

Tacony Creek Park – Tackling the Illegal Dumping, Stream Trash Problem



Entrance to TCP – by E Cheltenham Ave



Illegal Trash Dumping – S Whitaker Ave



Bottles Caught in Tree Branches – N Roosevelt Blvd



Stream Trash –Washed onto Floodplain - N Roosevelt Blvd



Stream Trash along bank by Juniata Park



Stream Trash by Juniata Park

Proposal for TCP Strategic Trash Program: Monitoring, Cleanup, Prevention, Communication

Kelly O'Day – 11/12/12

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Photos of Tacony Creek Just Below City – Montgomery County Line (11/8/12)



Plastic bags caught in bank vegetation



Stream trash on bank

We can do better than this!

Tacony Creek Park - Tackling the Illegal Dumping and Stream Trash Problem

"Trash is a huge problem. ..

".. much of the debris that finds its way into the Tacony and Cobbs creeks comes from overland flow and upstream."

" We find much less floatable debris in the Wissahickon and Pennypack."

"... Illegal dumping is a big problem in the Cobbs and Tacony... "

".. we need to focus on the litter on the street."

Source: Experienced Philadelphia Watersheds Observer, Sept., 2012

As a Philadelphia and TTF Watershed resident, I am concerned about the condition of Tacony Creek as it runs through Tacony Creek Park. This paper documents: 1) the result of my personal investigations into the extent of illegal dumping and stream trash conditions in the Park, 2) my assessment of the stream trash situation and 3) my conclusion that a City – TTF Watershed Partnership – Volunteer Task Force is needed to mobilize citizen scientists, university researchers, Park advocates and volunteers to help City agencies address this problem.

While I have discussed this issue with several organizations and individuals, the findings, conclusion and recommendations reflect my opinions and do not necessarily represent the positions of the TTF Watershed Partnership, City agencies or other parties.



Creek Just below E Cheltenham Ave: 11/8/12



Creek Just below Adams Ave: 11/8/12

Tacony Creek Park - Tackling the Illegal Dumping and Stream Trash Problem

Introduction

Tacony Creek Park (TCP) is being inundated with litter and stream trash that is being carried into the Park by illegal dumpers, Park visitors, it is flowing into the Park from upstream flows, stormwater runoff by direct runoff and by storm sewers and combined sewer overflows (CSO) and thrown into the Park by automobile commuters.

This is not a new problem. As part of PWD's 2003 River Conservation Plan, volunteers participated in a Visual Stream Assessment ([link to VSA](#)) to assess the conditions of Tacony/Frankford Creek. They found stream trash throughout the length of the Philadelphia section of the Creek, as shown in Figure 1.

"A total of 18 volunteers were involved in the assessments. Although the general reaction from the volunteers was a negative one, they were also hopeful of the positive impact that such a study and public awareness could have on the stream's future. They want this work to be a catalyst for the stream's improvement. They were disappointed with the condition of the streambank, the abundant amounts of debris, and the inaccessibility of the stream in many areas." **Source: PWD Tacony/Frankford Creek River Conservation Plan – VIII. 2003 Visual Stream Assessment (VSA)**

This 2003 VSA volunteer discussion shows their disappointment about the conditions of Tacony Creek and their concerns for what they saw in 2003.

In 2012, 9 years later, Tacony Creek and Tacony Creek Park (TCP) are still being inundated with litter and stream trash. Solving these long term problems will require a focused and coordinated effort by the City's Water, Streets and Parks & Recreation Departments and PennDOT working with the public, TTF Watershed Partnership, civic groups, volunteers and concerned individuals to solve these problems.

This paper reviews the problem and presents a proposal to establish a City - TTF Watershed Partnership – Volunteer supported Initiative to strategically address the TCP Illegal Dumping and Stream Trash problem.

- Monitoring** - we need to routinely measure stream trash conditions to understand the problem
- Clean-up** – we need to prioritize cleanups based on monitoring
- Prevention** - we need to reduce the trash load with fences, litter traps, surveillance
- Communication** – we need to educate the public about litter's pollution impact on our streams and rivers

