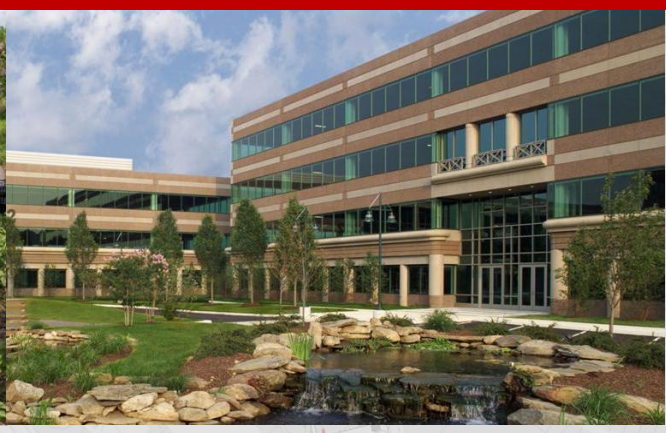
March 2012

NAS-JRB Willow Grove Redevelopment Plan



Prepared for:

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DRAFT

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Acknowledgements

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Horsham Township Authority for NAS-JRB Willow Grove (HLRA)
March 2012

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EXECUTIVE SUMMARY

A. INTRODUCTION

The redevelopment of the 862-acres at NAS-JRB Willow Grove is an unprecedented opportunity for Horsham Township. Once the land is transferred, the surplus property will comprise approximately 8% of the Township's total land area. With proper planning, the redevelopment of the NAS-JRB Willow Grove will become a centerpiece for economic development within the Township and surrounding region. The NAS-JRB Willow Grove Base Reuse Master Plan details the existing conditions, issues and opportunities, and recommendations that will guide the Horsham Township in the redevelopment process. This Executive Summary is a brief overview of the major issues and findings contained in the plan.

B. BRAC OVERVIEW

NAS-JRB Willow Grove Closed Under BRAC 2005

In 2005, the recommendation was made to the Base Realignment and Closure Commission (BRAC), and approved by act of Congress, to close NAS-JRB Willow Grove. BRAC is the process used by the Department of Defense to reorganize its installation infrastructure to more efficiently and effectively support its forces, increase operational readiness and facilitate new ways of doing business. As prescribed by law, in early 2006 all federal agencies were given an opportunity to acquire some or all of the property from the Navy, all declined. NAS-JRB Willow Grove was to have been declared surplus in June 2006. However, there was a delay in the closure process. This delay was initiated through the passing of special legislation at the request of former Governor Rendell, to allow for the creation of a joint interagency installation. However, in November 2009, the Governor was forced to withdraw support for the proposed installation, which would have been the nation's only state-operated base to provide national defense, homeland security, and emergency preparedness operations.

With state revenues contracting due to the severe economic recession of 2009, the Governor advised the U.S. Secretary of Defense that the Commonwealth of Pennsylvania would not be taking ownership

or title of the installation and suggested the property be retained by the Department of Defense (DOD). In January, 2010 all federal agencies were once again given an opportunity to acquire some or all of the property from the Navy. The navy approved the following transfers:

- 3 acres to the Federal Aviation Administration (FAA) for property along Horsham Road including their radar tower.
- 27 acres to the Air Force to add to their military enclave known as the Horsham Air Guard Station.

After a four year delay, the Navy finally issued a declaration of surplus property on September 16, 2010. This was the first official listing in the Federal Register of the amount of property that the Federal Government would be disposing of under BRAC 2005 at NAS-JRB Willow Grove."
On November 5, 2010, the HLRA solicited in the newspaper for proposals from national land planning consultants. The HLRA received three (3) requests for proposals and selected RKG Associates, Inc. a Dover, NH-based consulting firm in January, 2011 to help prepare a redevelopment plan for NAS-JRB Willow Grove.

RKG worked with the HLRA in holding numerous public meetings and gathering and analyzing data. The information was used to prepare a redevelopment plan for the 892 acres of surplus land when the military ceased operations in September, 2011. RKG undertook a comprehensive analysis to determine the condition of the base's physical infrastructure. RKG Associates, Inc. has worked with communities in more than 50 military base redevelopment projects in instances where the military installation shut down, was realigned or was growing.

C. PUBLIC ENGAGEMENT PROCESS

An extensive public outreach process was undertaken as part of the NAS-JRB Willow Grove Redevelopment Plan process. HLRA Board meetings, which were open to the public, were held once a month during this process. In addition to the Board meetings, the consultant team organized multiple community meetings, all of which were open to the general public, HLRA Board members and elected township officials. All meetings included an opportunity for open public comment, either through organized breakout sessions or in an open public forum. The HLRA Board members, elected township officials and the general public were in attendance at all meetings. The meetings were held at the Horsham Township Building and at the Horsham Township Community Center to accommodate all interested parties. The dates of the meetings were as follows:

December 16, 2010	HLRA Workshop and Base Tour
January 19, 2011	HLRA Executive Board Meeting
February 7, 2011	Kick-off Meeting
March 16, 2011	HLRA Executive Board Meeting

April 20, 2011	Existing Conditions Presentation
May 18, 2011	HLRA Executive Board Meeting
June 10, 2011	Community Design Charrette (session 1)
June 10, 2011	Community Design Charrette (session 2)
June 11, 2011	Open Public Viewing
June 15, 2011	HLRA Executive Board Meeting
July 27, 2011	Review of NOI's
August 17, 2011	Presentation of Base Reuse Alternatives
September 21, 2011	HLRA Executive Board Meeting
October 19, 2011	Presentation of Reuse Plan Refinements
November 16, 2011	Presentation of Preferred Reuse Alternative D
December 21, 2011	HLRA Executive Board Meeting
January 18, 2012	Presentation of Final Preferred Reuse Alternative E
February 15, 2012	HLRA Executive Board Meeting

D. EXISTING CONDITIONS

1. Site Characteristics and Conditions

- Status of IRP Program Sites - Based on unrestricted use and unlimited exposure scenarios at nine (Sites 1, 2, 4, 5, 6, 7, 8, 9, and 11) of the 12 IRP sites, no further action is required and there are no existing or anticipated restrictions on uses of the sites. Therefore, there are no constraints anticipated associated with potential future reuse or development of the property associated with these nine sites, or portions thereof. The Navy's Installation Restoration Program (IRP) includes sites both on the surplus property and the property owned and/or transferred to the Air Force for the Horsham Air Guard Station. Thus, Sites 1, 9, 10 and 11 do not impact the redevelopment plan in the same way as the remaining sites.

- Floodplains - A small area adjacent to Park Creek at the extreme northern end of the runway safety zone is the only area on base that would be inundated during 100-year flood events (Figure 2-2). This area encompasses both side of Keith Valley Road and is prone to road flooding during seasonal rain events.

- Wetlands - There are 21 separate wetland areas within the boundary of NAS-JRB (Figure 2-2). The wetlands are comprised of palustrine, riverine, and lacustrine systems and cover a total area of approximately 14.3 acres. The palustrine systems predominately consist of forested, scrub/shrub, emergent and open water classes. The riverine systems, which are located along Park Creek at the northern end of the base and at various other on-base drainage locations, are either perennial or intermittent in nature.

2. Infrastructure

- Potable Water - Potable water supply wells have been transferred to the U.S. Air Force and will not be available for reuse. The Horsham Water & Sewer Authority is negotiating with the Horsham Air Guard Station concerning access to excess water capacity from the Navy water supply wells being transferred to the U.S. Air Force.

- Wastewater - The Navy shut down the NAS-JRB Willow Grove wastewater treatment plant in September 2011, and demolished the plant. Sewage flows from the Horsham Air Guard Station facility are now sent to the Horsham Water & Sewer Authority system via a new

connector that was constructed in the fall of 2011. Currently, there is no system to handle wastewater distribution outside the Horsham Air Guard Station.

- Stormwater Management - The area located north of the main runway is a largely undeveloped area that slopes down to Keith Valley Road. The stormwater run-off at this location creates regular flooding during seasonal rain events. Stormwater flows to a small stream on the property and runs off the site to Keith Valley Road where it often overflows its banks resulting in road flooding several times a year. As redevelopment occurs at NAS-JRB, stormwater management in this area must be addressed.

- Runway, Taxiways, and Aviation Aprons - The existing runway is approximately 8,000 feet long by 200 feet wide. Although design drawings from 1953 indicate that the newer section (northern half) of the main runway was constructed using 12 or 18 inches of base material and 3 inches of bituminous asphalt paving, subsequent milling and overlays may have increased the thickness of the paved surface. The runway ends are 10 inches of reinforced concrete over 12 inches of base material. The aprons are of different thicknesses, varying from 10 inches of reinforced concrete with base material to 14 inches of unreinforced concreted slabs (with interlocking dowels) and base. It is likely that the entire runway, taxiways and aprons will have to be removed to facilitate redevelopment. The estimated cost of removal is roughly $17 million.

3. Existing Buildings

- Reuse of Existing Structures - The reuse of existing buildings and the infrastructure that supports them presents issues of age, condition, cost, and suitability for reuse. Most of the buildings are in poor or moderate condition. The Navy's decision to terminate building utilities (heat, air conditioning, water and sewer) will hasten deterioration of the existing buildings and make their future reuse uncertain or cost prohibitive.

- Costs of "Reactivating" Facilities – The Navy's mothballing program will require significant expenditures to reactivate any building in the future. It is anticipated that the per square foot costs of reactivation could be in the range of $14 to as much as $40 per square foot, depending on the type of building, location, proximity to infrastructure and intended use. This means that if the 600,000 square feet of facilities reviewed in this section were reactivated, the total cost would range from $8.4 to $24 million. It should be noted that these cost ranges do not include the costs of bringing the facilities up to current code and include only the reactivation of the buildings.

4. Traffic and Transportation

- Regional Access – NAS-JRB and Horsham Township enjoy favorable regional access with the proximity of the Pennsylvania Turnpike (Interstate 276), which is located approximately 2.5 miles south of the subject property and connects the township to the rest of the metropolitan region and Center City Philadelphia which is located 18 miles south of the township.

- Traffic Congestion - The roadway network is generally congested particularly during peak hours (AM and PM rush hours). The overall traffic volumes, combined with limited site access, the presence of businesses, and limited network connections around the facility contribute to localized road congestion.

- Public Transit Service - The area around The Willow Grove Naval Air Station is served by SEPTA's Route 55 Bus Service that connects Doylestown in Bucks County with the Olney

Transportation Center. The bus route makes several transit stops at Doylestown in the north and Willow Grove, Noble, Elkins Park and Melrose Park in the south. The Olney Transportation Center has connections to multiple bus lines as well as the Broad Street subway line.

- North/South Commuting Patterns - The traffic volumes are highly directional with southbound traffic peaking in the morning and a reverse commute northbound peaking in the late afternoon. In large part this is due to commuting patterns traveling to and from the region's large employment centers, heading south in the morning and returning north in the evenings.

- AADTs (Annual Average Daily Traffic volumes) – AADTs were analyzed using Delaware Valley Regional Planning Commission historical traffic data for PA 611 and Horsham Road. The analysis shows that traffic volumes have not changed significantly over the past 5 years. The AADT for PA 611 near the entrance to the former Naval Air Station was documented to be 35,348 in August of 2006 and 36,568 in August of 2009. This equates to approximately a 1% growth rate per year. The AADT for Horsham Road near the site was documented to be 30,351 in August of 2007 and 29,450 in August of 2008. This was a 3.0 % decrease in volume over 1 year.

- Constrained Intersections - Several intersections surrounding NAS-JRB that were studied fail or are on the verge failing under the existing conditions including:

Table 6-1
Existing Levels of Service
March, 2011

Intersections	Existing Levels of Service (Seconds of Delay)	
	Morning	**Afternoon**
EASTON RD (611) AND W. COUNTY LINE RD AND PRIVET RD		
Overall Rating	F (109.1 sec.)	F (89.5 sec.)
Traffic Approach	EB - F (95.8 sec.)	NB - F (164.9 sec.)
	WB - F (83.7 sec.)	
	SB - F (210.8 sec.)	
EASTON RD (611) AND MORELAND AVE		
Overall Rating	**A**	**A**
Traffic Approach		
EASTON RD (611) AND MEETINGHOUSE RD/DRESHER RD		
Overall Rating	**E (77 sec.)**	**D**
Traffic Approach	EB - E (64.2 sec.)	EB - E (78.8 sec.)
	NB - E (65.4 sec.)	
	SB - F (121.6 sec.)	
EASTON RD (611) AND HORSHAM RD (463)		
Overall Rating	**C**	**B**
Traffic Approach		
HORSHAM RD (463) AND MAPLE AVE		
Overall Rating	**C**	**B**
Traffic Approach		
HORSHAM RD (463) AND DRESHER RD		
Overall Rating	**D**	**E (79.5 sec.)**
Traffic Approach	EB - E (60 sec.)	NB - F (132.6 sec.)
	SB - E (65.8 sec.)	

Source: Urban Engineers, Inc., 2011
Notes:
EB - Eastbound SB - Southbound
NB - Northbound WB - Westbound

  - Easton Road (PA 611) and W. County Line Road
  - Easton Road (PA 611) and Meetinghouse Road/Dresher Road
  - Horsham Road (PA 463) and Dresher Road

5. Market Potential

- Residential Market - Horsham Township is a desirable place to live. It has a fairly stable employment base, is near the Pennsylvania Turnpike, and is located within a 30 to 45-minute drive of Center City Philadelphia. The NAS-JRB Willow Grove site presents a unique opportunity. The large supply of land (800+ acres) could allow Horsham Township to diversify the types of housing available in the community. A more diverse housing stock, in terms of housing types and price points, will create more opportunities for homebuyers and

renters. As such, it is recommended that a mix of housing types and densities be incorporated into the development in order to provide the maximum amount of options for residents. The appropriate number of housing units must be debated among community leaders to achieve a balanced mixed-use community and employment center.

Careful consideration needs to be given to the price points of new homes. Homebuyers have become more price sensitive, and the "McMansions" built during the early 2000s are in less demand. The housing affordability analysis indicates that almost all of the new housing units built in the past ten years were only affordable to those making over $78,081. It is recommended that the housing mix at the NAS-JRB Willow Grove site include homes priced in the $225,000 to $325,000 price range. It should be noted that the construction of more affordably-priced homes does not preclude the development of larger, higher value homes, but demand for this product has declined significantly in recent years.

Census 2010 data indicate that almost 28% of households in Horsham currently rent. However, traditional apartment units only comprise 16% of the total housing units in the Township. The last apartment building was constructed in the late 1980s and there are no options for renters who would prefer to live in a contemporary, professionally managed apartment community.

- Office Market - Horsham Township has an existing cluster of business parks. This presents both an opportunity and a constraint. New office development would build upon the existing cluster. It also would be competitive with existing space. Although there are signs the office market is recovering, including reduced vacancy and positive absorption in the Horsham/Willow Grove submarket in 2010, the Township and County as a whole may not be ready for a large (over 100,000 SF) speculative development. However, with the proper targeting and recruitment efforts, the NAS-JRB Willow Grove site would be ideal location for a build-to-suit office building. Target users would be those in the pharmaceutical or life-sciences industry, software developers, and financial companies.

- Industrial Market - Montgomery County has a large and well established industrial base. The NAS-JRB Willow Grove site would be a good location new industrial development. The site provides access to the Pennsylvania Turnpike and is near existing manufacturing clusters, including pharmaceutical, food processing, and surgical and medical devises. It is recommended that a portion of the development at the site include industrial uses. However, the industrial market in Montgomery County is still in recovery. During the past year Montgomery County experienced negative absorption and rising vacancy rates. Any large industrial users will need to be strategically targeted for the site. As mentioned in the industrial interview section, most recent industrial development has been built-to-suit. It was widely thought that the market would not be ready for a large speculative building for another few years.

- Green Energy Market - The "Greater Philadelphia Energy Cluster for Energy Efficient Buildings" (GPIC) is drawing national attention to the Philadelphia sustainability market. Although solar energy manufacturing is not prominent in Montgomery County, there could be potential for this, or other manufacturing companies of sustainable products, to locate to the County. There could be partnership opportunities available with the academic institutions, partners, and stakeholders of GPIC. The sustainable industry is a growing industry, and there is potential for the NAS-JRB Willow Grove site to capitalize on this rising momentum.

- Retail Market - There are a great variety of shopping opportunities in Montgomery County, including large malls to stand-alone neighborhood serving retail. Although the retail market

experienced a downturn due to the national recession, there are signs the market has started to recover. Vacancy is projected to decline as absorption is expected to return to positive levels. However, it is important that retail development at the NAS-JRB Willow Grove site be taken into context with the surrounding community. There are three malls within 10 miles of the study area site that contain over 1 million square feet of retail space each. There is also a smaller "life-style" center located in Bucks County, about a ten minute drive from the site. Due to the large amount of competition, it is recommended that retail at the study area site should be neighborhood serving retail. Restaurant uses, in particular, would complement office or residential space that would also be built at the study area site. Although there is a Giant grocery center located just south of the NAS-JRB Willow Grove site, there could be potential for small specialty grocery stores or convenience stores.

E. BASE REUSE ALTERNATIVES AND PREFERRED REUSE PLAN

1. Base Reuse Alternatives

The RKG planning team created three Base Reuse Alternatives (Options A, B, and C) from which the Preferred Redevelopment Plan evolved (Figures 1-3). The reuse plan alternatives were not intended as independent "solutions" for reuse of NAS-JRB Willow Grove. Instead, they presented a collection of plan "elements" in different combinations, locations, and configurations, intentionally varied across the three alternatives to illuminate multiple reuse opportunities. The final Preferred Redevelopment Plan is a mix of all these concepts and elements from the different base reuse alternatives presented in this chapter.

The following principles of the community, as summarized by the HLRA, were used in creation of the three base reuse alternatives:

- Encourage a mixed-use plan that allows people to live, work and recreate, in the same location, in order to reduce traffic moving on and off the site.
- Maximize its employment/tax base benefits to the township or achieve a more balanced plan that meets a variety of community needs.
- Create a sense of place and community with a Town Center.
- Consider traffic congestion impacts and circulation in and around NAS-JRB.
- Secure viable sources for water and wastewater utilities to support development.
- Incorporate the latest green and sustainable design principles where appropriate (e.g., LEED buildings, LID, complete streets, energy efficiency/renewable energy, etc.).

Figure 1 - Base Reuse Alternative – Option A

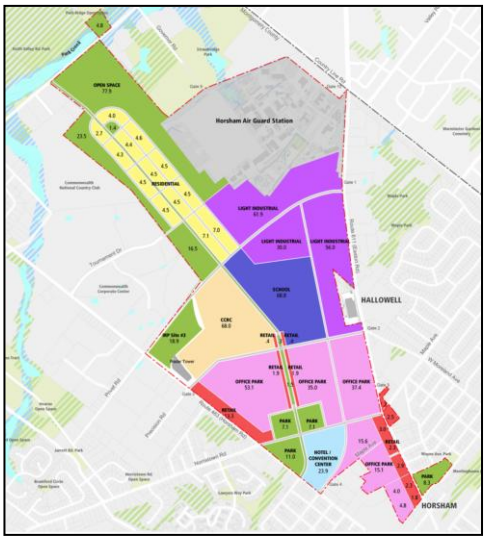
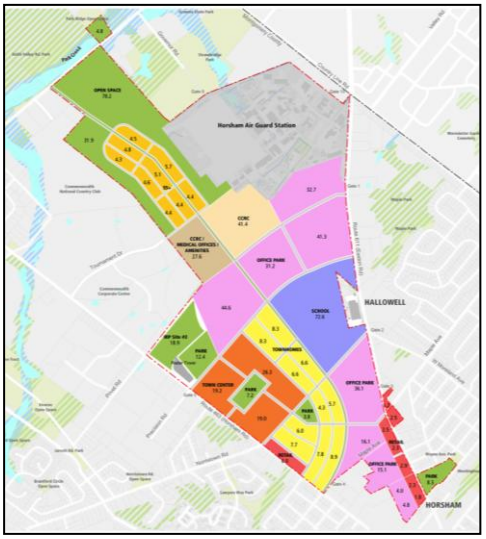


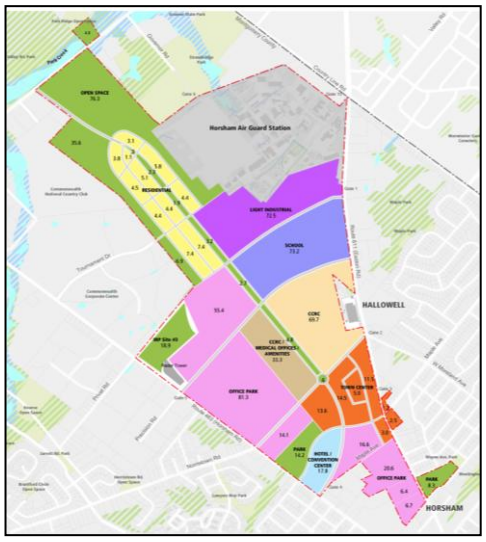
Figure 2 - Base Reuse Alternative – Option B



The major elements of the base reuse alternatives included the following:

- Town Center
- Retail
- Light Industrial
- Office Park
- Hotel/Conference Center
- Residential
- Parks/Open Space
- School

Figure 3 - Base Reuse Alternative – Option C



2. Preferred Base Reuse Alternative – Option E

Based on the three base reuse alternatives, the RKG Team prepared an Option D land plan that reflected all the elements identified by the community during the reuse planning process, as well as parcel designations for several major NOI applicants such as: (1) Hatboro Horsham School District, (2) Montgomery County, PA on behalf of the Delaware Valley Historical Aviation Association, and (3) Bucks County Housing Group/Genesis/TRF, which had not appeared on the earlier options (Map 1).

In accordance with HLRA Board and staff recommendation and public input, the consultants prepared a Preferred Base Reuse Alternative - Option E plan with the final development program presented in Table 1.

The plan was designed to incorporate best management practices (BMPs) for storm water management and to include the latest green and sustainable design principles. Examples include LEED buildings, Low Impact Design (LID), green infrastructure, complete streets and a range of energy efficiency and renewable energy options.

The major land use elements of the plan were defined as follows and are shown in Map 1:

- **Town Center** - Option E includes a mixed-use, pedestrian-oriented Town Center that is accessible from

Table 1
Base Reuse Alternative – Option
Land Use and Building Program

Land Use	Acres	Units/Building Square Feet
RESIDENTIAL		**UNITS**
Large Lot Single Family	64.6	90
Small Lot Single Family	34.3	250
Townhomes	36.2	350
Apartments/Condos	13.3	300
Town Center Apartment/Condos	7.9	100
CCRC Independent Living	19.4	141
CCRC Assisted Living/Nursing	8.0	185
Total Residential	183.7	1,416
COMMERCIAL		**SQUARE FEET**
CCRC Med Office/Amenities	3.0	25,000
Hotel/Conference	6.3	137,000
Town Center Retail/Service/Restaurants	11.0	239,580
Town Center Office	3.0	65,340
Movies/Entertainment	5.0	54,450
Office Park	133.5	1,163,052
Retail	6.9	96,180
Total Commercial	168.7	1,780,602
OTHER USES		**SQUARE FEET**
Regional Recreation Center	20.2	100,000
Housing for Homeless	7.4	30 (Units)
School	40.0	152,727
Aviation Museum	13.1	200,000
Shared Lot	5.6	--
FAA Tower	3.0	--
Park/Open Space	204.8	--
Roads, Sidewalks, Paths, Etc.	215.5	--
Total Other Uses	509.6	452,727
TOTAL	**862.0**	**1,446 Res. Units/ 1.8 Million Com. SF/ 452,727 Other SF**

Source: HLRA and RKG Associates, Inc., 2011

both Horsham Road (Route 463) and Easton Road (Route 611). The Town Center will include retail, office, entertainment, and residential uses. The Town Center also provides a sense of place with gathering spaces and a plaza incorporated into the design. The plaza can accommodate a water feature or recreational uses such as an ice skating rink.

- **Residential Uses** - The plan provides for distinct residential neighborhoods that include a broad range of housing types and price levels. These neighborhoods are connected together through a network of streets, including a central Runway Boulevard, which provide access to parks and open space. The street network encourages walking and connectivity with the surrounding neighborhoods as well as other uses in the site, such as the Town Center. Residential neighborhoods are centered on a neighborhood park and have easy access to recreational uses including pedestrian and bicycle trails.

- **Office Park** - Office and business parks are proposed along Horsham Road and south of Maple Avenue and are in close proximity to the proposed Town Center. The office parks are also positioned to take advantage of public open space and golf course amenity that is located in the middle of the office development off Horsham Road.

- **Hotel/Conference Center** - A hotel and a conference center are located near the proposed office parks and mixed-use town center. The proposed hotel and convention center facility will have visibility from Easton Road. The hotel is positioned to draw upon the demand that will be generated from the proposed office parks.

- **Congregate Care Retirement Community (CCRC)** - A Continuing Care Retirement Community (CCRC) is proposed in the northeast portion of the study area site between the Runway Boulevard and Easton Road. A CCRC is a type of retirement community where a number of senior care needs, from assisted living, independent living and nursing home care, may all be met. Housing types within CCRC's can include detached and attached single family homes, duplexes, quadraplexes, apartments, and assisted living center and nursing care units. Medical office and other support facilities are also proposed in proximity to the CCRC.

- **School** - A 40-acre site is proposed for the Hatboro-Horsham School District for replacement of existing school facilities and future expansion. The proposed school site would include a future middle school, administrative and recreational uses. The school site is centrally located near the intersection of Runaway Boulevard and Privet Road extension and within walking distance of the residential neighborhoods. The school site is adjacent to the recreation center, which allows for the sharing of recreational facilities.

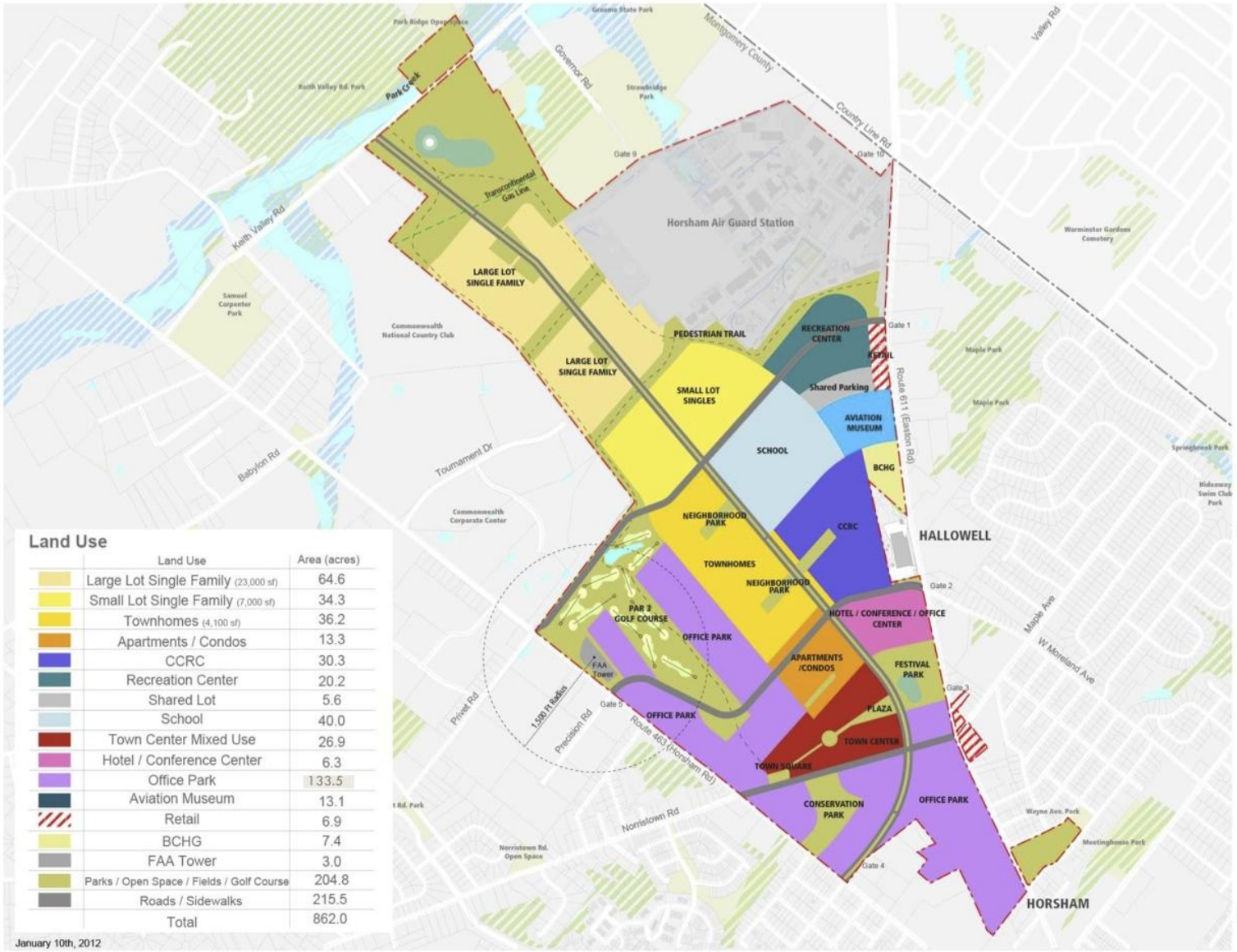
- **Retail** - In addition to the retail programmed into the Town Center, the final Preferred Redevelopment Plan has retail frontage along Easton Road. Easton Road is a well-travelled road, and retail located in this area is well-positioned to capture sales support from drive-by traffic.

- **Regional Recreation Center** - A regional indoor recreation center with several outdoor recreation fields is proposed near the existing Gate 1 area with visibility from Easton Road and adjacent to the proposed middle school. The indoor recreation center will include multiple athletic features such as a gymnasium, swimming pool, basketball courts, climbing halls, multi-purpose hall, health and fitness club, tennis and racquetball courts. An outdoor recreational area is also proposed, and will include a range of active recreational fields including soccer, baseball, lacrosse, softball and others. It is hoped that these fields will be used to attract high school and collegiate tournaments for soccer and lacrosse, among others.

Map 1

Preferred Base Reuse Alternative

Option E



Land Use

Land Use	Area (acres)
Large Lot Single Family (23,000 sf)	64.6
Small Lot Single Family (7,000 sf)	34.3
Townhomes (4,100 sf)	36.2
Apartments / Condos	13.3
CCRC	30.3
Recreation Center	20.2
Shared Lot	5.6
School	40.0
Town Center Mixed Use	26.9
Hotel / Conference Center	6.3
Office Park	133.5
Aviation Museum	13.1
Retail	6.9
BCHG	7.4
FAA Tower	3.0
Parks / Open Space / Fields / Golf Course	204.8
Roads / Sidewalks	215.5
Total	862.0

January 10th, 2012

Legend

- Willow Grove NAS
- Municipal Boundary
- Parcel
- Parks and Open Space
- Horsham Air Guard Station
- Transcontinental Gas Line
- NWI Wetlands
- FEMA Flood Plain
- Vegetation
- Habitat Areas

Sources

NAS GIS data from Weston Solutions Inc. (received from Tetra Tech), Google and Bing Maps. Surrounding context data from DVRPC.

0 300' 600' 1,200' 1,800' 2,400'

Prepared by HLRA, 2012

- **Aviation Museum/Park** - A 13.1-acre site is proposed for the future aviation museum and park located on the eastern edge of the property with direct visibility from Easton Road. The aviation museum and park are being sponsored by Montgomery County, on behalf of the Delaware Valley Historical Aircraft Association (DVHAA). The DVHAA is a nonprofit entity currently operating the existing aviation museum on site. The proposed museum and park will include a number of restored aircraft within new hanger facilities and will include the existing Harold F. Pitcairn Wings of Freedom Air Museum located within the NAS-JRB site on Easton Road. In the recent past, the museum operated on 2.6 and more recently the HLRA provided additional access to 4.3 acres through a lease agreement between the Navy and the HLRA.

- **Homeless Housing -** A 7.4-acre site is proposed to accommodate housing for homeless. The site is located adjacent to the aviation museum and would include the existing Navy Lodge building and adjacent single family homes. This site is proposed for homeless service providers to provide permanent supportive housing under provisions of the McKinney-Vento Act. The site will accommodate permanent supportive housing for 30 one and two bedroom apartments plus space for provision of support services for qualified individuals and families.

- **Parks/Open Space -** The Redevelopment Plan includes a network of parks and open spaces which will be able to provide for a range of recreational uses and activities. A total of 205 acres of open space is proposed within the land use plan, which comprises about 24% percent of the total land area. The parks and open spaces will be able to support natural resources and vegetation. The park and open space network also will be designed to be part of a comprehensive stormwater management system and provide controls to address localized flooding issues at the property boundaries, especially along Keith Valley Road. Pedestrian and bicycle trails will connect the study area with existing local and regional trails within Horsham Township (Samuel Carpenter Park Trail and Power Line Trail, etc.).

  - Neighborhood Parks – Small park areas located within residential neighborhoods.
  - Community Parks **-** Located throughout the study area. They include:
  - Community Golf Course - A 9-hole, Par 3 golf course is proposed within the middle of the property adjacent to the Commonwealth National Country Club. The golf course will include the existing pond. This "chip & putt" facility will be a recreational amenity open to the public and will also serve as an open space amenity for the office park.
  - Green Corridors and Trails - The Runway Boulevard is also proposed as a green corridor that will connect the entire development together and serve as a central road through the site. It will feature a wide median that will include pedestrian and bicycle trails and bio-swales as well as best management practices for storm water management. A network of walking paths will traverse the property and connect with the township's existing public trail/bike path network.
  - Open Space near Office Parks - Open space is proposed near the office parks along Horsham Road as an amenity to the office uses.

F. ENVIRONMENTAL ISSUES

There are certain areas at the NAS-JRB Willow Grove site where development could be affected or limited due to existence of sites with environmental contamination. The Navy has been investigating and remediating, as necessary, environmental contamination at the NAS-JRB Willow Grove facility via the Installation Restoration Program (IRP). The restrictions and considerations presented in the following Table 2 are based on the status of the IRP sites as of the December 2011 Restoration Advisory Board meeting.

Table 2
IRB Site Impacts to Redevelopment Plan
Preferred Base Reuse Alternative – Option E

Site	Description	Containing Land Use	Constraints
1	Privet Road Compound Groundwater	Parks, Retail, Recreation Center	Development of parks or pedestrian trail in the area should not be affected by LUCs or site contamination. If a habitable building were built, then a vapor mitigation system may need to be installed.
2	Antenna Field Landfill	Conservation Park/Office	No constraints
3	Ninth Street Landfill	Parks, Office Park	Development may be impeded by soil cap, or access to treatment equipment and groundwater monitoring wells to track the progress of remediation. A vapor mitigation system may need to be installed.
4	North End Landfill	Parks and Open Space	No constraints
5	Fire Training Area	Office Park/Golf Course	Development may be impeded by the need to maintain integrity of groundwater monitoring/injection wells to implement and track the progress of remediation. If a habitable building were built, then a vapor mitigation system may need to be installed.
6	Abandoned Rifle Range 1	Office Park	No constraints
7	Abandoned Rifle Range 2	Parks and Open Space	No constraints
8	Abandoned Fuel Tank	Office Park	No constraints
9	Steam Plant Building	Air Guard Station	No constraints
10	Navy Fuel Farm	Air Guard Station	No constraints
11	Aircraft Parking Apron	Air Guard Station	No constraints
12	South Landfill	Town Center, Office, Parks, Apar	Development may be impeded by access to treatment equipment, soil cap, groundwater monitor wells, and/or injection wells. A vapor mitigation system may need to be installed.

G. INFRASTRUCTURE COSTS

In order to realize the redevelopment vision, the implementation LRA and future developers, will need to invest in certain infrastructure improvements including water and wastewater, roads, runway demolition, and building demolition. The cost for these public infrastructure improvements is estimated at more than $64 million and primarily consists of the trunk infrastructure, as well as the demolition of existing building and the runway, taxiways and aprons (Table 3). Total private infrastructure costs are estimated at approximately $79.6 million. The largest public infrastructure cost items include:

- Roads – Construction of the four major road connections (including Precision Road, Privet Road, Norristown Road, and Runway Boulevard) are a needed public investment that will spur development. Construction of these four roads would cost ~$11 million. The remaining network of local streets would be funded and constructed by private developers.
- Water and Wastewater Improvements - It is anticipated that the major trunk lines for the potable water and wastewater infrastructure would be provided by Horsham Township along the four major roads. In 2011 dollars, the estimated public infrastructure costs for water and wastewater infrastructure is estimated at $21.4 million.
- Runway, Taxiways & Aprons - Although it may be possible to use some of the runway as a portion of the central boulevard of the preferred plan, it is anticipated that most of the runway and all of the taxiways and aprons will be demolished. Removal of the runway and aprons is estimated to cost roughly $17 million.
- Building Demolition - Most of the existing buildings will need to be demolished. The exceptions are the Navy Lodge (to be reused by the Bucks County Housing Group) and the Fire Station (to be reused by the Township or Greater Philadelphia Search and Rescue). In total, it is estimated that building demolition could cost as much as $15 million.

Table 3
Public and Private Infrastructure Cost Estimates
Preferred Redevelopment Plan NAS-JRB Willow Grove

Type of Infrastructure	Length (ft)	Width (ft) of paving	Area of paving (sf)	Area of paving (sy)	Costs [1]
PUBLIC INFRASTRUCTURE COSTS					
Roads					
Runway Blvd	13,107	70	917,490	101,943	$4,802,550
Privit Road Connection	6,669	60	400,140	44,460	$2,094,511
Precision Road Connection	5,603	60	336,180	37,353	$1,759,716
Norristown Road Connection	3,019	70	211,330	23,481	$1,106,195
Total Roads	28,398				$9,762,972
Curbs	56,796				$1,249,512
Stormwater Retention Pond	1				$2,400,000
Water Mains	28,398				$7,099,500
Water Storage Tank (850,000 gal)	1				$2,000,000
Sewer Mains	28,398				$9,939,300
Runway Demolition	---				$17,000,000
Building Demolition	---				$15,000,000
Total Public Infrastructure Costs					**$64,451,284**
PRIVATE INFRASTRUCTURE COSTS					
Internal Collector Streets	99,369	30	2,981,070	331,230	$15,604,245
Curbs	198,738				$4,372,236
Interior Water Lines	99,369				$24,842,250
Interior Sewer Lines	99,369				$34,779,150
Total Private Infrastructure Costs					**$79,597,881**

Source: Weston Solutions, Inc., 2012
[1] Roads = $47.11/sy; Curbs = $22/ft; Water Distribution = $250/ft; Wastewater Distribution = $350/ft

H. TRANSPORTATION IMPACTS AND MITIGATION STRATEGIES

1. Traffic Impacts

The following section summarizes the estimated traffic impacts associated with the Preferred Base Reuse Alternative – Option E Plan.

a.) Traffic Impacts

For the purposes of this study the RKG Team focused on the AM and PM peak hours of the adjacent roadway system. There are also standard trip reductions for multiple destination trips and "pass-by" trips. Multiple destination trips are people who visit more than one location internal to the site. In this scenario, although there may be distinct uses or locations, the trip that is generated serves multiple establishments and should not be double-counted. Pass-by trips refer to individuals who use an amenity during the course of their normal travels. This is often the case for things such as gas stations, convenience stores, and drive thru restaurants where people stop along their trip to make a specific purchase and then continue. In this case the development did not generate a new trip, but was merely temporarily diverted from the original path.

Based on the Final Preferred Land Use Plan the primary trip generators are:

- Office Park
- Residential Uses (Single Family Homes, Townhomes, Condominiums, and CCRC)
- Elementary School
- Retail
- Hotel/Conference Center

The analysis focused primarily on the signalized intersections along the network and projected traffic to the year 2026 based on available growth factors. The comparisons are made between 2026 projected AM and PM peak hour traffic with no development on the site and 2026 AM and PM peak hour traffic with full build-out of the site. Overall the signalized intersections generally experience traffic increases between 15-20% between the 2026 Full Build and the 2026 No Build scenarios. With the current baseline reflecting a vacant Naval Air Station, the actual projected traffic volumes over historical levels (e.g., before the base closure) are projected to be much less on a percentage basis.

b.) AM/PM Peak Traffic

A Synchro/Sim-Traffic traffic simulation model was completed for the 2026 No-Build condition and the 2026 Full-Build condition. This comparison was done using the existing geometry (i.e., no widening or lane changes). Signal timings were modified as appropriate to limit the negative impact of the new development trips. The AM analysis (Table 4) revealed that two intersections improved, four remained relatively the same, and three intersections worsened. The PM

Table 4
Traffic Comparisons – Current vs. Proposed
NAS-JRB Willow Grove

Intersection	AM Peak	PM Peak
Easton Road/County Line Road	Comparable	Comparable
Easton Road/Gate 1	Worse	Worse
Easton Road/Moreland Avenue	Worse	Worse
Easton Road/Upper Maple Avenue	Comparable	Worse
Easton Road/Lower Maple Avenue	Better	Better
Horsham Road/Maple Avenue	Better	Better
Horsham Road/ Norristown Road	Worse	Worse
Horsham Road/Precision Road	Comparable	Comparable
Horsham Road/Privet Road	Comparable	Comparable

Source: Urban Engineers, 2011

analysis indicates that two intersections improved, three remained relatively the same, and four intersections worsened.

c.) *Change over Current Traffic Volumes*
As a result of the closure of the base and the limited activities that now encompass this area it is noted that there is currently much less traffic generated at the site as compared to when the base was an active base. Although the plan will likely increase traffic 15% to 20% over a no-build scenario, the change would likely not be as much of an increase over historic traffic levels that occurred when the base was open and active.

d.) Traffic Mitigation Strategies
Based on the analysis of the intersections using the Synchro/Sim Traffic program a series of localized improvements were studied that could be implemented at specific locations. Generally the improvements included widening to allow additional turning lanes at intersections. The order-of-magnitude cost estimates are intended for planning purposes only, and do not include estimated costs for property acquisition, if necessary.

