	100%
32	0	40	0%	100%
33	0	40	0%	100%
34	0	40	0%	100%
35	0	40	0%	100%
36	0	40	0%	100%
37	0	40	0%	100%
38	0	40	0%	100%
39	0	40	0%	100%
40	0	40	0%	100%
41	0	40	0%	100%
42	0	40	0%	100%
43	0	40	0%	100%
44	0	40	0%	100%
45	0	40	0%	100%
46	0	40	0%	100%
47	0	40	0%	100%
48	0	40	0%	100%
49	0	40	0%	100%
50	0	40	0%	100%
51	0	40	0%	100%
52	0	40	0%	100%
53	0	40	0%	100%
54	0	40	0%	100%
55	0	40	0%	100%
56	0	40	0%	100%
57	0	40	0%	100%
58	0	40	0%	100%
59	0	40	0%	100%
60	0	40	0%	100%

Whitman, Requardt and Associates, LLP
Radar Speed Study
Quantitative Summary

Description:

Route: **South Street**

Direction: **Southbound**

Location: **W. 6th Street**

County: **New Castle**

Posted Speed Limit: **25**

Date: 5/2/2013

Time: 4:00 - 5:00 pm

Weather: 60 degrees

WRA W.O.#: 31745-017

Recorder(s): Gunyuzlu

File Name: Speed study - South Street

Results:

85th %-ile Speed = **25 mph**

Modal Speed = **20 mph**

Mean Speed = **22 mph**

% Exceeding Speed Limit = **11%**

Speed (mph)	Number Vehicles	Cumul. Vehicles	% of Total	% Accum.
15	0	0	0%	0%
16	0	0	0%	0%
17	0	0	0%	0%
18	1	1	4%	4%
19	2	3	7%	11%
20	8	11	30%	41%
21	5	16	19%	59%
22	1	17	4%	63%
23	3	20	11%	74%
24	1	21	4%	78%
25	3	24	11%	89%
26	1	25	4%	93%
27	1	26	4%	96%
28	0	26	0%	96%
29	1	27	4%	100%
30	0	27	0%	100%
31	0	27	0%	100%
32	0	27	0%	100%
33	0	27	0%	100%
34	0	27	0%	100%
35	0	27	0%	100%
36	0	27	0%	100%
37	0	27	0%	100%
38	0	27	0%	100%
39	0	27	0%	100%
40	0	27	0%	100%
41	0	27	0%	100%
42	0	27	0%	100%
43	0	27	0%	100%
44	0	27	0%	100%
45	0	27	0%	100%
46	0	27	0%	100%
47	0	27	0%	100%
48	0	27	0%	100%
49	0	27	0%	100%
50	0	27	0%	100%
51	0	27	0%	100%
52	0	27	0%	100%
53	0	27	0%	100%
54	0	27	0%	100%
55	0	27	0%	100%
56	0	27	0%	100%
57	0	27	0%	100%
58	0	27	0%	100%
59	0	27	0%	100%
60	0	27	0%	100%

Tri-State Traffic Data, Inc.

www.TSTData.com

Location:New Castle County, DE
Intersection:South St/7th Street
Date:Wednesday, May 8, 2013
Counter:pb