**2003 Tacony Frankford River Conservation Plan (PWD)
Visual Stream Assessment - Stream Trash Conditions**

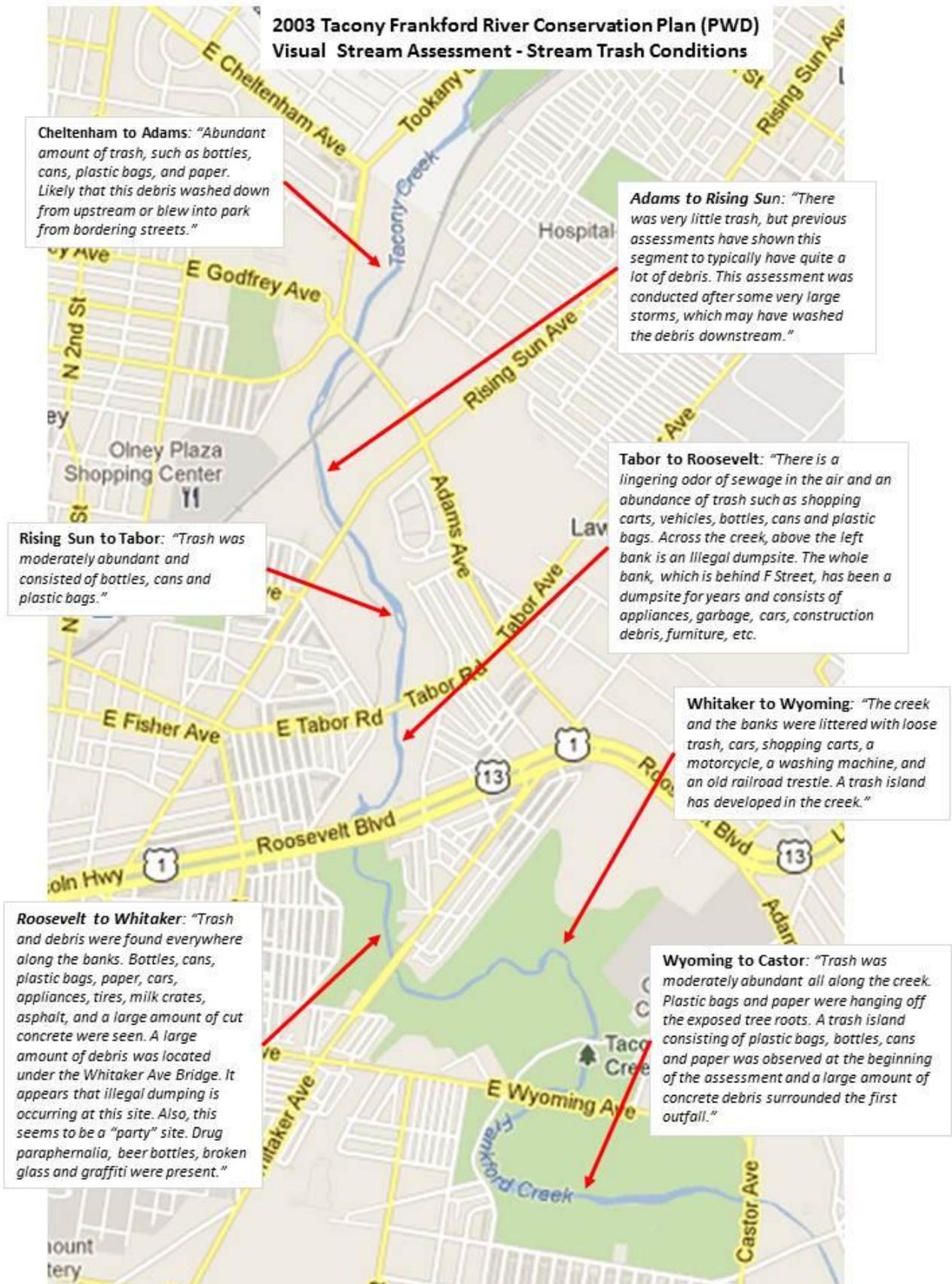


Figure 1: 2003 Visual Stream Assessment – Stream Trash Summary by Stream Section

Visual Stream Assessment (VSA)

The Water and Parks & Recreation Departments have made significant and visible progress in improving the Tacony Creek Park. The 2003 VSA for the section between Whitaker Ave and Wyoming Ave, for example, found a washing machine, 3 cars and a shopping cart.