Intersection and Road Widening Around NAS-JRB Willow Grove

- **Horsham Road/Norristown Road Intersection**
  Estimated Cost: $375,000
- **Easton Road/Meetinghouse Road Intersection**
  Estimated Cost: $125,000.
- **Easton Road/Upper Maple Road Intersection**
  Estimated Cost: $200,000
- **Easton Road/Main Gate Intersection**
  Estimated Cost: $200,000
- **Easton Road/Moreland Avenue Intersection**
  Estimated Cost: $650,000
- **Horsham Road/Dresher Road Intersection**
  Estimated Cost: $150,000

Off-Site Transportation Improvements

Further off the base, there are a number of transportation improvement projects that are linked to the future redevelopment of NAS-JRB Willow Grove. These projects are of local and regional significance and are worthy for inclusion in this plan.

- **Implementation of Adaptive Signal Technology** - Adaptive traffic signals are a relatively new innovation that allows signals to adapt to changing traffic demands and patterns in real time. This thereby optimizes the signals on a minute by minute basis. They have been deployed nationally and locally to great initial success. Locally they have been installed by PennDOT along Route 202 in King of Prussia, PA adjacent to the King Of Prussia Mall with initial success. Future deployments are planned in the area.

- **Improved Access Control** - Businesses in the area and primarily along Easton Road have multiple driveways that are often times adjacent to one another. This creates situations where patrons and employees entering businesses reduce the capacity and potentially lead to unsafe conditions. By combining driveways and using shared access points these locations can be evaluated and better handled through the installation of turn lanes or other measures.

- **Widening of County Line Road** - The intersection of County Line Road and Easton Road experiences substantial delays in the peak hours. Widening County Line Road to the west and east of Easton Road to Route 202 would allow modifications to the signal timing and may improve the overall operations of the intersection.

- **Widening of Easton Road north of Blair Mill Road** - North of Blair Mill Road, Easton Road is two lanes per direction while south of Blair Mill Road it is three lanes per direction. Widening Easton Road would remove this bottleneck and improve the overall capacity of the roadway. This improvement is a long term project that would require right-of-way purchases, utility relocations, access modifications, and environmental clearances.

- **Maple Glen Triangle** - This project has been on and off the Transportation Improvement Program (TIP) over the last two decades and involves improvements to the following intersections: Welsh and Norristown, Welsh and Limekiln and Limekiln and Welsh, as well as the road way between the intersections. These improvements will expedite traffic to the southbound 309 Expressway.

- **Horsham/Route 202 Parkway** - Horsham Road from Babylon out to where the Route 202 Parkway improvements terminate in Montgomery Township. This will enable access to Northbound 309 and the 202 Parkway.

- **Easton Road/Route 202** - County Line between Easton Road and to where the Route 202 Parkway improvements terminate in Montgomery Township (lower State Road). There are significant drainage, elevation and capacity issues currently. This project has been long overdue and was funded previously.

- **Easton Road Widening**- Easton Road needs to be improved to 6 lanes from County Line to the Turnpike along with various intersection improvements to include Blair Mill Road and Easton Road.

- **PA Turnpike Interchange** - The turnpike interchange needs to be improved to allow for two southbound on Easton Road lanes to the toll Plaza and upgrade of the toll plaza with more booths and high speed EZ pass. This project requires the replacement of the PennDOT bridge overpass for the turnpike ramp.

I. FISCAL IMPACTS AND ECONOMIC IMPACTS

RKG Associates prepared a preliminary economic and fiscal impact analysis of the Final Preferred Redevelopment Plan. The fiscal impacts are reported Township and School District level at full build-out (Year 20). The fiscal impact analysis is intended to be a rough estimate of municipal revenues and expenditures over the life project.

1. Net Fiscal Impact

It is estimated that the Final Preferred Land Use Plan results in a net positive impact to the combined Township and School District of roughly $5.1 million (Table 5). The school district expenditures for educating children from the new single family, townhome, apartments, and Town Center residential units are the greatest among the proposed development uses ($6.7 million). However, it is important to note that total school impacts are positive. The school district collects property taxes and a portion of the earned income taxes from employees working at the NAS-JRB development. At the same time, the

"other uses" do not contribute tax revenues at comparable levels because they are either tax exempt municipal uses or nonprofit entities.

Table 5
Total Net Fiscal Impacts
NAS-JRB Preferred Redevelopment Plan

Land Use	Revenue	Expenditure	Net Impact
RESIDENTIAL			
Large Lot Single Family	$1,461,018	$1,119,264	$341,754
Small Lot Single Family	$1,563,651	$602,443	$961,208
Townhomes	$2,951,139	$3,877,782	($926,644)
Apartments	$904,796	$1,675,667	($770,871)
Town Center Apartment/Condos	$348,545	$566,721	($218,176)
Independent Living	$563,399	$78,086	$485,313
Assisted Living/Nursing	$266,342	$46,323	$220,020
Total Residential	$8,058,889	$7,966,285	$92,604
COMMERCIAL			
CCRC Med Office/Amenities	$56,047	$3,821	$52,226
Hotel/Conference	$338,311	$24,686	$313,625
Town Center Retail/Service/Restaurants	$456,411	$29,909	$426,502
Town Center Office	$160,955	$9,615	$151,340
Movies/Entertainment	$114,796	$8,431	$106,365
Office Park	$4,264,607	$274,434	$3,990,173
Retail	$199,293	$13,193	$186,101
Total Commercial	$5,590,420	$364,090	$5,226,331
OTHER USES			
Regional Recreation Center	$882	$18,427	($17,545)
Housing for Homeless	$375	$168,490	($168,114)
School	$17,933	$30,024	($12,091)
Aviation Museum	$294	$14,081	($13,787)
Park/Open Space	$0	$0	$0
Total Other Uses	$19,485	$231,022	($211,537)
TOTAL NET IMPACT	**$13,668,795**	**$8,561,397**	**$5,107,398**

Source: RKG Associates, Inc., 2011

2. Permanent Employment Generation

It is estimated that approximately 7,059 jobs are created through the preferred land use plan at build-out. The job creation estimates were made by applying employees per square foot estimates from the Urban Land Institute and the U.S. Energy Information Administration to the total square feet for each land use. It should be noted that the jobs generated at the site will be phased over the 20-year period. It is estimated that the first ten years of development will generate approximately 1,676 jobs or 24% of the total. The remaining jobs (5,382) will be created as development of the office park and town center gains momentum. At full build-out the office park (4,652 jobs) and Town Center retail (1,198 jobs) developments account for roughly 83% of total jobs.

The consultant used the Quarterly Census of Employment and Wages for Montgomery County to assess

the associated payroll impacts. In total, there will be about $457.0 million in payroll in Year 20 once all jobs have been created. Office park payroll accounts for the largest share ($368.9 million) of annual payroll, due to the number of jobs and the comparatively high annual payroll of office workers. Over the first 20 years of the project, it is estimated that total payroll could approach $3.3 billion.

J. ZONING COMPATIBILITY

There are some proposed land uses which would not fit with existing Horsham zoning code. The land uses within the Town Center, including retail, movies/entertainment, office, and residential, would require zoning that allows for a mix of different land uses to be located on the same parcel. Currently, there is no existing mixed-use zone in the existing code. In terms of residential zoning, the proposed small lot single family, townhomes and apartments/condominiums would require zoning that allows for a higher density of units than currently exists.

Other uses which do not fit the current zoning code include Hotel/Conference Center and Museum. The land plan calls for a hotel that is likely to be taller than 4-stories, which exceeds the current permitted height limits. The Business Campus District (BC) currently allows for a museum use, which is likely the zoning to be used for the corporate office development. However, the code states that the building, or collection of buildings, must be on lots no smaller than 30 acres. Since the museum property is not contiguous to the proposed office development. Accordingly, the museum development may need a special exception or a zoning overlay district at its current location.

1 INTRODUCTION

A. INTRODUCTION

The redevelopment of the 862-acres at NAS-JRB Willow Grove is an unprecedented opportunity for Horsham Township, Pennsylvania. Located approximately 18 miles northwest of Center City Philadelphia, Horsham has the unique opportunity to transform its future. If the installation property is transferred as proposed in this plan, the resulting redevelopment site will comprise approximately 8% of the Township's total land area. With proper planning and community support, a favorable real estate market, and major infrastructure investment, the former joint reserve base could become a centerpiece for economic development for the Township and surrounding region.

The NAS-JRB Willow Grove Redevelopment Plan details the existing conditions, issues and opportunities, and recommendations that will guide the Horsham Township Authority for NAS-JRB (HLRA) in the redevelopment process. The report is organized into a series of sections that culminate with an implementation strategy for the final preferred redevelopment plan. It should be noted that public input and participation were integral to the formulation of this plan, and the public process is summarized in the following section.

The report begins with a description of existing conditions of the site, including land uses, infrastructure, and roadways, and their associated issues and opportunities. From this analysis, three base reuse alternatives were prepared by the planning team, which provide variations of a mixed-use development that was desired by the community. The report concludes with the final preferred redevelopment plan, which captures the general land vision for the property.

B. HISTORY OF NAS-JRB WILLOW GROVE

1. Aviation Beginnings

In 1926, Harold Pitcairn, an aviation pioneer, bought a large section of farmland on the west side of Route 611. He then turned the area, what would later become known as NAS-JRB Willow Grove, into a flying field. Pitcairn, who is widely considered the founding father of rotary wing aviation in North America, developed, tested and built many different aircrafts at this site from 1926 to 1942. One of his more famous flights was in an "Autogiro" invented by the Spanish inventor Juan de la Cierva. In 1929, Pitcairn formed a business partnership with Cierva and made the first successful rotary-wing Autogiro flight in America over the Willow Grove Field.[1]

[1] Source website: http://themilitaryzone.com

Aviation legend Amelia Earhart also had a famous connection to Pitcairn Field and the Autogiro. Earhart was the first female Autogiro pilot in the world, and in April 1931, Earhart achieved the Autogiro altitude record at Pitcairn Field (Figure 1-1). She reached an altitude of 18,415 feet, a record which held until September of 1932. Although Earhart stopped flying the autogiro in 1932, she helped to bring national attention to the invention of rotary flight, which eventually led to the invention of the helicopter.

Figure 1-1 – Amelia Earhart and the Autogiro

In 1942, Pitcairn sold the field to the U.S. Navy during World War II for the cost of $480,000. A year later, the field was officially commissioned the United States Naval Air Station Willow Grove (Figure 1-2). During World War II tens of thousands of military personnel deployed in and out of NAS Willow Grove. At the end of World War II, NAS Willow Grove was designed at "Reserve Training Station" under the Chief of Naval Air Reserve Training. In 1994, the base was re-designated a Joint Reserve Base to more accurately reflect its status. The mission of NAS-JRB Willow Grove was to provide, train, and maintain a ready reserve force for the country.[2] In 2005, NAR Willow Grove was re-designated the Naval Operations Support Command (NOSC) to emphasize both the strategic and operational missions of the Reserve Forces.

Figure 1-2 – Naval Air Station Willow Grove

2. Base Realignment and Closure (BRAC)

In 2005, the recommendation was made to the Base Realignment and Closure Commission (BRAC), and approved by act of Congress, to close NAS-JRB Willow Grove. BRAC is the process used by the Department of Defense to reorganize its installation infrastructure to more efficiently and effectively support its forces, increase operational readiness and facilitate new ways of doing business. As prescribed by law, in early 2006 all federal agencies were given an opportunity to acquire some or all of the property from the Navy, all declined. NAS-JRB Willow Grove was to have been declared surplus in June 2006. However, there was a delay in the closure process. This delay was initiated through the passing of special legislation at the request of former Governor Rendell, to allow for the creation of a joint interagency installation. However, in November 2009, the Governor was forced to withdraw support for the proposed installation, which would have been the nation's only state-operated base to provide national defense, homeland security, and emergency preparedness operations.

[2] Source website: http://military.com

With state revenues contracting due to the severe economic recession of 2009, the Governor advised the U.S. Secretary of Defense that the Commonwealth of Pennsylvania would not be taking ownership or title of the installation and suggested the property be retained by the Department of Defense (DOD). In January, 2010 all federal agencies were once again given an opportunity to acquire some or all of the property from the Navy. The navy approved the following transfers:

- 3 acres to the Federal Aviation Administration (FAA) for property along Horsham Road including their radar tower.
- 27 acres to the Air Force to add to their military enclave known as the Horsham Air Guard Station.

After a four year delay, the Navy finally issued a declaration of surplus property on September 16, 2010. This was the first official listing in the Federal Register of the amount of property that the Federal Government would be disposing of under BRAC 2005 at NAS-JRB Willow Grove."

3. Creation of Horsham Township Authority for NAS-JRB Willow Grove

In preparation for the closure of the base, the Horsham Township Authority for NAS-JRB Willow Grove (HLRA) was formed by Horsham Township Resolution 2005-26 on October 12, 2005 to oversee and facilitate the creation of a Redevelopment Plan. The HLRA is a corporation established on November 7, 2005 under the authority of the Pennsylvania Authorities Act. The HLRA is located in the Horsham Township Municipal Building at 1025 Horsham Road, Horsham, PA 19044. The articles of Incorporation were filed with the Secretary of the Commonwealth of Pennsylvania on November 23, 2005.

The Authority was created with a seven member Board but in early 2006, Horsham Township Council adopted an ordinance resulting in the Authority's Board being expanded to nine members. The Board's membership included a broad representation of affected municipalities and entities to include local and county elected officials, representatives from the local business community, the county's Industrial Development Corporation, the local school district and a local resident. In addition to the Executive Board, there are five subcommittees including Reuse Planning, Economic Development, Environmental, Housing and Homeless and the Bucks County Housing committees.

4. Base Reuse Planning Team and Process

On November 5, 2010, the HLRA solicited in the newspaper for proposals from national land planning consultants. The HLRA received three (3) requests for proposals and selected RKG Associates, Inc. a Dover, NH-based consulting firm in January, 2011 to help prepare a redevelopment plan for NAS-JRB Willow Grove.

RKG worked with the HLRA in holding numerous public meetings and gathering and analyzing data. The information was used to prepare a redevelopment plan for the 892 acres of surplus land when the military ceased operations in September, 2011. RKG undertook a comprehensive analysis to determine the condition of the base's physical infrastructure. RKG Associates, Inc. has worked with communities in more than 50 military base redevelopment projects, in instances where the military installation shut down, was realigned or was growing.

In addition to RKG Associates, planning team included Wallace, Roberts & Todd (Land Planning, Conceptual Design, Green Design Solutions), Weston Solutions (Environmental Coordination, Analysis and Utilities Assessment), Urban Engineers (Transportation and Building Assessment) and JDA, LLC (Market and Economic Research and Financial Analysis).

The NAS-JRB Willow Grove Redevelopment Plan was funded, in part, by a grant from the U.S. Department of Defense, Office of Economic Adjustment (OEA). The Plan was completed during the

period January 2011 – March 2012. After completion of the Redevelopment Plan, an application containing the Redevelopment Plan and Homeless Assistance Submission is submitted to the Secretary of Defense and the Secretary of Housing and Urban Development (HUD). HUD's review will determine if the HLRA's application is complete and, with respect to the expressed interests and requests of representatives of the homeless, whether it meets HUD's criteria. Following HUD's review and approval of the application, the Department of the Navy will complete the analysis of the property disposal required under the National Environmental Policy Act (NEPA). Under NEPA, the Department of the Navy must analyze the environmental effects of the disposal action.

C. PUBLIC OUTREACH PROCESS

An extensive public outreach process was undertaken as part of the NAS-JRB Willow Grove Redevelopment Plan process. HLRA Board meetings, which were open to the public, were held once a month during this process. In addition to the Board meetings, the consultant team organized multiple community meetings, all of which were open to the general public, HLRA Board members and elected township officials. All meetings included an opportunity for open public comment, either through organized breakout sessions or in an open public forum. The HLRA Board members, elected township officials and the general public were in attendance at all meetings. The following section summarizes each public meeting and the resulting feedback.

1. Redevelopment Plan Meeting Schedule

Public meetings were held to inform the public as to the process and progress of the project. The meetings were held at the Horsham Township Building and at the Horsham Township Community Center to accommodate all interested parties. The dates of the meetings were as follows:

December 16, 2010	HLRA Workshop and Base Tour
January 19, 2011	HLRA Executive Board Meeting
February 7, 2011	Kick-off Meeting
March 16, 2011	HLRA Executive Board Meeting
April 20, 2011	Existing Conditions Presentation
May 18, 2011	HLRA Executive Board Meeting
June 10, 2011	Community Design Charrette (session 1)
June 10, 2011	Community Design Charrette (session 2)
June 11, 2011	Open Public Viewing
June 15, 2011	HLRA Executive Board Meeting
July 27, 2011	Review of NOI's
August 17, 2011	Presentation of Base Reuse Alternatives
September 21, 2011	HLRA Executive Board Meeting
October 19, 2011	Presentation of Reuse Plan Refinements
November 16, 2011	Presentation of Preferred Reuse Alternative D
December 21, 2011	HLRA Executive Board Meeting
January 18, 2012	Presentation of Final Preferred Reuse Alternative E
February 15, 2012	HLRA Executive Board Meeting

2. Overview of Public Meetings

LRA Outreach Workshop and Base Tour
December 16, 2010
The Public Benefit Conveyance and Homeless Outreach Workshop and Base Tours were held on December 16, 2010 in the Horsham Township Community Center. Michael McGee, HLRA Executive Director, indicated that the Notices of Interest (NOI's) were due by March 22, 2011. The HLRA will

evaluate each NOI to incorporate them with assistance of the planning consultant for submittal to HUD, Navy and DoD for review and approval. With regards to the redevelopment plan, the HLRA has not yet considered future uses of the base; however the plan will need to balance economic impact redevelopment and community needs.

Led by Mr. McGee, the group departed Horsham Township's Community Center for an hour-long bus tour of the sprawling air base, which fronts Route 611 and Horsham Road in Horsham. About 80 people toured the base and were able to see how their vision for a park, school, homeless shelter, airport or more might fit into the redevelopment plan for NAS-JRB Willow Grove. The attendees represented 35 government entities or non-profit organizations

Project Kick-Off Meeting
February 7, 2011

Roughly 200 people attended the public kick-off meeting for the NAS-JRB Willow Grove Redevelopment Plan. The RKG consultant team was introduced to the community and provided an overview of the NAS-JRB Redevelopment Planning Process. The presentation included a review of the NOI/Federal Screening process, the planning approach and project schedule. Initial observations of the base, including environmental, transportation, infrastructure, real estate market, and land uses were presented. The meeting concluded wit a public question and answer session followed by the facilitation of a Community Reuse Survey. Each person in attendance was asked to complete a brief survey, which was collected at the end of the meeting. In total, the consultant team received 167 completed surveys. Highlights of the survey results include:

- When asked about the importance of redeveloping the NAS-JRB Willow Grove property, 96% of the respondents noted it was *very important* to the future of Horsham.
- The top three most important community goals for redeveloping the NAS-JRB Willow Grove site included: (1) expanding the Township's tax base, (2) creating new open space and recreation areas for residents, and (3) attracting new private investment.
- The top three redevelopment Alternatives that the respondents wanted the consultants to research and report back to the HLRA Board included: (1) an education campus, (2) a municipal park and walking trail system, and (3) a corporate business park/science & technology park.
- When asked what role the HLRA and Township should play in the redevelopment of NAS-JRB Willow Grove, more than half of the respondents (60%) wanted the HLRA to enter into a partnership agreement with one or more developers to create a master planned development that achieved the community's goals.

Community Meeting #1 – Presentation of Existing Conditions
April 20, 2011

The focus of the first community meeting was to provide an early analysis of the existing conditions of the site and region and invite public input on the key issues and principles that were to guide the planning process. The presentation portion of the meeting included an in-depth overview of socioeconomic, real estate, buildings, infrastructure, environmental, and transportation existing conditions.

During the second-half of the meeting, the planning team separated the public into four break-out session groups. Each group discussed the key issues and principles that were related to a specific topic. The four main topics included: (1) Environmental and Infrastructure, (2) Transportation and Existing Buildings, (3) Economic Development, and (4) Land Use and Site Planning. The issues and principles were then rated according to their importance. Highlights of the breakout sessions included:

- Environmental and Infrastructure Issues and Principles - The issue that was considered the most important and received the highest number of votes was related to environmental remediation of the site. The public consensus was that the federal government should assume the cost of environmental remediation to allow for redevelopment to occur. In addition, the redevelopment plan must secure viable sources for water and wastewater treatment to support redevelopment.

- Transportation and Existing Buildings Issues and Principles - The highest rated transportation issue concern the future impacts that base redevelopment would have on traffic congestion. In addition, the highest rated transportation and existing building principle concerned the use of transportation management techniques to manage traffic.

- Economic Development Issues and Principles - The highest rated issue in the economic development breakout session was the importance of incorporating a "sense of place" or town center into the redevelopment. Since Horsham does not have a downtown district, residents wanted to create a place where the town could gather for events and offer shopping, dining, and entertainment for local families.

- Land Use and Site Planning Issues and Principles - The most important land use and site planning issue was the creation of a mixed-use development plan combining commercial and residential uses. In addition, the community wanted several major road crossings through the property in order to relieve traffic congestion and encourage the flow of traffic through the site.

Community Meeting #2 - Community Design Charrette
June 10 & 11, 2011

The original word charrette comes from the École des Beaux Arts in Paris during the 19th century. The French term for "cart", art and architecture students in Paris would actually ride the charrette to the proctor's office to afford themselves extra time to complete their art assignments before handing them in to the proctor (Figure 1-3). Today, the term charrette typically refers to an intensive, multi-day design process, with the participants taking up to the final minutes to complete the plan.

The purpose of the NAS-JRB Willow Grove community design charrette was to obtain public input regarding the most desired land use elements for inclusion in the redevelopment plan. This public input exercise took place over the course of two days. Due to the expected large turnout, the first days' charrette breakout groups were conducted in two identical sessions. Approximately 270 people attended the afternoon session and 248 people attended the evening session.

Figure1-3 - Final art projects being delivered in a charrette or cart

On Saturday afternoon June 11, 2011 the planning team summarized the public input and findings from the previous day's charrette sessions. The presentation concluded with bubble diagrams which synthesized the results into very general land use plans for the property. A total of five land use alternatives were prepared, with three reflecting "Non-Airport Scenarios" (Figures 1-4 through 1-6) and two reflecting an "Airport Scenario (Maps 1-7 and 1-8)." The major land use elements of these early concepts included:

- **Town Center –** A Town Center that provides a sense of place and community. The Center would incorporate a mix of uses (retail, residential, entertainment) that is pedestrian friendly and contains open space and civic uses.

- **Office Park –** An office park that could accommodate a mix of corporate, headquarters, research and development, and science and technology space was desired. Medical-related office uses were also discussed.

- **Retail –** An integrated mix of shops, convenience stores, restaurants, and entertainment uses was preferred. No strip malls, regional shopping centers, or big box development was desired by the community.

- **Light Industrial –** Clean manufacturing, green, pharmaceuticals, and research and development facilities were discussed.

- **Residential –** Some of the residential options desired at the site include affordable senior housing, 55+ communities, assisted living and Continuing Care Retirement Communities (CCRC), loft-style apartments above Town Center ground floor space, and a mix of single family, townhomes, and condominiums. It was desired that all residential communities be walkable and tied to open space.

- **Open Space –** Integrated hiking/biking trails, active and programmed recreation space (such as playfields & courts, swimming pools, and volleyball courts), community-supported agriculture or community gardens, and natural preserves were desired open space features.

- **Corporate Airpark –** A segment of the community advocated for the continued use of the 8,000 foot runway and the establishment of a corporate airpark. The existing runway would be use by private companies and individuals and portions of the site would be redeveloped for economic development purposes. Two redevelopment alternatives

Figure 1-4
Preliminary Land Use Alternative #1 – 611 Town Center Concept

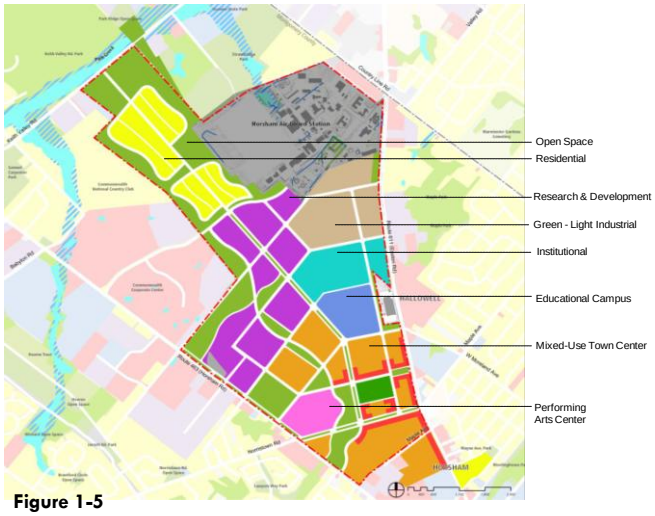


Figure 1-5
Preliminary Land Use Alternative #2 – Central Town Center Concept

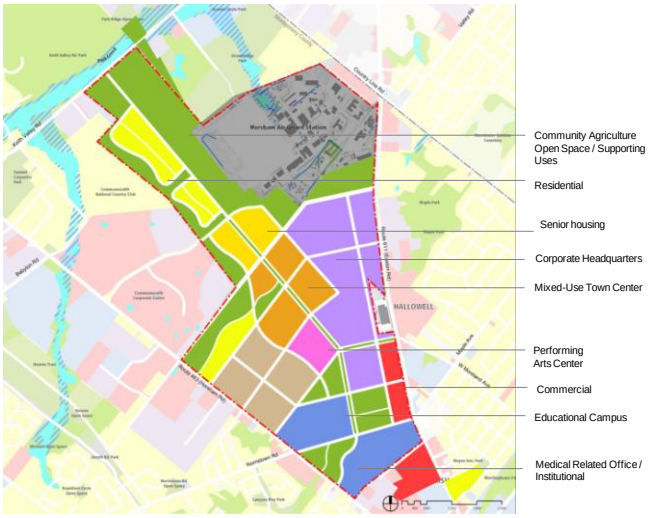
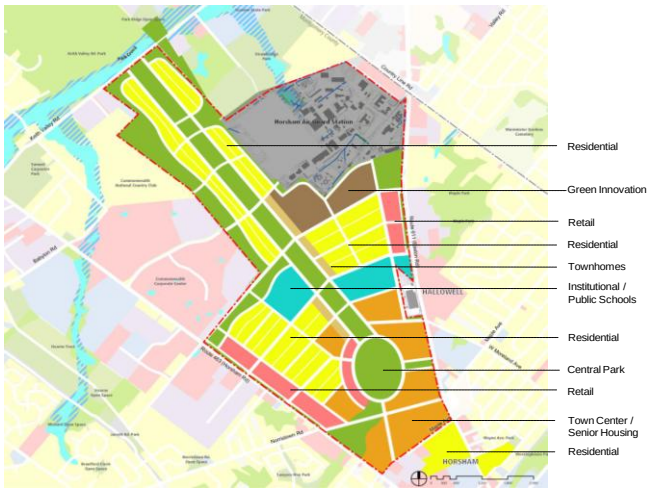


Figure 1-6
Preliminary Land Use Alternative #3 – Central Park Neighborhood Concept



were developed by the planning team depicting this use of the property (Figures 1-7 and 1-8.)

- **Other –** A variety of other land use elements were discussed, such as a cultural/performing arts center, family entertainment center, multi-purpose community space, police/fire training facilities, and churches.

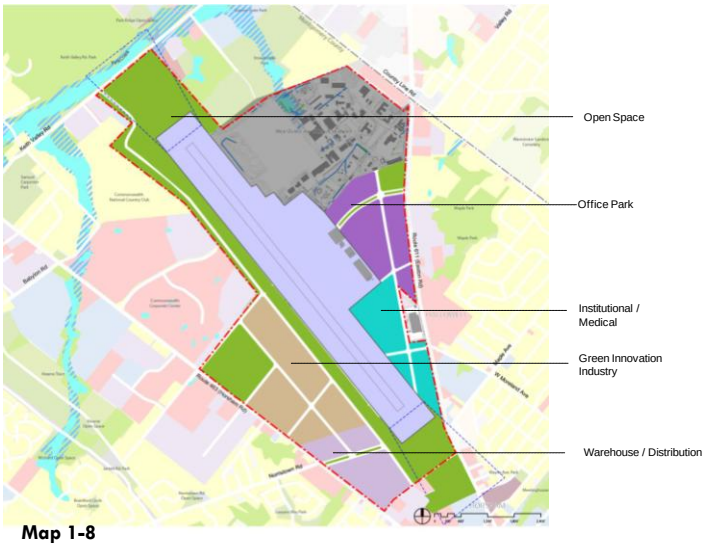
Community Meeting #3 – Board Review of Notices of Interest (NOI)
July 27, 2011

At this public meeting, the 17 Notice of Interest (NOI) applications for no or low cost Public Benefit Conveyances were publicly presented and evaluated by the HLRA Board. The outreach process for public benefit conveyances began in October, 2010 with a publication in the local newspapers and letters sent to known potential applicants. The deadline for submitting a Notice of Interest (NOI) was March 22, 2011. After several months of review and an opportunity for the applicants to submit additional information, the HLRA Board rendered decisions on which NOIs to carry forward into the three redevelopment alternatives. A decision not to approve the two airport-related NOIs was made by the HLRA Board, ending further consideration of an airport redevelopment alternative.

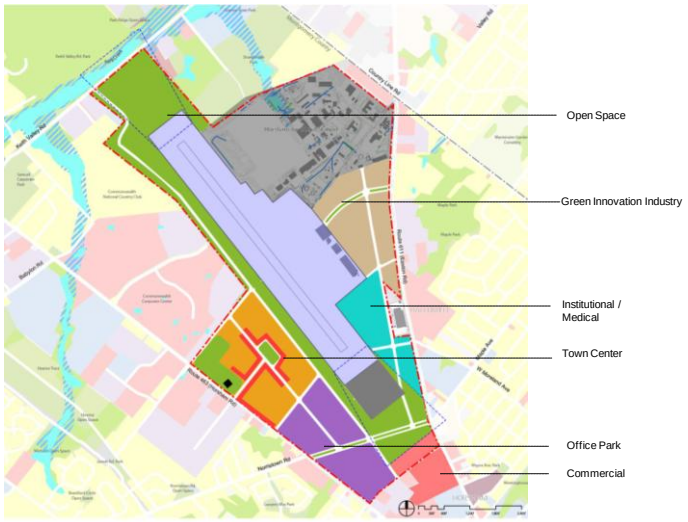
The HLRA Board also adopted a set of redevelopment planning principles to guide the development of the three base redevelopment alternatives. They include basic sound planning principles that were identified by the public during community meeting #1. The top principles were ranked by the HLRA Board members.

- Encourage a mixed-use plan that allows people to live, work and recreate, in the same location, in order to reduce traffic moving on and off the site.
- Maximize its employment/tax base benefits to the township or

Map 1-7
Preliminary Land Use Alternative #5 – Airport Employment Concept



Map 1-8
Preliminary Land Use Alternative #5 – Airport Town Center Concept



achieve a more balanced plan that meets a variety of community needs.
- Create a sense of place and community with a Town Center.
- Consider impacts of traffic congestion and circulation in and around NAS-JRB.
- Secure viable sources for water and wastewater utilities to support development.
- Incorporate the latest green and sustainable design principles where appropriate (e.g., LEED buildings, LID, complete streets, energy efficiency/renewable energy, etc.).

Community Meeting #4 – Presentation of Three Base Redevelopment Alternatives
August 17, 2011

The formation of the preliminary base redevelopment alternatives was the result of months of research, public outreach, and key stakeholder interviews. The findings and feedback were collected and synthesized into three alternative scenarios, which were presented to the public and HLRA Board on August 17, 2011. The two airport alternatives were not approved by the HLRA Board at their July meeting and thus were not presented as redevelopment alternatives at the August meeting. After the presentation, there was a public question and answer period. Attendees were also given comment cards, which were collected at the end of the presentation. A sampling of comment card feedback included:

- **Road Network –** There were concerns amount of traffic that would be generated by the scenarios as well as questions about how road improvements would be made. There was specific concern on how flooding would be controlled along Keith Valley Road.
- **Density –** The density of residential development was a noted concern. In general, less density was desired.
- **Retail –** Big boxes and malls were noted as retail that was not desired at the site.
- **Town Center –** Many of the comments indicated support for a Town Center option, with a focus on Alternative B.

Community Meeting #5 – Leadership Directives on Final Preferred Redevelopment Plan
October 19, 2011

The focus of this community meeting was to obtain feedback and directives from the community's leaders regarding the elements of the three redevelopment alternatives they wanted to carry forward as part of the final preferred redevelopment plan. For two months following the August presentation, the HLRA received public comments and concerns from various community interests. Input was collected via e-mail, phone calls, comment cards, and through individual meetings with members of the HLRA Board and Horsham Township Council. The consultant summarized and addressed these comments and concerns during the

presentation. A general summary of those comments include:

- **Town Center -** There was strong support for the creation of a Town Center. The preferred layout was for an open space feature to be in the middle of the Town Center, with retail uses, such as restaurants and neighborhood-serving shops, lining the public space. Big boxes and malls were not desired anywhere on the NAS-JRB Willow Grove redevelopment site. It was preferred that the Town Center be within walking distance of the proposed hotel/conference center and office park.

  In general, it was agreed that the Town Center needed to be a unique "destination" attraction. This could include cultural or recreational event programming at the park located at the middle of the Town Center. The programmed events or entertainment destination would in-turn help to support the restaurants and retail shops.

- **Hotel/Conference Center -** There was a large amount of support for a high-end quality hotel and conference center. Ideally, it would be located near the Town Center and future office park. It was noted that the height limits in current zoning ordinances could be raised to a maximum of 10-stories if the right user was interested.

- **Residential -** It was preferred that the residential units include the number necessary to make the Town Center project economically viable. There was support for higher-end single-family homes to be located on the northern end of the property. These homes would be able to capitalize on the views and golf course. It was also preferred that these homes be part of a Homeowners Association that takes care of outside maintenance/landscaping.

  It was preferred that the smaller single family homes, townhomes, and condominiums be located near the Town Center. While these housing types are attractive to those 55+, the general input was that there should not be age-restrictions placed on the homes. This would ensure these homes would be available to singles, couples, and small families as well as older adults initially and in future years.

- **Road Network –** It was preferred that Norristown Road connect to Maple Avenue, Precision Road connect to Moreland Avenue and Privet Road connect to the Main Gate on Easton Road. There was concern about Keith Valley Road being able to handle the increased traffic in its current condition. Flood mitigation efforts and improvements would be needed to upgrade this low lying area prone to flooding.

  The "Grand Boulevard", which would run through the center of the base, was widely supported. The large grass/planted median would be wide enough to allow for sports fields, if desired. The Grand Boulevard would likely be a one-lane road on each side, with a lane for parking.

- **Open Space -** There was also concern the alternatives did not include enough active park land. Sports fields, such as soccer or baseball fields, were highly desired. The fields would allow for regular practice and game space, as well as space for larger tournaments. Sports events at the fields could include Tier 2 college-level events, such as lacrosse tournaments, as well as Little League baseball games and other elementary or high-school sporting events. It was desired for some active recreation fields to be located near the school site, which would allow for use by both the schools and other sports organizations.

- **Aviation Museum** - An aviation museum was also desired on the base. Although placement and size of the museum site will need to be defined, the museum was generally thought to be a positive addition to final preferred plan.

After the comments and concerns were addressed, the consultant received the board's directives and recommendations regarding certain land use elements, including the Town Center, hotel/conference center, residential, open space, and road network. These directives are included in the Preferred Redevelopment Plan chapter of this report.

Community Meeting #6 - Presentation of Preferred Reuse Alternative – Option D
November 16, 2011
The HLRA Board and its subcommittees, Horsham Township Council and Horsham Planning Commission, as well as public comment, provided direction to RKG Associates in refining the best aspects of the three Base Reuse Alternatives into a single Preferred Reuse Alternative D. Alternative D represents the draft proposed redevelopment plan for NAS-JRB Willow Grove. The plan is a mixed use plan configured to integrate the site with the Horsham community.

Community Meeting #7 – HLRA Board Directive on Preferred Reuse Alternative – Option D
December 20, 2011
The HLRA Board met on December 20, 2011 to provide review comments and final directives to the RKG planning team on the key elements to be depicted on the final preferred redevelopment plan. The board made final decisions regarding future road crossings and alignments, residential development densities and building square footage, and the allocation of various proposed land uses.

Community Meeting #8 - Presentation of Preferred Reuse Alternative – Option E
January 18, 2012
Following the December HLRA Board meeting, the consultant team made final revisions to the preferred redevelopment plan and presented it to the public at the January18, 2012 meeting, where it was voted on and approved by the board. The HLRA Board also directed RKG Associates to make changes to the map and to complete the NAS-JRB Willow Grove Redevelopment Plan and Homeless Assistance Submission based on that map.

Community Meeting #9 – Presentation of Final Base Reuse Plan
RKG Associates presented the NAS-JRB Willow Grove Redevelopment Plan and Homeless Assistance Submission for the purpose of soliciting and receiving public comments.

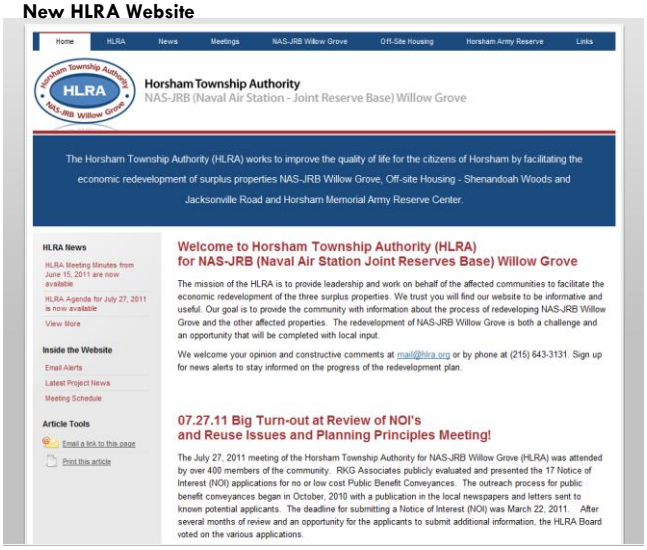
Community Meeting #10 – Adoption of Final NAS-JRB Willow Grove Redevelopment Plan and Homeless Assistance Submission
March 21, 2012
The HLRA Board voted on the approval of the proposed NAS-JRB Redevelopment Plan and Homeless Assistance Submission

3. Community Outreach Tools

In addition to the public meetings, the HLRA conducted a public outreach campaign to obtain comments, suggestions and opinions about the redevelopment of the base from a broad spectrum of residents, business owners and local and regional stakeholders. The community responded with hundreds of comment cards, emails, and letters. A description of the outreach tools are as follows:

- **HLRA Website -** An important aspect of a public outreach strategy in today's digital age is the project website. The HLRA website provides a number of helpful outreach features including: latest project news, information about upcoming HLRA meetings, HLRA approved agendas and meeting minutes, general information about the HLRA and Board, Email News Alert sign-ups which advise participants of all project meetings and events, a repository for all planning products and reports, presentations, or other documentation developed over the course of the project by the HLRA and the consultant team, background information on the BRAC process, draft and final Redevelopment Plan for public viewing and input, and, opportunities for the general public to submit comments and concerns related to draft documents.

Figure 1-9
New HLRA Website



The website (Figure 1-9) is updated whenever new information is received or a new activity is planned. The website became functional in August 2006 and was updated in March 2011 and will remain functional throughout the adoption of the Redevelopment Plan.

- **Branding/Image Development -** To establish consistency in communication and to promote and enhance public awareness about the HLRA and NAS-JRB, a logo was created that could be used on all documents and materials associated with the redevelopment of NAS-JRB Willow Grove.

- **Media -** Involvement by local media in the redevelopment planning effort is critical to furthering exposure of NAS-JRB Willow Grove, its considerable assets and the long-term potential for redevelopment. Involvement by newspapers included The Intelligencer Newspaper, the Philadelphia Inquirer, Montgomery Newspapers, Lansdale Reporter, The Times Herald and The Public Spirit, and all widely distributed newspapers to both Montgomery County and Bucks County. Media involvement included the following web-based news carriers: www.phillyburbs.com, www.horsham.patch.com and www.philly.com.

- **E-mail News Alerts -** A voluntary email news alert list was set up to automatically notify all interested parties by email of upcoming meetings, agendas, meeting changes and other key project information.

- **Public TV -** Meeting dates and announcements were broadcast on the local government Public Access channel.

- **Horsham Day -** The HLRA had a booth at Horsham Day, a community event attended by over 5,000 residents of the Horsham area. HLRA staff handed out flyers inviting the community to the Community Design Charrette on June 10 and 11, 2011 to help plan the

future of the base. The HLRA staff also answered questions, provided comment cards and collected feedback from attendees.

- **Outreach Office -** The HLRA established a publicly-available, locally-based administrative office at the Horsham Township Municipal Building. The purpose of the administrative office is to provide a centralized location for staffing, administrative support, files, and database, provide a location for face-to-face interaction with the general public, and provide meeting space for internal operations and external outreach

- **Sub-Committees -** The HLRA established four (4) sub-committees designed to solicit the input from local professionals and lay people on the redevelopment of NAS-JRB Willow Grove. The four sub-committees included: (1) Base Reuse Planning Committee, (2) Economic Development Committee, (3) Environmental Committee, and (4) Housing and Homeless Committee.