File Name : DD0508-2
Site Code : 00000000
Start Date : 5/8/2013
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	SOUTH STREET Southbound					7TH STREET Westbound					SOUTH STREET Northbound					7TH STREET Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	2	4	0	0	6	0	5	0	1	6	0	9	16	0	25	53	1	22	0	76	113
07:15 AM	1	1	0	0	2	1	4	1	1	7	0	1	18	1	20	66	2	37	0	105	134
07:30 AM	1	2	0	0	3	0	5	0	1	6	0	3	24	0	27	94	2	27	0	123	159
07:45 AM	1	2	0	0	3	1	2	1	0	4	1	5	25	0	31	107	2	28	0	137	175
Total	5	9	0	0	14	2	16	2	3	23	1	18	83	1	103	320	7	114	0	441	581
08:00 AM	3	2	1	0	6	1	2	1	0	4	0	5	25	0	30	70	1	21	0	92	132
08:15 AM	2	4	0	1	7	0	3	0	0	3	0	3	12	0	15	51	3	16	0	70	95
08:30 AM	4	2	2	0	8	2	2	1	0	5	0	4	22	0	26	46	2	12	0	60	99
08:45 AM	1	3	2	0	6	1	5	2	0	8	0	4	16	0	20	30	2	9	0	41	75
Total	10	11	5	1	27	4	12	4	0	20	0	16	75	0	91	197	8	58	0	263	401
*** BREAK ***																					
04:00 PM	4	4	1	0	9	1	18	4	2	25	0	8	60	0	68	18	2	7	0	27	129
04:15 PM	3	1	1	1	6	2	33	1	1	37	0	11	69	0	80	46	0	5	0	51	174
04:30 PM	3	4	1	1	9	0	17	0	0	17	2	4	67	0	73	45	0	4	1	50	149
04:45 PM	3	1	0	0	4	1	22	1	2	26	1	6	85	0	92	43	2	5	0	50	172
Total	13	10	3	2	28	4	90	6	5	105	3	29	281	0	313	152	4	21	1	178	624
05:00 PM	5	1	0	1	7	2	31	0	2	35	0	7	82	0	89	36	0	1	0	37	168
05:15 PM	5	2	0	0	7	2	36	0	0	38	0	4	85	0	89	29	0	4	0	33	167
05:30 PM	5	2	0	0	7	1	22	1	0	24	1	3	94	0	98	27	1	9	0	37	166
05:45 PM	4	1	0	0	5	0	11	1	0	12	0	3	67	0	70	23	2	10	0	35	122
Total	19	6	0	1	26	5	100	2	2	109	1	17	328	0	346	115	3	24	0	142	623
Grand Total	47	36	8	4	95	15	218	14	10	257	5	80	767	1	853	784	22	217	1	1024	2229
Apprch %	49.5	37.9	8.4	4.2		5.8	84.8	5.4	3.9		0.6	9.4	89.9	0.1		76.6	2.1	21.2	0.1		
Total %	2.1	1.6	0.4	0.2	4.3	0.7	9.8	0.6	0.4	11.5	0.2	3.6	34.4	0	38.3	35.2	1	9.7	0	45.9	
Cars	47	34	8	4	93	15	218	13	10	256	5	78	754	1	838	760	22	217	1	1000	2187
% Cars	100	94.4	100	100	97.9	100	100	92.9	100	99.6	100	97.5	98.3	100	98.2	96.9	100	100	100	97.7	98.1
Heavy Vehicles	0	2	0	0	2	0	0	1	0	1	0	2	13	0	15	24	0	0	0	24	42
% Heavy Vehicles	0	5.6	0	0	2.1	0	0	7.1	0	0.4	0	2.5	1.7	0	1.8	3.1	0	0	0	2.3	1.9

Tri-State Traffic Data, Inc.

www.TSTData.com

Location:New Castle County, DE
Intersection:South St/7th Street
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File Name : DD0508-2
Site Code : 00000000
Start Date : 5/8/2013
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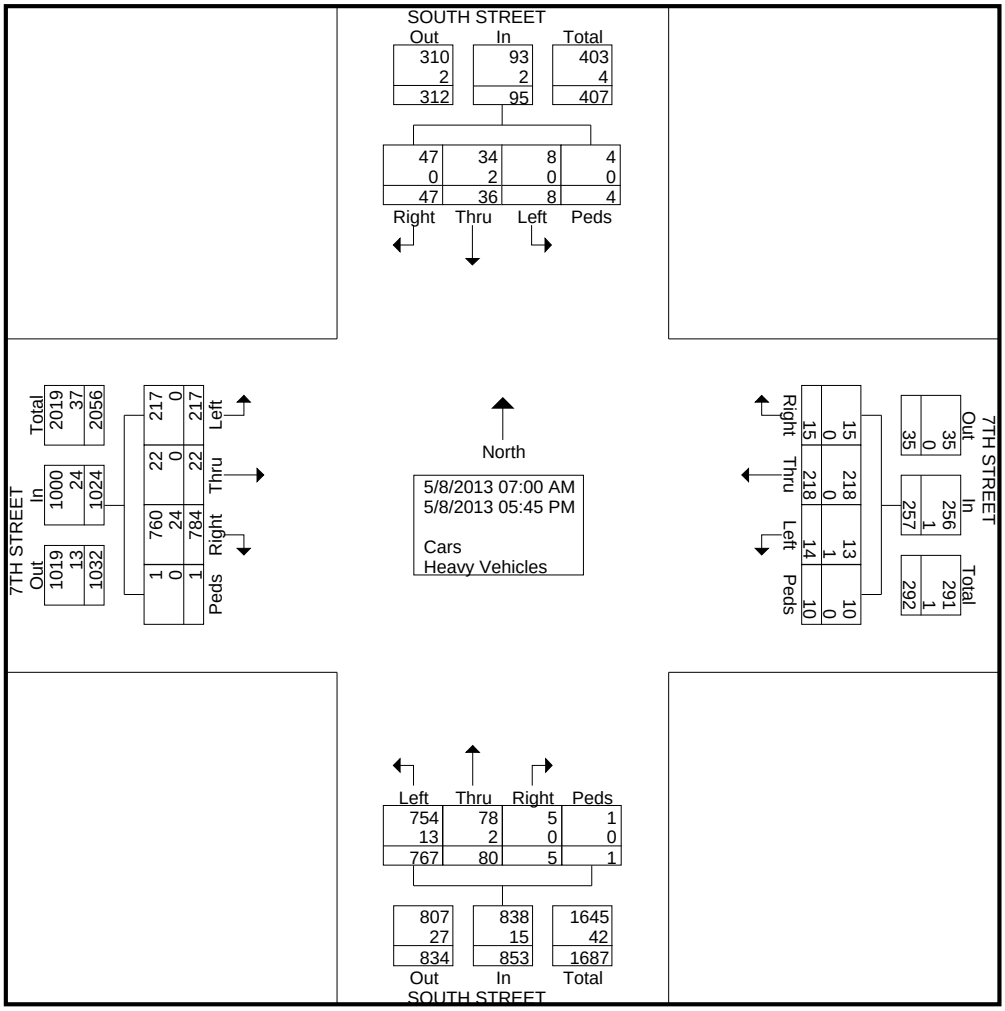