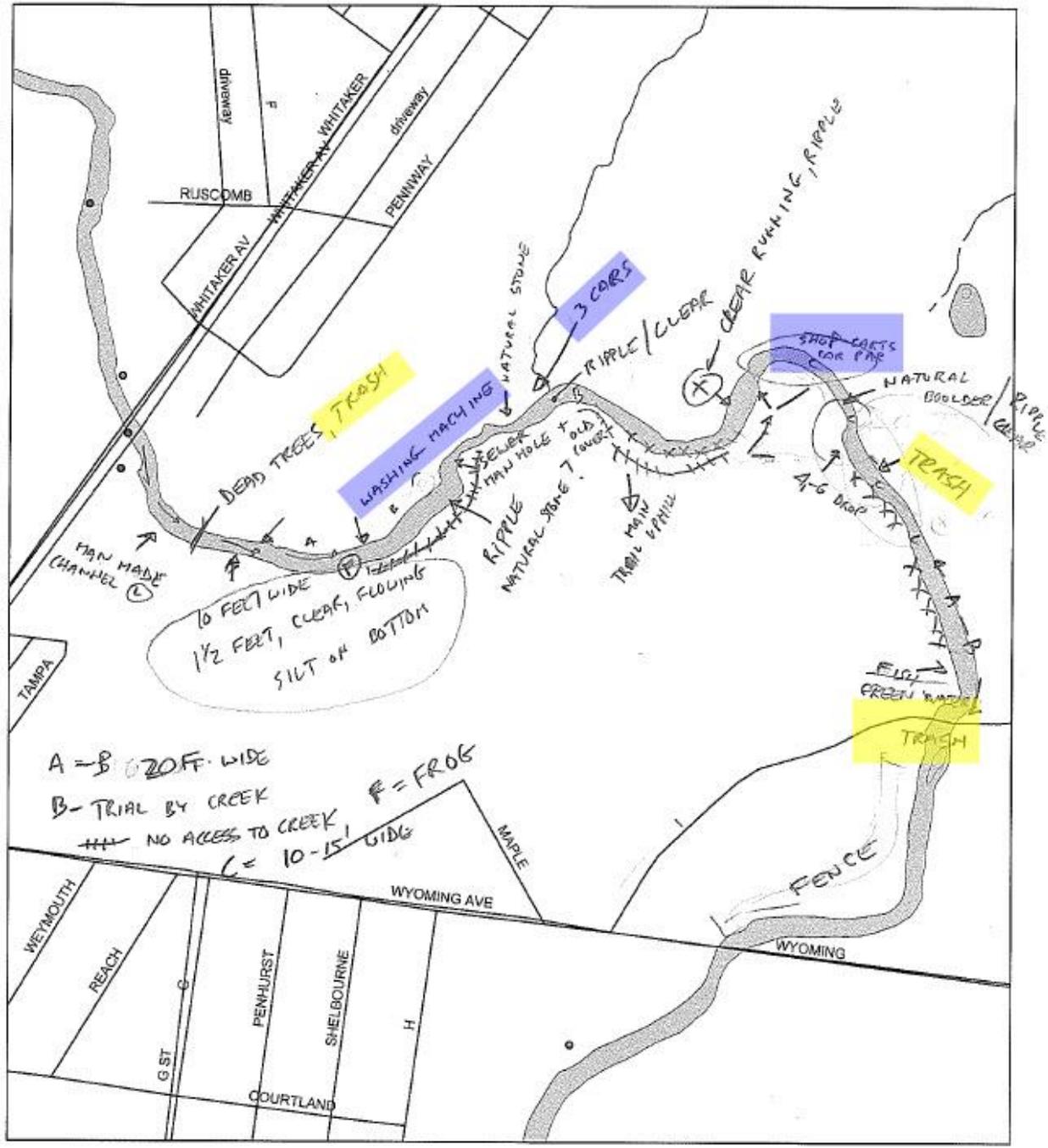


Figure 2: Whitaker Ave to Wyoming Ave Conditions (2003 VSA Field Notes Sketch)

The 2012 conditions for the Whitaker Ave to Fisher Lane section of Tacony Creek Park are shown in Figure 3. While the 3 cars, washing machine and shopping cart have been removed, illegal dumping and stream trash continue.