4. Summary

The HLRA has ensured an open public process to obtain citizen input on the NAS-JRB Willow Grove Redevelopment Plan and Homeless Assistance Submission. The process has been transparent and many opportunities were provided to gather input from the general public and affected parties. Each of the communication and outreach strategies listed above has been instrumental in the development of the Plan.

2 NATURAL, CULTURAL & ENVIRONMENTAL CONDITIONS

A. INTRODUCTION

The following section describes the summary of major findings; existing site conditions and natural resources at NAS-JRB Willow Grove; the environmental conditions at each of the Installation Restoration Program (IRP) sites; the built environmental conditions; and includes a site-specific evaluation of the conditions and constraints that currently exist at each IRP site. This report provides a comprehensive list of the site visits and record reviews that were used in the production of this section.

1. Site Visits and Records Review

a.) Site Visits

Weston Solutions visited NAS-JRB Willow Grove on two occasions to meet with Navy officials and public works facility managers. On February 22-23, 2011, Weston participated in a van tour of NAS-JRB, and attended a facility infrastructure and maintenance personnel briefing. Weston reviewed the current status of the waste water treatment plant, reservoir and potable water treatment building and conducted a visual inspection. On March 22-24, 2011, Weston inspected the waste water, storm water, potable water, electrical distribution, mechanical and structural facilities and sites.

b.) Plans & Drawings

The drawings listed below were used as reference for drawings and graphics generated by Weston Solutions, Inc. and were obtained from the NAS-JRB Willow Grove Engineering Department, Horsham Township, Horsham Water & Sewer Authority, HLRA, and Tetra Tech.

- Stormwater Preparedness Prevention and Contingency Plan Survey and Inspection, 9/2000
- UV System Installation, 7/27/2001
- Sewage Treatment Plant Repair, undated
- Sanitary Sewer System Map, undated
- Storm Water P Map, undated
- Steam Distribution Map, undated
- Electrical Distribution Map, undated
- Natural Gas Distribution Map, undated
- Electrical Distribution System Map, undated
- Electrical Distribution System Map, undated
- Network System Design and Installation, 1991 (telephone)
- Updating of Plant Operations and Manual Waste Water Treatment System, (September 2000)

- Zoning Map (December 6, 2010)
- Base Map, 12/20/2010
- Location of IR Sites (June 29, 2009)

c.) Environmental Acronyms & Definitions

- **CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act)** - The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as Superfund, was enacted by Congress on December 11, 1980. This law created a tax on the chemical and petroleum industries and provided broad Federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment. Over five years, $1.6 billion was collected and the tax went to a trust fund for cleaning up abandoned or uncontrolled hazardous waste sites.
- **IRP (Installation Restoration Program)** - IRP is a DoD program developed in 1975 to investigate and manage environmental impacts on military bases. The IRP adheres to all applicable regulations, including those issued by the U.S. Environmental Protection Agency (EPA), Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986.
- **NPL (National Priorities List)** - The National Priorities List (NPL) is the list of national priorities among the known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States and its territories. The NPL is intended primarily to guide the EPA in determining which sites warrant further investigation.
- **OU (Operable Unit)** - Term for each of a number of separate activities undertaken as part of a Superfund site cleanup. A typical operable unit would be removal of drums and tanks from the surface of a site.
- **RCRA (Resource Conservation and Recovery Act)** - The Resource Conservation and Recovery Act (RCRA) gives EPA the authority to control hazardous waste from the "cradle-to-grave." This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA also set forth a framework for the management of non-hazardous solid wastes.
- **ROD (Record of Decision)** - The Record of Decision (ROD) is a public document that explains which cleanup alternatives will be used to clean up a Superfund site. The ROD for sites listed on the NPL
- **UU/UE (Unlimited Use/Unrestricted Exposure)** - Unlimited Use/Unrestricted Exposure (UU/UE) means that there are no restrictions placed on the potential use of land or other natural resources.[1]

B. SUMMARY OF MAJOR FINDINGS

Installation Restoration Program and RCRA

- Status of IRP Program Sites - Based on unrestricted use and unlimited exposure scenarios at nine (Sites 1, 2, 4, 5, 6, 7, 8, 9, and 11) of the 12 IRP sites, no further action is required and there are no existing or anticipated restrictions on uses of the sites. Therefore, there are no constraints anticipated associated with potential future reuse or development of the

[1] http://www.epa.gov/

property associated with these nine sites, or portions thereof.

The Navy's Installation Restoration Program (IRP) includes sites both on the surplus property and the property owned and/or transferred to the Air Force for the Horsham Air Guard Station. Thus, Sites 1, 9, 10 and 11 do not impact the redevelopment plan in the same way as the remaining sites.

- Site 1 - Privet Road Compound Groundwater - The groundwater in the area of Site 1 (OU 3) is contaminated with volatile organic compounds (VOCs), specifically chlorinated solvents, and the source of the contamination has been identified as an off-post location. EPA is in the process of investigating the off-site source of groundwater contamination and will ultimately issue a final ROD.

- Site 3 - Ninth Street Landfill - Soil, sediment, surface water and groundwater has been investigated the RI/RA report is being reviewed by EPA. The RI data and RA for the site indicate that the soil (OU 6) and groundwater (OU 10) have been contaminated as a result of activities at the site, and that remedial actions are required; a feasibility study to evaluate remedial actions is currently being prepared. The Navy has made a commitment to completing the CERCLA process for the site and implementing a remedial action that is operating properly and successfully to support property transfer.

- Site 5 - Fire Training Area Groundwater - Groundwater is contaminated with chlorinated solvents (VOCs), primarily PCE, tricholorethene (TCE), and - tricholorethane (TCA) as a result of activities at the site, and remedial actions are required. The CERCLA process is still in progress for groundwater at the site (OU 2), and currently is in the Proposed Plan stage. The Navy has extended an enhanced biological treatment pilot study, which has shown to be effective at treating the contaminant source area. The Navy has made a commitment to completing the CERCLA process for the site and implementing a remedial action that is operating properly and successfully to support property transfer.

- Site 10 – Navy Fuel Farm - The status of Site 10 is such that there is no further action at this time. However, this is based on continued use as commercial/industrial property.

- Site 12 - South Landfill - The CERCLA process is in progress for the site soil, sediment, surface water, and groundwater (OU 11) and currently is in the RI stage (Phase I complete). The RI data to date for the site indicate that soil, sediment and surface water at the site have been contaminated by SVOCs, metals and, pesticides as a result of activities at the site, and that remedial actions are likely required. In addition, buried waste has been found at the site. The CERCLA process needs to be completed, including additional investigations, risk assessments, and determining and implementing appropriate remedial actions for the site.

Resource Conservation and Recovery Act (RCRA)

- Information for RCRA activities at the NAS-JRB site indicate that there are no existing or anticipated restrictions on land use or constraint due to past RCRA activities.

- Hazardous wastes have been removed from Building 633 and RCRA wastes are no longer generated on the Base, therefore there are no anticipated constraints related to past RCRA activities.

Built Environmental Conditions

- Radiological Materials - Review of the Environmental Condition of Property (ECP) Report for NAS-JRB Willow Grove (Dept. of the Navy, 2006) indicates that "according to site personnel, there are no radiological materials currently used or located at NAS-JRB Willow Grove." However, the Navy is currently updating its study and additional information will be provided when it is available.

- Radon - Preliminary radon screenings in approximately 8% of the buildings was performed in 2001and also summarized in the ECP Report. Of the 200 samples analyzed (8 samples were lost in transit), only 1 sample, collected from Room 122 in building #137, contained radon concentrations above the USEPA action level of 4 picoCuries per liter.

- Archeological Resources - The 1996 Louis Berger Archaeological Resources survey indicated that as the vast majority of the land surface within NAS-JRB Willow Grove has been subjected to severe disturbance resulting from construction activities that have occurred since 1944, the potential for intact historic or prehistoric archaeological remains are limited.

  Four out of 15 locations with historical documentation of occupation on-base were evaluated to have either moderate or high potential for intact archaeological remains. The remaining 11 locations possessed low or extremely low potential for archaeological remains. Only one circumscribed area appeared to possess moderate potential for prehistoric resources.

C. NATURAL RESOURCES

a.) Topography

NAS-JRB Willow Grove is characterized by generally rolling topography that varies from north to south and east to west. The location of the base is at the summit of one of the topographic highs in the region with the highest elevation reported to be 370 feet above mean sea level (MSL) and the lowest at 240 feet above MSL (Navy BRAC PMO, 2006). Slopes are generally less than 3% except where regrading has modified the natural topography of the land during previous development and expansion of the base (Brown and Root, 1998).

b.) Geology

The base is located within the Triassic Basin geomorphologic region of southeastern Pennsylvania with a bedrock comprised of a portion of the middle arkose member of the late Triassic Age Stockton Formation (Figure 2-1). It has been determined that the average depth to bedrock across the base is between 5 to 25 ft below ground surface (Brown and Root, 1998).

c.) Soils

The Soil Survey of Montgomery County (USDA, 1967) indicates that 14 soil types exist on NAS-JRB Willow Grove. Of these 14 soil types, three types appear on the National Hydric Soils list (Naval reserve Force, 2001). The soils types on the base are depicted in Figure 2-1.

d.) Floodplains

A small area adjacent to Park Creek at the extreme northern end of the runway safety zone

is the only area on base that would be inundated during 100-year flood events (Figure 2-2). This area encompasses both side of Keith Valley Road and is prone to road flooding during seasonal rain events.

e.) Waterbodies

There are three waterbodies within the boundary of NAS-JRB Willow Grove, including a pond just west of the Commanding Officer's residence, the Navy retention pond upstream from Outfall #5, and the nature trail pond near Outfall #6. All three ponds are heavily vegetated around the majority of their perimeters and provide habitat for a number of species of waterfowl. In addition, the Navy retention pond has been used for recreational fishing with a previous stocking program that included large-mouth bass, bluegill, catfish, and minnows. (Naval Reserve Force. 2001) However, the presence of detected PAHs in the pond sediment has resulted in an advisory against fish consumption.

f.) Watercourses

There are three named watercourses that are proximal to the base. These streams are discussed below.

- **Pennypack Creek** - is located just south of the base and is a direct tributary to the Delaware River. This watercourse receives stormwater flow from the base via a drainage swale at Outfall No. 5, which is located along Horsham Road at the southwest corner of the base. In addition to the outfall on Horsham Road there is significant sheet flow from the property especially outside the fence line.

- **Little Neshaminy Creek** - is located just northeast of the base and receives flows from Park Creek, which is a perennial stream that flows adjacent to the northern limits of the base.

- **Park Creek** - is a perennial stream that flows adjacent to Keith Valley Road at the northwest corner of the base. This stream drains into Little Neshaminy Creek and is prone to seasonal flooding.

g.) Wetlands

There are 21 separate wetland areas within the boundary of NAS-JRB (Figure 2-2). The wetlands are comprised of palustrine, riverine, and lacustrine systems and cover a total area of approximately 14.3 acres. The palustrine systems predominately consist of forested, scrub/shrub, emergent and open water classes. The riverine systems, which are located along Park Creek at the northern end of the base and at various other on-base drainage locations, are either perennial or intermittent in nature. The remaining lacustrine systems exist in areas that have been constructed primarily for the management of stormwater. (Naval Reserve Force, 2001).

h.) Vegetation

Approximately half of NAS-JRB is developed land consisting of little or no vegetation. The remaining sections of the base consist of undeveloped vegetated areas primarily limited to the western side of the base on the extreme north end of the runway. Approximately 40% of the base land area consists of mowed grass, 8% consists of shrub-land and approximately 6% consists of forestland (Geo-Marine, 2000).

i.) Wildlife

A base Integrated Natural Resources Management Plan prepared by Geo-Marine, Inc in 2000 concluded that 37 species of herpetofauna, 32 species of birds, and 29 species of

mammals were either observed or likely to occur on NAS-JRB Willow Grove. (Geo-Marine, 2000)

j.) Rare, Threatened, and Endangered Species
There are no State or Federal known populations of rare, threatened, or endangered plant or animal species identified on NAS-JRB Willow Grove (Dept. of the Navy, 2006).

D. INSTALLATION RESTORATION PROGRAM

1. Installation Restoration Program Overview

The NAS-JRB Willow Grove Installation Restoration Program (IRP) overview and site status presented herein is based on information obtained from the following references, as well as from a meeting with the Navy BRAC Program Management Office (PMO) Northeast on March 7, 2011 and Restoration Advisory Board (RAB) meeting on May 25, 2011.

- Site Management Plan, Fiscal Year 2010, Naval Air Station Joint Reserve Base (NAS-JRB), Willow Grove, Pennsylvania, Tetra Tech NUS, Inc., October 2010
- Environmental Summary of Installation Restoration Sites, Provided by Navy BRAC PMO Northeast, May 2011.
- Environmental Condition of Property Report for the Naval Air Station Joint Reserve Base Willow Grove, Pennsylvania. U.S. Department of the Navy (Navy). Base Realignment and Closure Program Management Office. 11 May 2006.

The Navy established an Installation Restoration Program (IRP) for the NAS-JRB Willow Grove facility in the 1990s. The IRP is a DoD program developed in 1975 to investigate and manage environmental impacts on military bases. The IRP adheres to all applicable regulations, including those issued by the U.S. Environmental Protection Agency (EPA), Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986. The former industrial operations are currently managed under various environmental programs, primarily CERCLA, which was established to identify those sites where environmental releases had occurred and to take appropriate action to remedy those releases.

NAS-JRB Willow Grove was placed on the National Priorities List (NPL) (USEPA ID# PAD987277837) in 1995. The NPL is a prioritized list of sites with known or threatened releases of hazardous substances, pollutants, or contaminants at locations throughout the U.S. and its territories. The NPL is intended primarily to guide the EPA in prioritizing sites that warrant further investigation. In addition, a Federal Facilities Agreement (FFA) was finalized in June 2005 between the Navy, the EPA and the Pennsylvania Department of Environmental Protection (PADEP). The FFA ensures that environmental impacts associated with the sites are fully investigated and proper response actions are taken.

Some IRP Site Not on Surplus Property

The Navy's Installation Restoration Program (IRP) includes sites both on the surplus property and the property owned and/or transferred to the Air Force for the Horsham Air Guard Station. Thus, Sites 1, 9, 10 and 11 do not impact the redevelopment plan in the same way as the remaining sites.

The Navy has identified 11 IRP sites at NAS-JRB Willow Grove since 1994; one additional site (potential "Site 11") was studied although was never added to the list of IRP sites or the NPL. NAS-JRB Willow Grove currently has five sites in various stages of investigation and cleanup, and seven sites, including the potential "Site 11," recommended for No Further Action, as listed in Table 2-1. Since placement of NAS-JRB Willow Grove on the NPL in

1995, the air station has rectified identified source areas through activities including excavation, source removal, and underground storage tank (UST) upgrades. A summary of the 12 sites and current status is provided in the following subsections.

Table 2-1
Summary of Installation Restoration Program Sites
NAS-JRB Willow Grove

SITE	NAME	OPERABLE UNIT (OU)	STATUS
1	Privet Road Compound	Soil - OU 1	No further Action ROD Signed September 2006
		Groundwater -OU 3	Interim ROD Signed September 2008
2	Antenna Field landfill	Soil - OU 5	No Action ROD Signed June 2010 (OU 5 and OU 9)
		Groundwater- OU 9	
3	Ninth Street Landfill	Soil - OU 6	Draft RI/FS Report Signed October 2011
		Groundwater- OU 10	
4	North End Landfill	----	Consensus Agreement for No Action January 2009
5	Fire Training Area	Soil - OU 4	No Further Action ROD
		Groundwater -OU 2	June 2011 Proposed Remedial Action Plan
6	Abandoned Rifle Range No. 1	----	Consensus Agreement for No Action December 2007
7	Abandoned Rifle Range No. 2	----	Consensus Agreement for No Action August 2008
8	Site 8 - Building 118 Abandoned Fuel Tank	---	No Further Action Agreement October 2006
9	Steam Plant Building 6 Tank Overfill	----	No Further Action Agreement October 2006
10	Navy Fuel Farm	----	No Further Action at this time - not cleared for unrestricted use
SSA 11	Aircraft Parking Apron	---	Eliminated From Consideration
Site 12	South Landfill	Soil and groundwater - OU 11	RI/FS Process

Figure 2-1

NAS JRB Willow Grove
Horsham Township, PA

Soil Features

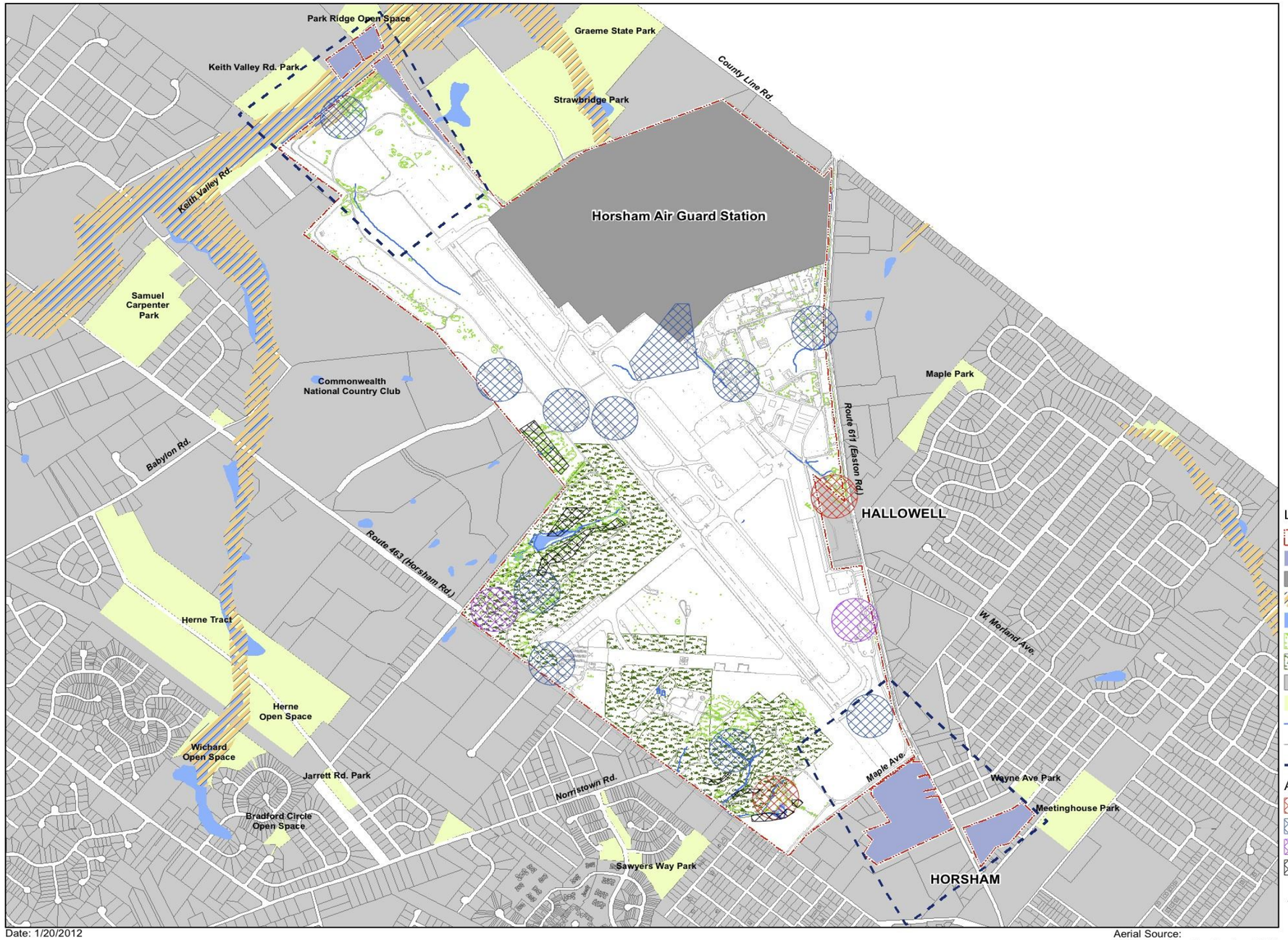
Date: 1/3/2012

Aerial Source:
ESRI Bing Mapping Service, 2010

Figure 2-2

NAS JRB Willow Grove
Horsham Township, PA

Natural Resources



Legend
- Willow Grove NAS
- US Navy Property
- Horsham Air Guard Station
- FEMA Flood Plain
- NWI Wetlands
- Vegetation
- Habitat Areas
- Parcels
- Parks Open Space
- Water
- Runways/Aprons and Roadways
- Clear Zone

Archeological Sensitive Areas
- High Potential
- Low Potential
- Moderate Potential
- Prehistoric Arch Sites Potential

0 625 1,250 2,500 Feet

Date: 1/20/2012

Aerial Source:
ESRI Bing Mapping Service, 2011

2. Installation Restoration Program Sites

a.) Site 1 - Privet Road Compound

The Privet Road Compound, Site 1 is located west of Privet Road, lies within a heavily developed section of the NAS-JRB near the eastern boundary of the Base, adjacent to Privet Road, across from the steam plant (Building No. 6) (Figure 2-3). The entire site area is approximately 2 acres and formerly consisted of a bowling alley, parking lot, and a 1/2-acre grass covered lot (formerly) fenced area. The site was used in the past for waste handling and disposal. The land associated with Site 1 was transferred (18.25 acres including Site 10) to the Air Force in September 2009 as part of the BRAC 2005 requirement to construct an Army Reserve Center.

Current status of site soils is that no further action is required, based on an evaluation of unlimited use and unrestricted exposure (UU/UE), as documented in the Site 1 Soil, Operable Unit (OU) 1, 2006 Record of Decision (ROD). The groundwater in the area of Site 1 is contaminated with volatile organic compounds (VOCs), specifically chlorinated solvents, and the source of the contamination has been identified as an off-post location. The Navy prepared an ROD with an interim remedy for groundwater, since EPA is in the process of investigating the off-site source of groundwater contamination; EPA will ultimately issue a final ROD. The interim ROD consists of land use controls, restricting use of untreated groundwater in the area, which includes portions of the Base beyond the Site 1 boundary (Figure 2-3). Information regarding the site history and environmental studies is provided in the following paragraphs. As of November 2011 construction of the Horsham Reserve Center training enclave appears complete.

The Privet Road Compound site was used to process wastes from 1967 to 1975. A fence was erected around the compound area in 1972 to control waste disposal and handling within the compound. The suspected former waste handling area is believed to extend throughout Site 1, including the area where the former Bowling Alley and parking lot were located. The Privet Road Compound was constructed as a transfer station to handle materials not accepted by the trash pickup service. During operations at the compound, wastes were temporarily stored on site to await off-site disposal or burned and/or buried on site. Burning and burial ceased by 1975; but stored waste material was not completely removed from the site until 1977. Wastes reportedly disposed at the site included paint wastes, paint stripper and solvents, Freon, general refuse, asbestos, battery acid, sewage sludge containing heavy metals, oils and lubricants, and mercury-containing dental amalgam. Transformers containing polychlorinated biphenyls (PCBs) were also stored at the site and PCB-containing liquids spilled when stored transformers overturned during an incident at the compound.

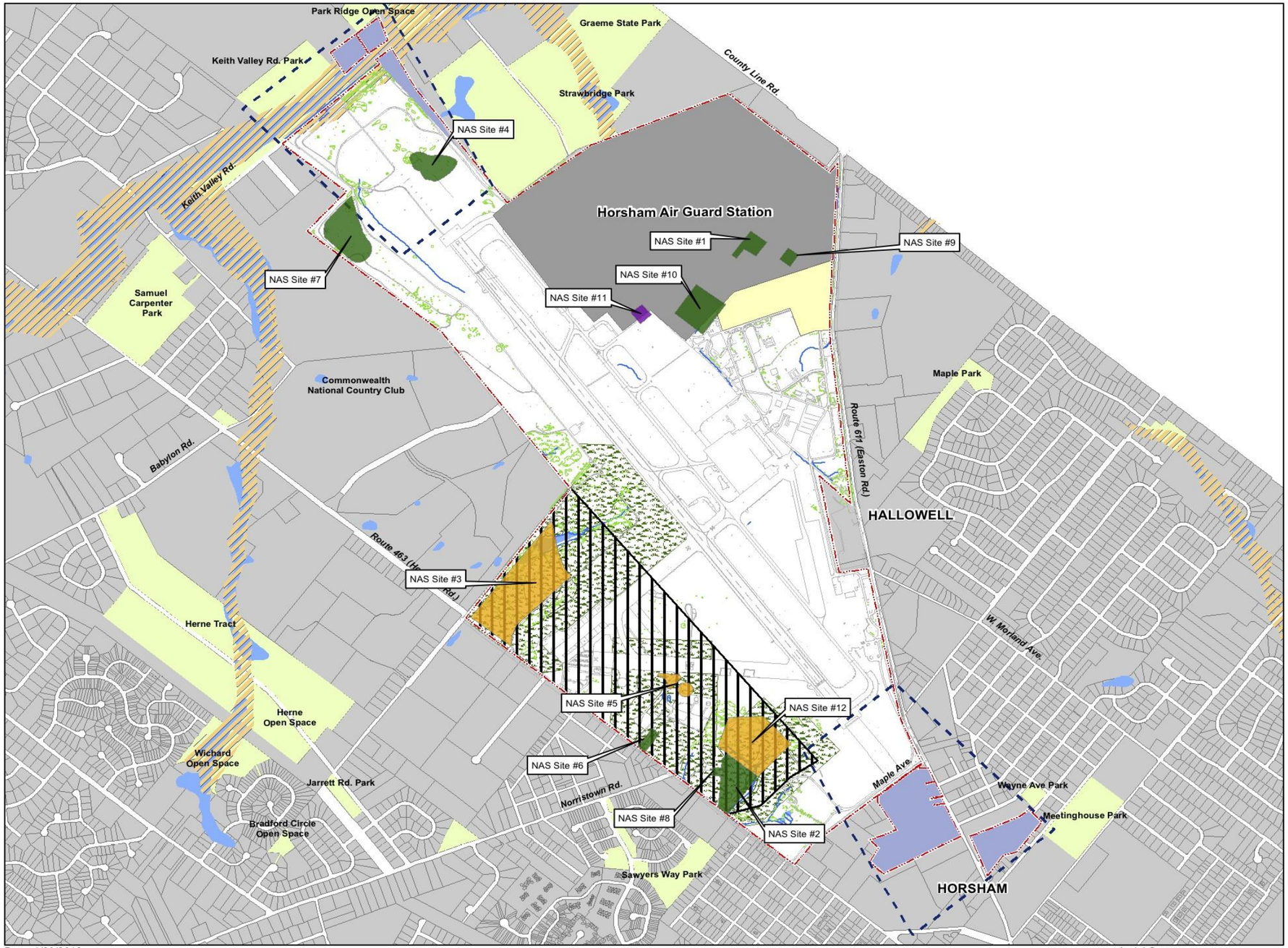
Remedial investigations (RIs) and risk assessments (RAs) were conducted at various times from 1991 through 2006 to characterize nature and extent of contamination and site risks associated with soil and groundwater conditions at Site 1. In addition, groundwater data from NAS-JRB facility two deep Navy production wells was evaluated. In June 1999, a removal action for PCB-contaminated soil at Site 1 was completed. A total of approximately 1,100 tons of soil was removed for disposal off-site.

It was determined that the chlorinated solvents found in the local groundwater do not originate substantially from the Privet Road Compound area, but from an off-Base location southeast of Site 1, across Pennsylvania Route 611 in the vicinity of the former Kellet Aircraft manufacturing facility.

Figure 2-3

NAS JRB Willow Grove
Horsham Township, PA

Environmentally Sensitive Sites (Installation Restoration Sites)



Legend

- Willow Grove NAS
- US Navy Property
- Horsham Air Guard Station
- FEMA Flood Plain
- NWI Wetlands
- Vegetation
- Habitat Areas
- Parcels
- Parks Open Space
- Water
- Runways/Aprons and Roadways
- Clear Zone
- IRP Sites - Investigations Underway
- IRP Sites - Records of Consensus Aggreement No Further Action Decision
- IRP Sites - Eliminated from Consideration (No Action Needed)
- Land Use Controls
- Potential Future Land Use Controls

0 625 1,250 2,500 Feet

Date: 1/20/2012

Aerial Source:
ESRI Bing Mapping Service, 2011

The CERCLA process was followed for Site 1. Currently there is a 2006 final ROD for soil (no further action), and an 2008 final ROD for interim groundwater (OU 3) remedy, consisting of LUCs precluding unrestricted use of untreated groundwater, periodic groundwater monitoring, and a review of site conditions and risks every five years. Interim measures will be in effect while EPA investigates the off-site source of the groundwater contamination. The first round of Site 1 groundwater monitoring as per the ROD and Remedial Design was conducted in September 2009.

In August, sampling was conducted for volatile organic compounds in the monitoring wells and the supply wells, and the supply wells were also analyzed for metals. Results show that the monitoring wells are below action levels, which are the MCLs. One of the supply wells contains PCE above the MCL of 5, but the levels are decreasing since they were first sampled back in the 1990s. It was recommended to sample another round in a couple years to monitor the low levels of PCE. It was also noted that the operating permit for the supply wells has been transferred from the Navy to the Pennsylvania Air National Guard.[2]

b.) Site 2 - Antenna Field Landfill

The Antenna Field Landfill is located in the southern portion of the property, southwest of Runway 10-28 (Figure 2-3). The landfill was estimated to be approximately 4 acres in size, and currently is an open grassed area and an antenna array consisting of five antennae. The landfill was used between 1948 and 1960 as the principal disposal area for solid waste generated by the facility. Current status of site soils is that no further action is required, based on an evaluation of UU/UE site use, as documented in the Site 2, soil (OU 5) and groundwater (OU 9) 2010 ROD. Information regarding the site history and environmental studies is provided in the following paragraph.

Waste disposal activities included the excavation of trenches where wastes were subsequently burned and/or buried. In addition to general wastes, other materials such as furniture, tires, shingles, and reportedly paint wastes and sewage sludge were disposed at Site 2. RIs and RAs were conducted at various times from 1991 through 1998 to characterize nature and extent of contamination and site risks associated with soil and groundwater conditions at Site 2. The RI/RA report was held up due to issues related to site boundaries and data associated with removal of drums and debris in 2003 found by the Navy between sites 2 and 5; this area is now referred to as Site 12. The CERCLA process was followed for Site 1. Currently there is a No Action 2010 final ROD for soil and groundwater at Site 2.

c.) Site 3 - Ninth Street Landfill

The Ninth Street Landfill site is a 9-acre grassed/shrubby area located at the western boundary of the NAS-JRB facility, immediately north of Ninth Street. The site was used as landfill to replace disposal at the Antenna Field Landfill, beginning in 1960. Wastes were disposed by burning and burial in excavated trenches. The current status of Site 3 is that soil, sediment, surface water and groundwater were investigated; the results of the investigations are detailed in the RI/RA Report, which was released in October 2011. Information regarding the site history and environmental studies is provided in the following paragraphs. The RI data and RA for the site indicate that the soil (OU 6) and groundwater (OU 10) have been contaminated as a result of activities at the site, and that remedial actions are required; a feasibility study to evaluate remedial actions is currently being prepared.

Wastes were deposed at Site 3 from 1960 to 1967; wastes were similar to those at Site 2, including general wastes, bulk items, paint waste, asbestos, and sewage sludge.

[2] Restoration Advisory Board (RAB) Meeting Minutes , RAB Meeting No. 47, December 11, 2011.

Transformers containing PCBs were also stored and serviced in a salvage yard established on the landfill after the landfill's closure in 1967.

RIs and RAs were conducted at multiple times from 1991 through 2009 to characterize nature and extent of contamination, delineate areas of waste disposal/landfill cells, and characterize site risks associated with soil sediment, surface water, and groundwater conditions at Site Groundwater studies include down-gradient area on the adjacent Commonwealth National Country Club/golf course to the north/northwest (outside of the base boundary). Significant quantities of buried waste material at several Site 3 locations were encountered during the 2007 investigation, and soil samples associated with some of the buried waste contained elevated levels of semivolatile organic compounds (SVOCs), pesticides, polychlorinated biphenyls (PCBs), polychlorinated dibenzo(p)dioxins (dioxin), and metals. Groundwater monitoring, including more recent data form a interim groundwater monitoring (IGWM) program (2009) and new monitoring well data (2010), indicate that groundwater in the area of Site 3 is contaminated with chlorinated solvents (VOCs), primarily tetrachloroethene (PCE). The extent of the contamination within the footprint of the site and extends beyond the Base boundary in the flow of the unconfined aquifer groundwater direction (to the north/northwest).

d.) Site 4 - North End Landfill

The North End Landfill site is approximately 3.5-acre open area and is located between the northern end of Runway 15/33 and the Perimeter Road. Site 4 was reportedly used from approximately 1967 to 1969 to accept overflow wastes from the Privet Road Compound. The site currently is covered with a mix of grass, shrubs, and bare soil areas. Waste materials disposed at the site were believed to be bulk municipal waste items, sewage sludge, and oils and lubricants.

The current status of Site 4 is that, based on the results of the Site Screening Process, no action is required for the site, based on UU/UE site use, as agreed to and documented by the Navy, EPA, and PADEP. Additional information regarding the site history and environmental studies is provided in the following paragraph.

During waste disposal operation at site 4, wastes were reportedly buried or covered. However, past observations indicated presence of pool of oily or tar-like waste at the site. The site investigation in 1990 support initially supported a no further action decision; however, the Navy conducted a site screening investigation and additional soil sampling at multiple times in 2008 to determine the nature and extent of the tar-like substance. The tarry waste and related soil were excavated for off-Base disposal in 2008. Based on discussions among the Navy, EPA and PADEP, the Navy agreed to prepare an individual site screening process consensus agreement for No Action at Site 4. The Record of Consensus Agreement was finalized in 2009.

e.) Site 5 - Fire Training Area

The Fire Training Area, Site 5, is located in the south-central portion of the Base, approximately midway between Runway 10-28 and State Route 463 (Figure 2-3). The site is located immediately south of Taxiway Juliet and covers an irregularly shaped area of approximately 1.25 acres. Site 5 currently is primarily covered with grass, with some woody and brushy vegetation present within the southern portion of the area. The training area was used from 1942 to 1975 for large-scale firefighting exercises, which included the storage, disposal and burning of flammable liquid wastes generated by the Base.

The current status of Site 5 is that a 2007 final no further action ROD exists for the soil at the site (OU 4). The CERCLA process was followed for Site 5 soils and included two rounds of soil removal actions for polynuclear aromatic hydrocarbons (PAHs)-contaminated, conducted in

late 2005 through 2006. The CERCLA process is in progress for groundwater at the site (OU 2), and currently is in the Proposed Plan stage. Investigations at the site indicate that groundwater is contaminated with chlorinated solvents (VOCs), primarily PCE, tricholorethene (TCE), and 1,1,1- tricholorethane (TCA), as well as benzene and toluene.

Currently the Navy is continuing with a new phase of an enhanced biological treatment pilot study, which has shown to be effective at treating the contaminant source area. The treatment is focused on the contamination source area, which is near the area where the drums were stored. The groundwater contamination is present in the shallow aquifer, in the near vicinity of the former drum storage area, and in intermediate groundwater, extending to the north/northwest beyond the source area. Additional information regarding the site history and environmental studies is provided in the following paragraphs.

Wastes disposed/burned at Site 5 firefighting exercises included solvents, paint chemicals, xylenes, toluene, and various petroleum compounds (approximately 4,000 gallons per year burned). The area was also reportedly used for the drum storage of these flammable materials during the periods between burning exercises. The burn area, consisting of the "burning ring" (section of a partially buried steel tank, top open), was located in the south-central portion of the site.
RI/RA activities to determine nature and extent of soil and groundwater contamination at Site 5, and to assess site risks, were conducted via multiple times and reports during the period of 1991 through 2007. Field work included sampling to verify that site groundwater contamination was not moving off-Base toward the Horsham Township Municipal water supply well number 26. Sentinel monitoring wells on the Base property are being used for annual water quality monitoring to verify contamination is not migrating closer toward the municipal water supply well. The soil removal action for PAH- contaminated soil at Site 5, conducted in 2005-006, included confirmation sampling for dioxins, as per EPA request. A feasibility study documenting evaluation of groundwater remediation options for the site was finalized in 2008.

The Navy initiated a bioremediation pilot study for Site 5 groundwater in 2009 using biostimulation and groundwater recirculation. The primary objective of biostimulation was to promote population growth of native bacterial populations by creating more favorable environmental conditions using sodium lactate and sodium bicarbonate. Two rounds of biostimulation were completed, along with post-injection monitoring, from 2009 through 2010. The Navy has initiated a bioaugmentation phase of the pilot study consisting of adding sodium lactate in emulsified oil from using groundwater recirculation wells. As of May 2011, the Navy has completed half of an 8-week injection period of this phase of the pilot study. The Navy is currently in the Proposed Plan stage for groundwater at Site
5.

The latest round of groundwater testing took place in September 2011. Results indicate that the original pollutant compounds are now reduced (or absent); and intermediate compounds, which result from the breakdown of the original pollutants due to the action of the biological 'bugs', are steady to declining. The EPA is currently reviewing documentation that will formalize the bio-remediation action and add "land use controls", which will prohibit the future use of untreated groundwater until pollutants levels are reduced below action levels. A ROD for Site 5 is anticipated in 2012, and a RA in 2013.

f.) Site 6 - Abandoned Rifle Range No. 1
Site 6, Abandoned Rifle Range No. 1, is located adjacent to Horsham Road in the south/southwest area of the base, near the southwestern corner of the Marine Reserve Compound. The historic extent Site 6 (approximately 1 acre) is covered primarily by the Marine Reserve Training Center building and parking area that was constructed in the mid1990s,

surrounded by grassed and tree covered areas. The rifle range was built in 1942 and consisted of a firing mat and an earthen rampart. The range was thought to be in active use until the second range was built in 1965.

The current status of Site 6 is that a final Record of Consensus Agreement No Action Decision for Site 6 based on UU/UE was reached for the site in 2007. Additional information regarding the site history and environmental studies is provided in the following paragraph.

After the rifle range site was closed, the rampart was regraded. There are no records indicating whether or not the lead from the fired rounds was removed; therefore, it is assumed that the lead was mixed with the earth from the rampart during the regrading process. An extended site investigation was conducted at Site 6 in 1991. Results indicated no apparent threat to health or the environment based on UU/UE; therefore, and no further action was recommended for the site. Based on the results of the Site Screening Process performed in accordance with the FFA, the Record of Consensus Agreement No Action Decision for Site 6 was reached by the Navy and EPA in 2007, and PADEP concurred with the decision.

g.) Site 7 - Abandoned Rifle Range No. 2

Site 7 is located in the northwestern corner of the NAS-JRB Willow Grove, west of the north end of Runway 15/33. The size, configuration, and operation of the rifle range were similar to Site 6 and consisted of a l-acre earthen rampart to collect fired rounds of ammunition. The abandoned rifle range No. 2 operated from 1965 until 1977.

The current status of Site 7 is that a final Record of Consensus Agreement No Action Decision for Site 7 based on UU/UE was reached for the site in 2008. Additional information regarding the site history and environmental studies is provided in the following paragraph.

The rifle range ceased operations in 1977 when the current range was constructed at Building 176 at the Army Reserve Compound. The rampart, along with the spent ammunition, was regraded in 1977. This area was subsequently used as a landfill for inert materials including clean fill, broken concrete, asphalt, and cinderblocks. In addition, dry wastewater treatment sludge and emulsified oil and grease from on-site oil/water separators were reported to have been buried at the site.

An extended site investigation was conducted at Site 7 in 1992. Results combined with the results of the site screening process and a human health screening in 2008, indicated no apparent threat to health or the environment based on UU/UE; therefore, and no further action was recommended for the site. Based on the results of the Site Screening Process performed in accordance with the FFA, the Record of Consensus Agreement No Action Decision for Site 7 was reached by the Navy, EPA, and PADEP in 2008.

h.) Site 8 - Building 118 Abandoned Fuel Tank

Site 8 consists of a former underground 500-gallon heating fuel tank located approximately 50 feet north of Building 118. The No. 2 heating fuel tank was placed in service in 1959 and was abandoned in place in 1980 when it was replaced with a 290-gallon above ground tank. In 1980, oil was observed seeping into the basement of Building 118, continued to occur on an intermittent basis, and the oil was removed after each occurrence. The tank investigation indicated an empty tank with no noted presence of released materials in the soils around the tank.

The current status of Site 8 is that the Navy and PADEP documented an agreement of no further action in 2005. In 2006 EPA concurred that the site had non-CERCLA issues and could

be closed out from a CERCLA perspective.

i.) Site 9 - Steam Plant Building 6 Tank Overfill

Site 9 was the result of a fuel oil release in 1978 that occurred in the area between Building 6 and Building 114 as a result of an overfill during a fuel delivery. The total affected area was less than 1 acre. Spill containment did not exist at that time. The fuel backed up through the vent pipe, and approximately 3,000 to 5,000 gallons of fuel oil were released. During the spill response, the fuel was flushed with water and runoff was directed to drainage swales downstream of the steam plant and toward the Air Reserve Facility's detention basin on the northern side of the facility (equipped with oil spill containment devices).

The current status of Site 9 is that the Navy and PADEP documented an agreement of no further action in 2005. In 2006 EPA concurred that the site had non-CERCLA issues and could be closed out from a CERCLA perspective.

j.) Site 10 - Navy Fuel Farm

Site 10 is located south of the Air Reserve facility along the north side of Privet Road. The land associated with Site 10 was transferred (18.25 acres including Site 1) to the Air Force in September 2009 as part of the BRAC 2005 requirement to construct a consolidated Armed Forces Reserve Center.