Tri-State Traffic Data, Inc.

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Location:New Castle County, DE
Intersection:South St/7th Street
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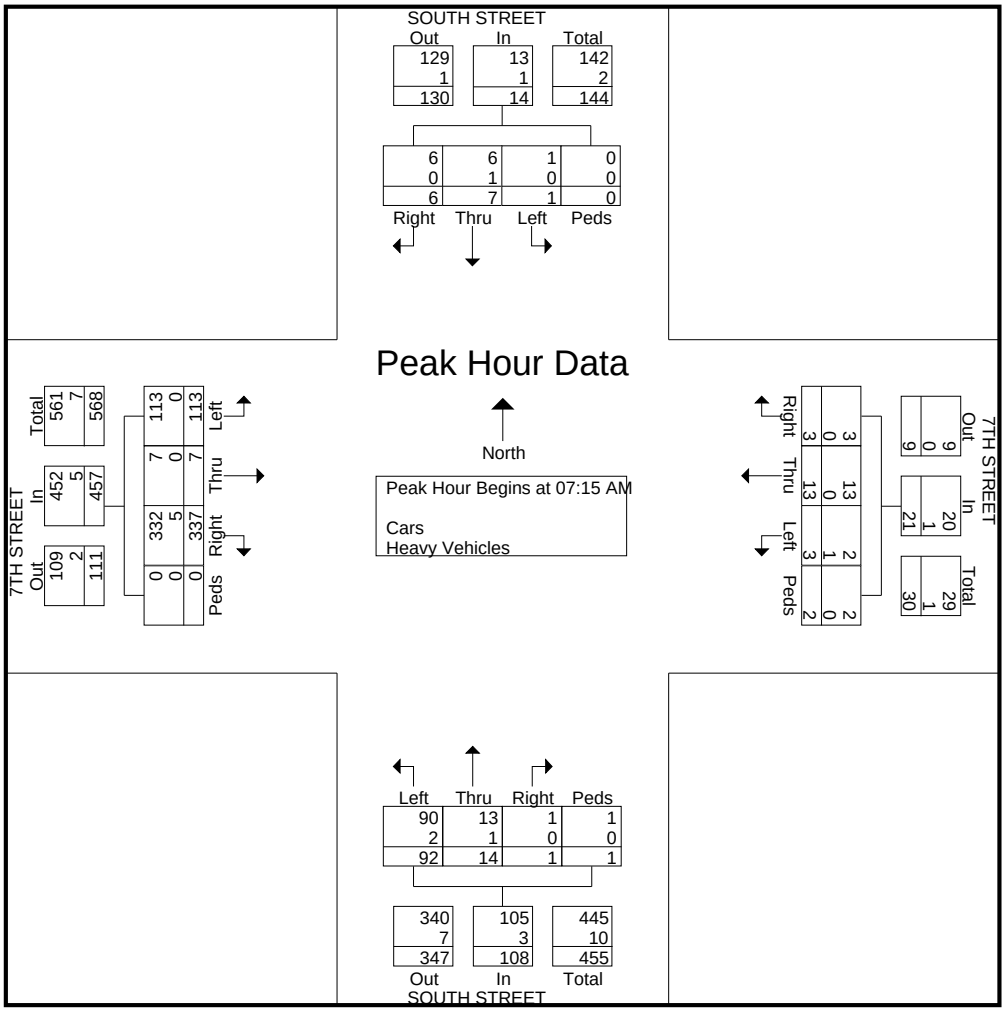
File Name : DD0508-2
Site Code : 00000000
Start Date : 5/8/2013
Page No : 3