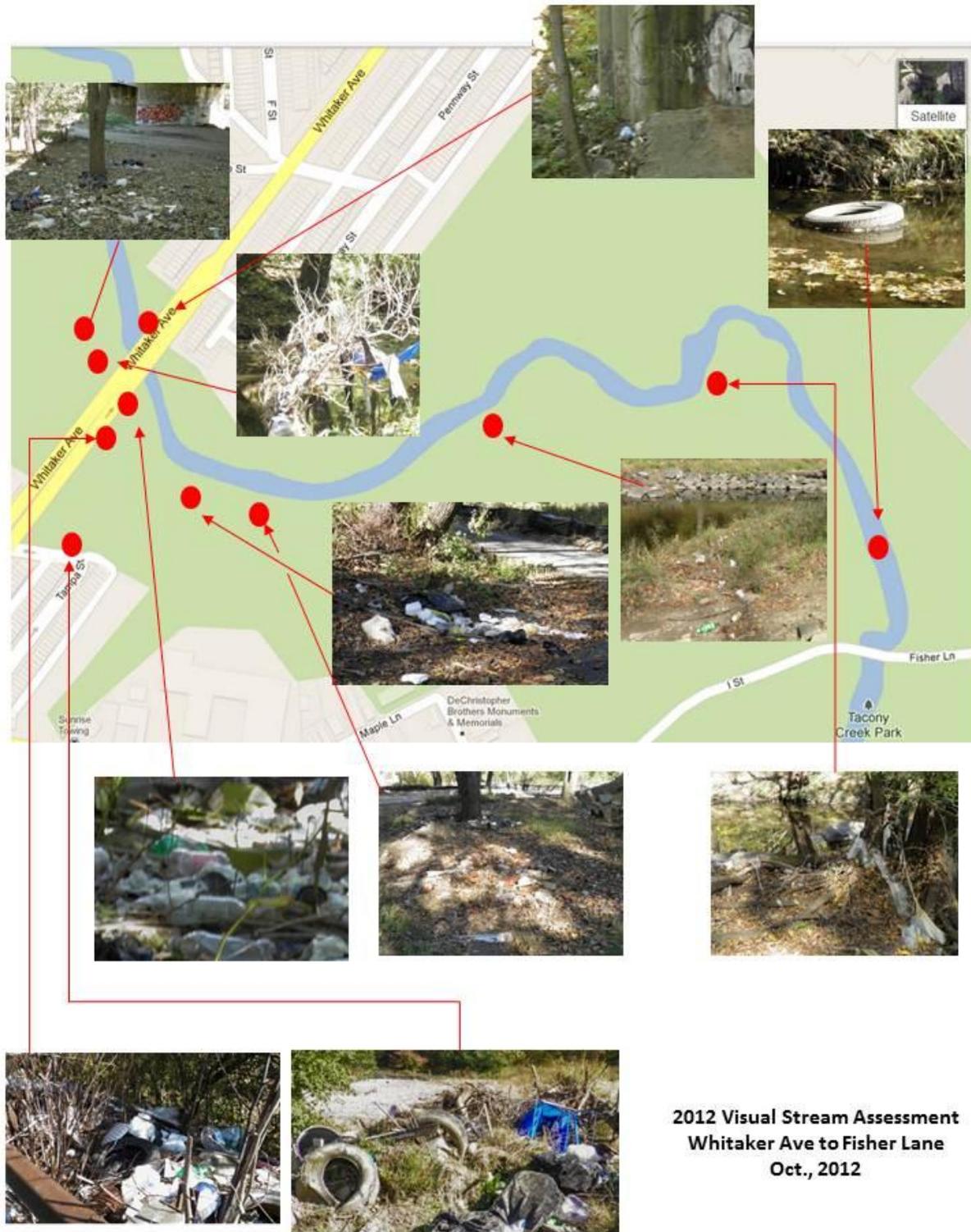


Figure 3 – 2012 Photo Survey: Whitaker Ave to Fisher Lane

The comparison of the 2003 and 2012 Tacony Creek Park Section 5 conditions shows the potential power of annual VSAs to spot illegal dumping and document stream trash conditions to help refocus City and volunteer efforts as needed.

Sources of Stream Trash (upstream, stormwater, illegal dumping)

There are a several stream trash sources upstream and in the Tacony Creek Park, including:

- Montgomery County
- Street Litter in Direct Run-off
- Stormwater Related : CSO/ Storm Drain Discharges
- Thrown by auto commuters
- Illegal Dumping
- Park Visitors

To eliminate TCP Stream Trash, we will need to understand the magnitude, frequency and patterns of stream trash contributions from each source. For example, how important are Tookany Creek flows, Philadelphia street litter run-off, Park Visitors and illegal dumping to the problem? The relative contributions will vary by location and season. Each of these potential sources is briefly discussed below.

Montgomery County: There are approximately 16 square miles of TTF Watershed drainage area upstream of the TCP at the City Line near E Cheltenham Ave. How much stream trash comes down the Tookany Creek to the TCP? There is limited information on stream trash in this first section of Tacony Creek as it enters Philadelphia via Tookany Creek. The 2003 VSA report for the VSA Section 1 ([link](#)) from E Cheltenham Ave to Adams Ave reported:

There was an abundant amount of trash, such as bottles, cans, plastic bags, and paper. It is likely that this debris washed down from upstream or blew into the park from its bordering streets.

The VSA Section 1 detailed field notes indicated that *overflowing* .

Montgomery County appears to contributing stream trash in the upper section of Section 1. Estimation of the Montgomery County trash load will require field measurements.



Photo 1: Adams Ave littered stormwater runoff

Street Litter in Direct Run-off: There are several areas in TCP where street litter appears to be carried to the Park via direct runoff.

Adams Ave is a prime example. Photo 1 shows how street litter from Adams Ave stormwater runoff enters Tacony Creek from the NW side of Adams / ***Photo 1: Adams Ave Direct runoff pathway***

Photo 2 shows litter build-up on the SW side of Adams Ave which can easily wash into Tacony Creek via direct runoff through natural channels like the one in Photo 3, taken on the SW side of Adams Ave.



Photo 2: Adams Ave litter ready to flow into TCP

Since Adams Ave is a PENNDOT highway, any Adams Ave street litter trapping will need to be coordinated with PENNDOT.



Photo 3: Adams Ave stormwater channel into TCP

Stormwater Related : CSO/ Storm Drain

Discharges: City inlets are trapped so that, when working properly, they should not contribute significant floatables to Tacony Creek during storm conditions. Separate storm sewer and CSO inlets, while trapped, may not all be working properly so that a few may contribute to the stream trash situation from time to time, depending on the trap conditions.

Photo 4, just upstream of Whitaker Ave, shows that CSO T11 may have discharged floatable debris in the August – October, 2012 time period.



Photo 4: CSO T11

Photo 5, just downstream of T11, shows the left bank is full of debris that appears to be from T11.



Photo 5: Just Downstream CSO T11

Photo 6 shows a separate storm sewer that discharges under the NE side of Tabor Road bridge as it crosses Tacony Creek. This storm drain discharges trash which is evident just downstream of the overflow point.



Photo 6: Separate Sewer – NE side of Tabor Road

Photo 7 shows stream trash in Tacony Creek near the Rising Sun Ave T4 CSO. PWD conducted a long term demonstration project which concluded that little litter related stream trash was discharged at this CSO. Visual inspection near the outfall, however, shows signs of stream trash near the outfall



Photo 7: CSO T4 By Rising Sun Ave

Routine, visual inspection of Tacony Creek after rain events could help identify storm water related stream trash sources and provide useful information on stream trash discharges from storm sewer and/or CSO overflow discharges. PWD could then investigate the drainage area upstream of the discharge to find the problem inlet(s).

Illegal Dumping: Keep Pennsylvania Beautiful conducted a comprehensive Illegal Dumpsite Survey in Philadelphia in 2011 – 2012 ([link](#)). They found a total of 296 dumpsites in the City with an estimated 559 tons of trash ([link](#)). The TTF Watershed illegal dumps from the Keep Pa Beautiful Survey are shown in Figure 4 below.

The Whitaker Ave to Wyoming Ave section of TCP has a considerable number of illegal dumpsites close to the Creek that need attention (see Figure 3, page 6).