The site, currently primarily a grassed area, exists due to past releases from former partially buried fuel tanks and diesel/water underground storage tanks (removed in 1991). Current status of site soils is that no further action is required at this time, based on continued use as commercial/industrial property, as documented in the Navy's 2004 Request for No Further Action for IR Program Site 10 Groundwater. The groundwater in the area of Site 1 is contaminated with organic compounds from the past jet fuel releases, and has undergone treatment for removal of light non-aqueous phase liquid (LNAPL) present in the area of the former tanks. However, PADEP noted in their letter (PADEP, April 2004) that groundwater and soil at Site 10 do not meet criteria for unrestricted use and that it may be appropriate to seek full closure under Act 2 if land use changes. The most recent documentation regarding extent of contamination available on the Administrative Record appears to be a 2001 treatment system performance report, which seems to indicate that the contamination is confined to the land that has been transferred to the Air Force. Additional information regarding the site history and environmental studies is provided in the following paragraph.

Two partially buried, 210,000-gallon fuel tanks containing aviation fuel (Tank 115 and 116) were formerly located at Site 10. In addition, two smaller underground storage tanks (USTs) (waste oil and diesel fuel) were located in the southeastern corner of the site. The waste oil tank was formerly used for fuel storage. In 1986, Tank No. 115 was overfilled and fuel was released to the ground. During excavation for utility work on the southern side of the site in 1986, nonaqueous phase liquid (NAPL) was observed floating on top of the water in the trench in the area of a dry well located south of the 210,000-gallon tanks. In March 1989, aviation fuel was detected emanating from the ground on the west side of Tank No. 115. Inspection of the waste oil tank during removal in 1991 revealed that the tank was not intact as holes up to 1 inch in diameter were reported.

An LNAPL recovery system designed to remediate the fuel spill was installed in 1998. The Navy discontinued active operation of the LNAPL recovery system for the jet fuel spill in 2001. Quarterly floating product recovery by bailing, or capture by absorption onto recovery "socks" placed in the well, continued until January 2003. Field work included installation

and sampling of monitoring wells and soil borings to evaluate current site conditions. A final RI for Site 10 soil was submitted by the Navy in 2003 to support "no further investigation at this time" decision for Site 10.

k.) Site Screening Area (SSA) 11 - Aircraft Parking Apron

SSA 11 is located at the north end of the main runway, between the Navy and Air Force parking aprons and is inside the current Air Force property. Currently there is a building and parking area at this location. SSA 11 was designated as a suspected site because during construction of footers for an Air Force building in 1992, organic odors were detected by the construction crew; therefore there are suspected past fuel releases in the area.

The current status of Site 11 is that the Navy and PADEP documented an agreement in 2004 that no further action of any kind is required for SSA 11, the suspected "site" 11. EPA concurred with a no further remedial actions decision in 2007. Additional information regarding the site history and environmental studies is provided in the following paragraph.

Upon discovery of organic vapors at SSA 11 in 1992, soil samples were analyzed and the suspected contaminated soil was excavated; however, confirmation sampling was not conducted. Therefore, PADEP requested that confirmation soil samples be collected and evaluated to determine if attainment for Act 2 liability protection for closure could be demonstrated for the former excavated area (SSA 11). In addition, PADEP requested that groundwater be sampled downgradient of the site to determine if the petroleum- contaminated soil had affected the groundwater in the area. An investigation was conducted in 2003 to evaluate site soil and groundwater conditions, and to determine if any of the previously reported petroleum contamination remained at the site. The 2004 investigation report results supported that the "site" did not meet the criteria necessary to be considered under any program for potential remediation.

l.) Site 12 - South Landfill

Site 12 is located in the southwest area of the site, adjacent to Site 2. The (approximately) 15-acre area is grassed and contains shrubs/woody vegetation (most of which has been cleared to perform site investigations).

The current status of Site 12 is that the CERCLA process is in progress for the site soil, sediment, surface water, and groundwater (OU 11) and currently is in the RI stage (Phase I report submitted in January 2011). A drum removal was conducted at the site in 2003, and further investigations were conducted in 2008 and 2010 to determine the extent of buried waste at the site. The Phase I investigation indicates that historical disposal practices at Site 12 have resulted in the contamination of soil, sediment and surface water by SVOCs, metals and, pesticides. The CERCLA process needs to be completed, including additional investigations, risk assessments, and determining and implementing appropriate remedial actions for the site. Additional information regarding the site history and environmental studies is provided in the following paragraphs.

Site 12 was originally identified as a site screening area, initially part of Site 2, when drums and debris were discovered in a wooded area, and subsequently removed in 2003. However, due to unacceptably high analytical detection limits, site data could not be sufficiently evaluated by comparison to published health-based screening levels. As a result of a geophysical survey in 2008 (implicated presence of subsurface burial of waste) and additional site inspections, the extent of the site was increased beyond the initial scope of north of the drainage ditch, and was split-off of Site 2. The Navy subsequently initiated a separate Remedial investigation and CERCLA decision process for what is now designated as Site 12, South Landfill.

To further delineate the nature and extent of any buried waste at the site and to further characterize the nature and extent of the soil contamination discovered during previous investigations, the Navy initiated Phase I Remedial investigation at Site 12 in 2010, which included test pits and soil samples, as well as surface water, sediment, and surface soil samples. The Site 12 Phase I RI Data Report was finalized in January 2011. The data indicated that additional investigations are necessary. Historical disposal practices at Site 12 have resulted in the contamination of soil by SVOCs, metals and pesticides, and likely to a lesser extent sediment and surface water at Site 12 have been impacted. Debris was found during the test pit investigation, primarily consisting of construction waste/debris, and municipal waste, such as bottles, scrap metal, bricks, cans, wire, china, wood, concrete, asphalt pavement, etc. The existing (Site 2) monitoring wells do not indicate the presence of groundwater contamination; however, these wells were not optimally placed to monitor groundwater potentially impacted by Site 12, and additional monitor wells are to be installed and sampled. Since the soil sampling program was biased towards areas displaying geophysical anomalies, data gaps exist between anomalies and near anomalies near the site boundary.

A ROD for Site 12 is anticipated in 2012, and a feasibility study in 2013. The RA for Site 12 is dependent on the availability of funds; therefore, a potential date is currently unknown.

m.) Resource Conservation and Recovery Act (RCRA) Status

RCRA is a waste management program that identified specific operations and processes that were known to generate, treat, or store hazardous wastes. The NAS-JRB Willow Grove facility was classified by PADEP as a large quantity generator of hazardous waste (#PA4170000158), producing more than 1,000 kilograms per month, based on the former industrial operations. Hazardous waste was generated by a number of different processes at NAS-JRB Willow Grove producing wastes, such as solvents, waste paints, adhesives, sealants, contaminated fuel, rags, and various acids. Hazardous waste was accumulated in Building 633 for less than 90 days, prior to contractor collection for off- site treatments, recycling, and disposal. The Base did not have any RCRA-permits for storage (>90 days), treatment, or disposal facilities. Hazardous wastes have been removed from Building 633 and RCRA wastes are no longer generated on the Base.

E. BUILT ENVIRONMENT CONDITIONS

1. Radiological Materials

The Environmental Condition of Property Report for NAS-JRB Willow Grove (Dept. of the Navy, 2006) indicates that "according to site personnel, there are no radiological materials currently used or located at NAS-JRB Willow Grove." The Navy is currently updating its study; additional information will be provided when it is available.

2. Radon

The Environmental Condition of Property Report for NAS-JRB Willow Grove (Dept. of the Navy, 2006) indicates that a preliminary radon screening in approximately 8% of the buildings was performed in 2001. Of the 200 samples analyzed (8 samples were lost in transit), only 1 sample, collected from Room 122 in building #137, contained radon concentrations above the USEPA action level of 4 picoCuries per liter.

3. Cultural Resources

a.) Historic Resources
A Cultural Resources Survey was conducted by Louis Berger and Associates for NAS-JRB in 1996. The survey did not identify any buildings or structures that meet National Register criteria for a historic district or individual cultural resources (Dept of the Navy, 2006). However, since 1996 additional buildings have become more than 50 years old so the Cultural Resources Survey needs to be updated by the Navy and submitted to the Pennsylvania Museum and Historical Commission for review.

b.) Archaeological Resources
The results of the Cultural Resources Survey conducted in 1996 indicated the following conclusions regarding the potential for archaeological resources within the boundaries of NAS-JRB (Naval Reserve Force, 2001).

- The vast majority of the land surface within the boundaries of NAS-JRB Willow Grove has been subjected to severe disturbance resulting from construction activities that have occurred since 1944. As a result, the potential for intact historic or prehistoric archaeological remains at the station are limited;

- Out of 15 locations with historical documentation of occupation on-base, four were judged to have either moderate or high potential for intact archaeological remains. The remaining 11 locations were judged to possess low or extremely low potential for archaeological remains, and;

- One circumscribed area within the station boundaries appears to possess moderate potential for prehistoric resources.

- Figure 2-2 depicts the locations within the boundaries of NAS-JRB Willow Grove that have the potential for archaeological resources.

F. EVALUATION OF CONDITIONS AND CONSTRAINTS

1. Installation Restoration Program and RCRA

a.) IRP Sites
The following subsections present the status for site investigation and/or remediation activities for the IRP sites at NAS-JRB Willow Grove and discuss existing and anticipated constraints related to future uses of the property. Locations of the sites and existing and anticipated LUCs are shown on Figure 2-3.

The Navy's Installation Restoration Program (IRP) includes sites both on the surplus property and the property owned and/or transferred to the Air Force for the Horsham Air Guard Station. Thus, Sites 1, 9, 10 and 11 do not impact the redevelopment plan in the same way as the remaining sites.

b.) No Further Action Sites
The Navy, EPA, and PADEP have agreed upon and documented no further action for the following sites:

- Site 1- Privet Road Compound: No Further Action ROD 2006 for soils only (OU 1)
- Site 2 - Antenna Field Landfill: No Action ROD 2010 for soil (OU 5) and

groundwater (OU 9)
- Site 4 - North End Landfill Consensus Agreement for No Action for soil and groundwater 2009
- Site 5 - Fire Training Area: No Further action ROD 2007 for soils only (OU 4)
- Site 6 - Abandoned Rifle Range No. 1: Consensus Agreement for No Action for soil and groundwater 2007
- Site 7 - Abandoned Rifle Range No. 1: Consensus Agreement for No Action for soil and groundwater 2008
- Site 8 - Building 118 Abandoned Fuel Tank: No Further Action Agreement for soil and groundwater 2006
- Site 9 - Steam Plant Building 6 Tank Overfill: No Further Action Agreement for soil and groundwater 2006
- SSA 11 - Site Screening Area 11 Aircraft Parking Apron: Eliminated From Consideration (no action needed).

Current status of sites is that no further action is required for site soils and/or groundwater (as stipulated in the previous bulleted text) and that there are no existing or anticipated restrictions on uses of the site based on current soil and/or groundwater conditions based on unrestricted use and unlimited exposure scenarios. Therefore, there are no constraints anticipated associated with potential future reuse or development of the property associated with these sites, or portions thereof as stated above.

In addition, the status of Site 10, Navy Fuel Farm, is such that there is no further action at this time. However, this is based on continued use as commercial/industrial property. The groundwater in the area of Site 1 has been treated for contamination from past jet fuel releases (removal of LNAPL present in the area of the former tanks). However, groundwater and soil at Site 10 do not meet criteria for unrestricted use and PADEP noted that it may be appropriate to seek full closure under Act 2 if land use changes. Available documentation indicates that the contaminated area is confined to Site 10) which is within the parcel that was transferred to the Air Force in September 2009 as part of the BRAC 2005. Therefore the contaminated area parcel is not part of the NAS-JRB Willow Grove property to be transferred to the public/redevelopment authority. In this regard there are no specific constraints for the development authority to be concerned with at this time.

However, it should be confirmed that groundwater and/soil contamination in the Site 10 could not potentially affect future land use in the adjacent parcels. For example, there could be potential groundwater use restriction if a well were to be installed within the cone of influence of the existing contaminated area. In addition, if a nearby building would be used or constructed, it needs to be verified that vapor intrusion would not be of concern. Vapor Intrusion can be of concern when a habitable building exists or is constructed within and near (exact distance depends on the site geology) an area of a groundwater VOV-contamination plume or VOC-contaminated soil. The existence of the building provides for a mounding or accumulation affect under the building, and harmful vapors can enter the building through a basement or subslab, similar to radon. If this pathway is of potential concern, then testing may be necessary, or a vapor barrier or other mitigation system installed and operated.

- **Site 1 - Privet Road Compound Groundwater** - The groundwater in the area of Site 1 (OU 3) is contaminated with volatile organic compounds (VOCs), specifically chlorinated solvents, and the source of the contamination has been identified as an off-post location. Currently there are LUCs in place at Site 1area as per the 2008 ROD stipulating an interim remedy for groundwater. EPA is in the process of investigating the off-site source of groundwater contamination and will ultimately issue a

final ROD. The LUCs consist of restricting use of untreated groundwater in the area, which includes portions of the Base beyond the Site 1 boundary (Figure 2-3). These LUCs would remain in place until groundwater concentrations are within levels safe for unrestricted and unlimited exposure use, as defined by the ROD.

The groundwater restrictions, along with maintaining integrity/allowing access to monitoring wells, needs to be considered when developing future land use options. In addition to the groundwater use restrictions, it is anticipated that there may be restrictions necessary regarding the vapor intrusion pathway. Evaluation of this pathway was not noted in existing documentation. As discussed previously, vapor Intrusion can be of concern when a habitable building exists or is constructed within and near an area of groundwater contamination plume or contaminated soil. If an existing building would be inhabited or constructed, within or nearby the area of concern (contamination), testing may be necessary, and/or a vapor barrier or other mitigation system installed and operated, to verify that vapor intrusion would not be of concern or to mitigate.

- **Site 3 - Ninth Street Landfill** - The current status of the Ninth Street Landfill, Site 3, is that soil, sediment, surface water and groundwater has been investigated and the RI/RA report is being reviewed by EPA. The RI data and RA for the site indicate that the soil (OU 6) and groundwater (OU 10) have been contaminated as a result of activities at the site, and that remedial actions are required; a feasibility study to evaluate remedial actions is currently being prepared. The Navy has made a commitment to completing the CERCLA process for the site and implementing a remedial action that is operating properly and successfully to support property transfer.

  Anticipated restrictions and constraints that may affect considerations of future uses of the property are restrictions regarding use of untreated groundwater, conditions regarding maintaining integrity/allowing access to monitoring wells and/or treatment systems, and potential restrictions regarding the vapor intrusion pathway. If an existing building would be inhabited or constructed, within or nearby the groundwater or soil contamination areas concern, testing may be necessary, and/or a vapor barrier or other mitigation system installed and operated, to verify that vapor intrusion would not be of concern or to mitigate. Depending on the extent of remediation at the site, there may be land use restrictions regarding types of uses, for example, if the cleanup is performed to an extent based on a likely future use scenario of commercial/industrial, then the property could not be used for purposes less restrictive than commercial/industrial. In addition, the commercial/industrial use restriction would remain with the property, until the time that site conditions are acceptable for UU/UE use. Also, if the selected remedial approach includes leaving waste in place with a cover or cap, there may be restrictions regarding the integrity of a landfill cover. Similarly, there may be limitations on building structures at this location, particularly on top of the landfill areas due to potential surface subsidence in filled areas.

- **Site 5 - Fire Training Area Groundwater -** The RI data and RA for Site 5 indicate that groundwater is contaminated with chlorinated solvents (VOCs), primarily PCE, tricholorethene (TCE), and 1,1,2- tricholorethane (TCA) as a result of activities at the site, and that remedial actions are required. The CERCLA process is still in progress for groundwater at the site (OU 2), and currently is in the Proposed Plan stage. The Navy has extended an enhanced biological treatment pilot study, which has shown to be effective at treating the contaminant source area. The treatment is focused on the contamination source area, which is near the road where the drums were stored. The

Navy has made a commitment to completing the CERCLA process for the site and implementing a remedial action that is operating properly and successfully to support property transfer.

Anticipated restrictions and constraints that may affect considerations of future uses of the property are restrictions regarding use of untreated groundwater, conditions regarding maintaining integrity/allowing access to monitoring wells and/or treatment systems, and potential restrictions regarding the vapor intrusion pathway. If an existing building would be inhabited or constructed, within or nearby the groundwater or soil contamination areas concern, testing may be necessary, and/or a vapor barrier or other mitigation system installed and operated, to verify that vapor intrusion would not be of concern or to mitigate. Depending on the extent of remediation at the site, there may be land use restrictions regarding types of uses, for example, if the cleanup is performed to an extent based on a likely future use scenario of commercial/industrial, then the property could not be used for purposes less restrictive than commercial/industrial. In addition, the commercial/industrial use restriction would remain with the property, until the time that site conditions are acceptable for UU/UE use.

- **Site 12 – South Landfill -** The current status of Site 12 is that the CERCLA process is in progress for the site soil, sediment, surface water, and groundwater (OU 11) and currently is in the RI stage (Phase I complete). The RI data to date for the site indicate that soil, sediment and surface water at the site have been contaminated by SVOCs, metals and, pesticides as a result of activities at the site, and that remedial actions are likely required. In addition, buried waste has been found at the site. The CERCLA process needs to be completed, including additional investigations, risk assessments, and determining and implementing appropriate remedial actions for the site. The Navy has made a commitment to completing the CERCLA process for the site and implementing a remedial action that is operating properly and successfully to support property transfer.

  Anticipated restrictions and constraints that may affect considerations of future uses of the property are restrictions regarding use of untreated groundwater, conditions regarding maintaining integrity/allowing access to monitoring wells and/or treatment systems, and potential restrictions regarding the vapor intrusion pathway. If an existing building would be inhabited or constructed, within or nearby the groundwater or soil contamination areas concern, testing may be necessary, and/or a vapor barrier or other mitigation system installed and operated, to verify that vapor intrusion would not be of concern or to mitigate. Depending on the extent of remediation at the site, there may be land use restrictions regarding types of uses, for example, if the cleanup is performed to an extent based on a likely future use scenario of commercial/industrial, then the property could not be used for purposes less restrictive than commercial/industrial. In addition, the commercial/industrial use restriction would remain with the property, until the time that site conditions are acceptable for UU/UE use. Also, if the selected remedial approach includes leaving there is waste left in place at the site with a cover or cap, there may be restrictions regarding upholding the integrity of a landfill cover, and there may be limitation due to structural reasons, to building structures on top of landfill areas (i.e., potential for surface subsidence in filled areas).

2. Resource Conservation and Recovery Act (RCRA)

Information for RCRA activities at the NAS-JRB site indicate that there are no existing

or anticipated restrictions on land use or constraint due to past RCRA activities. To comply with RCRA, all hazardous material/waste must have been removed from the facilities before operational closure. Hazardous waste was accumulated in Building 633 for less than 90 days, prior to contractor collection for off-site treatments, recycling, and disposal. Therefore, the Base is not subject to RCRA closure requirements as long as the waste has been removed and there have been no known releases or violations of the less than 90 day storage period. Since hazardous wastes have been removed from Building 633 and RCRA wastes are no longer generated on the Base, there are no anticipated constraints related to past RCRA activities.

3 INFRASTRUCTURE

A. INTRODUCTION

The following section summarizes the major findings, existing conditions of the major infrastructure systems at NAS-JRB Willow Grove; and highlights the conditions and constraints that could impact base redevelopment. The following information is based on multiple site visits by the project team, interviews with base command staff, as well as a comprehensive review of documents (drawings and reports) provided by the Navy.

B. SUMMARY OF MAJOR FINDINGS

- Telecommunications - Telephone services are at present available and are reported functional throughout the site with present infrastructure.

- Electrical Distribution - The electrical distribution system and equipment was found to be in fair condition. The equipment condition is not as good as expected for a 20-year old system. In Pennsylvania, the only entity that can charge for electrical power is a utility company. Therefore a utility company must take ownership of the electrical distribution network, and metering would have to be added for each property.

- Natural Gas - Facility single line drawings were made available which depicted the location of the natural gas infrastructure, but no determination of the adequacy of the system can be made without a more extensive review of the remaining infrastructure to provide a better definition of the system equipment and capabilities.

- Steam Distribution - The Boiler House has been transferred to the U.S. Air Force and will not be available for reuse.

- Potable Water - Potable water supply wells have been transferred to the U.S. Air Force and will not be available for reuse. The Horsham Water & Sewer Authority is negotiating with the Horsham Air Guard Station concerning access to excess water capacity from the Navy water supply wells being transferred to the U.S. Air Force.

- Wastewater - The Navy shut down the NAS-JRB Willow Grove wastewater treatment plant in September 2011, and demolished the plant. Sewage flows from the Horsham Air Guard Station facility are now sent to the Horsham Water & Sewer Authority system via a new connector that was constructed in the fall of 2011. Currently, there is no system to handle wastewater distribution outside the Horsham Air Guard Station.

- Stormwater Distribution - The condition of the piping could not be verified and sheet flow patterns have not been documented. A more extensive review of the remaining infrastructure is required to provide a better definition of the system equipment and

capabilities. Anecdotal evidence suggests that stormwater run-off from the property does contribute to flooding conditions at the northern end of the property at Keith Valley Road.

- Storage Tanks - Most of the steel storage tanks appear to be close to the end of their service life, and appear to require repainting and rust removal. Thickness determination by non-destructive testing (NDT) should be performed prior to any significant capital investment in the tanks.

- Road Network - Although much of the roads within the boundaries of NAS-JRB Willow Grove are in good condition, it is unlikely that their dimensions and method of construction (e.g., thickness of paving and base material) are within the established Horsham Township codes for their intended use.

- Runway, Taxiways, and Aviation Aprons - The existing runway is approximately 8,000 feet long by 200 feet wide. Although design drawings from 1953 indicate that the newer section (northern half) of the main runway was constructed using 12 or 18 inches of base material and 3 inches of bituminous asphalt paving, subsequent milling and overlays may have increased the thickness of the paved surface. The runway ends are 10 inches of reinforced concrete over 12 inches of base material. The aprons are of different thicknesses, varying from 10 inches of reinforced concrete with base material to 14 inches of unreinforced concreted slabs (with interlocking dowels) and base. Due to the uncertainty of the method of construction and subsequent repairs/overlays, a suitable number of borings should be taken from the runway, runway ends, taxiways, and aprons to determine the actual thickness, method of construction, and condition of this infrastructure. It is likely that the entire runway, taxiways and aprons will have to be removed to facilitate redevelopment.

C. BUILT ENVIRONMENT CONDITIONS

1. Utilities and Base Infrastructure

The following is description of the utilities and base infrastructure, which is also shown in Map 3-1.

a.) Telecommunications

Weston Solutions, Inc. met with Lil Spurgeon, a facility supervising engineer at NAS-JRB, for a general discussion regarding the telecommunication distribution system. No maintenance records were available at that time, and no facilities were available for inspection. Bell of Pennsylvania (Verizon Pennsylvania, Inc.) drawings were made available by WGNAS facilities management.

Based upon anecdotal information, the telephone service enters the base via Bell of Pennsylvania above-ground lines. The base telecommunications system conductors are routed in ducts with concrete encasement, generally accessible only by manhole. A more extensive review of the remaining infrastructure is required to provide a better assessment of the system equipment and capabilities. After the base was decommissioned, the telecommunications system was abandoned in place and the Air National Guard installed a new system in to serve their enclave.

b.) Electrical Distribution

Electrical Engineers from Weston performed a visual electrical evaluation of NAS-JRB Willow Grove's electrical distribution infrastructure locations on March 22, 2011. The consultants met with Roland Gelinas and Vince Ennis, engineering supervisors for the facility, for general

a discussion, plan review and tour regarding the electrical distribution system. No maintenance records were available at that time. The tour provided visual and verbal information to determine the general condition and practicality of reuse for future commercialization of the facility. A visual inspection of the following facilities was conducted:

- PECO Service Drop (building 6). Transformers.
- Substation. (buildings #15B and #24).
- Main Service Entrance Substation and Switchgear Buildings (buildings #28 and #117). This substation is the location where PECO Energy delivers power to the site at 33Kv.
- PECO Service Drop (building 118).
- PECO Service Drop (building 176).
- PECO Service Drop (building 190). Transformers and generator backup for the Wastewater Treatment Plant.
- PECO Service Drop (building 191). Transformers.
- PECO Service Drop (building 638).
- PECO Service Drop (building 653). FAA site.

In 1990, the base electrical service was converted from a 2400 volt service to a 33Kv service with 4160 volt internal base distribution. At the time of the voltage conversion, the Main Service Entrance Substation was installed and all pad mounted transformers and the base underground feeder distribution system were replaced. Therefore, most of the site electrical distribution equipment has been in operation for approximately twenty one years.

The majority of the underground distribution network is routed in ducts with concrete encasement. The underground 4160 volt distribution system consists of seven major feeders routed to different areas within the site. The feeders are typically routed through manholes, many of which have cable taps (mechanical splices) for feeds to pad mounted transformers at the buildings. Previously, there was a 4160 volt tie feeder between the Navy main service switchgear and the main service switchgear for the United States Air Force. This tie feeder was taken out of service several years ago when the cable failed. Electrical testing on the major transformers and switchgear has been performed on an annual basis. Maintenance has been performed where testing has indicated problems. According to facility engineers, there have not been a significant number of cable failures in the underground 4160 volt distribution system over the last twenty years.

c.) Natural Gas

The project team met with Tom Gannon, a facility supervising engineer, to discuss the natural gas distribution system. No maintenance records were available at that time, and no facilities were available for inspection. Facility single line drawings were made available, which depicted the location of the natural gas infrastructure. A more extensive review of the remaining infrastructure is required to provide a better definition of the system equipment and capabilities.

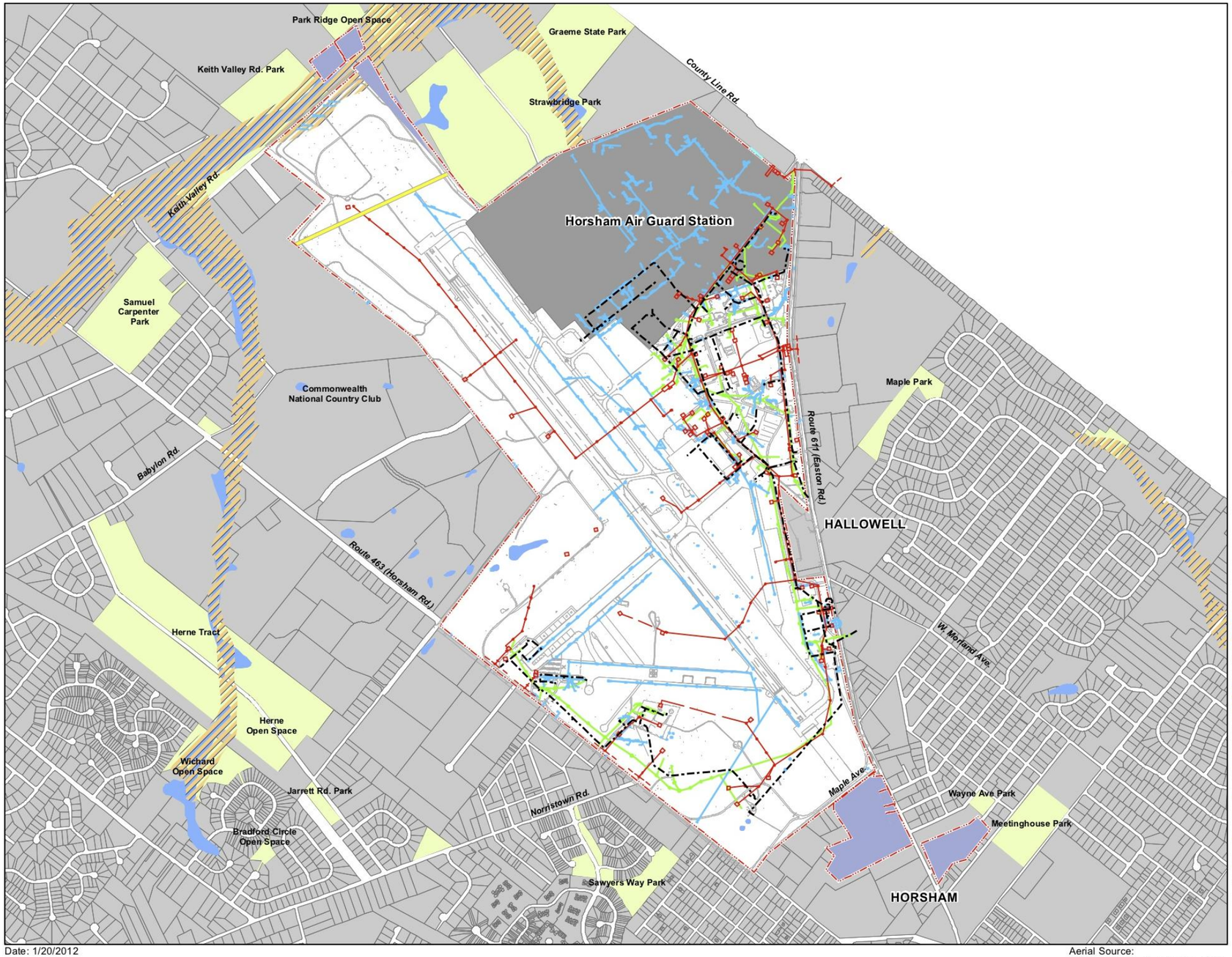
Transcontinental Pipeline

A Transcontinental gas line runs through the northern end of the NAS-JRB Willow Grove property, but does not provide natural gas to the site. A utility easement will likely prohibit development in the northern end of the site where single-family residential development is being proposed

d.) Steam Distribution

A mechanical engineer from Weston performed a visual mechanical evaluation of the facility's steam production and distribution infrastructure on March 22, 2011. Project team members met with Bill McKenna, an engineering supervisor for a tour of the boiler house. The tour provided visual and verbal information to determine the general condition and practicality of reuse for future commercialization of the facility.

Map 3-1



NAS JRB Willow Grove
Horsham Township, PA

Key Infrastructure Systems

Legend
- Willow Grove NAS
- US Navy Property
- Horsham Air Guard Station
- FEMA Flood Plain
- NWI Wetlands
- Parcels
- Parks Open Space
- Potable Water
- Electric
- Storm Water
- Sanitary Sewer
- Transcontinential Gas Pipeline
- Runways/Aprons and Roadways

0 625 1,250 2,500 Feet

Date: 1/20/2012

Aerial Source:
ESRI Bing Mapping Service, 2011

Steam is centrally produced and distributed to each building by two steam boilers in the Boiler House which were installed in 2004. There are two Hurst, scotch marine type, steam boilers nominally rated at one thousand horse power. The Boiler House will be transferred to the U.S. Air Force and will not be available for reuse. No district cooling system exists. All buildings are cooled locally.

e.) Potable Water

An Environmental Engineer from Weston performed a visual inspection of the wastewater treatment plant (WWTP) and one reservoir and treatment/pump building on February 22 and 23, 2011. In addition, a Mechanical Engineer performed a visual mechanical evaluation of the existing potable and fire protection water distribution infrastructure on March 22, 2011. Members of the project team met and toured the facility with Vince Ennis, Tom Gannon and Bill McKenna, engineering supervisors for the base to discuss the domestic water system. The tour provided visual and verbal information to determine the general condition and practicality of reuse for future redevelopment of the facility. The following buildings were visited:

- Reservoir and Pump Station (building 24)
- Domestic and fire protection pumps, storage tank (building 6)
- Chlorinator (building 30)
- Well Houses (buildings #31 and #32)
- Hangar (building 80)
- Hangar Pump House (building 183)
- MAG Pump House (building 681).

The water treatment and distribution system (WTDS) is a relatively simple treatment system consisting of supply wells, storage tank reservoirs, a chlorinator, and an air stripper tower to remove contaminants. At the time of this report, the WTDS was functional. Air strippers were installed at the reservoirs to remove contaminants from the water sources. The underground reservoirs hold approximately 500,000 gallons of potable water each according to facility engineers. The main distribution node for potable and fire protection water is the Boiler House (building 6). In addition to the on-site water tanks, the Horsham Water & Sewer Authority provides potable water from its own municipal system.

There are four domestic cold water pumps, two of which are electric and are 25+ years old, and two combination steam/electric pumps which are approximately 40+ years old. The condition of the pumps ranges from fair to poor; one steam/electric pump is out of service. The domestic cold water expansion/storage tank which is approximately 40+ years old and in fair condition. Visual inspection revealed un-insulated sections of pipes, and pumps exhibit surface corrosion. Between 1990 and 1992, the base underground water distribution pipes were relined. Potable water supply wells will be transferred to the U.S. Air Force and will not be available for reuse. The Horsham Water & Sewer Authority is negotiating with the Horsham Air Guard Station concerning future access to excess to water capacity from the Navy water supply wells being transferred to the U.S. Air Force. Currently, the Horsham Water & Sewer Authority is a purchaser of potable water from other nearby communities.

f.) Wastewater Treatment Plant (WWTP)

An Environmental Engineer performed a visual inspection of the wastewater treatment plant (WWTP) and one reservoir and treatment/pump building on February 22 and 23, 2011. A Structural Engineer performed a visual structural evaluation of the WWTP on March 22, 2011 and the consultants met and toured the facility with Vince Ennis, Tom Gannon and Bill McKenna, engineering supervisors for the base for a review of the WWTP. The tour provided visual and verbal information to determine the general condition and practicality

of reuse for future commercialization of the facility. The following buildings were visited:

- Wastewater treatment plant buildings
- Domestic and fire protection pumps, storage tank (building 6)
- Chlorinator (building 30)
- Well Houses (buildings #31 and #32)
- Hangar (building 80)
- Hangar Pump House (building 183)
- MAG Pump House (building 681).

The WWTP is a conventional wastewater treatment system using primary clarification, biological treatment via two stage trickling filtration, secondary clarification and disinfection using ultraviolet light. The UV system at the WWTP was installed at the WWTP approximately 10-12 years previous (1999-2001). Anaerobic digestion is used for sludge treatment with the digested sludge being trucked off for disposal. The plant is currently functional and generally meets its current discharge limitations at flows of approximately 0.14 million gallons per day (MGD).

The pumps in the WWTP basement were replaced approximately 9 to 10 years ago (2001-2). Discharge is into an unnamed tributary which flows into Park Creek under National Pollutant Discharge Elimination System (NPDES) Permit No. PA 0022411. The plant also has a current Resource Conservation and Recovery Act (RCRA) Permit No. PA 4170000158 as a large quantity generator.

The structural inspection was limited to visible surfaces above grade for exterior surfaces, and above the freeboard for structures in operation. Surfaces that were safely accessible were tapped with a handheld hammer to discern the condition of the concrete. The structures observed were two (2) approximate 25 ft. diameter digesters, four (4) approximate 30 ft diameter trickling filters, two (2) aeration basins, four (4) 12 ft by 40 ft primary clarifiers and two (2) 16 ft by 55 ft secondary clarifiers. All of the structures were partially interred to varying, unknown depths. The two digesters feature a floating roof system that rises and falls with varying liquid level contents.

The Navy shut down the NAS-JRB Willow Grove wastewater treatment plant in September 2011 and demolished the facility. Sewage flows from the Horsham Air Guard Station facility are now sent to the Horsham Water & Sewer Authority system via a new connector that was constructed in 2011. These changes have effectively eliminated the wastewater distribution system for the remainder of the NAS-JRB property, rendering the existing buildings unusable without a major investment to extend sanitary sewer to the southern part of the site.

g.) Stormwater Distribution

The project team met with facility supervising engineers, for general discussion regarding the storm water piping system. No maintenance records were available at that time, and no facility tour was conducted. Facility single line drawings were made available which depicted the location of drainage piping. Anecdotally, stormwater runs into culverts at the roadsides and is generally characterized as sheet flow across the runway area, being directed through a network of pipes generally toward the northwestern end of the base. The condition of the piping could not be verified and sheet flow patterns have not been documented. A more extensive review of the remaining infrastructure is required to provide a better definition of the system equipment and capabilities. Historical evidence reveals that stormwater run-off from the property does contribute to off-site flooding conditions at the northern end of the property at Keith Valley Road.

h.) Storage Tanks

A Structural Engineer performed a visual structural evaluation of water storage tanks on March 22, 2011. Project team members met and toured the facility with Vince Ennis and Bill McKenna, engineering supervisors for the base to review the status of the water storage tanks. The tour provided visual and verbal information to determine the general condition and practicality of reuse for future commercialization of the facility.

Two 38 foot diameter steel tanks were observed from ground level. The tanks are listed as Buildings 682 and 683, and are adjacent to the Marine Air Group 49 hangar. The tanks are of bolted construction, and estimated to be 35 to 40 feet high. The tanks are erected on a concrete foundation. It is unknown whether the foundations are ring walls that support the tank shell or are full slabs on grade. The tanks show visible signs of rust where the paint has deteriorated. The age of the tanks is not known and no apparent damage to the tanks was apparent from ground level visual observations.

Structure #182 is a steel fire fighting water supply tank approximately 40 feet in diameter and 40 feet high which was also observed. The tank is covered in a foam type insulation that shows signs of deterioration and has some apparent waterlogged sections. The foam insulation was not removed to visually assess the steel beneath it. However, the tank shows visible signs of rust in some areas where the insulation is missing. The age of the tank is not known, and no apparent damage to the tank was apparent from ground level visual observations.

Structure #107 is 500,000 gallon storage reservoir located in the southern portion of NAS-JRB Willow Grove that holds potable water that has been treated using an air stripper and disinfected with chlorine.

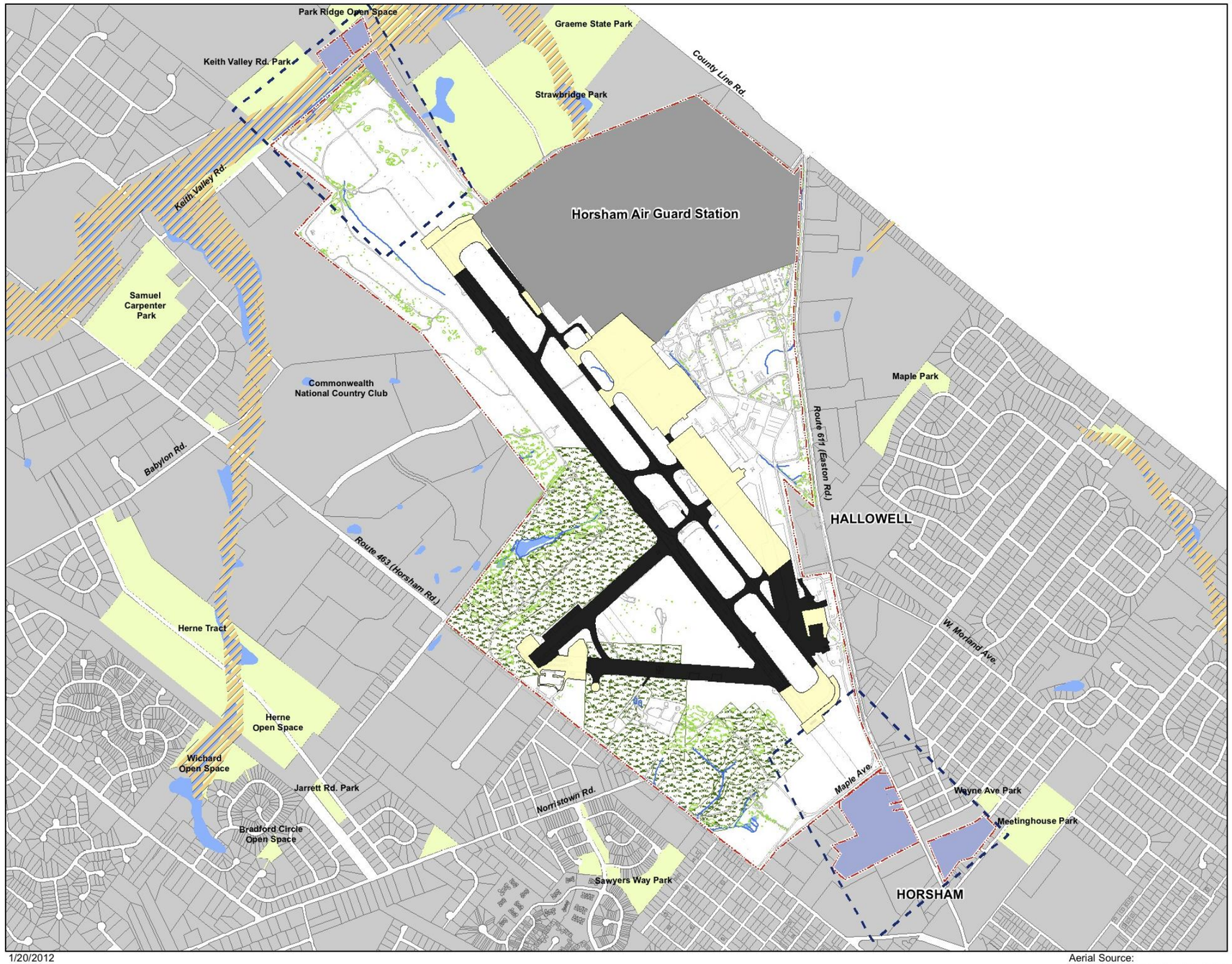
i.) Road Network - Although much of the roads within the boundaries of NAS-JRB Willow Grove are in good condition, it is unlikely that their dimensions and method of construction (e.g., thickness of paving and base material) are within the established Horsham Township codes for their intended use. A new road network will be required to provide the framework for future redevelopment.

j.) Runway, Taxiways, and Aviation Aprons - The existing runway is approximately 8,000 feet long by 200 feet wide (Map 3-2). Although design drawings from 1953 indicate that the newer section (northern half) of the main runway was constructed using 12 or 18 inches of base material and 3 inches of bituminous asphalt paving, subsequent milling and overlays may have increased the thickness of the paved surface. The runway ends are 10 inches of reinforced concrete over 12 inches of base material. The aprons are of different thicknesses, varying from 10 inches of reinforced concrete with base to 14 inches of unreinforced concreted slabs (with interlocking dowels) and base. Due to the uncertainty of the method of construction and subsequent repairs/overlays, a suitable number of borings should be taken from the runway, runway ends, taxiways, and aprons to determine the actual thickness, method of construction, and condition of this infrastructure.