	SOUTH STREET Southbound					7TH STREET Westbound					SOUTH STREET Northbound					7TH STREET Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	1	1	0	0	2	**1**	4	**1**	**1**	**7**	0	1	18	**1**	20	66	**2**	**37**	0	105	134
07:30 AM	1	**2**	0	0	3	0	**5**	0	1	6	0	3	24	0	27	94	2	27	0	123	159
07:45 AM	1	2	0	0	3	1	2	1	0	4	**1**	**5**	**25**	0	**31**	**107**	2	28	0	**137**	**175**
08:00 AM	**3**	2	**1**	0	**6**	1	2	1	0	4	0	5	25	0	30	70	1	21	0	92	132
Total Volume	6	7	1	0	14	3	13	3	2	21	1	14	92	1	108	337	7	113	0	457	600
% App. Total	42.9	50	7.1	0		14.3	61.9	14.3	9.5		0.9	13	85.2	0.9		73.7	1.5	24.7	0		
PHF	.500	.875	.250	.000	.583	.750	.650	.750	.500	.750	.250	.700	.920	.250	.871	.787	.875	.764	.000	.834	.857
Cars	6	6	1	0	13	3	13	2	2	20	1	13	90	1	105	332	7	113	0	452	590
% Cars	100	85.7	100	0	92.9	100	100	66.7	100	95.2	100	92.9	97.8	100	97.2	98.5	100	100	0	98.9	98.3
Heavy Vehicles																					
% Heavy Vehicles	0	14.3	0	0	7.1	0	0	33.3	0	4.8	0	7.1	2.2	0	2.8	1.5	0	0	0	1.1	1.7



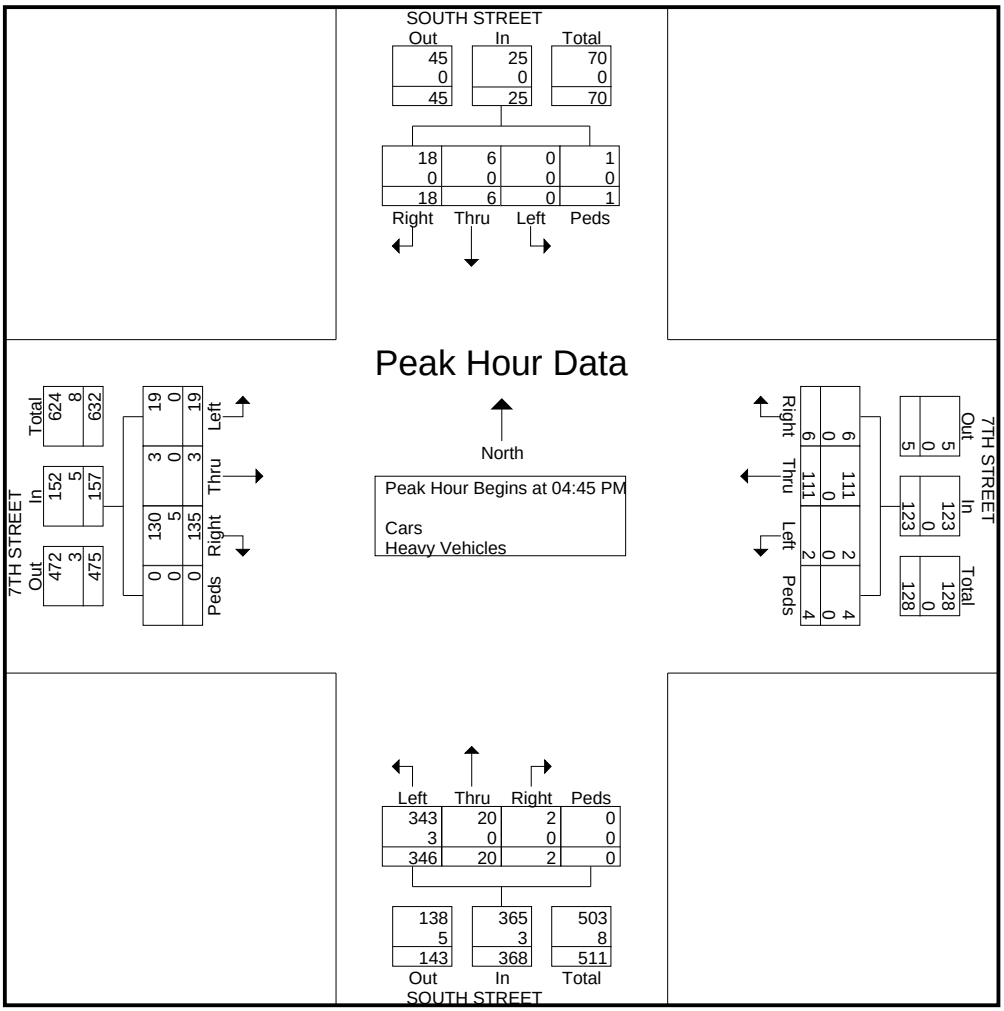
Tri-State Traffic Data, Inc.

www.TSTData.com

Location:New Castle County, DE
Intersection:South St/7th Street
Date:Wednesday, May 8, 2013
Counter:pb