Illegal Dumpsites – Philadelphia Portion of TTF Watershed
Source: Keep Pa Beautiful, 2012 Illegal Dumpsite Survey

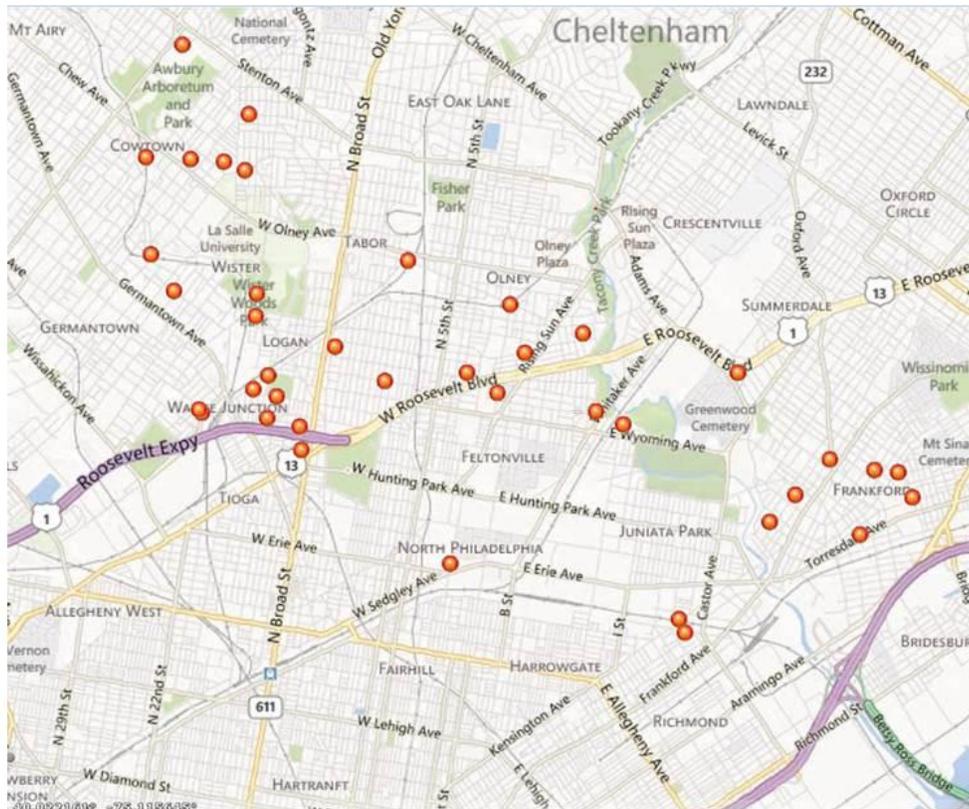


Figure 4: Illegal Dumpsites – Philadelphia Portion of TTF Watershed

PWD and P&PR have been successful in addressing several illegal dumpsites in the TCP area, including the F Street dumpsite. Photo 8 shows fencing and a barricade that were installed to prevent illegal dumping in the alley behind F Street.



Photo 8: Fencing – Barricade to Prevent Illegal Dumping – F Street

Park Visitor Litter: Inconsiderate Park visitors may leave litter, picnic debris and worse near where they spend time In the Park. Park visitor litter can be viewed as a base trash load condition which is increased by Illegal Dumping and Stormwater related stream trash.



Photo 9 : Overflowing Trash Bin – Section 1, Upstream of Adams Ave (11/8/12)

Connecting the Litter – Stream Trash Dots

Understanding why stream trash builds-up in specific areas requires an understanding of the sources of the trash, the movement of the trash through the Park and the physical characteristics of the stream channel and floodplain. Trash that has been thrown into the Park by passing cars, for example will move differently than debris that has flowed into the Park from upstream, or by overland flow or CSO/storm sewer discharges within the Park.

To be able to prevent future stream trash, we need stream trash detectives who are able to spot trash during visual surveys, assess the nature of the trash and where it came from and how it got to its current location (no movement, wind movement or stormwater movement).

Figure 5 shows 4 locations where plastic bottle have built up in the TCP: SW side of Adams Ave Bridge, W side of Tacony Creek by F Street, Old Bingham Ball Field, below Whitaker Ave Bridge.

How did the plastic bottles get there? Did they flow downstream or were they thrown there? We must understand the source(s) and movement before we can design corrective measures.