Map 3-2

NAS JRB Willow Grove
Horsham Township, PA

Runway



Legend
- Willow Grove NAS
- US Navy Property
- Horsham Air Guard Station
- FEMA Flood Plain
- NWI Wetlands
- Vegetation
- Habitat Areas
- Parcels
- Parks Open Space
- Water
- Runways/Aprons and Roadways
- Clear Zone

Runway
- Asphalt (85.17 Acres)
- Concrete (75.42 Acres)

0 625 1,250 2,500 Feet

1/20/2012

Aerial Source:
ESRI Bing Mapping Service, 2011

D. EVALUATION OF INFRASTRUCTURE CONDITIONS AND CONSTRAINTS

1. Telecommunications

As stated previously, the existing telecommunication system has been transferred to the Air Force but has been abandoned in place. The Air National Guard has installed a new system separate from the Navy system. While the old system is still functional, it is likely that an entirely new system will installed to support redevelopment of the base.

2. Electrical Distribution

The electrical distribution system and equipment was found to be in fair condition. The equipment condition is not as good as expected for a twenty-year old system. In Pennsylvania, the only entity that can charge for electrical power is a utility company. Therefore a utility company must take ownership of the electrical distribution network, and metering would have to be added for each tenant property. The base main distribution system and equipment is not configured to make it practical for feeding and metering individual properties. The four smaller PECO services that are along Horsham Road are separately metered, and the transformers are owned by PECO. These sites could easily be converted to commercial use by changing service ownership. Additionally, Federal installations do not always satisfy OSHA requirements, i.e. it has been observed that the distribution equipment has not been provided with ARC Flash labeling.

3. Natural Gas

No maintenance records were available at the time of the facility tour, and no facilities were available for inspection. Facility single line drawings were made available which depicted the location of the natural gas infrastructure, but no determination of the adequacy of the system can be made without a more extensive review of the remaining infrastructure to provide a better definition of the system equipment and capabilities.

4. Steam Distribution System

The Boiler House has been transferred to the U.S. Air Force and is being used to provide service to the Horsham Air Guard Station. The only functional equipment still in the old boiler house are booster pumps for the water distribution system, in particular the fire plugs on the Air Force side of the property. The fire hydrants on the Navy side have all been disabled

5. Potable Water System

Potable water supply wells will be transferred to the U.S. Air Force and will not be available for reuse. The Horsham Water & Sewer Authority is negotiating an agreement with the Horsham Air Guard Station concerning access to water capacity from the Navy water supply wells that were transferred to the U.S. Air Force. The Water Treatment and Distribution System is currently functional. With reasonable maintenance it can likely perform adequately in the immediate future. Based upon preliminary discussions with the WTDS operator, the system appears reliable and simple to operate.

There are limitations, potential liabilities and risks that must be considered concerning the continued operation of the WTDS. A detailed review of maintenance records and/or recent engineering reports should be conducted to more completely evaluate the need for and cost of any required rehabilitation. Depending on the results of that review it may be appropriate to perform a more detailed inspection of the WTDS, and in particular, the water storage tanks to confirm their condition.

The WTDS uses air stripping to remove groundwater contaminants. If air emission controls were required in the future, the cost of operating the system would increase. Should treatment criteria for the current contaminants be lowered or if other contaminants are discovered, modifications to the treatment system may be required. Regulations concerning the level of reliability (at the utility level) involved in providing adequate water quantities and pressure for fire protection have not been investigated for this report. The assessment and recommendations herein are based upon preliminary review of the WTDS facilities. Additional reviews and investigation is warranted to fully assess potential reuse issues and needs.

6. Wastewater Treatment

The Navy demolished the existing NAS-JRB wastewater treatment plant in late 2011 and sewage flows from the Horsham Air Guard Station are now sent to the Horsham Water & Sewer Authority system via a new connector that was constructed in 2011. Similarly, the remainder of the property will be served by an extension of that sewer line. The Horsham Water & Sewer Authority is currently pursuing the expansion of their wastewater treatment plant to increase capacity. According to the authority, roughly 500,000 to 600,000 GPD have been allocated to support the redevelopment of NAS-JRB.

7. Stormwater Distribution and Retention

The condition of the piping could not be verified and sheet flow patterns have not been documented. A more extensive review of the remaining infrastructure is required to provide a better definition of the system equipment and capabilities. However, a known flooding problem exists at the northern end of the property at Park Creek, which is located on the base and passes under Keith Valley Road and flows into Little Neshaminy Creek. This low lying area occasionally floods during seasonal rain events and stormwater run-off from the property is contributing to this problem. There are many techniques for managing run-off, but consideration should be given to the construction of a stormwater retention pond at the north end of the property.

8. Water Storage Tanks

The steel storage tanks appear to be close to the end of their service life, and in the near term require repainting and rust removal. Thickness determination by non-destructive testing (NDT) should be performed prior to any significant capital investment in the tanks. The tank covered in foam insulation has likely experienced oxidation from the trapped moisture. No visual assessment of the underground concrete storage tanks is possible, but testing should be conducted to determine the possible continuing use of these structures.

A more thorough investigation, including NDT, should be made as part of a design of reuse or repairs to the storage tanks. As with all of the structures, a comprehensive investigation, repair, rehabilitation and structural monitoring program should be instituted shortly after transfer of ownership. Mass balance studies throughout the systems should be conducted to determine if there is significant leakage present within the system that maybe the result of concrete cracking, metal fatigue or other deterioration of components.

9. Road Network

Although much of the roads within the boundaries of NAS-JRB Willow Grove are in good condition, it is unlikely that their dimensions and method of construction (e.g., thickness of paving and base material) are within the established Horsham Township codes for their intended use. It is anticipated that most, if not all, of the existing roads within the base would be removed in order to implement the preferred reuse plan. However, consideration should be given to recycling the base and paving material from demolition onsite for use in new road construction.

10. Runway, Taxiways and Aviation Aprons

Although it may be possible to reuse some of the runway as a portion of the main north/south boulevard serving the preferred development program, it is anticipated that most of the runway and all of the taxiways and aprons will be demolished. However, consideration should be given to recycling the base and paving material from demolition onsite for use in new road construction. It is anticipated that significant cost savings can be realized by crushing these materials onsite and reusing them as base materials for new road construction at NAS-JRB.

4 LAND USE & SITE CONDITIONS

A. INTRODUCTION

The NAS-JRB Willow Grove site is situated between Horsham Road (Route 463) and Easton Road (Route 611) in Horsham Township, Pennsylvania. In total, the redevelopment site is estimated at 862-acres, which equates to roughly 8% of the Township's land area. The site is abutted by a variety of land uses. The Navy owned properties located outside the fence to the northwest and southeast of the base are located in an airport clear zone and are currently undeveloped. The major street frontages that serve the property include Horsham Road on west side, Keith Valley Road on the north, Easton Road on the east, and Maple Avenue on the southern edge. In addition, there are three commuter transit stations and three highway interchanges located within five miles of site, which makes it well positioned for access in the market.

B. SUMMARY OF MAJOR FINDINGS

- Land Acres - The site offers approximately 862 acres of land for the community to create a unified vision for land use and infrastructure.

- Abutting Land Uses - Commercial uses are predominant along the major Horsham and Easton Roads corridors. There is a minimal amount of residential uses immediately abutting the site.

- Surrounding Zoning - The majority of the land immediately adjacent to the site is zoned light industrial and commercial. However, there are some residentially zoned parcels to the north of the site that are impacted by the township's Aircraft Crash and Noise Overlay District (ACNOD) in the zoning code that require large lot developments in an effort to provide safety in the areas designated as having high accident potential.. If these restrictions, are removed new residential development is likely to occur in this area.

- Stormwater Management - The area located north of the main runway is a largely undeveloped area that slopes down to Keith Valley Road. The stormwater run-off at this location creates regular flooding during seasonal rain events. Stormwater flows to a small stream on the property and runs off the site to Keith Valley Road where it often overflows its banks resulting in road flooding several times a year. As redevelopment occurs at NAS-JRB, stormwater management in this area must be addressed.

- Reuse of Existing Structures - The reuse of existing buildings and the infrastructure that supports them presents issues of age, condition, cost, and suitability for reuse. Most of the buildings are in poor or moderate condition. The Navy's decision to terminate building utilities (heat, air conditioning, water and sewer) will hasten deterioration of the existing buildings and make their future reuse uncertain or cost prohibitive.

- Improved Traffic Movements – the property will have several different access points to facilitate access into and through the property. Historically, the base has created a traffic island and vehicles have been forced to drive around the perimeter of the site. With several signalized road crossings, vehicle traffic and pedestrians will be able to cross the property both east and west and north and south.

C. BUILT ENVIRONMENT CONDITIONS

1. Surrounding Land Uses

The private land uses surrounding the base are generally characterized by a patchwork of uses. Commercial uses are predominant along Horsham (Route 463) and Easton (Route 611) Roads. Examples of retail and commercial establishments along these corridors include convenience stores, moving and truck rental facilities, and sandwich shops and restaurants, among others.

There is a minimal amount of residential development immediately abutting the site. However, just behind the main roads there are several established, single family neighborhoods, as well as park land and other uses (Map 4-1). The complete list of existing land uses in the surrounding area includes: institutional, public education, light industrial, commercial, corporate office, residential (single family detached and multi-family), recreation and golf courses and parkland.

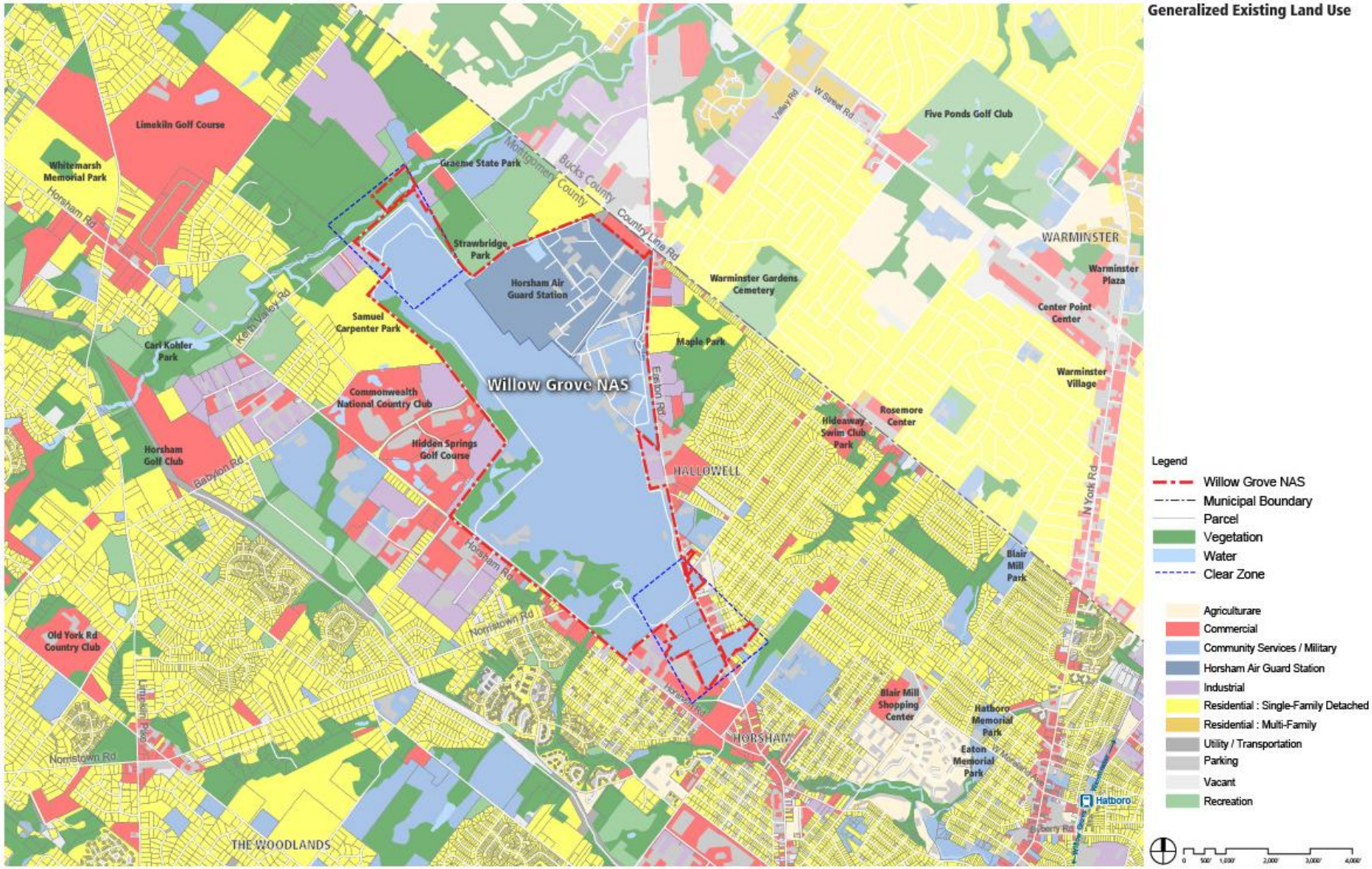
Immediately to the upper-west of the NAS-JRB property is a corporate office park known as Commonwealth Corporate Center. This business park shares its site with Commonwealth National Country Club. The Hatboro-Horsham High School and other office and retail uses are located across Horsham Road. To the north of the site the major land uses include local and state parkland, undeveloped land parcels zoned for residential and business park, the Warrington Crossing Shopping Plaza, the Horsham sewer plant and smaller areas of residential, office and light industrial. On the northeast edge of the property is the Horsham Air Guard Station, which is a military enclave that will remain in operation.

Along Easton Road, Maple Avenue, and a portion of Horsham Road (to Norristown Road), the predominant land uses are commercial, including offices, retail and vacant land within and associated with the airport clear zone. The highest concentrations of residential, both in multi-family and single family, are found to the south and southeast in the nearby town of Upper Moreland. The land area located within the airport clear zones are controlled by a restrictive development easement that was obtained by the Navy. With the Navy's departure, this area may eventually have the development restrictions removed by the Township Council, which would permit future development activity.

2. Current Zoning Classifications

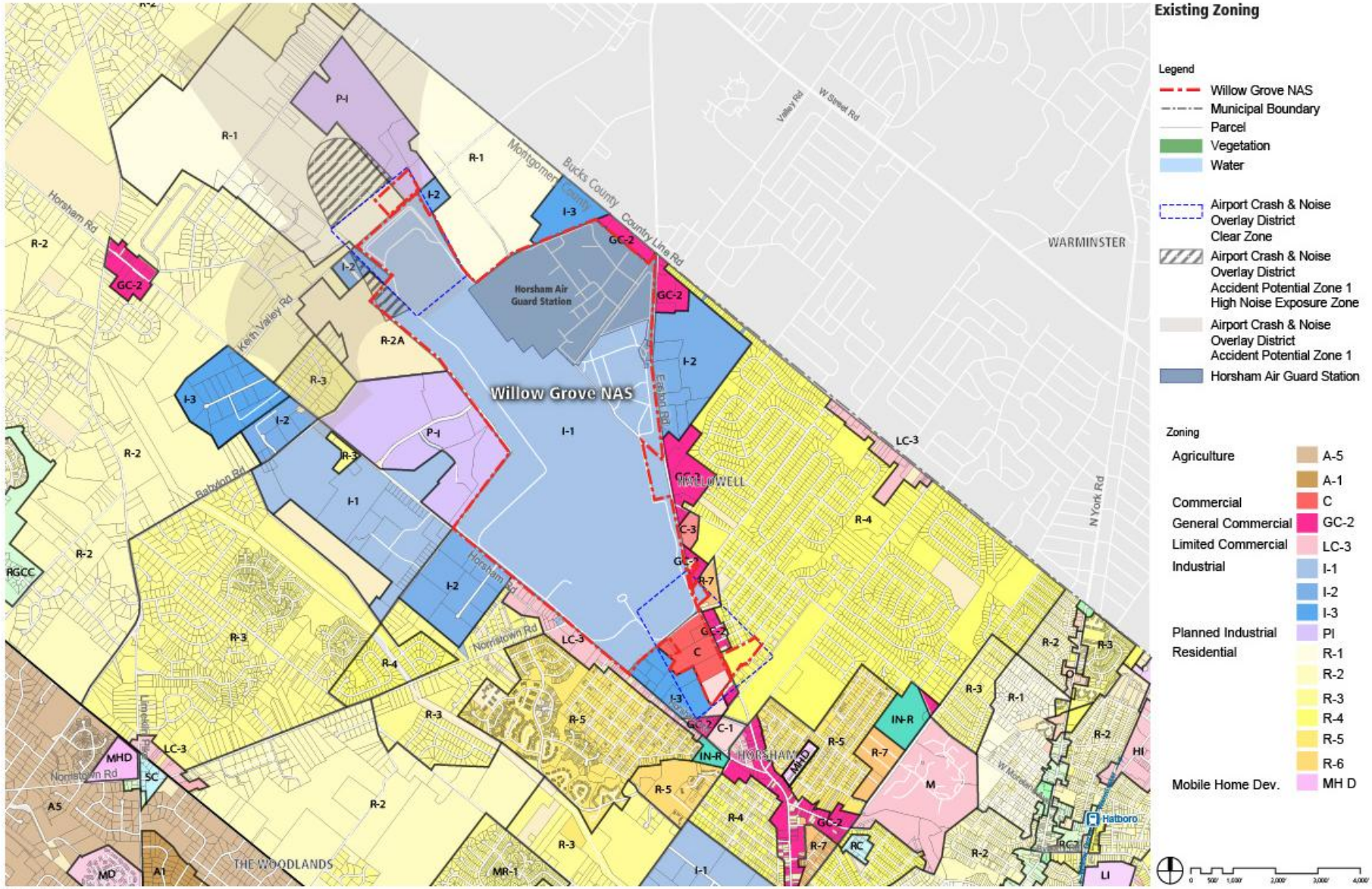
The majority of the land immediately adjacent to the site is zoned light industrial and commercial. However, the northwest area adjacent the site is zoned residential (Map 4-2). There is also a portion of residentially- zoned land surrounding part of the northern portion of the site. In keeping with the context of the area, the preferred redevelopment plan incorporates residential uses in the northern portion of the site.

Map 4-1



April 15th, 2011

Map 4-2


Existing Zoning
Legend
Willow Grove NAS
Municipal Boundary
Parcel
Vegetation
Water
Airport Crash & Noise Overlay District Clear Zone
Airport Crash & Noise Overlay District Accident Potential Zone 1 High Noise Exposure Zone
Airport Crash & Noise Overlay District Accident Potential Zone 1
Horsham Air Guard Station
Zoning
Agriculture
A-5
A-1
Commercial
C
General Commercial
GC-2
Limited Commercial
LC-3
Industrial
I-1
I-2
I-3
Planned Industrial
PI
Residential
R-1
R-2
R-3
R-4
R-5
R-6
Mobile Home Dev.
MH D
Willow Grove NAS
Horsham Air Guard Station
WARMINSTER
HORSHAM
THE WOODLANDS
Hatboro
April 18th, 2011

There are existing Airport Crash and Noise Overlays to the north of the property that reflect the 1977 Air Impact Compatible Use Study (AICUS) and are zoned Residential R-1 and R-2. It is anticipated that the regulatory development restrictions in these overlay zones will be lifted in the future due to the closing of the base and the HLRA's decision to discontinue use of the 8,000 foot runway and the elimination of future flight operations.

The NAS-JRB site is zoned for industrial uses, which must be changed in the future to permit redevelopment to occur. The Township's existing zoning code currently does not make provisions for certain land use types that are likely to be recommended in the future. The use of special mixed-use zones or overlay districts may be required to allow new land use types, combined uses and development densities to occur in the future.

3. Predominant Land Resources

There are three distinct areas within the Naval Air Station Willow Grove property based on its historic use: (1) Core Base along Easton Road; (2) Main Runway, aprons and taxiways; and (3) Horsham Road Frontage. These three areas in addition to other Navy owned parcels along Route 611 and Keith Valley Road (outside NAS-JRB fenceline), constitute a total of roughly 862 acres. A discrepancy currently exists between the Navy's calculation of total land acres and the consultant's measurement. The Navy reports a total surplus land area equal to 862 acres, both inside and outside the fence line. The consultant's totals are slightly less, but the property is currently being surveyed by an independent contractor and the issue should be resolved in early 2012. For purposes of the redevelopment plan, these small measuring differences are inconsequential to the outcome.

a.) Core Base Area

Fronting on Easton Road, a major arterial street, these 175 acres contain the main gate and the majority of existing structures on the base, including administrative offices, residential barracks, recreational facilities, mechanical shops and utility structures (Map 4-3. The building and site configurations are varied, lacking a sense of a cohesive campus. The buildings are not historically significant individually or as a collection.

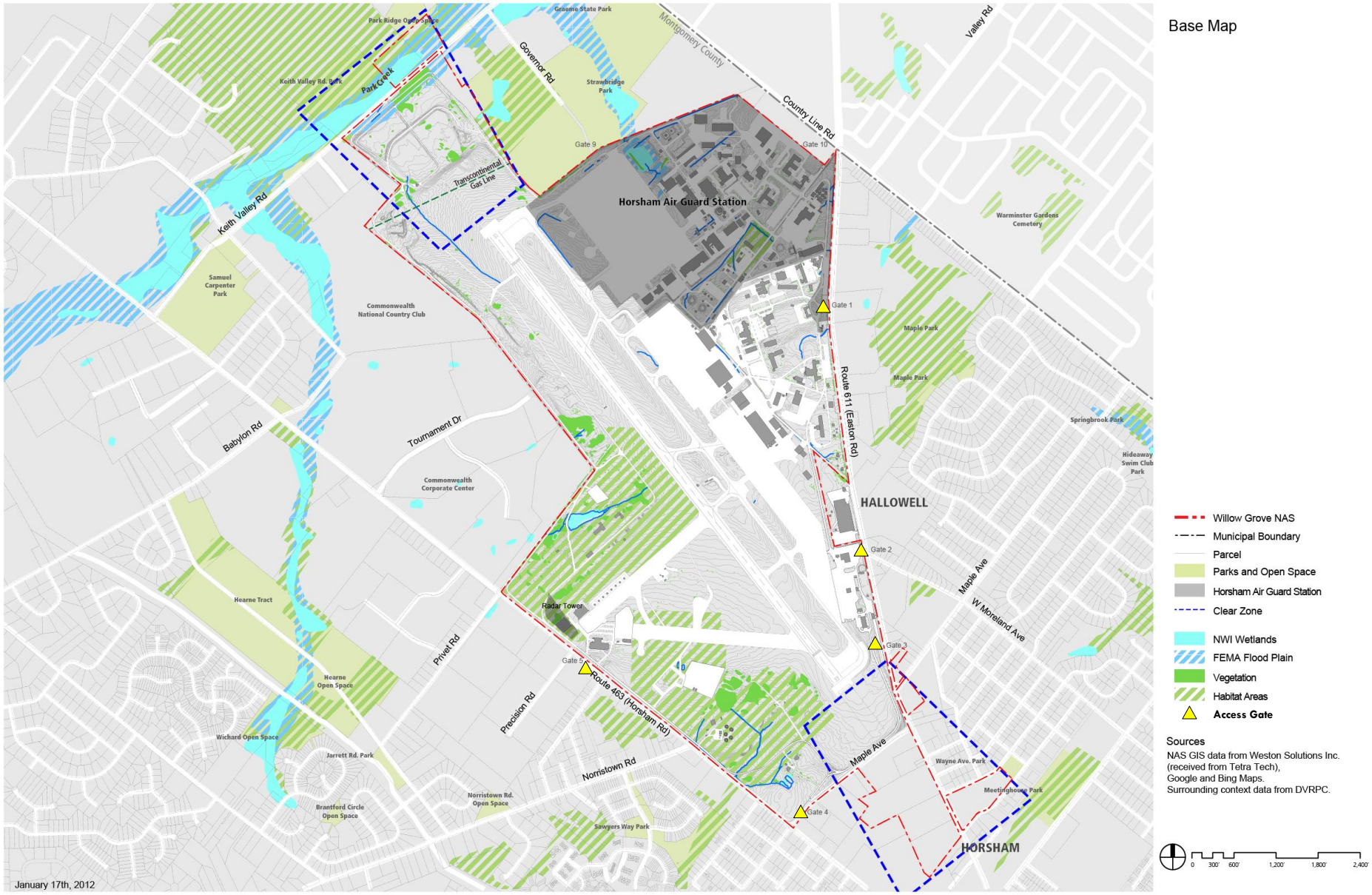
b.) Main Runway Area

The main runway contains an 8,000 foot concrete facility with associated access infrastructure and supporting hangar buildings. The runway ends are 10 inches of reinforced concrete over 12 inches of base material. The aprons are of different thicknesses, varying from 10 inches of reinforced concrete with a base to 14 inches of unreinforced concreted slabs (with interlocking dowels) and a gravel base. The area located north of the main runway is a largely undeveloped area that slopes down to Keith Valley Road. The stormwater run-off at this location contributes to occasional flooding during seasonal rain events. Stormwater flows to a small stream on the property and runs off the site under Keith Valley Road where it often overflows its banks resulting in road flooding several times a year. As redevelopment occurs at NAS-JRB, stormwater management in this area must be addressed.

c.) Horsham Road Frontage Area

The area along Horsham Road is sparsely developed and contains support facilities for the Main Runway Area, including an existing radar tower that will be transferred to the Federal Aviation Administration, an aviation hangar building, an office building and various ancillary buildings. Most of this area is characterized by undeveloped areas, wooded areas, a pond and a vegetative buffer between the main runway and Commonwealth Corporate Center.

Map 4-3


Base Map
Horsham Air Guard Station
HALLOWELL
HORSHAM
Gate 1
Gate 2
Gate 3
Gate 4
Gate 5
Gate 9
Gate 10
Radar Tower
Route 611 (Easton Rd)
Route 463 (Horsham Rd)
Country Line Rd
Governor Rd
Keith Valley Rd
Babylon Rd
Tournament Dr
Privet Rd
Precision Rd
Norristown Rd
Maple Ave
W Moreland Ave
Valley Rd
Transcontinental Gas Line
Park Creek
Montgomery County
Willow Grove NAS
Municipal Boundary
Parcel
Parks and Open Space
Horsham Air Guard Station
Clear Zone
NWI Wetlands
FEMA Flood Plain
Vegetation
Habitat Areas
Access Gate
Sources
NAS GIS data from Weston Solutions Inc. (received from Tetra Tech), Google and Bing Maps. Surrounding context data from DVRPC.
0 300' 600' 1,200' 1,800' 2,400'
January 17th, 2012

4. Existing Site Access Points

Current access to NAS-JRB is quite constrained and is governed by movements through the signalized intersection at the main gate located on Easton Road. Up until the Navy's departure in June 2011, all access to the base was restricted and managed by the military. In the future access to the Horsham Air Guard Station will be repositioned just north of the main gate and they will maintain a secured restricted access for those entering the federal enclave. There are a total of five gated access points into the property. Gates 1-3 are located along Easton Road at the main gate, at a point near the southern boundary of the Tinius Olsen building and at the intersection of Easton and Maple Avenue. Gate 4 is located at the southern edge of the property at the Horsham Road side of Maple Avenue and at the intersection of Precision and Horsham Roads.

In the future the property will have several different access points the facilitate access into and through the property. Historically, the base has created a traffic island and vehicles have been forced to drive around the perimeter of the site. With several signalized road crossings, vehicle traffic and pedestrians will be able to cross the property both east and west and north and south.

5. Easements

The major easement on the site is for the Transcontinental Gas Pipe Company in the northern portion of the site. The easement will prohibit development from occurring in the area of the pipeline crossing and development will be set-back from the easement right-of-way. This area is generally located beyond the northern end of the main runway and is proposed as a natural open space area.

6. Key Land Use and Site Development Issues and Opportunities

Through analysis of the site and surrounding area, and with input from the community in a series of public meetings, the consultant team identified key issues and opportunities for land use and site development. In general, the issues relate to the condition and re-use potential of the infrastructure and buildings, restrictions on use, and the timing of investments related to remediation and re -use. While opportunities also relate to the same issues, the key opportunities focus on the ability of the plan to create and/or reassert Horsham's identity and market position in the region.

a.) Issues

While the development opportunities at NAS-JRB would appear great, there are issues that will need to be addressed in the final preferred land use plan. The following are three key issues for land use and site development:

- **Site Infrastructure** - The major issues include the existing traffic congestion, the lack of water and wastewater utilities, and determining what infrastructure is needed for future development to be supported. With regard to traffic, the creation of additional access points, road crossings through the site and a network of internal streets will need to be strategically planned.
- **Development Easements, Brownfield Sites, and Sensitive Areas -** The potential for site development is limited in some area by utility easements, site contamination and environmentally sensitive areas throughout the site. Easements are fixed agreements that limit development and accessibility through some areas of the property. The brownfield sites present issues of timing and ultimate land use of the sites, in terms of the duration and level of remediation that will be completed related to proposed development. A more detailed description of the environmental and sensitive areas is included in Chapter 2. The future use of the radar tower along Horsham Road comes with FAA restrictions which limit development heights and use of certain construction materials with a 1,500-foot radius of the tower. These restrictions will also apply to

private development within this restricted area that is located outside the fence line.

- **Existing Building Infrastructure -** The reuse of existing building and the infrastructure that supports them presents issues of age, condition, cost, and suitability for reuse. Most of the buildings are in poor or moderate condition and generally not feasible for reuse due to low market appeal and the high cost of rehabilitation and utility connections. These buildings are also not compliant with the Commonwealth of Pennsylvania's Uniform Construction Codes. It should be noted that the Navy's decision to terminate utilities (heat, water and sewer) will hasten deterioration of the existing buildings. A more detailed description of the existing buildings is included in Chapter 5.

b.) Opportunities

Horsham is a community that is defined, in a transportation and land use sense, by the auto-oriented commercial corridors that run through it. Redevelopment of the NAS-JRB Willow Grove property provides opportunities for the Township to create a new "front door" image; address traffic congestion and transportation challenges near the site, and capture new development at the edge of the region's urban fringe. While the short-term opportunities are limited by the current market conditions, the long-term opportunities will come from a commitment to pursue prudent land development practices that produce a high quality, mixed-use employment center for future generations. The following are the key opportunities that the consultant team has distilled from the site analysis and community input:

- **Township Comprehensive Plan** - The site offers approximately 862 acres of land for the community to create unified vision for land use and infrastructure, which will impact the township's comprehensive plan. The land use decisions will impact the Townships projections for growth. It will also provide opportunities for transportation improvements as well as extending and enhancing the parks and open space network.

- **Multi-modal Street Network Potential** - By exploring options for new local streets and the integration of best practices for creating a "sense of place," there is an opportunity to create a multi-modal street network connecting across the site. This network would improve choice, in both routes and modes of transportation that leverage the transit and highway access within a 5-mile radius. It should also be an area within the community that is highly pedestrian friendly and provides options for people to move throughout the site without traveling by vehicle.

- **Market Shift** - By lifting the Airport Safety Clear Zone restrictions, there are opportunities to increase access, visibility, market position of the site and adjoining controlled land. The opportunities for development exist both on and off of the site and can provide early development that can shift or help "make" a new market in Horsham. As such, the future development program on the NAS-JRB property should be mindful of, and complementary to, other adjacent properties that are likely to development during the same time period.

5 EXISTING BUILDINGS ASSESSMENT

A. INTRODUCTION

A site investigation and building assessment was performed to inspect the overall condition of the existing buildings at NAS-JRB Willow Grove. Building assessments are intended to provide general information based on observations of the visible conditions of the structure, its components, systems and subsystems on the date of the assessment. The results of this building assessment are not intended to make any representation regarding the presence or absence of latent or concealed defects that are not reasonably known or ascertainable through walk-thru inspection. This assessment is based upon a visual site investigation performed by Urban Engineers, Inc. and Jeffery Donohoe Associates LLP (JDA) during February and March 2011.

The NAS-JRB Willow Grove surplus property consists of approximately 862 acres. The base contains 81 buildings and other structures totaling over 1 million SF of space. During the site visit, Urban Engineers and JDA inspected the most significant buildings and a sample of the remaining buildings and structures. A total of 38 buildings that were considered potential candidates for reuse were inspected and 43 buildings that were either utility structures or not considered viable for reuse were not physically inspected but are assumed to be of similar age and quality. In addition, the consultants obtained a spreadsheet report completed by the Navy identifying the specific characteristics of each building, including a physical condition rating that were field checked by the consultants.

B. SUMMARY OF MAJOR FINDINGS

- Building Age - The majority of existing buildings are located in an enclave near the main gate off Easton Road. According to building inventory data provided by the base command, roughly 40% of the existing buildings were acquired or constructed prior to 1975. The largest share (45.7%) was constructed between 1975 and 2000 and only 11.1% or 9 buildings have been constructed since 2000.

- Building Conditions - Based on the results of physical assessment, the largest share (47.5%) of building square footage was categorized as moderate condition (485,189 SF). Buildings in this condition are generally considered functional, although some have condition issues and may not meet contemporary building standards. Additionally, access to water/sewer utilities will not be transferred to the HLRA. The Navy's transfer of the water supply wells to the Air Force and demolition of the sewage treatment plant significantly impacts the ability to easily reuse most buildings.

- Navy "Mothballing" Program - The Navy has initiated an aggressive program of "mothballing" buildings at NAS-JRB Willow Grove. The intent of this effort is to minimize the potential risks of damage in unoccupied buildings, principally from water

leaks or fire. Secondarily, the Navy appears to be making an effort to minimize their operating and maintenance costs on these facilities, but these decisions will effectively render the existing building unusable in the future.

- Carrying Costs - It is expected that the new owner of the facility will incur costs associated with inspecting facilities on a regular basis, particularly to limit damage from water infiltration and possibly mold. This will require one or more inspectors or security personnel to physically inspect each facility on a regular basis. It is likely that more security personnel will be required to ensure that copper plumbing and electrical lines are not stolen for their resale value as scrap copper.

- Building Vandalism & Security Needs - A vacant facility of the size and visibility of NAS-JRB Willow Grove frequently becomes an "attractive target" for vandals, squatters, and mischievous teenagers. It is likely that the HLRA (or another owner) will have to carry comprehensive liability insurance to protect against lawsuits resulting from injuries.

  The costs of security will depend on staffing levels. If the owner elects to provide round-the-clock coverage with a single officer, a minimum of four full-time staff will be required. Assuming an average cost of $35,000 per officer including benefits, personnel costs would be $140,000 annually, with no revenue to support these costs.

- Costs of "Reactivating" Facilities – The Navy's mothballing program will require significant expenditures to reactivate any building in the future. It is anticipated that the per square foot costs of reactivation could be in the range of $14 to as much as $40 per square foot, depending on the type of building, location, proximity to infrastructure and intended use. This means that if the 600,000 square feet of facilities reviewed in this section were reactivated, the total cost would range from $8.4 to $24 million. It should be noted that these cost ranges do not include the costs of bringing the facilities up to current code and include only the reactivation of the buildings. The costs do not reflect building or life safety code upgrades, extensive façade repairs or upgrades, tenant improvements, upgraded plumbing, interior upgrades or distribution upgrades for water, HVAC, or telecommunications.

C. DESCRIPTION OF EXISTING BUILDINGS

The building stock at NAS-JRB Willow Grove consists of several different building types. The majority of existing buildings are located in an enclave near the main gate off Easton Road. According to building inventory data provided by the base command, roughly 40% of the existing buildings were acquired or constructed prior to 1975. The largest share (45.7%) were constructed between 1975 and 2000 and only 11.1% or 9 buildings have been constructed since 2000 (Table 5-1).

Table 5-1
Age of Building Stock
NASJRB Willow Grove (2011)

Year Acquired	Total Buildings	% of Total
Pre-1950	19	23.5%
1951-1975	13	16.0%
1976-2000	37	45.7%
2000 +	9	11.1%
Unknown	3	3.7%
Total	**81**	**100.0%**

Source: NAS JRB Willow Grove Base Command 2011

The various building types are categorized as follows:

- Automotive – Buildings that were utilized for automotive maintenance or repair.
- Aviation – Buildings that were used for storage, maintenance or repair of airplanes.

- Education – Buildings that were used for a classroom or learning environment.
- Hospitality – Buildings that were used for transient lodging of guests.
- Residential Barracks – Buildings that were utilized for the purpose of group housing of base personnel. Other residential buildings include single family housing.
- Office – Buildings utilized for administrative activities.
- Public Safety – Buildings used for firefighting or hazardous materials storage and apparatus.
- Recreation – Buildings used primarily for physical training (i.e. indoor playing courts) or personnel entertainment (i.e. enlisted dining club).
- Retail – Buildings utilized for food, merchandise and/or clothing sales.
- Utility – Buildings such as pump houses or electrical transmission or other utility services.
- Warehouse – Buildings utilized for storage of materials or goods.
- Miscellaneous & Unknown – Buildings that were used for a specific purpose (i.e. dog kennel or ground electronics) or were of unknown use.

Table 5-2
Existing Building Stock
NAS-JRB Willow Grove

Building Category	Building SF	% of Total SF	# of Buildings	% of Total
Automotive	10,624	1.0%	3	3.7%
Automotive/Recreation	11,687	1.1%	1	1.2%
Aviation	365,294	35.8%	6	7.4%
Hospitality	34,060	3.3%	2	2.5%
Housing (barracks)	136,689	13.4%	4	4.9%
Miscellaneous	10,080	1.0%	3	3.7%
Office	22,828	2.2%	2	2.5%
Office/Education	200,671	19.6%	5	6.2%
Public Safety	21,084	2.1%	2	2.5%
Recreation	67,383	6.6%	6	7.4%
Residential (Single Family)	7,214	0.7%	4	4.9%
Retail	20,240	2.0%	2	2.5%
Unknown	17,890	1.8%	4	4.9%
Utilities	24,118	2.4%	31	38.3%
Warehouse	71,732	7.0%	6	7.4%
Total - Existing Buildings	**1,021,594**	**100.0%**	**81**	**100.0%**

Source: NAS-JRB Willow Grove Base Command, 2011

The total building square feet on the base is estimated at 1.02 million SF. The largest single building category is aviation, which accounts for 365,294 SF or 35.8% of the total building space (Table 5-2). Other major building categories include office and education (200,671 SF), barracks (136,689 SF), and recreation (67,383 SF). Together, these four use categories comprise about 75% of the total building space, but only account for 26% of the total building inventory (21 buildings).

D. ASSESSMENT OF GENERAL BUILDING CONDITIONS

1. Building Inspections

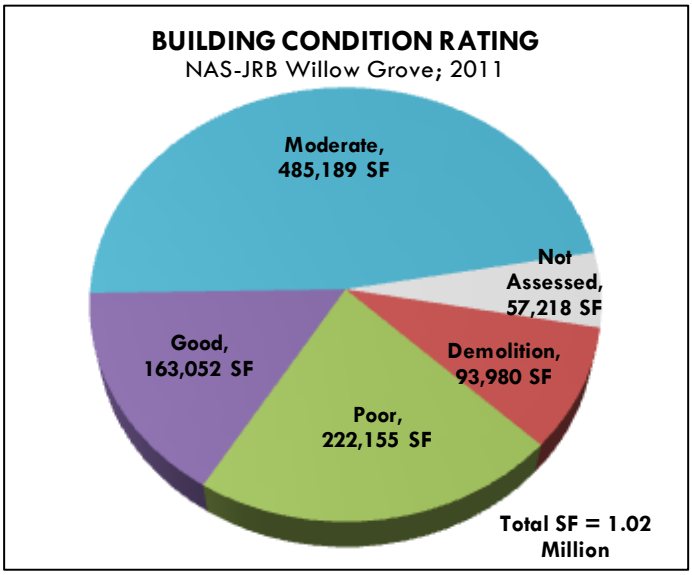
The first day of the buildings assessment consisted of a half day van tour with the BRAC base coordinator to obtain a better understanding of the base layout and building inventory. Once the van tour was finalized, a walkthrough of each of the potentially viable buildings was conducted. During the walkthrough, approximately 5 to 10 minutes was spent in each building. The consultants viewed the main areas, some mechanical rooms, randomly selected quarters, bathrooms, attics, crawl spaces and roofs. Day 2 of the building assessment tour consisted of a meeting with the base's Public Works Department (PWD), in which two of the PWD employees guided the walkthrough tour. The PWD staff provided information relative to the approximate building age, estimated time of major improvements, type of construction, problematic areas of concern as well as information relative to the buildings futures or caretakers status. It should be noted that not every room of every building was assessed.

Of the 38 buildings inspected, moderate to poor conditions were most common. The buildings were assessed on a scale of 1 through 5, (1) demolition candidate, (2) poor condition, (3) moderate condition, (4) good condition and (5) excellent condition (Map 5-1). As of the date of this assessment, the buildings were generally in the best condition that they'll be for reuse. The observed buildings have received minimum or no maintenance and repairs by the PWD within the recent past. Once the Navy departs the base, a minimum caretaker program will be instituted, which will include minimal oversight to ensure that buildings are locked and uninhabited. No physical improvements will be made once the decommissioning is complete.

2. Physical Condition Ratings

Given the age and condition of most of the buildings, a limited number will have reuse value. Based on the results of Urban Engineers and JDA's physical assessment, the largest share (47.5%) of building square footage was categorized as moderate condition (485,189 SF). Buildings in this category are generally considered functional although some may not meet contemporary building standards (Figure 5-1).