File Name : DD0508-2
Site Code : 00000000
Start Date : 5/8/2013
Page No : 4

	SOUTH STREET Southbound					7TH STREET Westbound					SOUTH STREET Northbound					7TH STREET Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	3	1	0	0	4	1	22	**1**	**2**	26	**1**	6	85	0	92	**43**	**2**	5	0	**50**	**172**
05:00 PM	**5**	1	0	**1**	**7**	**2**	31	0	2	35	0	**7**	82	0	89	36	0	1	0	37	168
05:15 PM	5	**2**	0	0	7	2	**36**	0	0	**38**	0	4	85	0	89	29	0	4	0	33	167
05:30 PM	5	2	0	0	7	1	22	1	0	24	1	3	**94**	0	**98**	27	1	**9**	0	37	166
Total Volume	18	6	0	1	25	6	111	2	4	123	2	20	346	0	368	135	3	19	0	157	673
% App. Total	72	24	0	4		4.9	90.2	1.6	3.3		0.5	5.4	94	0		86	1.9	12.1	0		
PHF	.900	.750	.000	.250	.893	.750	.771	.500	.500	.809	.500	.714	.920	.000	.939	.785	.375	.528	.000	.785	.978
Cars	18	6	0	1	25	6	111	2	4	123	2	20	343	0	365	130	3	19	0	152	665
% Cars	100	100	0	100	100	100	100	100	100	100	100	100	99.1	0	99.2	96.3	100	100	0	96.8	98.8
Heavy Vehicles																					
% Heavy Vehicles	0	0	0	0	0	0	0	0	0	0	0	0	0.9	0	0.8	3.7	0	0	0	3.2	1.2



Tri-State Traffic Data, Inc.

www.TSTData.com

Location:New Castle County, DE
Intersection: 6th St / South St
Date: Wednesday, May 8, 2013
Counter:RZ

File Name : DD0508-1
Site Code : 00000000
Start Date : 5/8/2013
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	SOUTH ST Southbound					6TH ST Westbound					SOUTH ST Northbound					6TH ST Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	5	6	42	1	54	13	3	1	0	17	3	8	0	0	11	0	0	2	0	2	84
07:15 AM	0	6	60	1	67	13	1	1	2	17	2	5	0	0	7	0	1	0	0	1	92
07:30 AM	0	7	89	0	96	20	1	0	0	21	2	8	0	0	10	0	1	0	0	1	128
07:45 AM	0	6	107	1	114	22	0	0	0	22	3	6	0	0	9	0	1	2	0	3	148
Total	5	25	298	3	331	68	5	2	2	77	10	27	0	0	37	0	3	4	0	7	452
08:00 AM	2	7	69	0	78	22	0	2	0	24	0	6	0	1	7	1	0	1	0	2	111
08:15 AM	0	10	44	3	57	9	0	4	0	13	4	3	0	0	7	0	0	3	0	3	80
08:30 AM	1	5	41	0	47	22	0	2	1	25	1	3	0	0	4	0	0	4	0	4	80
08:45 AM	0	1	32	0	33	11	2	1	0	14	4	6	0	0	10	0	0	0	0	0	57
Total	3	23	186	3	215	64	2	9	1	76	9	18	0	1	28	1	0	8	0	9	328
*** BREAK ***																					
04:00 PM	0	9	13	0	22	54	0	7	4	65	2	10	0	0	12	0	1	1	0	2	101
04:15 PM	0	10	36	0	46	67	3	7	1	78	4	17	1	0	22	0	5	2	0	7	153
04:30 PM	0	11	38	0	49	59	0	0	0	59	6	18	0	0	24	0	0	0	0	0	132
04:45 PM	0	8	40	0	48	75	0	1	5	81	2	13	0	2	17	0	2	1	2	5	151
Total	0	38	127	0	165	255	3	15	10	283	14	58	1	2	75	0	8	4	2	14	537
05:00 PM	1	9	32	0	42	75	2	2	1	80	3	10	0	0	13	0	2	2	0	4	139
05:15 PM	1	3	26	0	30	82	1	2	0	85	1	14	1	0	16	1	1	2	0	4	135
05:30 PM	0	11	22	0	33	84	0	3	0	87	2	10	0	0	12	0	0	0	0	0	132
05:45 PM	0	12	11	0	23	54	0	1	0	55	3	14	1	1	19	2	1	0	1	4	101
Total	2	35	91	0	128	295	3	8	1	307	9	48	2	1	60	3	4	4	1	12	507
Grand Total	10	121	702	6	839	682	13	34	14	743	42	151	3	4	200	4	15	20	3	42	1824
Apprch %	1.2	14.4	83.7	0.7		91.8	1.7	4.6	1.9		21	75.5	1.5	2		9.5	35.7	47.6	7.1		
Total %	0.5	6.6	38.5	0.3	46	37.4	0.7	1.9	0.8	40.7	2.3	8.3	0.2	0.2	11	0.2	0.8	1.1	0.2	2.3	
Cars	10	121	676	6	813	667	13	33	14	727	42	151	3	4	200	4	15	20	3	42	1782
% Cars	100	100	96.3	100	96.9	97.8	100	97.1	100	97.8	100	100	100	100	100	100	100	100	100	100	97.7
Heavy Vehicles	0	0	26	0	26	15	0	1	0	16	0	0	0	0	0	0	0	0	0	0	42
% Heavy Vehicles	0	0	3.7	0	3.1	2.2	0	2.9	0	2.2	0	0	0	0	0	0	0	0	0	0	2.3