Plastic Bottle Debris Areas

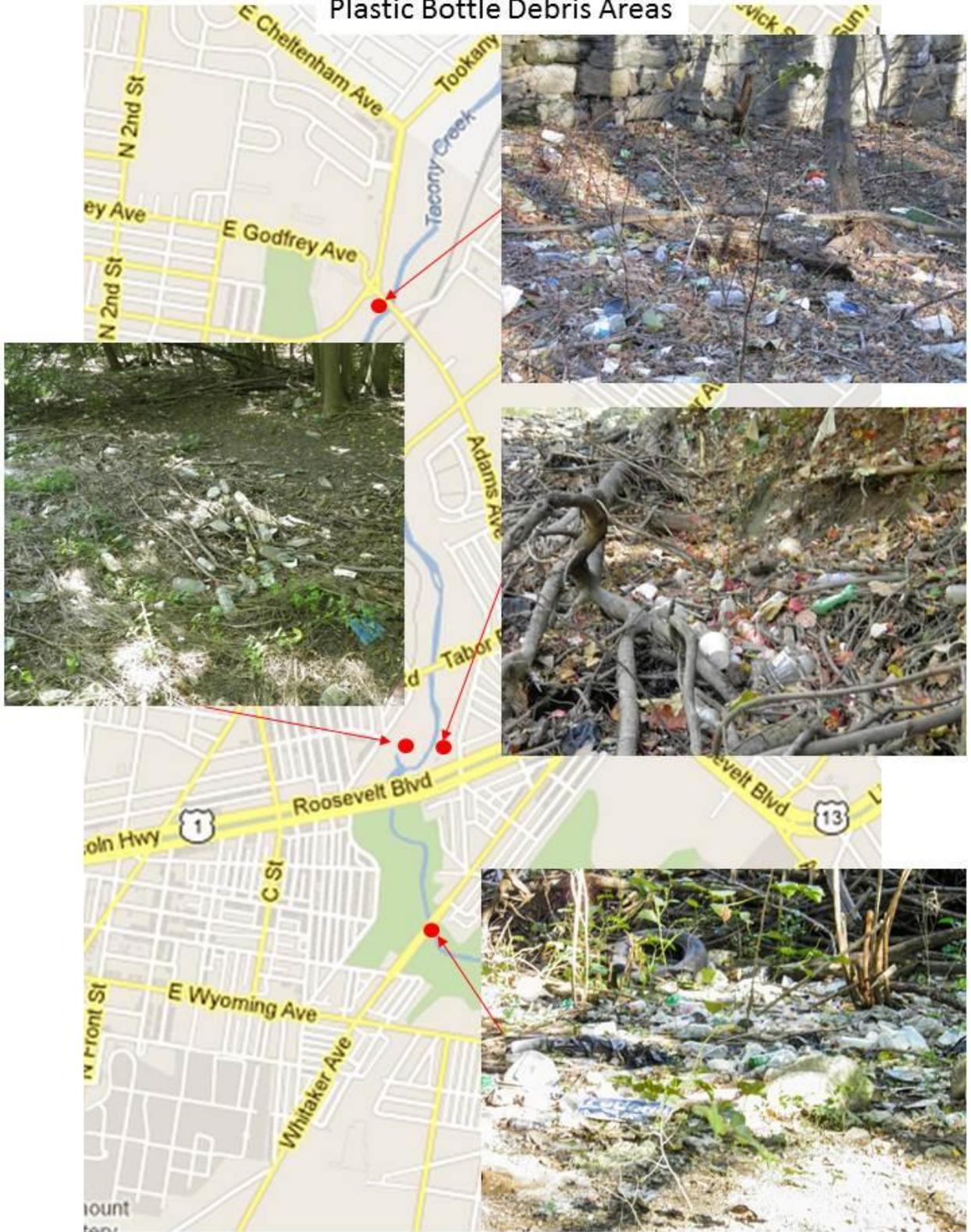


Figure 5: Plastic Bottle Debris Areas

The plastic bottle build-up in the Old Bingham Street Ball Field, shown in Photo 9, provides a good example of the interplay of litter with the physical characteristics of the stream channel – floodplain.

This area, just upstream of Roosevelt Blvd on the west side of the Creek, has an extensive plastic bottle and stream trash field. After reviewing PWD’s geomorphologic survey data for this stream section, it is clear that the stream trash build-up is caused by the relatively shallow floodplain in this area which allows upstream trash to be routinely deposited in this field during high stream flow events.



Photo 10: Old Bingham Street Ballfield Stream Trash

While cleanups can help remove this debris, the long term solution to this local debris build-up will require either prevention/ reduction of upstream stream trash loading or stream trash removal prior to deposition in the field.

Solving the Old Bingham Street Ball Field stream trash problem and similar storm trash problems will require an understanding of where the trash is coming from as well as specific corrective action plans. In this case, cleanups only provide a temporary band-aid solution to an on-going stream trash build-up problem.

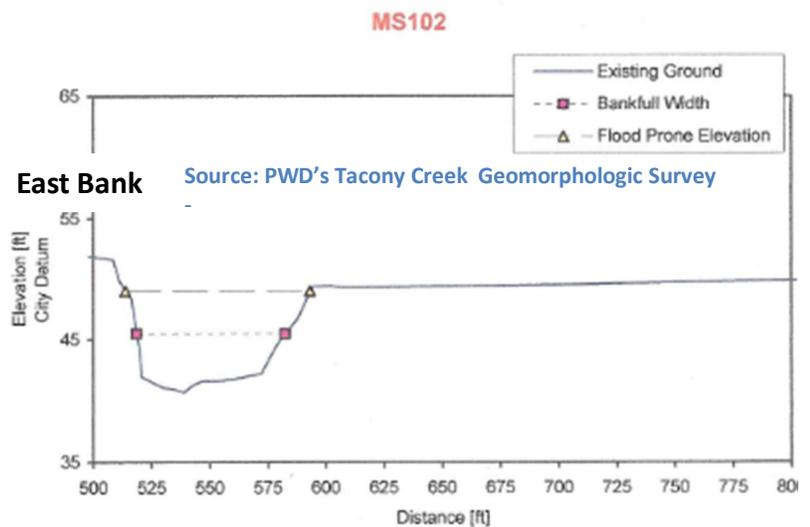


Figure 6: Stream Cross Section - MS102, Just N Roosevelt Blvd

Why Is Illegal Dumping and Stream Trash So Extensive in Tacony Creek Park?