Figure 5-1



Another 222,155 SF (21.7%) of buildings space was judged to be in poor condition and exhibited obvious signs of disrepair. Buildings in this category will require considerable reinvestment to make them suitable for reuse. Roughly 93,980 SF (9.2%) of space was rated less than poor and would not be suitable for reuse. In addition to those buildings that are considered demolition candidates due to their condition, there are a number of other buildings that should be demolished because they do not meet any market need.

3. Buildings with Asbestos

Although many of the older buildings at NAS-JRB Willow Grove contain asbestos, this is generally not a major health issue unless the material becomes "friable" or disturbed. However, the process of removing asbestos can be hazardous, and there is a premium placed on demolishing buildings with this issue. The cost of asbestos removal can vary greatly, but is generally quite expensive because of the enhanced safety measures required for removal. The amount of asbestos needed to be removed, as well as the type of asbestos, whether on floor tiles or wrapped around pipes, can affect the price of removal.

A survey completed in December 2011 for the Department of the Navy, by Michael Baker Jr., Inc., identified those buildings that contained positive Asbestos Containing Material (ACM) or were assumed to contain such materials. In total, 39 buildings (745,521 SF) were identified to contain ACM. Table 5-3 contains a complete list of the buildings that contain ACM. It should be noted that six buildings totaling 16,743 SF of were not surveyed by Michael Baker Jr., Inc. These buildings would need to be sampled by a professional surveyor in order to determine whether these buildings contain asbestos.

Table 5-3
Buildings with Asbestos Containing Material (ACM) [1]

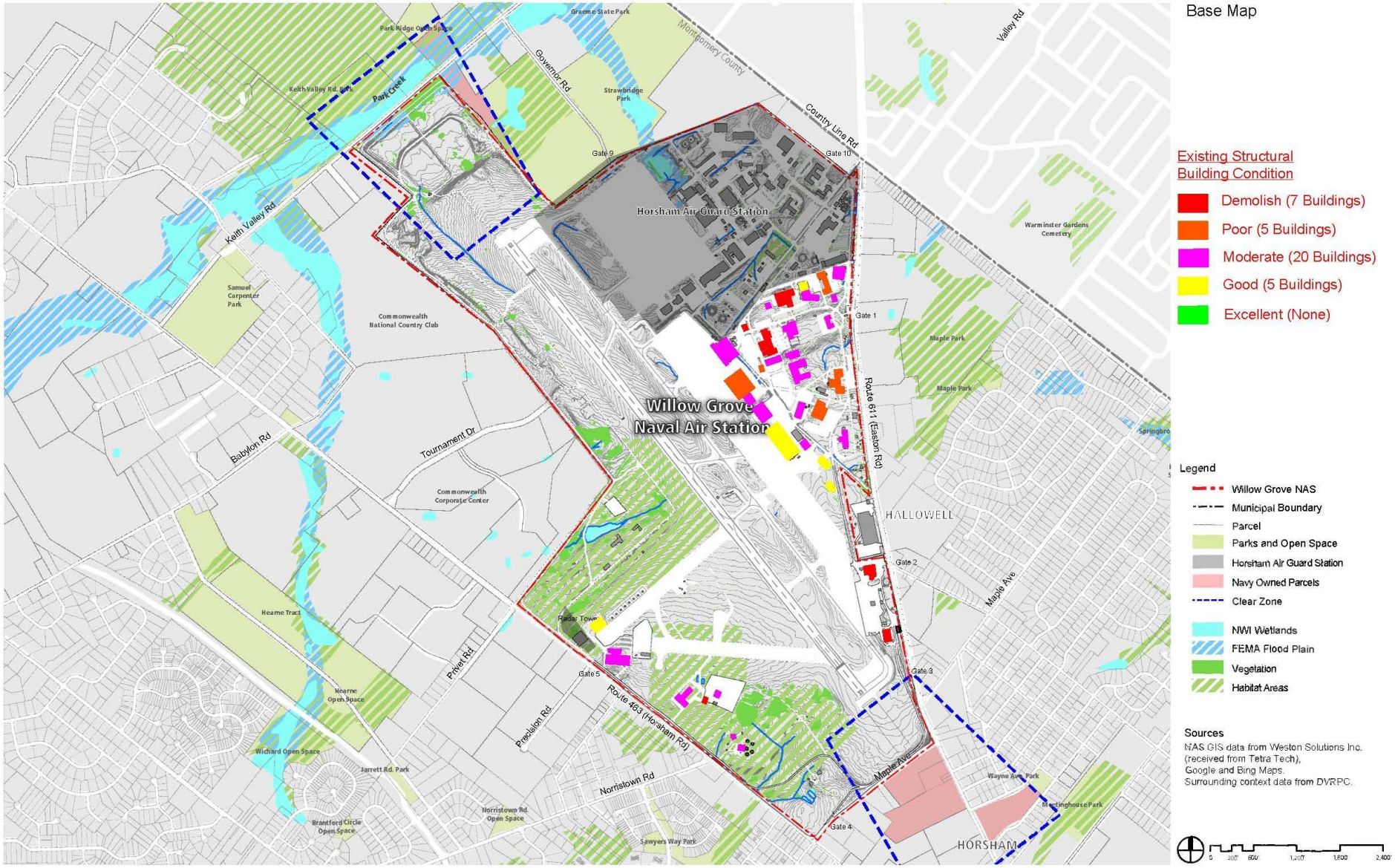
#	Facility Name	Square Feet
BUILDINGS WITH ASBESTOS CONTAINING MATERIAL (ACM)		
1	ADMINISTRATION BLDG	12,828
2	RECREATION BLDG	38,039
3	CHILD CARE FACILITY	19,170
5	BACHELOR OFFICERS QUARTERS	36,225
21	PW SHOP	3,212
22	WAREHOUSE	8,601
24	PUMP HOUSE SWITCH ROOM	1,777
29	STORAGE AVIATION	22,071
38	CHAPEL	5,000
43	INFORMATION RECRUITING	2,623
70	TRANSFORMER HOUSE	819
74	SUBSTATION	49
75	GARAGE STORAGE	625
80	HANGAR	129,014
111	QUARTERS C	2,354
118	TRANSMITTER BUILDING	3,240
126	EMERGENCY GENERATOR FACILITY	496
137	DISPENSARY	14,890
140	RESASWTRACEN APPLIED INSTR.	59,260
146	EQUIPMENT SHELTER	96
159	FILLING STATION	1,616
164	MACS ADM BLDG	1,860
172	BEQ #5	33,464
174	ENLISTED DINING CLUB	11,290
175	AIRCRAFT MAINTENANCE HANGAR	107,768
176	ARMY RESERVE TRAINING BLDG.	45,670
180	AVIONICS ENGINE SHOP	32,224
184	UTILITY BUILDING	600
601	RESERVE TRAINING BUILDING	18,024
605	NAVY EXCHANGE RETAIL STORE	19,200
606	MARINE GENERAL WAREHOUSE	16,098
608	FIRE AND RESCUE STATION	12,720
677	PERSONNEL SUPPORT ACTIVITY	10,000
681	PUMP HOUSE MARINE HANGAR	2,982
780	OPS PASSENGER TERMINAL	19,087
140A	RESASWTRACEN APPLIED INSTR. (A)	50,000
15A	BOILER HOUSE #2 (SOUTHEND)	1,729
175A	LINE SHACK A	400
175B	LINE SHACK B	400
	Total SF with ACM	**745,521**

BUILDINGS WITHOUT ASBESTOS CONTAINING MATERIAL		
13	AUTO HOBBY SHOP	11,687
49	NEX FAST FOOD	1,040
56	GARBAGE HOUSE BOQ	225
63	MAINT WHSE AMD	5,100
68	STORAGE	90
114	QUARTERS A	1,500
117	ELECTRIC SWITCHING STATION	72
139	APPROACH LIGHTING VAULT	680
177	MAINTENANCE HANGAR ARMY	18,950
178	AUTO VEH MAINT NON COMB ARMY	4,583
179	INDOOR PLAYING COURTS	989
609	BARRACKS #6	31,000
610	TRANSFORMER HOUSE (VACANT)	100
611	HEAT PLANT BLDG (POOL)	132
612	HEAT PLANT BLDG (BOQ)	208
613	ORDNANCE ASSEMBLY AREA	480
624	TRANSIENT LINE FLIGHT SHACK	525
625	CONCESSION STAND (VACANT)	495
626	ADMINISTRATION BUILDING	14,250
630	MATCS MOTOR TRANSPORT	2,336
631	COMMUNICATIONS ONE	640
632	COMMUNICATIONS TWO	640
634	MARINES FLIGHT LINE BLDG.	480
635	GROUND SUPPORT EQUIP BLDG	10,117
638	MARINE TRAINING CENTER	27,717
639	MARINE MAINTENANCE GARAGE	4,425
648	HOUSING OFFICE	1,500
650	HAZ FLAM MATERIAL STORAGE	8,364
651	DOG KENNEL	192
652	HAZMAT COVERED STORAGE	14,220
655	DOG KENNEL	1,840
660	NAVY LODGE	36,000
665	GUARD HOUSE GATE 3	64
666	GUARD HOUSE GATE 3	64
680	MARINE HANGAR	58,251
15B	ELECTRICAL VOLTAGE PLANT	374
	Total SF without ACM	**259,330**
BUILDINGS THAT WERE NOT SURVEYED		
370	PA ANG MUNITIONS & SUPPORT	10,198
371	PA ANG FIRE PUMP STATION	375
375	PA ANG MUNITIONS STORAGE	4,000
618	RADAR OPERATIONAL FAC PAD	1,120
636	MARINE TRAINING BLDG	1,000
685	BUS SHELTER (HOUSING)	50
	Total Not Surveyed	**16,743**

Source: Asbestos Inspection Report by Michael Baker Jr., Inc., and RKG Associates, Inc., 2011

[1] Buildings identified or assumed to contain Asbestos Containing Material (ACM)

Map 5-1



June 10th, 2011

E. IDENTIFICATION OF KEY ISSUES AND PLANNING PRINCIPLES

1. Key Building Reuse Issues

The HLRA must consider a number of strategic issues when deciding which of the existing facilities should be maintained for future redevelopment, rather than demolished in favor of developing new facilities. Some of these considerations include carrying costs for vacant buildings, the costs associated with reactivating facilities for reuse, the limiting impact of existing facilities on redevelopment planning, the impacts of keeping facilities on traffic and pedestrian circulations, and the effect that maintaining existing facilities will have on the tone and quality of the redeveloped site. Each of these issues is discussed below.

a.) Carrying Costs

Although it is anticipated that the buildings at NAS-JRB Willow Grove will be vacant at the time of transfer, with minimal direct operating costs, it is expected that the new owner will incur costs associated with inspecting facilities on a regular basis, particularly to limit damage from water infiltration and possibly mold. This will require one or more inspectors or security personnel to physically inspect each facility on a regular basis. It is likely that more security personnel will be required to ensure that copper plumbing and electrical lines are not stolen for their re-sale value as scrap copper. Finally, a vacant facility of the size and visibility of NAS-JRB Willow Grove frequently becomes an "attractive target" for vandals, squatters, and mischievous teenagers. It is likely that the LRA (or another owner) will have to carry comprehensive liability insurance to protect against lawsuits resulting from injuries.

The costs of security will depend on staffing levels. If the owner elects to provide round-the-clock coverage with a single officer, a minimum of four full-time staff will be required. Assuming an average cost of $35,000 per officer including benefits, personnel costs would be $140,000 annually, with no revenue to support these costs. Higher levels of security staffing may be necessary in order to protect the facility. Further, in order to routinely check almost 900 acres and the buildings at NAS-JRB Willow Grove, some sort of patrol vehicle and associated operating costs are likely be required. Adding in the cost of one or more vehicles, snow plowing for public safety, grounds maintenance and insurance, the annual operating budget could easily exceed $250,000, and could rapidly approach $1 million if staffing levels are increased.

b.) Costs of "Reactivating" Facilities

As discussed above, the Navy's mothballing program will require significant expenditures for any building which is reactivated. It is anticipated that the per square foot costs of reactivation could be in the range of $14 to as much as $40 per square foot, depending on the type of building, location, proximity to infrastructure and intended use (Table 5-4).

Table 5-4
Typical Building Reactivation Costs

Building Cost Items	Costs per SF	
	Low	High
Fire Safety	$2.00	$4.00
Water	$1.00	$3.00
Sewer	$2.00	$5.00
Electrical	$3.00	$8.00
HVAC	$2.00	$6.00
Telecommunications	$1.00	$3.00
Interior Plumbing	$1.00	$4.00
Building Envelope	$2.00	$7.00
Total	$14.00	$40.00

Source: JDA, 2011

This means that if the 600,000 square feet of facilities reviewed in this section were reactivated, the total cost would range from $8.4 to $24 million. It should be noted that these cost ranges include only the reactivation of the buildings, and do not assume the additional costs of building code

compliance, life safety code upgrades, extensive façade repairs or upgrades, tenant improvements, upgraded plumbing, interior upgrades or distribution upgrades for water, HVAC, or telecommunications.

F. MARKET POTENTIAL OF EXISTING BUILDINGS

The NAS-JRB Willow Grove site has an array of aviation and non-aviation buildings which are evaluated for their potential to be reused within the context of a redevelopment strategy for the site. In March of 2011, Jeffrey Donohoe Associates, LLP (JDA) inspected a selection of facilities at the NAS-JRB, together with Craig Seymour of RKG Associates (RKG). The tour was led by Martin Schy, the Navy's on-site representative, and included a windshield tour of the facility as well as interior inspections of select facilities.

This section provides an overview of the facilities inspected, in terms of the ability of the facilities to compete in the regional real estate marketplace. In addition, the anticipated impacts of the Navy's mothballing program are discussed, particularly as they relate to the long-term reuse potential of the facilities on the site. This section also reviews facilities which are expected to be demolished due to physical, functional and/or economic obsolescence. Finally, the analysis considers a variety of strategic issues associated with keeping existing facilities, and the impact of specific factors associated with impacts on the redevelopment of NAS-JRB Willow Grove.

1. Buildings with Market Potential

As part of the inspection of facilities, the consultants evaluated eighteen of the larger facilities on the site. Some large facilities were not available for inspection, primarily due to security issues. The facilities inspected ranged from as small as 10,000 square feet and as large as 129,000 square feet. The total square footage of these facilities was almost 600,000 square feet. Only five of the facilities were larger than 50,000 square feet in size.

a.) Aviation Facilities

A total of five facilities were inspected along the NAS-JRB flight line, excluding the fire station (Building 608), which can be used as a community services facility. These facilities range from 19,000 square feet to more than 129,000 square feet. Three of the five facilities are more than 50,000 square feet each. Overall, these facilities were considered to be in average condition at the time of inspection. As will be discussed later in this analysis, the Navy's mothballing program for facilities at NAS-JRB is expected to increase the costs of reactivating facilities in the future. In addition, the quality of facilities is likely to decline over time due to a lack of heating and ventilation. These issues are reviewed in a separate section of this analysis.

- **Building 80** - This is the largest aviation facility evaluated, totaling 129,014 square feet, according to Navy property record information. The facility has a metal skin, with Quonset style roof over the hangar bays. According to Navy records, the two primary hangar bays total just less than 60,000 square feet. The facility has sliding aircraft doors at each end, allowing access for aircraft and vehicles alike. It's estimated that these doors are

more than 32 feet high.

The facility also has an avionics shop, air navigation facility, control tower area, parachute shop, aircraft operations area and training area. The Navy indicates that the maximum height of the facility is 64 feet, substantially higher than the height required for most private aircraft.

Overall, this facility was considered to be in average condition at the time of inspection. However, the consultants were not allowed to tour the interior of this facility, and as such, limited information can be provided.

- **Building 175** - This is a large hangar facility, totaling 107,768 square feet, according to Navy property records. The facility is generally rectangular, with a metal-clad hangar facility closest to the airfield, and a concrete block addition to the rear of the building. The facility has minimal fenestration, and a limited number of personnel access doors. The aircraft doors are panelized sliding doors, with an estimated height of 35 feet. This facility is among the more "modern" buildings at NAS-JRB, having been constructed in 1977. Navy records indicate four separate hangar bays of 12,662 square feet each, though the bays are not physically separated. The hangar has fire sprinklers in place, as well as a ceiling-mounted crane system. The roof is metal, with exposed metal trusses. The interior floor of the hangar is poured concrete.

Overall, the condition of this facility is average at the present time.
Specific data on the operation of the systems was not provided. In terms of marketability, this facility is considered marketable for aviation uses if an airport is considered. The space is somewhat large for a hangar that would be used to support general aviation aircraft. There are a number of large hangars from prior rounds of base closure which are available from a competitive perspective. Alternative uses for a facility of this size could be for warehousing, distribution, indoor sports or manufacturing. However, in order to utilize the facility for manufacturing or warehousing uses, it would be necessary to create loading dock capability to support truck loading and unloading.

- **Building 177** - This facility is among the more "modern" buildings at NAS-JRB, having been constructed in 1977. This hangar is located in the western portion of the base, in proximity to Horsham Road. The building is a pre-engineered metal building. The aircraft doors are sliding, and are estimated to be 16 to 20

feet high. The facility has a gabled roof, and is considered to be in average condition. The facility includes a total of 18,950 square feet with the majority (15,366 square feet) being the primary hangar bay. The interior of the facility features exposed metal framing, florescent lighting and a painted concrete floor. In addition, a secure workshop has been constructed within the hangar, making part of the floor space less usable.

Overall, the condition of this facility is considered to be average to good. The facility is the most consistent in terms of size, ceiling height and door height, and contains more modern hangar spaces, as compared to the much larger hangars on the east side of the runway. If aviation uses are not pursued, the facility could support a small manufacturing or light industrial use.

- **Building 680** - This facility is among the newest at NAS-JRB, having been constructed in 1989, according to Navy property records. The facility is a pre- engineered metal panel hangar building with attached shop space. The aircraft doors leading to the hangar bay are panelized sliding doors. The estimated height of the aircraft doors is 22 to 24 feet.

The interior features an exposed metal truss roof system, concrete floor and exposed metal beams along the walls of the hangar bay. Of the facility's 58,251 square feet, the Navy reports that just over 28,300 square feet is contained in two hangar bays, with the remaining space being used as support space. Most of this support space is in the form of office, located along the rear of the building. The office spaces feature suspended ceilings, florescent lighting, drywall walls and carpeted floors.

The overall condition of this facility is considered to be average. The size of the hangar is still considered somewhat large in terms of a single-tenant hangar facility. Use as a multi-tenant facility is more likely if an aviation reuse is pursued. As an alternative, the facility could support manufacturing or light industrial uses if aviation reuse is not pursued.

- **Building 780** - This facility serves as the passenger operations terminal for NAS-JRB. The facility was constructed in 1991 according to Navy property records, and includes 19,087 square feet. The facility is a two-story brick structure, with a flat roof.

The majority of the space is used for aircraft operations. There is also an area dedicated to air traffic control and a separate area dedicated to military traffic radar approach control. The overall condition of this facility is considered to be average to good. The facility could support a variety of potential uses, including airport operations, small scale office, R&D, and commercial service businesses.

b.) Non-Aviation Facilities

In addition to the aviation facilities inspected by the consultants, a number of other facilities were evaluated in terms of their market potential. Thirteen facilities were inspected at NAS-JRB. In general, these facilities ranged from 10,000 square feet to as much as 46,000 square feet in size. The facilities total more than 266,000 square feet, and average just over 20,000 SF each (Table 5-6).

The quality, condition and marketability of these facilities vary greatly. Several of these facilities are likely to be recommended for demolition, due to existing and anticipated issues, including significant water infiltration issues, structural deficiencies and/or ability to compete in the regional marketplace.

Table 5-6

NAS-JRB Willow Grove Non-Aviation Buildings Inspected

Building #	Building Name	Square Footage
1	Administration	12,828
5	Bachelor Officer's Quarters	36,225
13	Auto Hobby Shop	10,575
29	Shop/Garage	18,071
137	Health Clinic	11,638
140	Education Center	42,596
176	Army Reserves	45,760
605	Navy Exchange	14,220
608	Fire Station	12,720
635	Shop	10,117
638	Marine Reserves	27,717
652	HazMat Covered Storage	14,220
677	Personnel Support Center	10,000
Total	13 Facilities	266,687

Source: Navy Property Record Cards and Donohoe Associates, Inc.

- **Building 1** - This facility serves as the primary office facility for NAS-JRB. It is a two story brick structure, with a central corridor on each floor. There are two interior stairways, one at each end of the building. According to the Navy's property records, the facility was built in 1942, and contains 12,828 square feet of floor space on two floors. A walkthrough of this facility indicates that it is considered low-end, Class C office space. Finishes are consistent with older military office spaces, and would likely require significant upgrades and renovations to be competitive with other low-end office facilities in the region. Given evidence of prior water damage, it may be prudent to demolish this facility.

- **Building 5** - This facility is the former Bachelor Officer's Quarters (BOQ). It is a two-story facility with pitched roof, covered with asphalt shingles. According to the Navy's property records, the facility was built in 1942, and contains 36,225 square feet. The facility is laid out similar to a suite hotel. It has a common kitchen and dining room, as well as a pub/tavern and an in-ground pool outside the facility.

Though the facility appears to be generally sound, the Navy's mothballing program has resulted in significant functional obsolescence of the facility. The Navy has disconnected and/or removed plumbing fixtures in each room, in order to protect against future plumbing issues. In addition, the face paneling has been removed from the bar in the tavern, and there seems to be some potential weakness in the floor in the great room. These issues are recommended for further evaluation.

Overall, this facility is considered to have limited marketability. It is in fair condition, and the Navy's mothballing program has created a situation where significant expenditures will be required to re-establish plumbing connections in every room of the facility. In addition, the Navy reportedly plans to fill the in-ground swimming pool with sand. These issues have a negative impact on the marketability of the property for either residential or hospitality uses.

- **Building 13** - This facility is used as an auto hobby shop. The facility was built in 1942, and is a single story brick and stucco structure containing 11,687 square feet of floor space. The facility has a gabled roof covered with asphalt shingles. Ceiling heights are estimated to be 10 feet.

The majority of the space, 10,575 square feet according to the Navy, is used for automotive bays. The building has multiple overhead doors, allowing easy access for vehicles. Overall, this facility is considered to be in fair to average condition. The nature of the facility makes it suitable for smaller scale warehousing, manufacturing or assembly. It could also be utilized for automotive service. This facility is considered to be moderately marketable, though it it's quality and location may not be consistent with a master-planned redevelopment of NAS-JRB.

- **Building 29** – This is an industrial shop/garage facility. The building was built in 1942, and is of concrete block construction. The building has a gabled roof, covered with asphalt shingles. Windows are metal-framed. The building is predominantly one story, though some mezzanine space has been constructed for additional storage. The building has overhead doors at each end, as well as personnel doors.

It appears that the heating system is in an underground room, which is accessed from outside the building. However, this area could not be inspected, as the stairway (and presumably the room) was filled with an estimated four feet of water. The office area in the building appeared to be impacted by excessive moisture, possibly from the room below. The net result was extensive peeling of paint, as shown in the adjacent picture.

Overall, this facility is considered to be in poor condition. Its marketability would likely be restricted to unheated warehouse or industrial storage. However, it will be important to evaluate whether the facility has developed a mold issue as a result of the excessive moisture buildup in the utility room. Consideration should also be given to whether the electrical system has been compromised due to the water issue. Demolition of this facility is considered likely.

- **Building 137** - This facility is the Navy's on-site health clinic. It is a brick structure with a flat roof, originally constructed in 1960. The facility is reported to be 14,890 square feet, and has a variety of interior finishes. Exterior doors and windowns are metal-framed. Due to its use as a health clinic, the facility has a higher level of plumbing than a traditional office space.

The facility has a handicapped access ramp. The facility has a central corridor, with offices and examination rooms on each side. There is a suspended ceiling, with florescent lights, drywall walls and vinyl tile flooring. Interior doors are metal- framed. The facility is protected by a fire sprinkler system.

The overall quality of this facility is considered to be average. Its potential use is for an office facility or medical office facility. However, the facility may require significant investment in order to meet the needs of medical users in the marketplace.

- **Building 140** - This facility is a one- and two-story brick and concrete educational facility. The building was originally constructed in 1961 and upgraded in 1990, according to Navy records. The building has a flat roof and metal-framed windows and doors. The facility also has roll up doors to access warehouse/storage areas of the building. Total floor space is reported to be 42,596 square feet.

The facility has a central corridor, with classrooms and offices on each side. Interior walls are generally a mix of concrete block and drywall. Most ceilings are suspended, with 2' by 4' florescent trough lights. Flooring is generally vinyl composition tiles. In addition, there are multiple classrooms with raised panel floors, which support computer room operations. Several room- specific cooling systems were also noted, though it is not clear whether these systems will remain in place. The facility also has a fire alarm and sprinkler system.

In general, this facility is considered to be in fair to average condition. The facility is designed as a training facility, and could be readily used for this purpose. Conversion to an office facility would be more problematic, as the room layouts are somewhat large for use as offices. Further, the facility only has windows in limited areas, such that many rooms/areas of the building do not enjoy the availability of natural light. Marketability of the facility is considered somewhat limited, due to the unique nature of the facility and the limited number of potential tenants/buyers that could make use of the facility. Further, the Navy's ongoing mothballing program is expected to make the facility even less desirable, due to the costs to re-establish utilities, the potential for interim damage and the difficulty in re-wiring the facility for telecommunications capabilities.

- **Building 176** - This building is a two story structure, built in 1977. In general, it has a brick and stucco exterior, a slightly pitched roof and serves as the Army Reserve Training building. The building reportedly has 45,760 square feet of floor space on two floors.

The interior includes some warehouse and garage-type space, but the majority of spaces are fit-out as offices and training/conference rooms. The office areas feature suspended ceilings; surface-mounted florescent lighting, walls are a combination of drywall and concrete block, and predominantly carpeted floors.

This facility would be considered to be a low-end office product, typically referred to as Class C office space. Overall, the physical condition is considered fair to average. There is evidence of prior roof leaks, and the facility will likely need to be renovated or upgraded to compete with other low end office properties in the region.

- **Building 605** - This facility is the former Navy Exchange, and served as the primary on-base retail facility, post office, and barber shop. It is predominantly of decorative block construction, with a flat roof. The building was constructed in 1983, and includes 19,200 square feet. The facility has a significant amount of dedicated parking, due to its prior use for retail activities.

The main retail floor includes approximately 13,000 square feet. This area includes suspended ceilings with florescent lights. The estimated ceiling height is ten feet. There are support columns spaced approximately twenty five feet on center. The floor is predominantly vinyl composition tiles (VTC), though there is noticeable damage from shelving and cash registers.

The warehouse/storage area of the facility is reported to be approximately 5,500 square feet, with concrete floors, exposed truss ceilings and florescent lighting. This area has roll-up door access for freight and inventory deliveries. The ceiling height in this area is approximately fourteen feet.

The overall condition of this facility is considered fair to average. Reuse of the facility for retail purposes is considered unlikely. The facility could support office uses, though the lack of windows and therefore natural light is considered problematic for office uses. The facility could support small-scale manufacturing, assembly and/or storage uses, though its marketability could be negatively affected by the presence of support columns.

- **Building 608** - This facility is the on-base fire station. The building was constructed in 1987, and is primarily brick construction with metal roof and gable trim. The facility is a single story, with five equipment bays. In addition, the facility has some sleeping quarters and a galley for firefighters. Equipment bay doors are located on both sides of the building, allowing the station to provide fire protection to airside and non-airside facilities.

The overall condition of this facility is considered average to good. It is anticipated that the facility will not be marketed, but rather will become a community facility used for fire protection purposes. If the facility were converted to an alternative use, it could be used as an auto repair facility or as a service facility for a small contractor.

- **Building 635** - This facility is a pre-engineered metal panel structure with brick walls at the lower sections of the exterior walls. The facility has a slightly gabled roof, multiple overhead doors and minimal windows. According to Navy property records, the facility was built in 1992, and contains 10,117 square feet of floor space. The facility has concrete floors, florescent lighting, exposed insulated walls and an exposed roof. In addition, there is a small amount of mezzanine storage space in a portion of the building, above concrete block walled office and restrooms.

Overall, the quality of this facility is considered to be average to good. From a reuse perspective, the facility manufacturing and service could support shop/garage uses. From a marketability type uses, as well as perspective, this facility is considered marketable, and likely to compete favorably against low end shop and garage facilities in the region.

- **Building 638** - The facility is a one- and two-story concrete structure with a metal roof. The building has two distinct two- story wings, joined by a two-story glass atrium. A large multi-purpose room is located at the rear of the building. The facility has metal framed doors and windows, and was built in 1997. According to Navy property records, the facility includes 27,717 square feet.

The interior of the facility is a mixture of office and training spaces. In addition, there are locker rooms adjacent to the multi-purpose room. Interior walls are predominantly drywall. The interior of the multi-purpose room is estimated to have clear heights of 16 feet at the sides and 20 feet in the center. The multi-purpose room has suspended lighting and composition flooring.

Overall, the quality of this facility is considered average to good. The mix of space makes the facility somewhat more difficulty to market to potential office users. As an alternative, the facility could be marketed to company which needs office space combined with a small-scale warehouse or production facility. The facility might also be marketed for medical uses such as physical therapy, which could utilize the multi- purpose room.

- **Building 652** - This facility is a covered exterior storage facility. It is a pre- engineered metal structure, including metal roof. The facility does not have walls up to a height of approximately eight feet, with goods being secured by a chain link fence. The facility includes 14,200 square feet, and was constructed in 2000.

Overall, this facility is considered to be in average to good condition. However, because it is a somewhat specialized facility, its potential market is limited to companies/organizations which require covered outside storage.

- **Building 677** - This facility is a brick office structure, with gabled, standing seam metal roof. According to Navy property records, the facility was built in 1988, and contains 10,000 square feet of floor space. Interior finishes are typical for an office facility, and include suspended ceilings with florescent lights, and drywall walls. Flooring includes tile in the main entryway and carpeting in most of the office areas. There is evidence of prior water damage in the ceiling tiles.

The overall quality of this facility is considered to be average. Due to the "bullpen" nature of some office spaces, electrical and telephone services are "dropped in" via poles from the ceiling This may necessitate additional investment in terms of relocating like to meet the needs of a new user. From a marketability perspective, it is anticipated that this facility will compete against other Class C office spaces in the regional market.

G. IMPLICATIONS OF FUTURE BUILDING REUSE

1. Risks of the Navy "Mothballing" Program

The Navy has initiated an aggressive program of "mothballing" buildings at NAS-JRB. The intent of this effort is to minimize the potential risks of damage in unoccupied buildings, principally from water leaks of any kind. Secondarily, the Navy appears to be making an effort to minimize their operating and maintenance costs on these facilities.

In general, the mothballing program is removing utility connections for all buildings. The Navy is demolishing the wastewater treatment plant, which will leave each building without sewer service. In addition, waste service to each building is reportedly being terminated. To minimize potential damage from leaking pipes, the Navy is taking the unusual steps of disconnecting plumbing fixtures and removing sprinkler heads from the sprinkler systems in each building. In addition to these steps, the Navy will also reportedly terminate electric service to the buildings.

Further, the majority of the buildings were heated from a central heating plant, which is being taken off-line. The net result of these actions is the buildings will have neither heat nor electrical service, and therefore minimal ventilation.

Three issues must be considered as a result of these actions.

a.) Buildings will deteriorate without Utilities and Maintenance
Unoccupied buildings tend to deteriorate much more rapidly than occupied buildings. The lack of heating and adequate ventilation will exacerbate this problem, particularly in a climate such as Horsham, PA, which experiences significant temperature and humidity changes throughout the year.

b.) Lack of Property Management will Lead to Undiagnosed Problems
Further, though the Navy has been aggressive in trying to minimize potential water damage by terminating water service, removing sprinkler heads and detaching plumbing fixtures, rain water is considered a significant potential source of water damage. Given the lack of occupancy, and what is likely to be intermittent inspection of facilities, there is the possibility that roof leaks or infiltration around doors and windows in individual facilities could go unnoticed for extended periods. This could lead to unchecked water damage, and possibly mold issues for facilities.

c.) Building Reactivation Could Become Cost Prohibitive
Finally, it is important to consider the costs associated with reactivating buildings when and if they are deemed suitable for occupancy. Re-connecting water and sewer service is likely to require a site-wide replacement of distribution and collection lines, in addition to service connections to individual buildings. In addition, each facility will require an individual heating system, due to the termination of service from the central heating plant.

The facilities currently existing on the base have not been reviewed by Horsham Township. Future occupancy permits will require meeting current applicable building codes. It is unclear whether the termination of electrical services and fire sprinkler systems will require these systems to be simply reactivated, or whether the systems will have to be brought up to meet current building and life safety codes. In many communities, a building which remains unoccupied for an extended period of time (frequently more than one year) must be brought up to current standards. In other cases, an investment of more than 25% to 50% if the value of the building "as-is" is the benchmark for requiring facilities to meet current codes. Given the diminution of value to these facilities as a result of the Navy's mothballing program, as well as the age of the structures, the investment in re-activating the building's utility systems is likely to be in excess of the 25% threshold.

2. Impacts on Base Reuse Planning

Maintaining existing buildings at the base could impact the community's ability to plan for a comprehensive redevelopment of the property. Any facility which is reused means that the reuse/redevelopment plan is constrained in terms of where roadways can be located, where water and sewer lines can be placed, and where other infrastructure services can be located. Much like a wetland is considered a development constraint, so too is an existing building, which cannot be removed or relocated. Each facility which is targeted for reuse rather than demolition will have a long term affect on the redevelopment of NAS-JRB.

3. Base Internal Circulation

Reusing existing facilities could have a significant impact on circulation within and around the site. If a significant number of the existing facilities are reused, new circulation improvements will have

to "work around" these facilities. This could negatively affect new or upgraded roadways, or could limit the ability to develop new uses on the site.

4. Redevelopment Tone and Quality

Reuse of existing facilities will affect the tone and quality of the potential redevelopment at NAS-JRB. Trying to attract new investment to an area where existing lower quality facilities are located can negatively impact marketing efforts. Simply put, investors are less inclined to invest their funds to develop a new building in a neighborhood that appears economically obsolete or under-performing. Further, the costs of rehabilitating aged facilities to "appear" newer generally do little to offset functional obsolescence. For example, though it may be possible to upgrade the façade of an older warehouse facility to make it appear more modern, it is typically not practical to remove support columns or raise the ceiling height in that same facility.

5. Potential Building Demolition

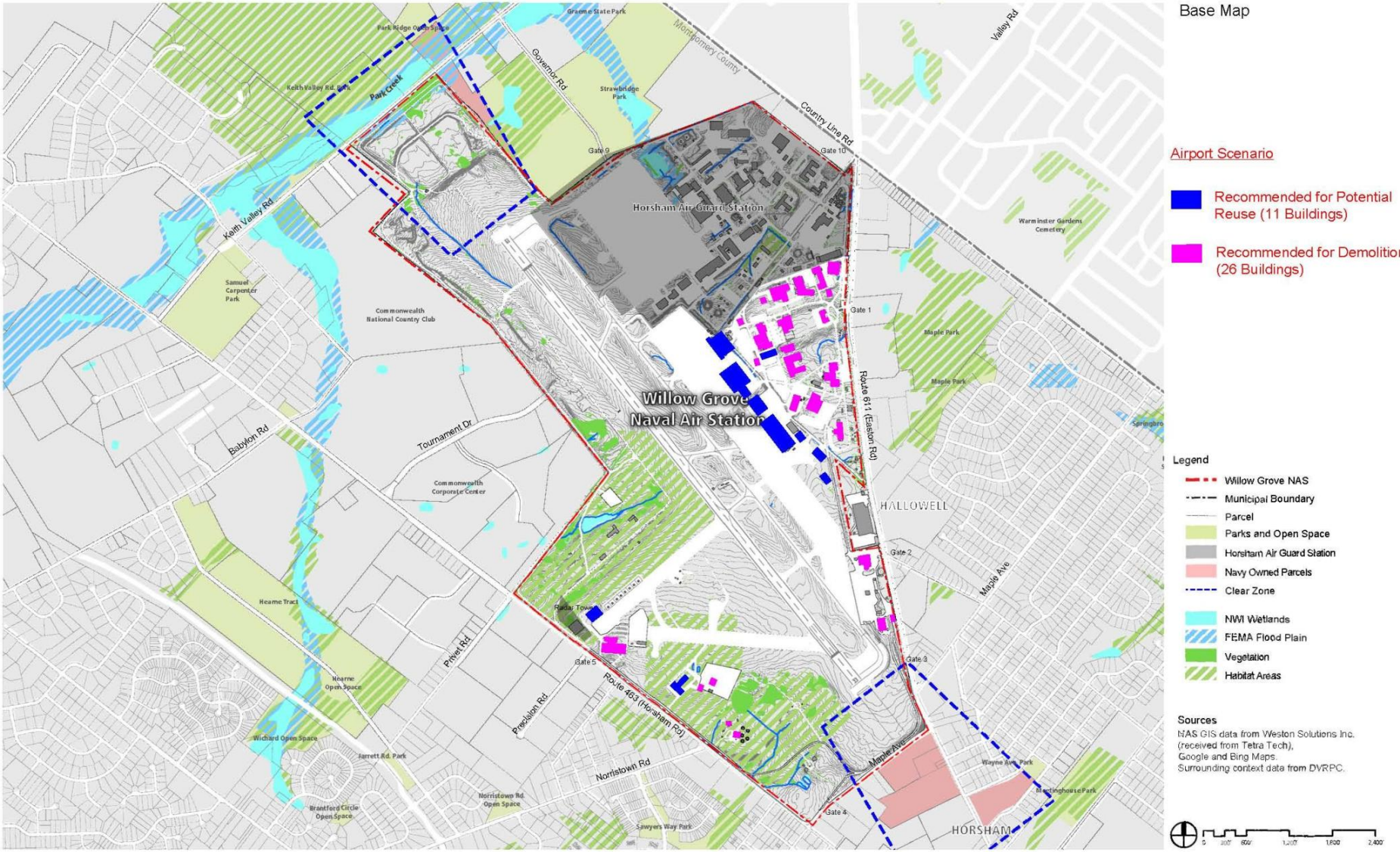
The consultants' analysis has produced a list of buildings that should be retained or demolished under either an airport or non-airport reuse scenario (Table 5-7). Under an airport reuse, all the aviation buildings would be retained, but would be demolished under the non-airport scenario. Under the airport scenario roughly 496,779SF of building space could be reused (Map 5-2 and 5-3) and 92,621 SF could be reused in the non-airport scenario.