Tri-State Traffic Data, Inc.

www.TSTData.com

Location:New Castle County, DE
Intersection: 6th St / South St
Date: Wednesday, May 8, 2013
Counter:RZ

File Name : DD0508-1
Site Code : 00000000
Start Date : 5/8/2013
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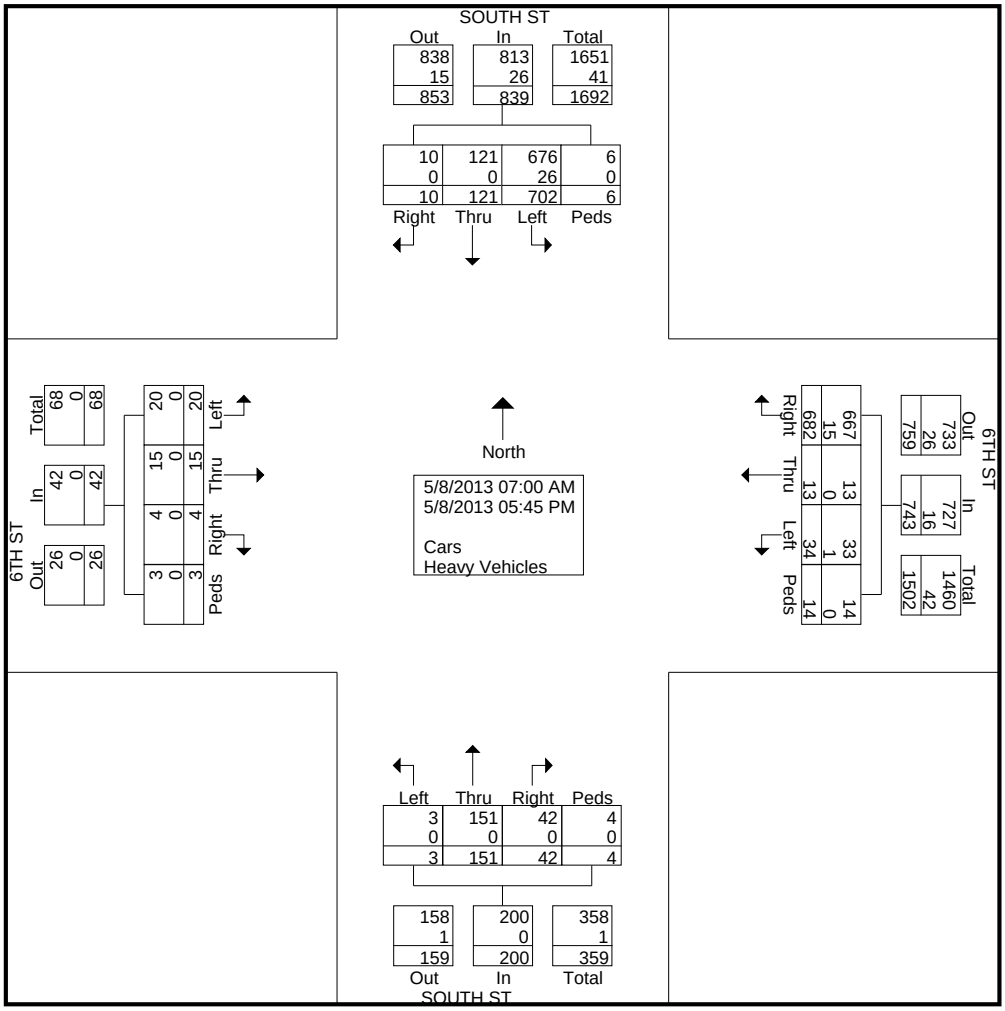

Tri-State Traffic Data, Inc.