Several factors make illegal dumping and stream trash particularly challenging in the Tacony Creek Park:

1. **Multiple City Agencies:** Several agencies are involved in specific aspects of the Tacony Creek Park Illegal Dumping and Stream Trash Problem, however, no agency has overall responsibility.
 - a. The Parks & Recreation Department has overall Park maintenance responsibility; however, PP&R does not have authority or resources to correct illegal dumping and stormwater based stream trash.
 - b. The Water Department has a major role in controlling stream trash. There are 13 combined sewer overflows (CSO's) and several stormwater outfalls that discharge to the Tacony Creek between Cheltenham Ave and Juniata Park. While City stormwater inlets are trapped, street litter may discharge to Tacony Creek from time –to-time if some inlet traps are not functioning properly.
 - c. The Streets Department has trash and illegal dumping control responsibilities. There are an estimated 296 illegal dumps throughout the City.
 - d. The Police Department has a surveillance role to play in illegal dumping. Since there are 5 Police Districts that cover part of Tacony Creek Park, coordinated surveillance of TCP illegal dumping is challenging.

2. **PennDOT:** PennDOT has design, construction and maintenance responsibility for 4 major roads that cross Tacony Creek Park in the Park area: Adams Ave, Rising Sun Ave, Roosevelt Blvd, Whitaker Ave. PennDOT also has full responsibility for Cresentville Road that runs along the Park's west perimeter between Cheltenham Ave and Adams Ave. Figure 7 shows these 5 routes and 2010 average daily traffic counts for each PennDOT's road sections.

Tabor Road, Fisher Lane and Wyoming Ave are City streets that cross Tacony Creek in the Park area.

While most Philadelphia City streets have curbs and trapped stormwater inlets, PennDOT does not provide curbs for several streets in the TCP area, allowing direct runoff of litter laden stormwater into Tacony Creek. Those PennDOT streets/highways with curbing only provide traps for the last inlet before discharge, which may allow potential discharge of street litter if some PennDOT inlet traps are not functioning properly.

The PennDOT stormwater runoff that drains to TCP needs to be carefully evaluated to assess the contribution of PennDOT roadway litter on the TCP stream trash load.

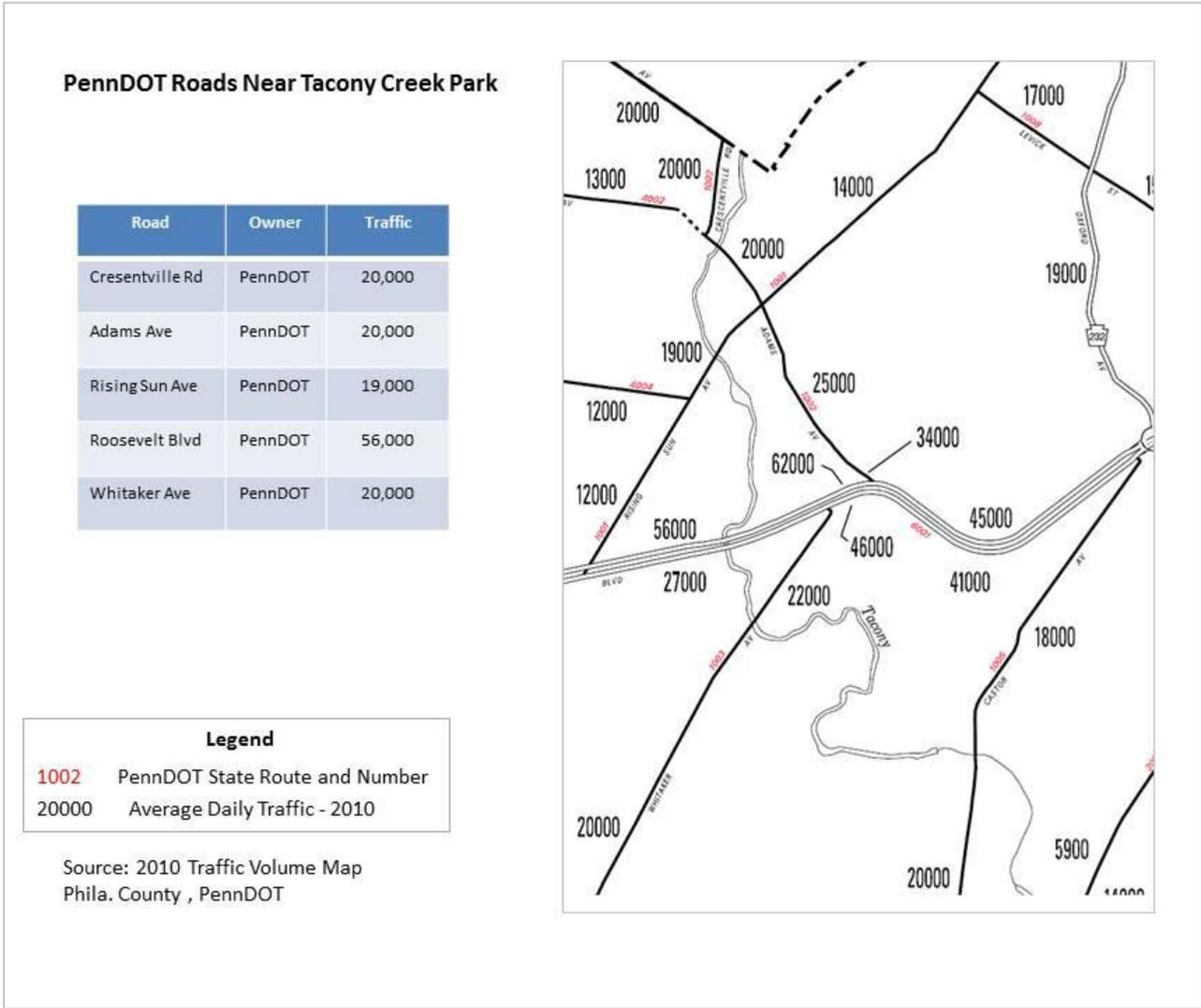


Figure 7: PennDOT TCP Area Routes and Traffic Counts (2010)