Table 5-7
Top Reuse and Demolition Buildings
Under Airport and Non-Airport Reuse Alternatives

Building Number	Name	Building Square Footage	Airport Scenario	Non-Airport Scenario
1	ADMINISTRATION BLDG	12,828	Demolish	Demolish
2	RECREATION BLDG	38,039	Demolish	Demolish
3	CHILD CARE FACILITY	19,170	Demolish	Demolish
22	WAREHOUSE	8,601	Demolish	Demolish
29	STORAGE AVIATION	22,071	Demolish	Demolish
38	CHAPEL	5,000	Demolish	Demolish
43	INFORMATION RECRUITING	2,623	Demolish	Demolish
63	MAINT WHSE AMD	5,100	Keep	Demolish
80	HANGAR	129,014	Keep	Demolish
111	QUARTERS C	2,354	Demolish	Demolish
118	TRANSMITTER BUILDING	3,240	Keep	Demolish
159	FILLING STATION	1,616	Keep	Keep
175	AIRCRAFT MAINTENANCE HANGAR	107,768	Keep	Demolish
176	ARMY RESERVE TRAINING BLDG.	45,670	Demolish	Demolish
177	MAINTENANCE HANGAR ARMY	18,950	Demolish	Demolish
179	INDOOR PLAYING COURTS	989	Demolish	Demolish
180	AVIONICS ENGINE SHOP	32,224	Keep	Demolish
184	UTILITY BUILDING	600	Demolish	Demolish
370	PA ANG MUNITIONS & SUPPORT	10,198	Keep	Keep
610	TRANSFORMER HOUSE(VACANT)	100	Keep	Demolish
625	CONCESSION STAND (VACANT)	495	Demolish	Demolish
626	ADMINISTRATION BUILDING	14,250	Keep	Keep
638	MARINE TRAINING CENTER	27,717	Keep	Keep
655	DOG KENNEL	1,840	Keep	Keep
660	NAVY LODGE	36,000	Keep	Keep
680	MARINE HANGAR	58,251	Keep	Demolish
780	OPS PASSENGER TERMINAL	19,087	Keep	Demolish
140A	RESASWTRACEN APPLIED INSTR. (A)	50,000	Keep	Demolish
15B	ELECTRICAL VOLTAGE PLANT	374	Keep	Demolish

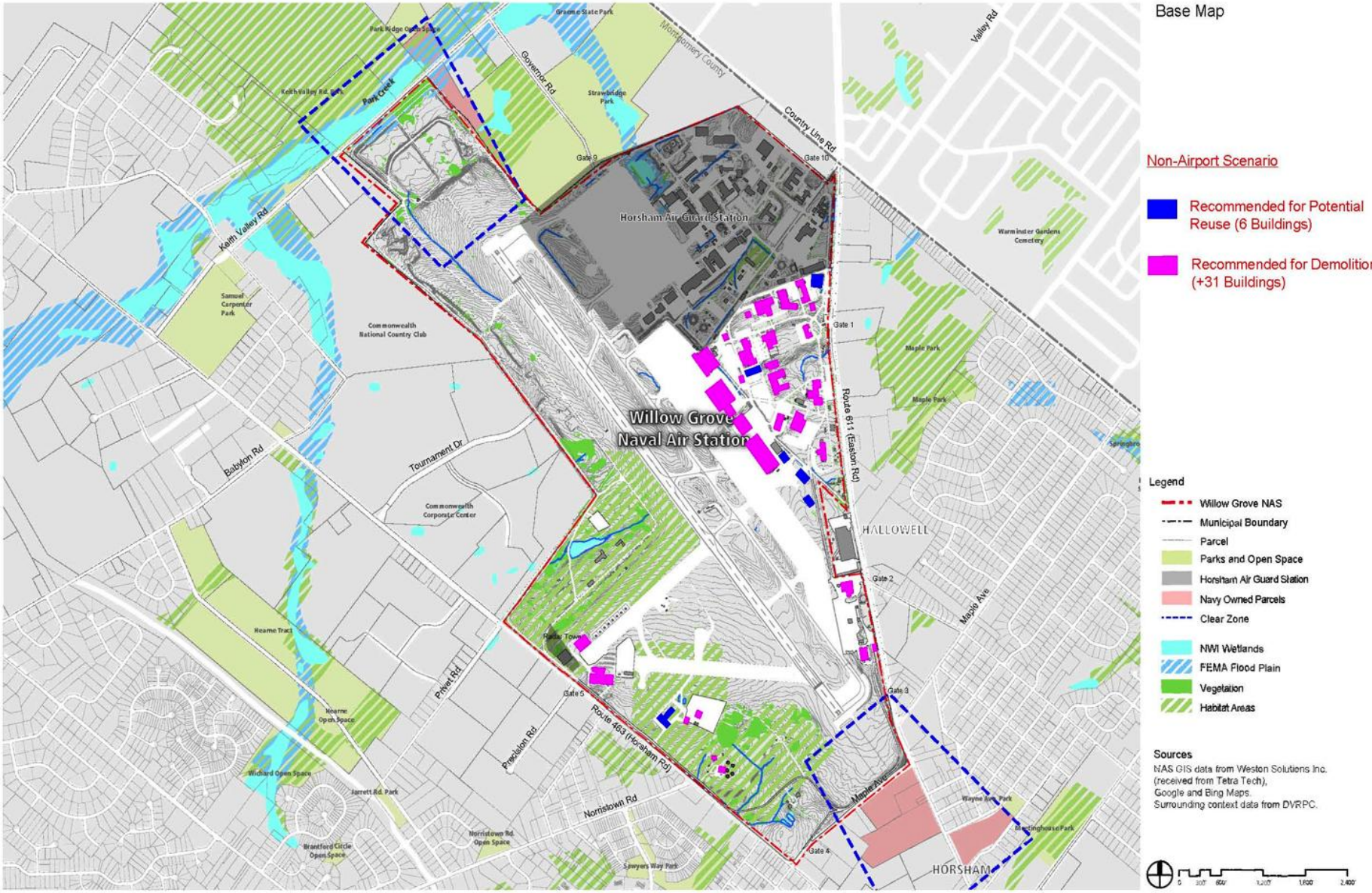
Source: Urban Engineers and JDA, 2011

Map 5-2



June 10th, 2011

Map 5-3



June 10th, 2011

6 TRAFFIC AND TRANSPORTATION

A. INTRODUCTION

The following section includes information and observations that were gathered from multiple site visits by the project team, research into the existing transportation infrastructure, manual turning movement counts at nine (9) intersections, and an analysis of existing traffic volumes and network distribution using the Synchro/SimTraffic software program created by Trafficware.

A Level of Service (LOS) analysis was performed using the existing system peak hour traffic volumes collected by Urban Engineers staff. These were then input into Synchro/SimTraffic at key intersections surrounding the former Naval Air Station. A comparison of historical volume information from Delaware Valley Regional Planning Commission was also performed for PA 611 (Easton Road) and Horsham Road.

The methods employed to arrive at the LOS analysis are nationally recognized and endorsed by the Federal Highway Administration and regional transportation authorities like PennDOT. "Level of Service" is a standard used to compare traffic congestion and the capacity at various types of road facilities. For this project the consultants utilized the signalized intersection criteria to establish existing LOS.

B. SUMMARY OF MAJOR FINDINGS

- Regional Access – NAS-JRB and Horsham Township enjoy favorable regional access with the proximity of the Pennsylvania Turnpike (Interstate 276), which is located approximately 2.5 miles south of the subject property and connects the township to the rest of the metropolitan region and Center City Philadelphia which is located 18 miles south of the township.

- Traffic Congestion - The roadway network is generally congested particularly during peak hours (AM and PM rush hours). The overall traffic volumes, combined with limited site access, the presence of businesses, and limited network connections around the facility contribute to localized road congestion.

- Public Transit Service - The area around The Willow Grove Naval Air Station is served by SEPTA's Route 55 Bus Service that connects Doylestown in Bucks County with the Olney Transportation Center. The bus route makes several transit stops at Doylestown in the north and Willow Grove, Noble, Elkins Park and Melrose Park in the south. The Olney Transportation Center has connections to multiple bus lines as well as the Broad Street subway line.

- North/South Commuting Patterns - The traffic volumes are highly directional with southbound traffic peaking in the morning and a reverse commute northbound peaking in the late afternoon. In large part this is due to commuting patterns traveling to and from the region's

large employment centers, heading south in the morning and returning north in the evenings.

- Proximity to Turnpike - Exit 343 of the Pennsylvania Turnpike is located approximately 3 miles south of NAS-JRB. State Route 611 (Easton Road) is the primary thoroughfare connecting the Turnpike to the base.

- Constrained Intersections - Several intersections surrounding NAS-JRB that were studied fail or are on the verge failing under the existing conditions including:

  - Easton Road (PA 611) and W. County Line Road
  - Easton Road (PA 611) and Meetinghouse Road/Dresher Road
  - Horsham Road (PA 463) and Dresher Road

C. TRANSPORTATION EXISTING CONDITIONS

1. Location and Access

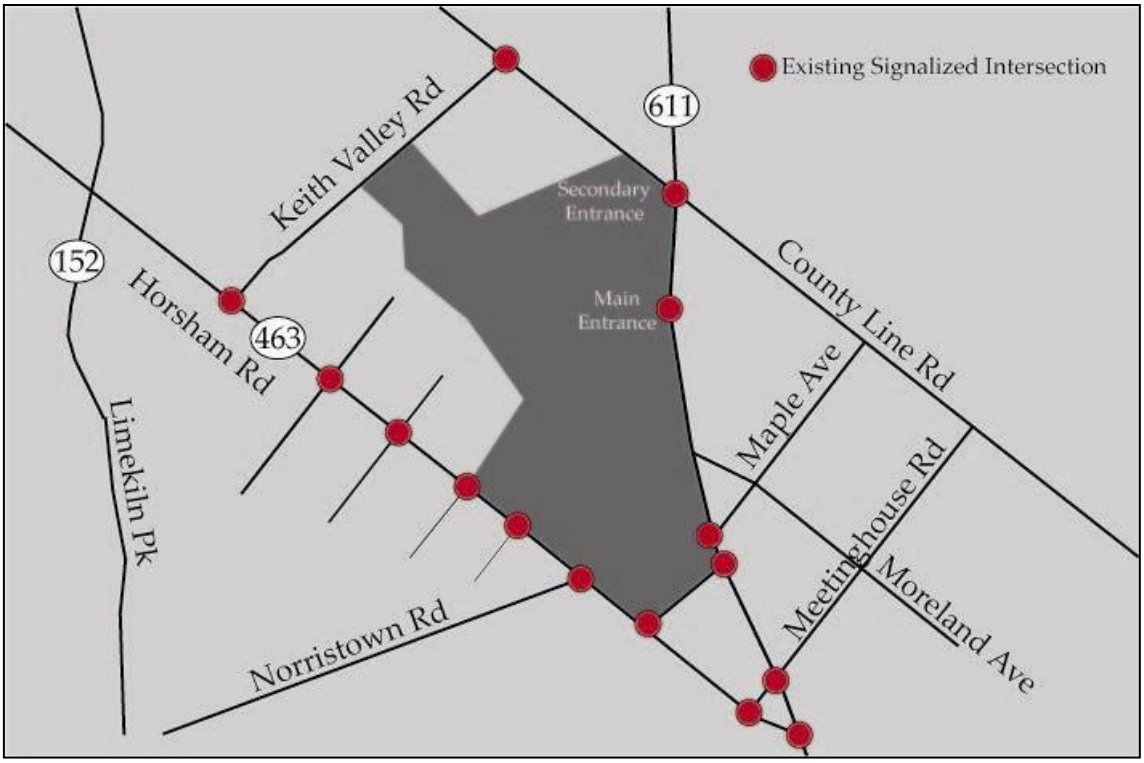
The NAS-JRB property enjoys very good regional access and proximity to the rest of the Philadelphia region. The site is located approximately 18 miles north of Philadelphia, PA in Horsham Township, PA. The primary regional highway serving the community is the Pennsylvania Turnpike (Interstate 276), with Exit 343 located approximately 2.5 miles south of the NAS-JRB property. The Turnpike connects Horsham to I-95 in the east, and interstates 76 and 476 to the west.

Locally, the base property is bordered by Easton Road (PA Route 611) on the east boundary, which connects directly to the center of Philadelphia and becomes Broad Street. This major arterial highway connects Philadelphia to its highly populated suburbs such as Jenkintown, Doylestown, Horsham and Warminster, PA. Horsham Road (PA 463) on the western boundary, merges with Route 611 just south of the site and connects Horsham to points north in the direction of Allentown, PA. These roads essentially form two legs of a triangle that surround the property, with Keith Valley Road forming the northern edge. Keith Valley Road is a rural connector road and only links Horsham Road to County Line Road, both of which run in a northwest to southeast orientation. East/west roadway connections around the NAS-JRB property are not prominent..

2. Road Network Characteristics

As seen in Figure 6-1, the site is bound by PA Route 611 (Easton Road), PA Route 463 (Horsham Road), County Line Road and Keith Valley Road. NAS-JRB is accessed by passenger and commercial vehicles through the main entrance along PA 611 (Easton Road). There is a secondary gated entrance at the intersection of PA 611 (Easton Road) and County Line Road. Key points of interest in terms of traffic movements include intersections at: (1) PA 611/Horsham Road, (2) PA 611/Dresher Road and (3) PA 611/County Line Road. Traffic signals control travel movements at each of these intersections surrounding the Naval Air Station.

Figure 6-1



3. Public Transit Connections and Initiatives

a.) Existing Public Transit Serving NAS-JRB Willow Grove

The area around The Willow Grove Naval Air Station is served by SEPTA's Route 55 Bus Service that connects Doylestown in Bucks County with the Olney Transportation Center. The bus route makes several transit stops at Doylestown in the north and Willow Grove, Noble, Elkins Park and Melrose Park in the south. The Olney Transportation Center has connections to multiple bus lines as well as the Broad Street subway line. The Route 55 bus travels along Route 611 with 10 to 20 minute headways during the day (from 6:00 a.m. until 7:00 p.m.). Overnight hours have limited service and greater headways between buses.

The Warminster Regional Rail line also serves the area. The nearest station is the Hatboro station located on Penn Street between Byberry Road and Moreland Avenue. This station is approximately two miles from the southern section of the NAS-JRB site, but no direct bus connections from the site. There are several parking lots in the vicinity – both SEPTA lots and Hatboro Municipal parking lots and they are generally full on a daily basis. The Warminster line has another station (Warminster Station) off of Jacksonville Road, south of Street Road. The Warminster Station is approximately 2 miles northeast of the Hatboro Station and has approximately 800 parking spots that are generally full on a daily basis as well as several bike racks. The Route 22 bus service connects the stations along the regional rail line.

b.) Local Transit Initiatives

A recent grant application prepared by the Delaware Valley Regional Planning Commission (DVRPC) and submitted to the Partnership Transportation Management Association of Montgomery County, highlights the need for additional public transit services and options between Route 63

and the Bucks County line. This corridor encompasses eight business parks, a variety or retail strip malls and the closed NAS-JRB Willow Grove property. The grant would fund additional activities designed to promote transit alternatives including:

- Employer outreach to encourage employee use of public transit,
- Public information campaign to increase awareness of public transit options,
- Promote safe biking and walking as a commuter alternative and an avenue to a healthier lifestyle,
- Create an enhanced network of contacts to implement a "Share a Ride" program,
- Inform employees and employers about high ozone levels and encourage use of carpooling, public transit and other transportation options on bad ozone days.

The Partnership Transportation Management Association of Montgomery County (PTMA) is a non-profit 501c3 organization that works with local businesses, municipalities, school districts and other non-profit organizations to help reduce traffic congestion, increase mobility and access to work and educate children and adults on the issues of land use, transportation, the environment and healthy lifestyles. The PTMA receives funding from a variety of sources including PennDOT, the Delaware Valley Regional Planning Commission, membership dues, in-kind contributions and payment for services rendered.

A variety of programs are available for businesses. Custom-designed programs can also be developed to meet a company's specifications. The following are some highlights of successful existing programs available through PTMA membership:

- Mobility Hotline Access
- CareerLink Liaison
- RideShare Programs
- SEPTA Route Information
- Shuttle and Subscription Bus Service Administration
- Emergency Ride Home
- Healthy Lifestyle Expos, Centers and Speakers
- Transit Promotion Programs
- Bike to Work Day

Municipal Programs

- Award-winning Construction Coordination Program
- Livable Community Workshops and Guide Books
- Transportation Resources Guides
- Municipal Shuttles
- Support for roadway projects and liaison for regional efforts
- Summer educational programs for children on land use, environment and transportation issues
- Pedestrian Enhancement[1]

c.) Horsham Breeze Minibus Shuttle Loop

The Horsham Breeze service was established during the 1990s in response to a need for a shuttle loop between the Willow Grove Park Mall, located about 15 miles north of Philadelphia, and

[1] The Partnership TMA website: http://www.ptma-mc.org/membership-information/what-is-tma

suburban employment centers in Horsham Township. The Horsham Breeze was designed to allow employees to transfer from the main line bus routes to access major employers via a fleet of minibuses. The program was conceived in partnership with local employers and business leaders who had difficulty hiring employees from the Center City without cars. With declining employment in the Center City and rapid suburban job growth during the 1990s, traditional bus routes were insufficient to get employees within convenient walking distance of suburban office parks.

Although the Horsham Breeze service does not extend to NAS-JRB Willow Grove, it is anticipated that the need for transit connections to this regional employment center will grow in the future. It is projected that more than 7,000 jobs will be created at NAS-JRB at build-out. The closest access point for the Horsham Breeze bus loop is at the intersection of Dresher Road and Gibraltar Road at Prudential's Central Atlantic Group Operations, which is roughly one half mile from the southern edge of NAS-JRB Willow Grove.

4. External Road Network

Easton Road is the primary north-south roadway in the area and is highly commercialized with retail and business complexes along its length. The cross section varies by location but is generally two lanes per direction with turning lanes at key intersections. Access varies but is plentiful throughout the area with limited access control.

Horsham Road (Route 463) connects with Easton Road just south of NAS-JRB and heads in a northwesterly direction. In the area of the base Horsham Road was widened to two lanes in each direction with turn lanes at key intersections. Horsham Road is less congested and becomes more rural in nature as you move farther north. Horsham Road provides access to some key local sites including the Hatboro-Horsham High School, the Commonwealth Corporate Center and National Country Club, and the Horsham Township Municipal Complex (Police, Fire, and Municipal Building).

Due to the location of the base there are limited east-west cross connections in the area. This lack of crossings causes traffic bottlenecks, primarily at the southern end of the site. Norristown Road is an east-west road that connects Route 309, Springhouse and other communities in the west with Horsham. It serves as a major route into the township, but due to the presence of the Naval Air Station, Norristown Road terminates at a signalized intersection at Horsham Road, forcing cars to go around the property.

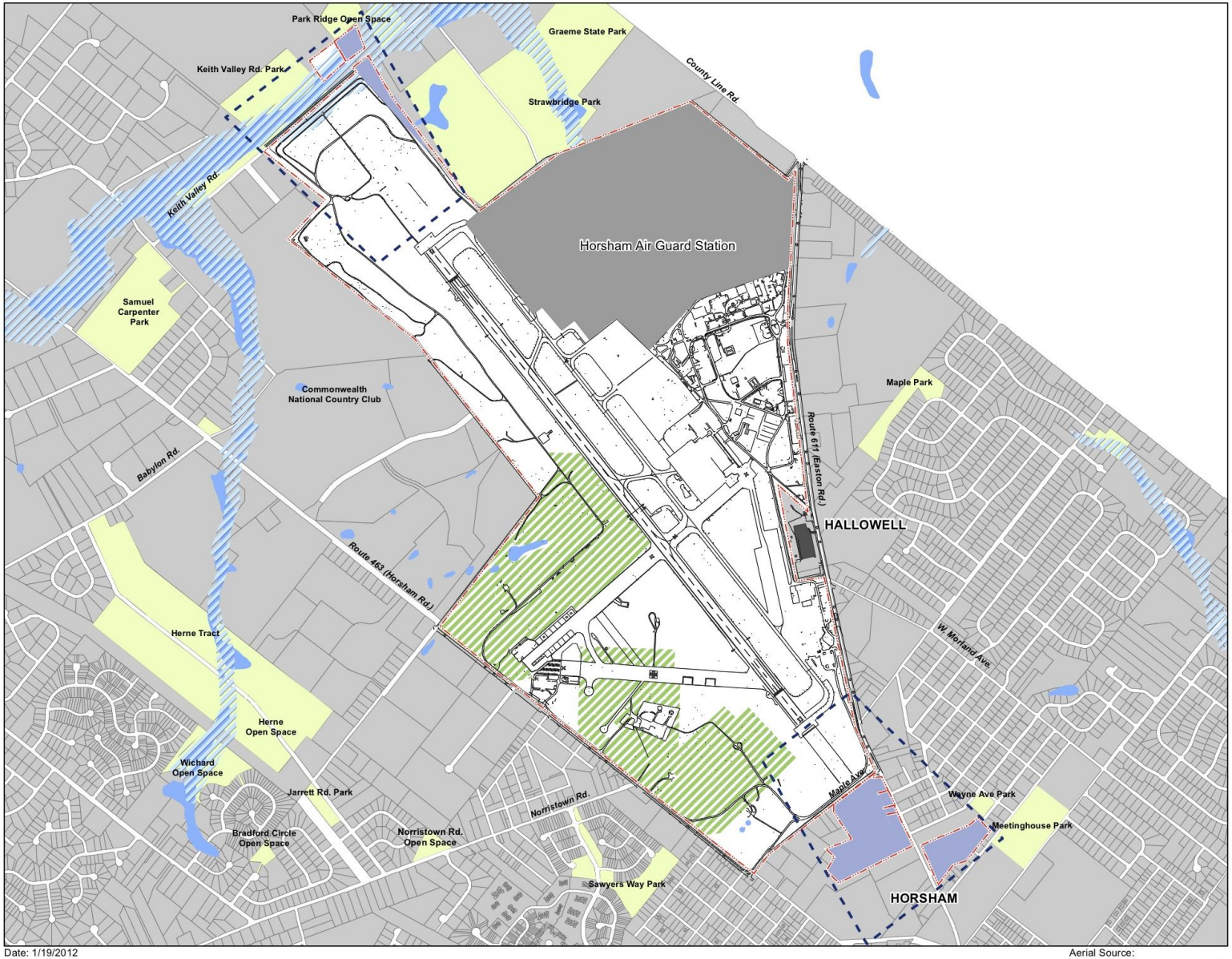
Maple Avenue has signalized intersections at each side of the southern portion of the site (Horsham Road and Easton Road) and serves as the limits of the base for transportation purposes. It is highly utilized by vehicles traversing the area, additionally there are several businesses located along its frontage.

The intersection of Horsham Road and Easton Road is a signalized Y Type intersection that experiences very high traffic volumes due to the funneling affect that the limited cross connections has on the area.

5. Internal Road Network

Map 6-1 depicts the network of roads, runway and taxiways that currently exist within the boundaries of NAS-JRB Willow Grove. Although much of the roads within the boundaries of NAS-JRB Willow Grove are in good condition, it is unlikely that their dimensions and method of construction (e.g., thickness of paving and base material) are within the established Horsham Township codes for their intended use.

Map 6-1



NAS JRB Willow Grove
Horsham Township, PA

Roads

Legend
- Willow Grove NAS
- US Navy Property
- Horsham Air Guard Station
- FEMA Flood Plain
- NWI Wetlands
- Habitat Areas
- Buildings
- Parcels
- parks open space
- Runways/Aprons and Roadways
- Clear Zone

0 625 1,250 2,500 Feet

Date: 1/19/2012

Aerial Source:
ESRI Bing Mapping Service, 2010

The current road network is designed to serve the small core area of buildings located near the main gate area. This is where most of the existing structures are located, but the remainder of the base is served by a limited number of access roads which trace the perimeter of the site. This is largely due to the presence of the main runway which splits the property in the middle.

It is anticipated that most, if not all, of the existing roads within the base will be removed in order to implement the preferred redevelopment plan. However, consideration should be given to recycling the road base and paving materials on site for use in future road construction. The costs associated with earthmoving and road bed materials are quite expensive and salvaging these materials could result in a construction cost savings.

6. Level of Service (LOS) Analysis

An analysis was performed by consultants to determine the existing operations of nine signalized intersections surrounding the NAS-JRB property. Manual turning movement counts were collected for two hours during the peak periods of 7:00 to 9:00 a.m. and 4:00 to 6:00 p.m. on a weekday. Volume data including passenger cars, trucks, buses and pedestrian activity was recorded. The following intersections were counted and their respective count day is noted:

- Easton Road (611) and W. County Line Road and Privet Road - Tuesday, March 8, 2011
- Easton Road (611) and W. Moreland Avenue - Tuesday, March 8, 2011
- Easton Road (611) and Meetinghouse Road - Thursday, March 10, 2011
- Easton Road (611) and Horsham Road (463) - Thursday, March 10, 2011
- Horsham Road (463) and Maple Avenue - Wednesday, March 9, 2011
- Horsham Road (463) and Dresher Road - Wednesday, March 9, 2011
- Horsham Road (463) and Norristown Road – Wednesday, June 13,2011
- Easton Road (611) and Maple Avenue (2 signals) – Wednesday, June 13, 2011

Level of Service (LOS) is a grading system for intersections and other transportation components (freeways, ramps, weaves, merges, etc) that reflects the efficiency of a road, in terms of congestion back-ups, queuing length and delay times and traffic movements. For example, a LOS of "A" indicates the best traffic conditions, while LOS "F" indicates the worst conditions. In the area surrounding the base, signalized intersections are the primary bottlenecks that determine the traffic operations of the main transportation corridors.

Written descriptions of level of service are shown below. The most important grade difference is between LOS E and F. At LOS E, although delays are becoming significant, queues still do not generally back-up through or affect nearby intersections. The volume is slightly under or at capacity. However, at LOS F, the demand volume exceeds capacity, and queues can and will frequently back-up through adjacent intersections. Also, LOS grades typically reflect travel conditions during peak travel times, which tend to occur during morning and evening commuting hours. During off periods, the LOS often returns to acceptable levels.

- **Level of Service A** - Motorists experience virtually no delays. Most vehicles pass through the intersection without stopping. This is indicative of very low volume compared to capacity and good signal coordination.

- **Level of Service B** - With slightly more delays than LOS A, LOS B still maintains excellent conditions. Some vehicles must stop for relatively short periods of time.

- **Level of Service C** - Delays are longer than LOS B, but operations would still be considered good. Short to moderate queue lengths form during the red phase of the traffic signal. In rare cases, a vehicle may have to wait through more than one signal cycle to proceed.

- **Level of Service D** - Delays start to become more noticeable, and longer queue lengths start to become apparent at intersections. Still, the majority of vehicles have to wait no more than one signal cycle to clear the intersection.

- **Level of Service E** - Intersection volume now equals capacity. Nearly all vehicles have to stop, and delays are long. Many vehicles may have to wait for more than one signal cycle to proceed. However, back-ups generally do not affect nearby intersections.

- **Level of Service F** - Volumes exceed capacity at LOS F. Delays are extremely long, and virtually all vehicles must wait through several signal cycles to proceed. Extensive queues frequently back-up through adjacent intersections, propagating the gridlock conditions.

D. HISTORICAL AND CURRENT TRAFFIC CONTEXT

1. Historical Traffic Context

AADTs (Annual Average Daily Traffic volumes) were analyzed using Delaware Valley Regional Planning Commission historical traffic data for PA 611 and Horsham Road. The analysis shows that traffic volumes have not changed significantly over the past 5 years. The AADT for PA 611 near the entrance to the former Naval Air Station was documented to be 35,348 in August of 2006 and 36,568 in August of 2009. This equates to approximately a 1% growth rate per year. The AADT for Horsham Road near the site was documented to be 30,351 in August of 2007 and 29,450 in August of 2008. This was a 3.0 % decrease in volume over 1 year.

Table 6-1
Existing Levels of Service
March, 2011

Intersections	Existing Levels of Service (Seconds of Delay)	
	Morning	**Afternoon**
EASTON RD (611) AND W. COUNTY LINE RD AND PRIVET RD		
Overall Rating	F (109.1 sec.)	F (89.5 sec.)
Traffic Approach	EB - F (95.8 sec.)	NB - F (164.9 sec.)
	WB - F (83.7 sec.)	
	SB - F (210.8 sec.)	
EASTON RD (611) AND MORELAND AVE		
Overall Rating	**A**	**A**
Traffic Approach		
EASTON RD (611) AND MEETINGHOUSE RD/DRESHER RD		
Overall Rating	**E (77 sec.)**	**D**
Traffic Approach	EB - E (64.2 sec.)	EB - E (78.8 sec.)
	NB - E (65.4 sec.)	
	SB - F (121.6 sec.)	
EASTON RD (611) AND HORSHAM RD (463)		
Overall Rating	**C**	**B**
Traffic Approach		
HORSHAM RD (463) AND MAPLE AVE		
Overall Rating	**C**	**B**
Traffic Approach		
HORSHAM RD (463) AND DRESHER RD		
Overall Rating	**D**	**E (79.5 sec.)**
Traffic Approach	EB - E (60 sec.)	NB - F (132.6 sec.)
	SB - E (65.8 sec.)	

Source: Urban Engineers, Inc., 2011
Notes:
EB - Eastbound SB - Southbound
NB - Northbound WB - Westbound

2. Current Traffic Volumes and Levels of Service at Key Intersections

Analysisand modeling of existing conditions were prepared using Synchro/ SimTraffic software. For proper modeling, system peak hour volumes were calculated for both peak hours. The system peak hours were determined to be 7:15 to 8:15 a.m. and 4:45 to 5:45 p.m. System peak hour volumes for both peaks are shown in Table 6-1. System peak hour volumes, existing lane configurations, phasing and timing, actuation, speeds and other pertinent operational information were input into Synchro to determine existing operations and levels of service (LOS) for the project intersections.

The following table summarizes the results of Synchro/ SimTraffic Level of Service Analysis for both peak hours. The table shows overall LOS for each intersection and approaches that have a LOS E or worse. Seconds of delay are included where the LOS is E or F.

E. TRANSPORTATION ISSUES, OBSERVATIONS AND OPPORTUNITIES

1. Issues

The area around NAS-JRB Willow Grove is heavily commercialized and inundated by traffic during multiple hours of the day. There is also a limited network of streets which places greater stress on the connections and signalized intersections that do exist. The commercial nature of the corridor and the multitude of driveways create a chaotic environment where conflicts from vehicles entering and exiting driveways, as well as side streets limits the overall capacity and functionality of the road system.

2. Field Observations

During the morning peak hour count, long queues and significant delays were present on the southbound approach of Easton Road at its intersection with County Line Road. Vehicles were also observed queuing beyond the available 400 foot storage length on the eastbound approach. At the intersection of Easton Road and Meetinghouse Road/ Dresher Road, there were substantial queues on the southbound approach; however most vehicles were able to clear the intersection during the next green light cycle. Although most other intersections experienced heavy volumes and some minor delay and queuing, most queues were cleared during the following cycle.

During the afternoon peak hour count, long queues and significant delays were present on the northbound approach of Easton Road at its intersection with West County Line Road. At Easton Road and Meetinghouse Road/ Dresher Road, there were substantial queues on the eastbound approach; however, most vehicles were able to clear the intersection during the following light cycle. At Horsham Road and Dresher Road, a large number of vehicles queued on the northbound approach of Dresher Road, with a high number of left turning vehicles. No other major queues were witnessed during the afternoon peak.

3. Conclusions

The development of a large, mixed-use employment center and residential community at NAS-JRB Willow Grove will create many challenges in the future, not least of which will be the challenge of moving people and vehicles through a fairly restricted transportation network. While some traffic impacts can be mitigated through investments in new intersection/lane improvements and signalization technology, the redevelopment will create larger transportation challenges for the road and highway network up- and down-stream from the site. Public transit solutions must be explored that give people travel options other than driving their vehicles to the site. There are good examples like the Horsham Breeze Shuttle Loop that can be incorporated into a comprehensive transportation strategy to reduce traffic volumes and congestion.

7 REAL ESTATE MARKET ANALYSIS

A. INTRODUCTION

This section details the residential, office, industrial and retail market forces that are shaping the region's development environment and how they relate to the demand for real estate at the NAS-JRB Willow Grove site. The real estate market analysis reflects the most current market conditions and includes information such as development trends, leasing, vacancy rates, and absorption for the different types of real estate uses. In addition, RKG Associates conducted interviews with local development and real estate professionals in order to understand the nuances of the Greater Horsham market and to gain an "in-field" perspective of the current investment climate in region. The general purpose of this analysis is to provide a sense of the redevelopment potential of the subject property and the region's ability to absorb this land resource over time.

B. SUMMARY OF MAJOR FINDINGS

1. Demographics

- Population Growth - Horsham Township has experienced significant population growth in recent decades. According to the 2010 U.S. Census, the local population has increased almost 64% since 1980 to its current level of 26,147.
- Median Age - Horsham and Montgomery County have an older median age (40.5 and 40.6, respectively) than the nation as a whole (37.1). Household demographics can shape the type of housing, retail goods and services provided in a given area.
- Household Formations - Similar to population trends, Horsham Township has experienced a growth in household formations in the recent past. Since 1990, the Township grew by 1,290 new households.
- Median Household Income Levels - Horsham Township has comparatively high household median incomes. According to the 2010 U.S. Census, the median household income was $80,324, or nearly $30,000 higher than the nation as a whole.

2. Residential Market

Residential Inventory

- The majority of units in Horsham are owner occupied (69.6%), with renter-occupied units composing 27.7% of total housing units.
- Traditional apartment units only comprise 16.6% (1,562 units) of the total housing stock in Horsham Township (9,433 units). It is likely that the remaining renters are residing in "non-traditional" rental units, such as single family homes, condominiums, or townhomes that the owner is renting out.

- All traditional apartment units in Horsham are in low-rise buildings (4-stories high or less), mixed-use retail/office/apartment buildings, or townhome-style buildings. There are no high-rise apartment buildings within Horsham.
- There are 292,651 housing units in Montgomery County and Horsham accounts for only about 3% of the total housing stock in the County.

Residential Development Trends

- Within Horsham Township, the vast majority (95%) of housing units built within the past 10 years have been single family homes.
- In terms of estimated market values, these newer homes have market values that are well above those of older homes. Single family homes built between 2006 and 2010 had a fair market value of $687,637. This value is more than double the market value of homes built before 1990 ($278,290).
- There has been very little apartment development activity in Horsham, as no new apartments have been built since 1987. However, there is evidence that new apartment developments have occurred within close proximity to Horsham Township.
- Montgomery County as a whole has experienced a higher level of condominium development than Horsham, especially during the 2006 to 2010 period. In Montgomery County, there were 1,629 condominiums built during this period, which increased the existing condominium inventory by 9.4%. In Horsham there were only 12 new condominiums constructed during the same period.

Housing Affordability

- "Affordable housing" is a concept used by the U.S. Department of Housing and Urban Development (HUD) to describe the cost of local housing in relationship to the monthly gross income of a households based on the size of those households. Housing that exceeds 30% of monthly gross income is generally consider not affordable. This issue becomes particularly acute for households making less than the area median income (AMI) of $80,324.
- In Horsham, the share of all ownership units affordable to working class households making 80% of the AMI is only 7%. The vast majority of Horsham's affordable housing stock is in older homes in established neighborhoods.

Sales Trends

- Home sales for all counties within the study area have declined since 2006, which is largely due to the mortgage and financial crisis that began in 2007, which slowed residential activity across the country.
- Sales trends were analyzed for Montgomery, Bucks, Chester, Delaware, and Philadelphia counties. In 2010, Montgomery County reported 7,039 home sales, second to only Philadelphia County at 10,160 sales.

Apartment Overview

- The last apartment building with 40 or more units to be constructed in the Horsham submarket was in 2008. Apartment options at the NAS-JRB site could provide greater options for people seeking modern apartment living within close proximity to the Pennsylvania Turnpike. The positive absorption and decreasing vacancies from the last full year of data (2009 to 2010) indicate a healthy and strengthening regional apartment market.
- The Horsham submarket, in particular, is projected to continue to strengthen, as the submarket is projected to add new units, experience positive absorption, and increased asking rents through 2015 while vacancy is projected to decline.

3. Office Market

Office Inventory

- Montgomery County is a large suburban office market with office parks located throughout the County. In particular, Horsham Township is home to a number of office/business parks, including Babylon Business Campus, Horsham Business Center, Commonwealth Corporate Center, and the Pennsylvania Business Campus.
- There are a great variety of office users in the County, with a cluster of office users in life sciences and health-related industries. There are also five Fortune 1000 companies with headquarters in Montgomery County.
- There is an estimated 5.89 million square feet of office space in Horsham Township. The majority of this space is in large office buildings located in office park settings. Office space in buildings less than 15,000 SF in size comprise just 1.3% of the total building stock.
- Montgomery County as a whole contains 50.9 million square feet of office space, with Horsham accounting for 11.6% of this total space. The majority of office space in the County is also in large buildings.

Office Development Trends

- Horsham Township experienced significant new office development during the 1990s, as the total amount of office space (expressed in building square feet), increased by 36%. Over the past 10 years, development has slowed as the local office space inventory expanded by 11.1%.
- Comparatively, Montgomery County has experienced stronger office growth than Horsham over the past decade, as the total office supply has increased by 8.2 million SF or 19.2%.

Office Submarket Analysis

- The Horsham/Willow Grove net absorption data indicates that the market is beginning to recover, as Class A, Class B, and Class C office absorption turned positive in 2010.
- Overall, the vacancy rate in the Horsham/Willow Grove submarket is 10.2%, the lowest of any of Philadelphia office submarket. In particular, Class A space has a comparatively low vacancy rate (8.3%), and the NAS-JRB site may be a good location for a Class A office park and R&D/technology park.
- Since Class A space is less expensive in Horsham/Willow Grove than the Philadelphia market, this could be considered an opportunity for many businesses that might not be able to afford the higher office rents closer to the center city.

4. Industrial Market

Industrial Inventory

- In Horsham Township, the largest number of manufacturing companies is in computer and electronic products manufacturing (23.2%). Of the chemical manufacturers (7.1%), three are pharmaceutical/biological product manufacturers, and one is a manufacturer of oil additives.
- There is roughly 2.3 million square feet of industrial space in Horsham Township. The majority (65.9%) of space is in buildings that are 15,000 SF to 100,000 SF in size.
- There is not a lot of diversity in the types of industrial buildings located in Horsham. There are no cold storage facilities or industrial condominiums in the Township.
- Horsham Township only comprises 3% of the total industrial space in Montgomery County. The County has over 77 million square feet of industrial space, which makes it a significant industrial employment center in the Commonwealth.

Industrial Development Trends

- The majority of industrial space in Horsham Township was built prior to 1990. The exception is a 90,644 SF industrial building developed between 1990 and 2000. This building increased the local industrial inventory by 4.1%.
- During the past ten years, Montgomery County has experienced a 5% increase in industrial space as over 3.6 million SF has been added to the supply.

Industrial Submarket Analysis

- Vacancy, which is one of the best indicators of market health, was 11.5% in 2010 in Montgomery County. The vacancy rate in the County was slightly higher than the national vacancy rate, which was reported to be 10.5%.
- Industrial absorption in 2009 was negative across the various region industrial submarkets. However, there are signs that the market may have "bottomed-out" and is in the early stages of recovery. The net absorption in 2010 was positive in Bucks County (559,571 SF) Philadelphia (279,405 SF), and Delaware County (565,922 SF). However, it remained negative in both Montgomery (-185,545 SF) and Chester Counties (-43,141 SF).

5. Retail Market

Retail Inventory

- There is 1.57 million square feet of retail space in Horsham Township. The majority of this space is in mixed-use developments which contain a mix of retail, office and/or apartments (375,559 SF).
- There are no large regional malls in Horsham Township.
- Montgomery County contains large regional malls, big box shopping centers and department stores. Much of the larger retail spaces, including malls, are concentrated near the Pennsylvania Turnpike.

Development Trends

- Horsham Township has experienced a fair amount of retail development in the past 10 years. The Township increased its existing retail SF base by 22.8% (291,532 SF) during this time.
- The majority of the new development was in shopping centers anchored by a grocery store (61.3%).
- There have not been any entertainment or recreation developments since the 1990s. The last entertainment development was the Lower State Road Driving Range, located a few miles west of the study area site.
- Approximately 2.4 million square feet of the new space developed in the County (38.3%) was mall and department store development.

Retail Submarket Analysis

- In 2009 the County experienced its largest drop in absorption since 1995 (a decline of 420,000 SF).
- Although absorption was negative in 2009, the positive 2010 absorption (21,000 SF) could indicate that the market "bottomed-out" during this year. Forecast data indicates that absorption will return to positive levels in 2012 through 2015.
- In the first quarter of 2011, vacancy was at 12.2%. The vacancy in Montgomery County was slightly above the national rate, which REIS reported to be 11.3% in the first quarter of 2011.

C. DEMOGRAPHIC TRENDS

The demographic section provides a baseline understanding of the population and its potential needs as it relates to real estate development. The data collected for this analysis was taken from the U.S. Census Bureau, ESRI and DemographicsNow[1].

1. Population Trends and Projections

Horsham Township has experienced fairly significant population growth in recent decades. According to the U.S. Census, the Township population has increased almost 64% since 1980 to a current level of 26,147 (Table 7-1). Much of this growth occurred from 1980 to 1990, when the population increased by 37.2%. Since then, the Township has continued to grow, albeit at a slower pace (Figure 7-1).

The counties surrounding Horsham Township also experienced growth in the past ten years. Chester County experienced the fastest average annual growth rate of 1.4% during the past decade, while Philadelphia County's population stabilized after an extended period of population decline.

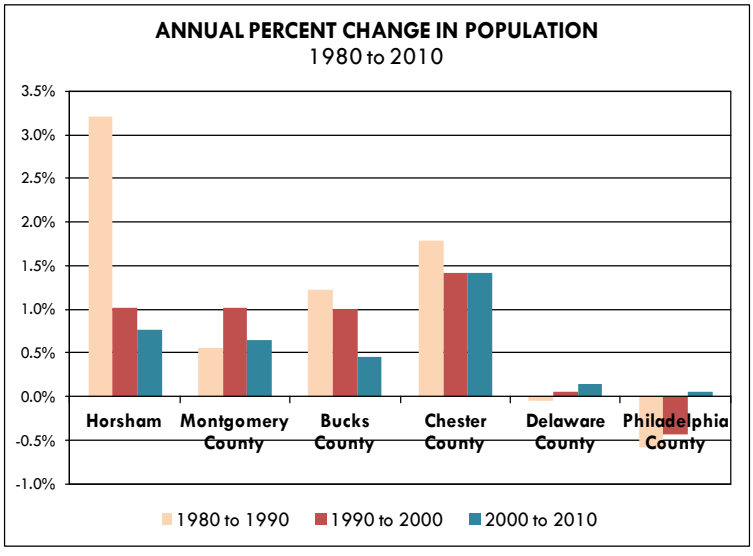
The 2015 population projections indicate that growth will continue to occur in Chester and Bucks counties and slightly decline in the other comparative study areas. However, these projections do not take into account the redevelopment of the NAS-JRB Willow Grove site. Due to the size and nature of the project, the potential growth impacts on Horsham Township could be significant over the next 20 years.

Table 7-1
Population Trends
Horsham and Comparison Areas; 1980 to 2015

	Census 1980	Census 1990	Census 2000	Census 2010	Projected 2015
POPULATION					
Horsham Township	15,959	21,896	24,232	26,147	25,210
Montgomery County	641,796	678,109	750,097	799,874	795,128
Bucks County	479,216	541,178	597,632	625,249	631,870
Chester County	315,269	376,391	433,501	498,886	534,717
Delaware County	550,061	547,654	550,864	558,979	555,818
Philadelphia County	1,681,563	1,585,577	1,517,550	1,526,006	1,436,484
PERCENT CHANGE IN POPULATION					
Horsham	--	37.2%	10.7%	7.9%	-3.6%
Montgomery County	--	5.7%	10.6%	6.6%	-0.6%
Bucks County	--	12.9%	10.4%	4.6%	1.1%
Chester County	--	19.4%	15.2%	15.1%	7.2%
Delaware County	--	-0.4%	0.6%	1.5%	-0.6%
Philadelphia County	--	-5.7%	-4.3%	0.6%	-5.9%
ANNUAL PERCENT CHANGE IN POPULATION					
Horsham	--	3.2%	1.0%	0.8%	-0.7%
Montgomery County	--	0.6%	1.0%	0.6%	-0.1%
Bucks County	--	1.2%	1.0%	0.5%	0.2%
Chester County	--	1.8%	1.4%	1.4%	1.4%
Delaware County	--	0.0%	0.1%	0.1%	-0.1%
Philadelphia County	--	-0.6%	-0.4%	0.1%	-1.2%

Source: U.S. Census Bureau, ESRI, and RKG Associates, Inc., 2011

Figure 7-1



Source: U.S. Census Bureau and RKG Associates, Inc., 2011

2. Population by Age

Horsham and Montgomery County have a slightly older median age (40.5 and 40.6, respectively) than the nation as a whole (37.1) (Table

[1] ESRI and DemographicsNow are private data vendors that compile and analyze socio-economic and demographic data. The companies also apply proprietary methodologies to develop future projections.