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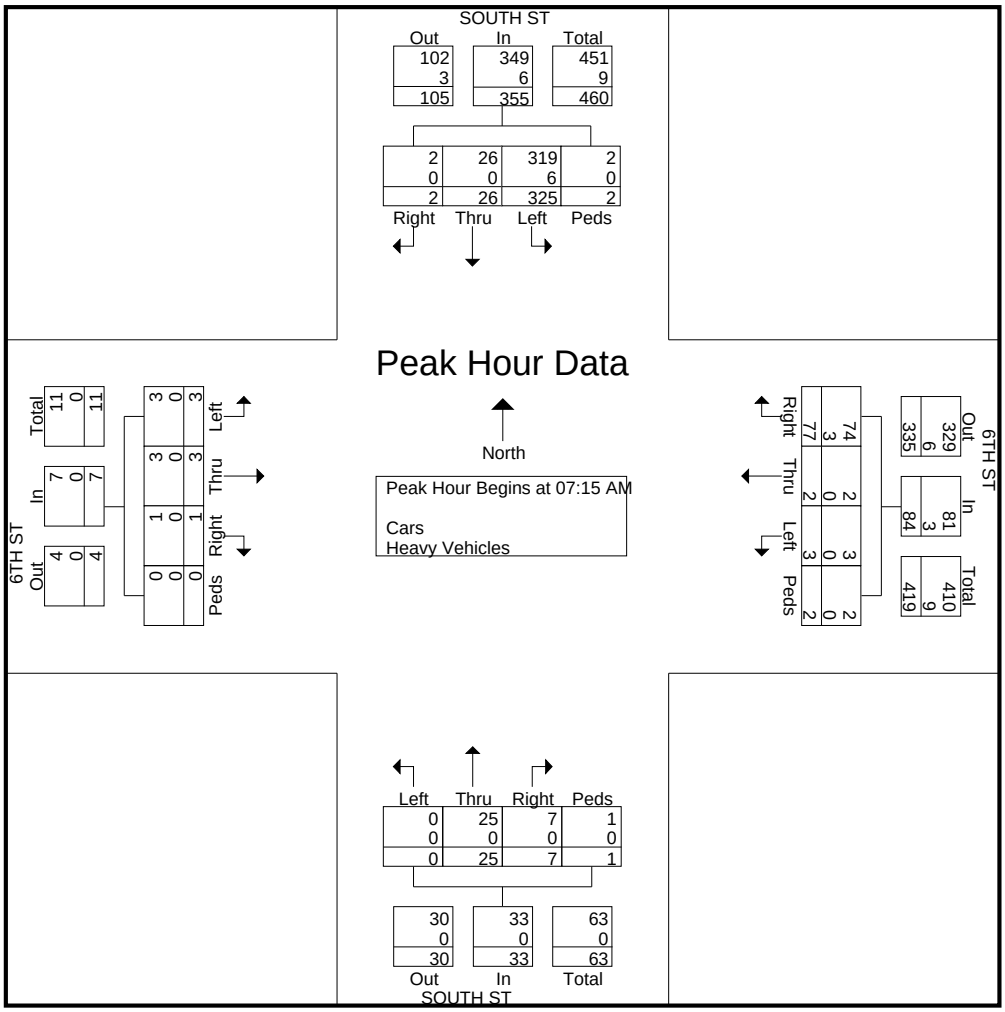
Location:New Castle County, DE
Intersection: 6th St / South St
Date: Wednesday, May 8, 2013
Counter:RZ

File Name : DD0508-1
Site Code : 00000000
Start Date : 5/8/2013
Page No : 3

	SOUTH ST Southbound					6TH ST Westbound					SOUTH ST Northbound					6TH ST Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	0	6	60	**1**	67	13	**1**	1	**2**	17	2	5	0	0	7	0	**1**	0	0	1	92
07:30 AM	0	**7**	89	0	96	20	1	0	0	21	2	**8**	0	0	**10**	0	1	0	0	1	128
07:45 AM	0	6	**107**	1	**114**	**22**	0	0	0	22	**3**	6	0	0	9	0	1	**2**	0	**3**	**148**
08:00 AM	**2**	7	69	0	78	22	0	**2**	0	**24**	0	6	0	**1**	7	**1**	0	1	0	2	111
Total Volume	2	26	325	2	355	77	2	3	2	84	7	25	0	1	33	1	3	3	0	7	479
% App. Total	0.6	7.3	91.5	0.6		91.7	2.4	3.6	2.4		21.2	75.8	0	3		14.3	42.9	42.9	0		
PHF	.250	.929	.759	.500	.779	.875	.500	.375	.250	.875	.583	.781	.000	.250	.825	.250	.750	.375	.000	.583	.809
Cars	2	26	319	2	349	74	2	3	2	81	7	25	0	1	33	1	3	3	0	7	470
% Cars	100	100	98.2	100	98.3	96.1	100	100	100	96.4	100	100	0	100	100	100	100	100	0	100	98.1
Heavy Vehicles																					
% Heavy Vehicles	0	0	1.8	0	1.7	3.9	0	0	0	3.6	0	0	0	0	0	0	0	0	0	0	1.9



Tri-State Traffic Data, Inc.