Case Study – Anacostia River

The Anacostia River runs through parts of Maryland and Washington DC before it discharges to the Potomac River. This watershed has a very serious stream trash problem and we may be able to learn from their experiences.

The Anacostia River watershed trash problem was so bad that the Maryland Department of the Environment and the District of Columbia Department of Natural Resources Administration assigned total maximum daily loads (TMDL) of trash for the municipalities within the Anacostia watershed ([link](#)).

There are several groups working hard to control the Anacostia River stream trash:

- Anacostia Riverkeeper ([link](#))
- Groundwork Anacostia River DC (GWARDC) ([link](#))
- Trash Free Potomac Watershed Initiative (Alice Ferguson Foundation) ([link](#))

These agency websites provide a wealth of practical experience dealing with stream trash in a complex – multi-jurisdictional situation. While there are many aspect to the Anacostia stream trash initiative, I would like to highlight one that may be directly applicable to the Tacony Creek, in-stream trash traps. The 1st in stream trash was installed in 2008. The District Department of the Environment (DDOE) installed 2 new trash traps in January, 2012 ([link](#)). They also provided a grant to the GWARDC for on-going trash removal from the traps.

Here is a video that shows how the in-stream trash trap operates ([link](#)).



To play videos, move cursor ovr image, standard video controls will appear. You can start and stop video.

To view full screen, move cursor overimage, right click and select full screnn option.

This video shows how DDOE issued a grant to a local non-profit group to provide a training opportunity for local youth.



Some of these Anacostia River approaches to stream trash control may be very useful for the Tacony Creek and other Philadelphia streams.

Proposal to Address the Tacony Creek Parks Illegal Dumping and Stream Trash Problem

Solving the Tacony Creek Park Illegal Dumping and Stream Trash problem will require a coordinated and innovative City – TTF Watershed Partnership – Volunteer effort to systematically monitor visual stream conditions, prioritize cleanups, measure build-up rates after cleanups, focus on problem area prevention plans for target areas, share data, photographs and maps and strive to continuously improve the Park conditions. Here are 4 elements of a comprehensive TCP Stream Trash Initiative:

Monitoring

- Baseline VSA (map, locate build-up areas, dump areas)
- Routinely survey illegal dumpsites and stream corridor, update maps and database
- Establish and updates maps and database to support on-going condition tracking
- Prioritize clean-up and prevention target areas based on VSA
- Assess build-up rates after clean-ups

Clean-up

- Coordinate City, volunteer clean-ups
- Focus on priority areas
- Characterize clean-up material to identify type, quantity, potential sources

Prevention

- Assess sources for priority areas
- Develop Action Plans for priority Target Areas (fences, lighting, surveillance, litter traps)
- Assess effectiveness of preventive actions

Communication

- Prepare and distribute annual report on TTF stream trash conditions
- Coordinate with Philadelphia's UnLitter US, Keep Phila Beautiful, Keep Pa Beautiful, other programs

Short Term Action Plan

- Establish TCP Task Force: City Agencies, TTF Watershed Partnership, Keep Pa Beautiful, Keep Philadelphia Beautiful, United-by-Blue, others – 1/15/13
- Conduct Baseline Illegal Dumping and Stream Trash Visual Stream Assessment – 4/1/13
- Develop Prioritized 2013 Cleanup Plan based on VSA – 5/1/13
- Develop Initial Prevention Plan Priority Areas and Schedule - TBD
- Develop Communication Plan - TBD

Stream Trash Resources

- A. [Tacony Creek Park – Stream Trash Web Page](#)
- B. [2003 Visual Stream Assessment \(Appendix VII\)](#)
- C. [2003 VSA Field Forms - Section 5](#)
- D. Maps
 - 1. [Simple TCP Map](#)
 - 2. [PennDOT Traffic Counts – TCP Area](#)
 - 3. [Philadelphia Police Districts – TCP Area](#)
 - 4. [Keep Pa Beautiful – Map of Philadelphia Illegal Dumpsites – Attachment 3 of 2012 Report](#)
- E. Anacostia River
 - 1. [Stream Trash Methodology – Anacostia River](#)
 - 2. [Anacostia River TMDL Baseline Monitoring Report](#) – Excellent Stream Trash Survey Information
 - 3. [Anacostia Riverkeeper](#)
 - 4. [Groundworks Anacostia River DC](#)
 - 5. [Trash Free Potomac Watershed Initiative](#)
 - 6. [Anacostia River Trash TMDL](#)
 - 7. [Bandalong Trash Trap Video](#)
- F. [South of South Neighborhood Association – Litter Survey Training Manual - Litter Index](#)