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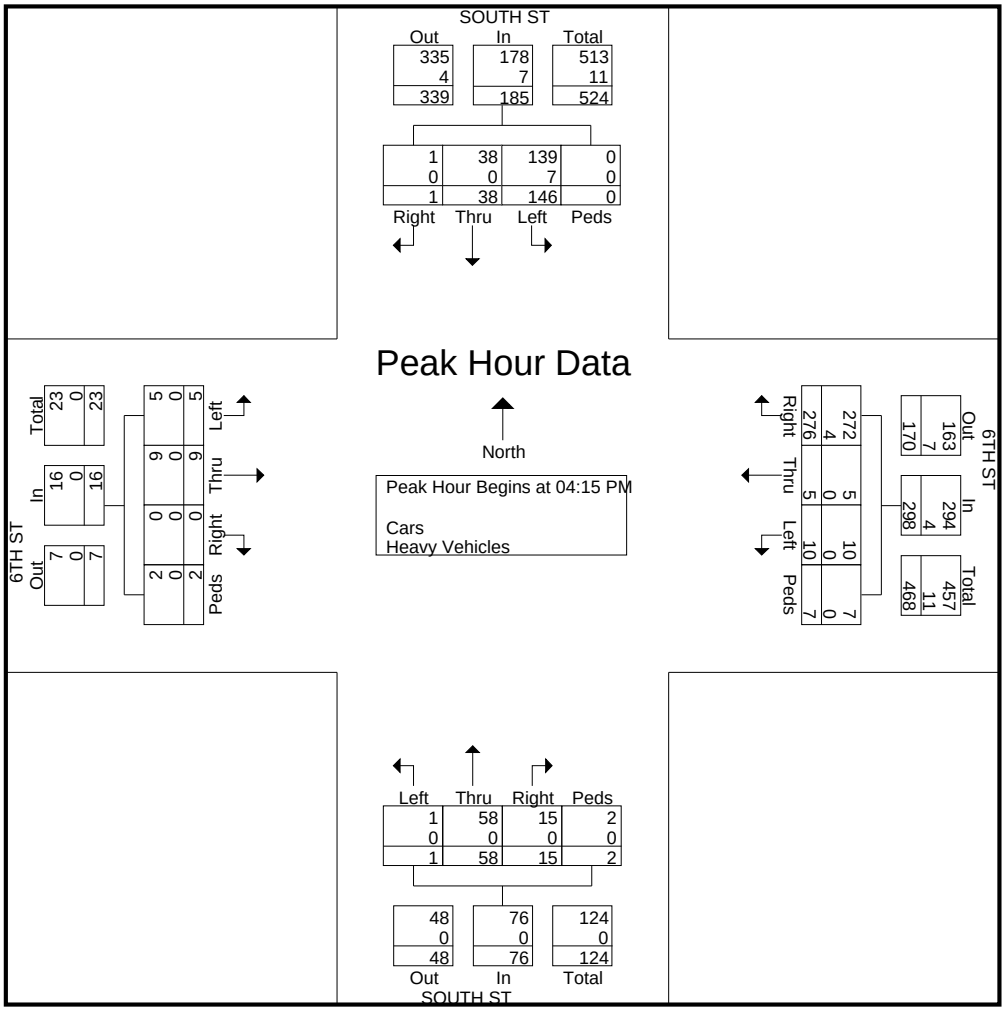
Intersection: 6th St / South St
Date: Wednesday, May 8, 2013
Counter:RZ

File Name : DD0508-1
Site Code : 00000000
Start Date : 5/8/2013
Page No : 4

	SOUTH ST Southbound					6TH ST Westbound					SOUTH ST Northbound					6TH ST Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	0	10	36	0	46	67	**3**	**7**	1	78	4	17	**1**	0	22	0	**5**	**2**	0	**7**	**153**
04:30 PM	0	**11**	38	0	**49**	59	0	0	0	59	**6**	**18**	0	0	**24**	0	0	0	0	0	132
04:45 PM	0	8	**40**	0	48	**75**	0	1	**5**	**81**	2	13	0	**2**	17	0	2	1	**2**	5	151
05:00 PM	**1**	9	32	0	42	75	2	2	1	80	3	10	0	0	13	0	2	2	0	4	139
Total Volume	1	38	146	0	185	276	5	10	7	298	15	58	1	2	76	0	9	5	2	16	575
% App. Total	0.5	20.5	78.9	0		92.6	1.7	3.4	2.3		19.7	76.3	1.3	2.6		0	56.2	31.2	12.5		
PHF	.250	.864	.913	.000	.944	.920	.417	.357	.350	.920	.625	.806	.250	.250	.792	.000	.450	.625	.250	.571	.940
Cars	1	38	139	0	178	272	5	10	7	294	15	58	1	2	76	0	9	5	2	16	564
% Cars	100	100	95.2	0	96.2	98.6	100	100	100	98.7	100	100	100	100	100	0	100	100	100	100	98.1
Heavy Vehicles																					
% Heavy Vehicles	0	0	4.8	0	3.8	1.4	0	0	0	1.3	0	0	0	0	0	0	0	0	0	0	1.9