7-2). The higher median age in the County is partly due to the higher percentage of older residents aged 65 and older found in these two areas (6.3% and 7.8%, respectively) as compared to the U.S. (6.1%). The large portion of older residents found in Montgomery County is an indicator that there may be a continued need for the provision of housing for the elderly.

Table 7-2
Population By Age
Horsham, Montgomery County, and USA; 1990 to 2015

	Census 1990	Census 2000	Census 2010	Projected 2015
HORSHAM				
0 to 4	8.1%	6.3%	5.1%	5.8%
5 to 14	11.6%	14.7%	14.1%	12.8%
15 to 19	5.2%	6.1%	7.2%	6.6%
20 to 24	7.7%	4.7%	5.6%	6.1%
25 to 34	24.4%	15.7%	11.3%	12.9%
35 to 44	14.8%	19.9%	13.8%	13.3%
45 to 54	10.2%	13.0%	19.0%	14.2%
55 to 64	9.2%	8.7%	11.4%	14.5%
65 to 74	5.6%	6.9%	6.0%	9.4%
75 to 84	2.4%	3.4%	4.0%	3.4%
85+	1.0%	0.7%	2.3%	1.0%
Median Age	**32.0**	**36.3**	**40.5**	**39.9**
USA				
0 to 4	7.4%	6.8%	6.5%	6.8%
5 to 14	14.2%	14.6%	13.1%	13.1%
15 to 19	7.1%	7.2%	7.1%	6.4%
20 to 24	7.6%	6.7%	7.0%	6.6%
25 to 34	17.4%	14.2%	13.3%	13.4%
35 to 44	15.1%	16.0%	13.3%	12.8%
45 to 54	10.1%	13.4%	14.6%	13.6%
55 to 64	8.5%	8.6%	11.8%	12.7%
65 to 74	7.3%	6.5%	7.0%	8.5%
75 to 84	4.0%	4.4%	4.3%	4.4%
85+	1.2%	1.5%	1.8%	1.8%
Median Age	**32.9**	**35.3**	**37.1**	**37.9**

	Census 1990	Census 2000	Census 2010	Projected 2015
MONTGOMERY COUNTY				
0 to 4	6.8%	6.3%	5.9%	5.7%
5 to 14	12.3%	13.9%	12.9%	12.0%
15 to 19	5.9%	6.1%	6.4%	6.4%
20 to 24	6.6%	4.9%	5.4%	6.5%
25 to 34	17.2%	13.5%	12.1%	11.3%
35 to 44	15.5%	17.1%	13.6%	11.5%
45 to 54	10.9%	14.2%	16.1%	15.1%
55 to 64	9.9%	9.1%	12.5%	14.6%
65 to 74	8.6%	7.4%	7.3%	9.6%
75 to 84	4.8%	5.5%	5.2%	5.1%
85+	1.6%	2.0%	2.6%	2.3%
Median Age	**35.8**	**38.2**	**40.6**	**42.4**

Source: DemographicsNow and RKG Associates, Inc., 2011

3. Households

Similar to population trends, Horsham Township has experienced growth in household formations. Since 1990, the Township grew by 1,290 (15.6%) new households (Table 7-3). Montgomery County and the surrounding counties have also experienced growth in household formations. For the most part, household growth has kept pace with population growth or has occurred at a slightly faster rate. However, Horsham Township experienced a slower rate of household formations (5.4%) than population growth (7.9%) over the past decade.

Table 7-3
Household Trends
Horsham and Comparison Areas; 1980 to 2015

	Census 1980	Census 1990	Census 2000	Census 2010	Projected 2015
HOUSEHOLDS					
Horsham Township	--	8,279	9,082	9,569	9,590
Montgomery County	223,273	254,995	286,098	307,750	308,033
Bucks County	156,660	190,509	218,724	234,849	233,430
Chester County	156,660	133,250	157,905	182,900	186,341
Delaware County	190,685	201,372	206,320	208,700	205,263
Philadelphia County	619,763	603,074	590,071	599,736	564,564
PERCENT CHANGE IN HOUSEHOLDS					
Horsham Township	--	--	9.7%	5.4%	0.2%
Montgomery County	--	14.2%	12.2%	7.6%	0.1%
Bucks County	--	21.6%	14.8%	7.4%	-0.6%
Chester County	--	-14.9%	18.5%	15.8%	1.9%
Delaware County	--	5.6%	2.5%	1.2%	-1.6%
Philadelphia County	--	-2.7%	-2.2%	1.6%	-5.9%
ANNUAL PERCENT CHANGE IN HOUSEHOLDS					
Horsham Township	--	0.0%	0.9%	0.5%	0.0%
Montgomery County	--	1.3%	1.2%	0.7%	0.0%
Bucks County	--	2.0%	1.4%	0.7%	-0.1%
Chester County	--	-1.6%	1.7%	1.5%	0.4%
Delaware County	--	0.5%	0.2%	0.1%	-0.3%
Philadelphia County	--	-0.3%	-0.2%	0.2%	-1.2%

Source: U.S. Census Bureau, ESRI, and RKG Associates, Inc., 2011

4. Median Household Income

Horsham Township has comparatively high household median incomes. According to the 2010 Census, the median household income was $80,324 (Table 7-4). Chester County is the only county in the study area to have a higher household income level at $84,284. Annual median household income in Horsham was nearly $30,000 higher than the national median in 2010.

Table 7-4
Median Household Income (Adjusted to Current Dollars)
Study Region; 1990 to 2015

	Census 1990	Census 2000	Census 2010	Projected 2015
MEDIAN HOUSEHOLD INCOME				
Horsham Township	$75,313	$75,222	$80,324	$94,471
Montgomery County	$75,129	$79,561	$75,448	$93,887
Bucks County	$74,368	$77,912	$70,999	$91,237
Chester County	$78,393	$85,234	$84,284	$101,960
Delaware County	$64,141	$65,333	$59,125	$75,912
Philadelphia County	$42,429	$40,219	$34,400	$48,284

Source: U.S. Census, ESRI, and RKG Associates, Inc., 2011

D. RESIDENTIAL MARKET

The residential market in the greater region was assessed by analyzing residential inventories, development activity, and sales data, along with information gathered from real estate interviews. The housing types included in the analysis are single family, duplex/triplex/quadraplex, townhome, condominium, and apartment. This section concludes with recommendations on housing opportunities at the study area site.

1. Housing Tenure

Data obtained from DemographicsNow, a purveyor of demographic data, indicates the majority (69.6%) of units in Horsham are owner occupied (Table 7-5). Renter-occupied units compose 27.7% of units in Horsham. In comparison, Bucks County has the highest proportion of owner-occupied units in the study area (73.9%) and the lowest proportion of renter-occupied units (20.8%). Philadelphia County housing tenure greatly differs from Montgomery and Bucks counties, as a much smaller share

(48.7%) of housing units are owner-occupied, with rental units comprising a greater share (36.6%). Areas closer to the Center City typically have denser housing options and many more mid-rise and high rise apartment/condominium developments.

Historical housing tenure trends indicate that Horsham's owner-occupied units have increased by 4.6% since 1990 and renter-occupied units have decreased by 3.6%. Similarly, owner-occupied units in Montgomery and Bucks County have increased during this time (2.2% and 1.8%, respectively). Philadelphia County again differs from trends found in Montgomery and Bucks counties, with owner-occupied units declining 6.7% and renter-occupied units increasing 2.6%.

The proportion of owner- and renter-occupied units is projected to remain relatively stable through 2015. Horsham home-ownership is projected to slightly decline (1.1%) and renter-occupied units are projected to slightly increase (0.6%). Housing tenure in the other comparative jurisdictions is projected to remain the same or change by less than 1% through the next five years.

Table 7-5
Housing Units
Horsham and Comparison Areas; 1990 to 2015

	Census 1990	Census 2000	Census 2010	Projected 2015
HORSHAM				
Owner-Occupied	65.0%	72.0%	69.6%	68.5%
Renter-Occupied	31.3%	26.0%	27.7%	28.3%
Vacant	3.7%	2.0%	2.8%	3.2%
Total Units	8,599	9,269	9,774	9,905
MONTGOMERY COUNTY				
Owner-Occupied	69.3%	70.7%	71.5%	71.4%
Renter-Occupied	26.6%	25.5%	23.9%	24.0%
Vacant	4.1%	3.8%	4.6%	4.6%
Total Units	265,854	297,434	318,017	327,002
BUCKS COUNTY				
Owner-Occupied	72.1%	75.0%	73.9%	73.8%
Renter-Occupied	23.2%	22.0%	20.8%	20.9%
Vacant	4.7%	3.0%	5.3%	5.3%
Total Units	199,934	225,497	242,681	246,529
PHILADELPHIA COUNTY				
Owner-Occupied	55.4%	52.8%	48.7%	48.7%
Renter-Occupied	34.0%	36.3%	36.6%	36.6%
Vacant	10.6%	10.9%	14.7%	14.7%
Total Units	674,896	661,958	661,613	661,814

Source: DemographicsNow and RKG Associates, Inc., 2011

The tenure data obtained from DemographicsNow also includes information on the total housing units within each municipality. Bucks County has experienced the greatest percentage increase in housing units since 1990 (21.4%). Philadelphia County is the only comparative area that experienced housing unit declines (2.0% or 13,283 units). It should be noted that a separate housing unit analysis was performed for Montgomery County. Assessment information from the Montgomery County Assessment Board, which included information on a housing unit's year built, as well as residential types, for each property. The assessment data is more detailed than the Census and DemographicsNow estimates and more accurately represents current conditions within Montgomery County. The housing activity information is included in the following Housing Inventory and Development Trends sections.

2. Housing Inventory

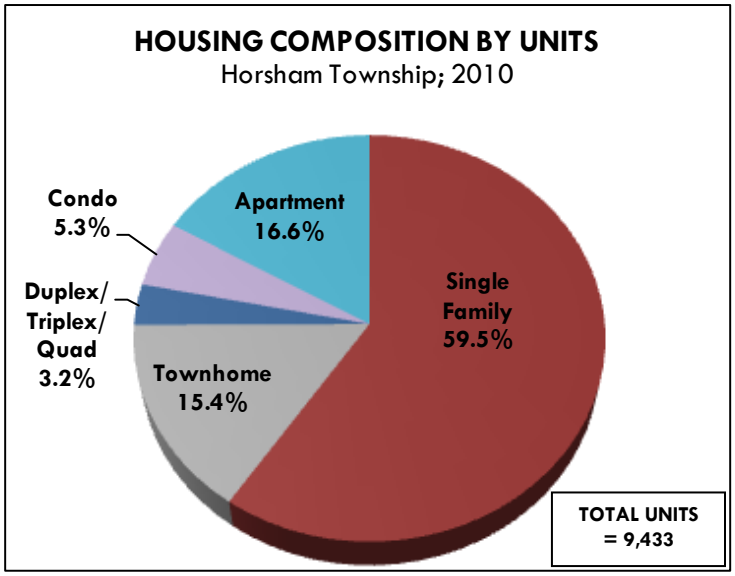
a.) Horsham Township

As previously mentioned, it is estimated that 27.7% of Horsham households reside in renter-occupied units. However, the traditional apartment rental unit only comprises 16.6% (1,562 units) of the total housing stock in Horsham (9,433 units) (Figure 7-2). It is likely that the rest of the renters are residing within "non-traditional" rental units, such as single family homes, condominiums, or townhomes that the owner is currently leasing. All traditional apartment units in Horsham are in low-rise buildings (4-stories or less), mixed-use retail, office, apartment

buildings, or townhome-style buildings. There are no high-rise apartment buildings within Horsham.

In terms of the total inventory, there are 9,433 housing units in Horsham. Single family homes comprise the majority of units (59.5%). Townhomes comprise 15.4% of the total units (1,457 units) and condominiums comprise 5.3% of the total (496 units). The majority of condominiums (300) are in garden-style buildings. Another 185 units are in attached townhouse-style buildings, and the rest are in small condo buildings that contain only two to five units. Duplexes, triplexes, and quadraplexes account for only 3.2% of the total housing stock. Most of these homes are duplexes (286 units). There are twelve triplex units and eight quadraplex units within Horsham.

Figure 7-2

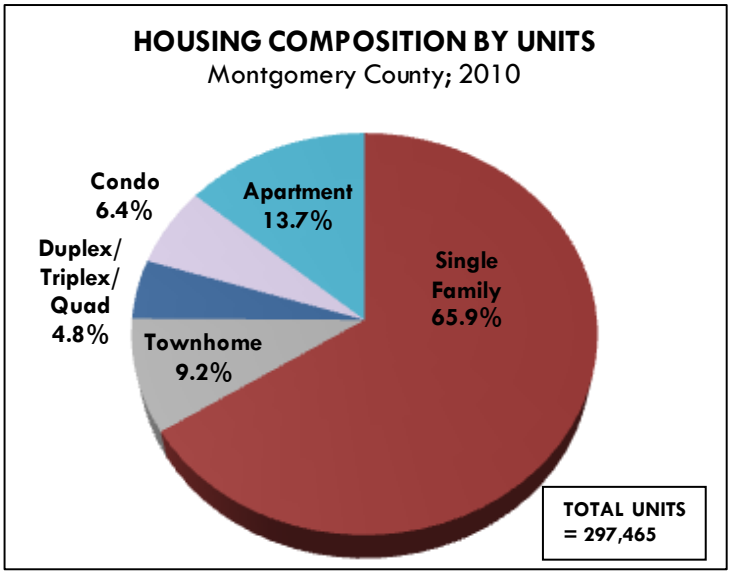


Source: Montgomery County Board of Assessment and RKG Associates, Inc., 2011

b.) Montgomery County

There are approximately 297,465 housing units in Montgomery County. Horsham contains only about 3% of the total housing stock within the County. There are some differences between the Horsham housing composition and that of the County. About 13.7% of the total units in the County are apartment units (40,892 units) (Figure 7-3), as compared to 16.6% of the inventory in Horsham. The majority of apartment units in the County are in low-rise apartment buildings (27,507 units). However, the County also has high-rise apartment units (8,030 units), which account for 2.7% of the total housing stock.

Figure 7-3



Source: Montgomery County Board of Assessment and RKG Associates, Inc., 2011

The rest of the housing composition in Montgomery County is 65.9% single family (196,158 units), 4.8% duplex/triplex/quadraplex (14,181 units), 6.4% condominiums (19,007 units) and 9.2% townhouse (27,227 units). Interesting to note, the largest proportion difference between Horsham and the County is in single family homes. The county is composed of a greater percentage of single family homes (6.4% greater) than in Horsham Township.

3. Development Trends

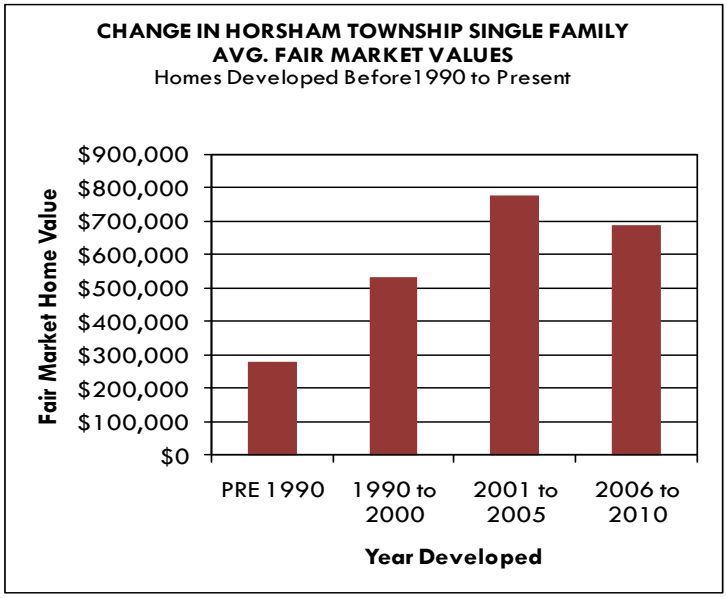
RKG Associates obtained real property assessment records for Montgomery County from the Montgomery County Board of Assessment. This inventory included information for all property types within the County. For the purpose of this analysis, RKG narrowed down the parcels to those that were categorized as having a residential land use. The consultant then arranged the data to analyze the development trends in both Horsham Township and Montgomery County as a whole. The associated development trend tables, which depict the total inventory, development activity, building SF, land acres, and fair market value information are included in the Appendix at the end of this Chapter (Appendix Tables 7-1 and 7-2). It should be noted that in order to analyze the fair market value of properties, the consultant had to upwardly adjust the total assessed value of each property by 56.1%. This adjustment factor was provided by the Montgomery County Board of Assessment in order to reconcile assessed values with current market values. In addition, where parcel records had incomplete data fields, RKG attempted to calculate or estimate the appropriate value (if possible) based on the average value of similar properties. Consequently, the data presented in this chapter does not reflect exact conditions, but is considered quite accurate and suitable for the purpose of identifying general land use trends and growth patterns in Montgomery County.

a.) Single Family

Within Horsham Township, the vast majority (95%) of the total units built in the past 10 years have been single family homes (Appendix Table 7-1). There were 413 single family homes built during this time period, which increased the existing single family housing stock by roughly 8%. It should be noted that most of these new homes were built from 2001 to 2005 (343 units). There were only 70 homes built in the past five years. A slow-down in new home development has been occurring in the Greater Philadelphia market, as well as many other markets across the country since 2006.

The newer homes constructed in Horsham have a fair market value that is well above that of the older homes. As Figure 7-4 shows, homes built from 2001 to 2005 had a fair market value of $778,172 and homes built from 2006 to 2010 had a fair market value of $687,637. These values are more than double the fair market value of homes built before 1990 ($278,290). The increase in value is consistent with an increase in the size of homes being built during that time. In fact, the average size of a single family home during the past five years was 4,095 SF,

Figure 7-4

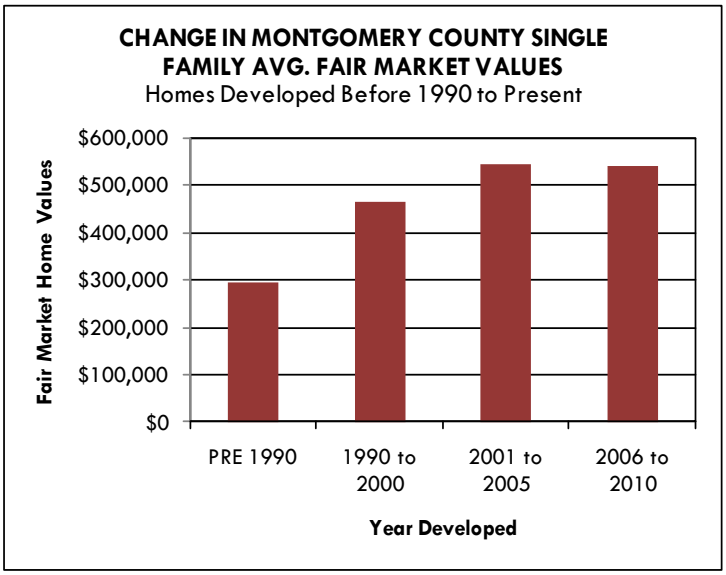


Source: Montgomery County Board of Assessment and RKG Associates, Inc., 2011

more than double the size of homes built prior to 1990 (1,941 SF). This indicates that the newer homes being built are generally estate-style houses that cater to a more affluent population. Since the start of the national mortgage crisis, and subsequent housing decline, the average size of newly constructed homes has declined as well.

Single family development in the County as a whole has grown at relatively the same pace as in Horsham. The County increased the existing single family housing stock by about 7% during the past ten years (13,003 additional units) (Appendix Table 7-2). The average fair market values of new single family homes in the County are less than in Horsham (Figure 7-5). The average value for a new home built during the last five was $537,327 or $150,310 less than the average market value of a single family home in Horsham. Similarly, new homes built in the County are smaller than in Horsham (3,398 SF in Montgomery County and 4,095 SF in Horsham).

Figure 7-5



Source: Montgomery County Board of Assessment and RKG Associates, Inc., 2011

Although the new homes in the County have an estimated market value above that of older homes, the difference in value is not as pronounced as in Horsham. Montgomery County homes built within the past five had values 84% higher than those built before 1990. In Horsham, the value spread was 147% between new and existing homes.

b.) Townhouse

There are 1,457 townhomes in Horsham. About 90% (1,317 units) of the townhouse units were built prior to 1990, and another 9.5% (138 units) were built from 1990 to 2000 (Appendix Table 7-1). Only two townhomes were built during the last ten years. While not always the case, townhomes tend to be a more affordable option for persons desiring to own their own home, but not able to afford a larger, more costly single family home. However, luxury townhomes can sometimes be as large and expensive as many detached, single family homes depending on their size and quality of construction.

Townhouse development within the County in the past ten years has been more active than in Horsham. The County increased the existing townhome stock by 3,905 units or 16.7% during this time period (Appendix Table 7-2). The average market value of townhomes built within the last five years was $268,700, or $124.20/SF.

c.) Duplex/Triplex/Quadraplex

The majority of duplex, triplex and quadraplex homes were constructed prior to 1990 (Appendix Table 7-1). Since then, 10 duplex units have been constructed, with 6 of those units built within the past 10 years. For duplexes built from 2006 to 2010, the average fair market

value was $199,577 ($399,153/building). No triplexes or quadraplexes were built since 1990.

Duplex, triplex, and quadraplex development in the County have experienced limited new development. There were 30 duplex units constructed during the past 10 years (15 buildings) (Appendix Table 7-2). However, in the County, there were also 12 triplex units (four buildings) and 12 quadraplex units constructed during this time (3 buildings). The new duplexes, triplexes and quadraplexes built in the County increased the existing housing stock for this type of home by only 0.4%.

d.) Condominium

In the past ten years, there have been 12 condominiums developed in Horsham, and all are in the attached townhouse-style. The average cost of a condominium built in the past five years was $244,641(Appendix Table 7-1). Similar to townhomes, condominiums provide a more affordable option for those wishing to own their own homes.

Montgomery County experienced new condominium development during the 2006 to 2010 period, as 1,629 new condominiums built. This increased the existing condominium supply by 9.4% (Appendix Table 7-2). Roughly 42% (685 units) of the new condominiums were in mid- to high rise buildings of 4 stories or more, 34% (545 units) were in townhouse-style buildings, and 22% (362 units) were in garden-style condominium buildings. The remaining 2% of new units were built as single detached condominiums (35 units) or condominium buildings with 2-5 units (2 units).

e.) Apartment

There has been very little apartment development activity in Horsham, as county assessment records indicate that no new apartments have been constructed since 1987 (Appendix Table 7-1). From 2001 to 2010, there were 2,250 units built in Montgomery County (Appendix Table 7-2). About 17% of these units were in high rise buildings (375 units). The rest of the majority of units built during this time were in low-rise apartments (1,862). There were also 12 apartments built the in the townhouse style of building and one apartment in a mixed-use building.

f.) Development Trend Conclusions

During the past ten years, Horsham has increased its existing housing stock by roughly 5%. Of the new homes that were constructed during this period, the vast majority (95.4%) were single family homes (Table 7-6) and the average price was greater than a half-million dollars. In terms of multi-family housing, no apartment buildings have been built in the past 30 years and only 39 condominiums were built during the same time period.

Table 7-6

Composition of Units Developed from 2001 to 2010
Horsham Township and Montgomery County

	Montgomery County		Horsham Township	
Housing Type	**Number of Units**	**% of Total**	**Number of Units**	**% of Total**
Single Family	13,003	59.9%	413	95.4%
Townhouse	3,905	18.0%	2	0.5%
Duplex	30	0.1%	6	1.4%
Triplex	12	0.1%	0	0.0%
Quadraplex	12	0.1%	0	0.0%
Condominium	2,488	11.5%	12	2.8%
Apartment	2,250	10.4%	0	0.0%
Total	**21,700**	**100.0%**	**433**	**100.0%**

Source: RKG Associates, Inc., and Montgomery County Board of Assessment, 2011

However, Horsham needs to be considered in context with the larger community. New housing development activity in the County during the last decade has been more diverse and more active (8% increase). In the County, single family development comprised 59.9% of the new housing units, with the remainder including townhomes (18.0%), condominiums (11.5%), and apartments (10.4%).

4. Housing Affordability

a.) Affordability Definition

"Affordable housing" is a concept used by the U.S. Department of Housing and Urban Development (HUD) to describe the cost of local housing in relationship to the monthly gross income of a households based on the size of those households. Housing that exceeds 30% of monthly gross income is generally consider not affordable because of the increased financial burden that it places on the household. This issue becomes particularly acute for households making less than the area median income (AMI).

There is a common misconception that affordably-priced housing is synonymous with publically-assisted housing. Generally, public housing is typically made available for individuals and households making less than 50% of the area median income ($36,200 for a 3-person household). In Horsham, affordable ownership housing would be for those household earning at least 80% of AMI or $57,800 per year for a 3-person household. However, housing affordability is really a function of local housing costs versus local households' ability-to-pay. If a household with an annual income of $125,000 can afford a half a million dollar home, the local housing market is only considered affordable for that household if homes priced below $500,000 are readily available on the local market. If the average "for-sale" listing price in the community is $575,000, then buying a home would be beyond affordability range for this particular household. This example makes the point that housing affordably is largely a function of local incomes and Horsham's definition of affordable housing will be defined by its higher household income levels.

Regarding the availability of affordably-priced housing in Horsham Township, the consultants conducted an analysis to see how the estimated value of local ownership housing compares with Horsham median household incomes. The AMI is set by the U.S. Department of Housing and Urban Development (HUD) and is reported at the County level. In 2011, HUD reported that 80% of AMI for a 3-person household in Montgomery County was $57,800 in 2011. The consultants also calculated affordability levels for 3-person households making 100% of AMI or $72,400.

b.) Housing Affordability Analysis

Ownership affordability was calculated using typical mortgage underwriting assumptions such as current property tax rates, homeowners' insurance expenses, and Private Mortgage Insurance (PMI) costs. The affordable housing analysis assumes the buyer would use an FHA loan to purchase the house. According to a national survey conducted by the Home Buying Institute in May of 2010, approximately 87% of homebuyers plan to use an FHA loan in the current mortgage climate. FHA loans allow for a lower down payment (3.5%) than conventional loans, which typically require a 20 to 25% down payment. For condominium units, the average condominium fee of $200/month was included in the affordability calculations. This fee was derived from local condominium listings in Horsham as well as interviews with residential brokers.

According to RKG's estimates, a 3-person household making 80% of area AMI ($57,800) can afford a $186,671 single family home or townhouse and a $170,061 condominium (Table 7-7). Those making 100% of the median income can afford a $233,339 single family home or $216,729 condominium. For the purposes of the affordability analysis, the consultant assumed the buyer would maximize his or her buying power without spending more than 30% of monthly gross income on housing costs. In reality, homes affordable to those making 80% AMI are also affordable to those making 100% AMI. However, the data were arranged to be mutually exclusive to show the amount of units available to those maximizing their housing budget.

Based on current Township home values, roughly 12.6% (955) of ownership units would be considered affordable to those making 80% AMI (Table 7-8). Condominiums account for the

Table 7-7
Home Values By Income Level
3-Person Household; FHA Buyer

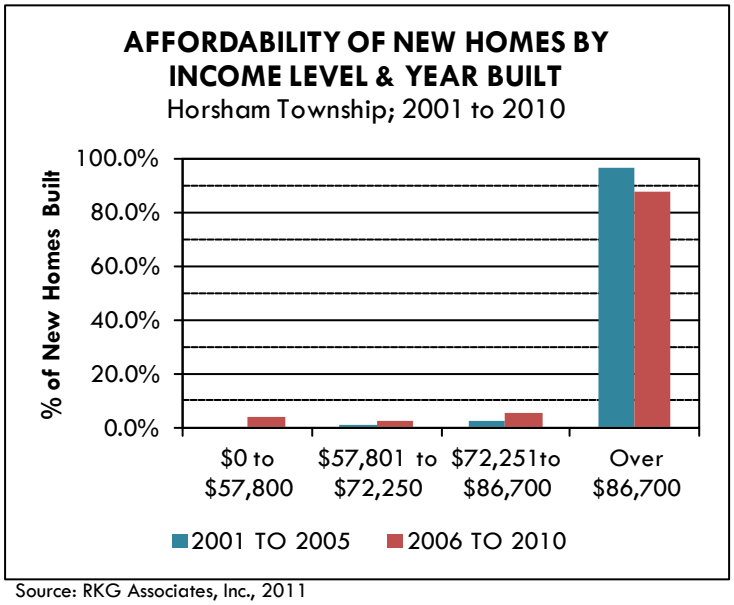
	Home Value	
Income Levels	**Single Family & Townhouse**	**Condominium**
$0 to $57,800 (80% AMI)	$0 to $186,671	$0 to $170,061
$57,801 to $72,250 (81% to 100% AMI)	$186,672 to $233,339	$170,062 to $216,729
$72,251 to $86,700 (101% to 120% AMI)	$233,340 to $280,006	$216,730 to $263,397
Over $86,700 (Over 120% AMI)	$280,006+	$263,398+

Source: RKG Associates, Inc., 2011

largest share (38.4%) of affordable housing at that income level. However, as incomes rise there are comparatively more units available to those households making between 81% to 100% AMI (2,035 units) and between 101% to 120% (1,157 units). Even so, just under half (45.2%) of the total housing stock is affordable only to 3-person households making 120% of area AMI (over $86,700).

The majority of single family homes (58.4%) are available only to those households with incomes exceeding 120% of AMI. In contrast, the vast majority of condominiums (99.2%) are affordable to those making less than 120% AMI. It is important to keep in mind that condominiums only comprise 6.6% of the total ownership housing stock in Horsham.

Figure 7-6



Source: RKG Associates, Inc., 2011

Roughly 77% of Horsham's ownership housing units, regardless of affordability, were constructed prior to 1990. These units tend to be more affordable, as nearly 53% of older units would be affordable to households earning 100% of AMI. However, of those units constructed within the past 10 years, only 22 units or 5.1% would be considered affordable to households making under120% of area AMI based on current home values (Figure 7-6).

Table 7-8
Housing Affordability in Horsham Township
3-Person Household; FHA Buyer

	Single Family		Townhome		Condo		ALL TYPES	
	Count	% of Total (all types)	Count	% of Total (all types)	Count	% of Total (all types)	TOTAL	% OF TOTAL
PRE 1960								
$0 to $57,800 (80% AMI)	284	97.3%	0	0.0%	8	2.7%	**292**	**16.2%**
$57,801 to $72,250 (81% to 100% AMI)	737	100.0%	0	0.0%	0	0.0%	**737**	**41.0%**
$72,251 to $86,700 (101% to 120% AMI)	436	99.8%	0	0.0%	1	0.2%	**437**	**24.3%**
Over $86,700 (Over 120% AMI)	332	100.0%	0	0.0%	0	0.0%	**332**	**18.5%**
Total	1,789	99.5%	0	0.0%	9	0.5%	**1,798**	**100.0%**
1960 TO 1989								
$0 to $57,800 (80% AMI)	21	3.2%	278	42.2%	359	54.6%	**658**	**16.3%**
$57,801 to $72,250 (81% to 100% AMI)	204	16.0%	983	77.0%	89	7.0%	**1,276**	**31.7%**
$72,251 to $86,700 (101% to 120% AMI)	593	91.4%	56	8.6%	0	0.0%	**649**	**16.1%**
Over $86,700 (Over 120% AMI)	1,446	100.0%	0	0.0%	0	0.0%	**1,446**	**35.9%**
Total	2,264	56.2%	1,317	32.7%	448	11.1%	**4,029**	**100.0%**
1990 TO 2000								
$0 to $57,800 (80% AMI)	2	100.0%	0	0.0%	0	0.0%	**2**	**0.2%**
$57,801 to $72,250 (81% to 100% AMI)	5	29.4%	1	5.9%	11	64.7%	**17**	**1.3%**
$72,251 to $86,700 (101% to 120% AMI)	41	71.9%	2	3.5%	14	24.6%	**57**	**4.4%**
Over $86,700 (Over 120% AMI)	1,098	89.1%	135	10.9%	0	0.0%	**1,233**	**94.2%**
Total	1,146	87.5%	138	10.5%	25	1.9%	**1,309**	**100.0%**
2001 TO 2005								
$0 to $57,800 (80% AMI)	0	0.0%	0	0.0%	0	0.0%	**0**	**0.0%**
$57,801 to $72,250 (81% to 100% AMI)	3	100.0%	0	0.0%	0	0.0%	**3**	**0.8%**
$72,251 to $86,700 (101% to 120% AMI)	3	30.0%	1	10.0%	6	60.0%	**10**	**2.8%**
Over $86,700 (Over 120% AMI)	337	98.8%	0	0.0%	4	1.2%	**341**	**96.3%**
Total	343	96.9%	1	0.3%	10	2.8%	**354**	**100.0%**
2006 TO 2010								
$0 to $57,800 (80% AMI)	3	100.0%	0	0.0%	0	0.0%	**3**	**4.0%**
$57,801 to $72,250 (81% to 100% AMI)	1	50.0%	0	0.0%	1	50.0%	**2**	**2.7%**
$72,251 to $86,700 (101% to 120% AMI)	1	25.0%	0	0.0%	3	0.0%	**4**	**5.3%**
Over $86,700 (Over 120% AMI)	65	98.5%	1	1.5%	0	0.0%	**66**	**88.0%**
Total	70	93.3%	1	1.3%	4	5.3%	**75**	**100.0%**
TOTAL								
$0 to $57,800 (80% AMI)	**310**	**32.5%**	**278**	**29.1%**	**367**	**38.4%**	**955**	**12.6%**
$57,801 to $72,250 (81% to 100% AMI)	**950**	**46.7%**	**984**	**48.4%**	**101**	**5.0%**	**2,035**	**26.9%**
$72,251 to $86,700 (101% to 120% AMI)	**1,074**	**92.8%**	**59**	**5.1%**	**24**	**0.0%**	**1,157**	**15.3%**
Over $86,700 (Over 120% AMI)	**3,278**	**95.9%**	**136**	**4.0%**	**4**	**0.1%**	**3,418**	**45.2%**
Total	**5,612**	**74.2%**	**1,457**	**19.3%**	**496**	**6.6%**	**7,565**	**100.0%**

Source: RKG Associates, Inc., 2011

c.) Conclusions

The percentage ownership housing units affordable to working class households making 80% of the AMI ($57,800) is only 12.6% of the total housing stock in Horsham. Additionally, the housing stock that is considered affordable to households earning up to $86,700 or 120% AMI, is primarily older housing built before 1990. The NAS-JRB Willow Grove study site presents an opportunity to provide new ownership units at an affordable price level. Incorporating affordable units into the development at the study area site would help create a more diverse housing stock and give working residents more housing options.

5. Residential Sales Trends

RKG Associates obtained residential sales trend data for Montgomery, Bucks, Delaware, Chester, and Philadelphia counties from TREND, the Multiple Listing Service (MLS) for the Philadelphia metropolitan region. Unfortunately, the sales information does not separate out sales by type of home. However, the following data do provide a good comparison of sales performance and pricing differences throughout the region.

Home sales for all counties within the study area have declined sharply since 2006 (Table 7-9), with Montgomery County experiencing a 34% volume drop. This is largely attributable to the mortgage and financial crisis that began in 2007, which slowed residential activity across the nation. The sales information indicates that the Philadelphia metro region has yet to recover, as sales for all counties continued to decline from 2009 to 2010. However, it should be noted that the sale price, another indicator of market health, has increased for all counties during the same time.

In 2010, Montgomery County reported 7,039 home sales, second to only Philadelphia County at 10,160 sales. The average sale price of a home was $313,689, which was less than Bucks County ($329,307) and Chester County ($353,113) but higher than the homes sold in Delaware County ($262,924) and Philadelphia County ($188,303). Once listed, homes in Montgomery County spent an average of 86 days on the market in 2010. In 2006, the average days on market was only 52, which reflects the increased demand for housing at that time. Homes in Philadelphia County spent the least number of days on market (75) in 2010, which may be a function of its more affordable housing prices.

Table 7-9
Residential Sales Trends
2006 to 2010

Year	Total # Homes Sold	Average Sale Price	Average Days On Market	% of Asking Price (Sold/List Price)
MONTGOMERY COUNTY				
2006	10,718	$339,782	52	97.9%
2007	9,873	$339,029	63	97.1%
2008	7,788	$323,874	73	96.2%
2009	7,636	$295,240	85	95.8%
2010	7,039	$313,689	86	95.7%
BUCKS COUNTY				
2006	7,194	$358,536	51	97.5%
2007	6,723	$356,669	63	96.9%
2008	5,413	$336,321	73	96.1%
2009	5,431	$314,835	88	95.6%
2010	5,109	$329,307	90	95.7%
DELAWARE COUNTY				
2006	7,169	$253,329	48	97.8%
2007	6,804	$268,945	57	97.1%
2008	5,181	$264,544	71	96.4%
2009	4,974	$248,155	87	95.9%
2010	4,157	$262,924	85	95.8%
CHESTER COUNTY				
2006	6,604	$373,377	55	98.2%
2007	5,940	$378,510	67	97.6%
2008	4,838	$369,376	79	96.5%
2009	4,715	$333,789	87	96.1%
2010	4,447	$353,113	90	96.1%
PHILADELPHIA				
2006	17,157	$179,945	56	96.7%
2007	15,807	$187,555	66	96.3%
2008	12,253	$190,947	72	95.2%
2009	11,033	$183,915	78	95.3%
2010	10,160	$188,303	75	95.2%

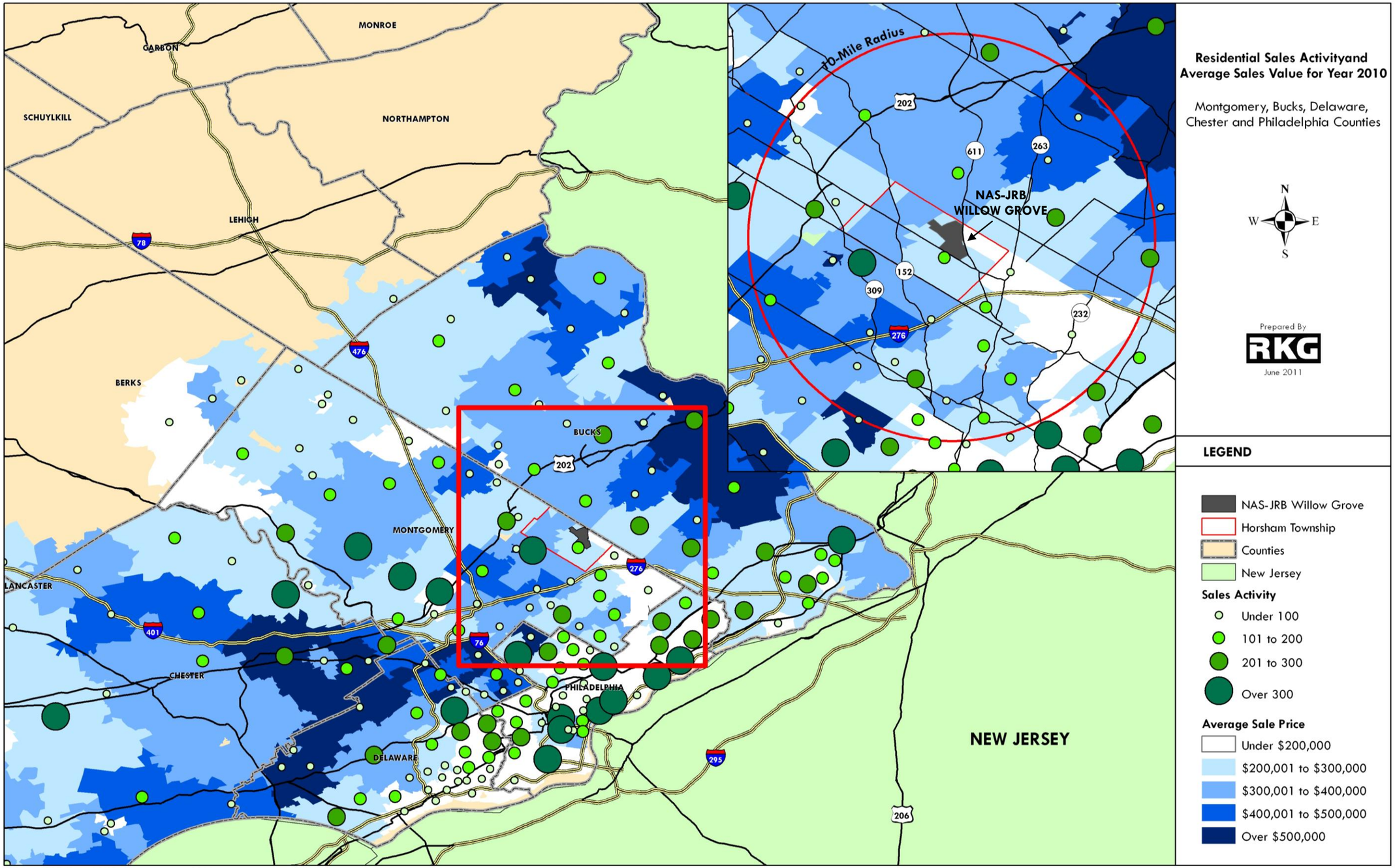
Source: TREND and RKG Associates, Inc., 2011

A map of residential sales activity and average sale price by zip code provides some regional context to the region's residential market (Map 7-1). In addition, a 10-mile radius around the NAS-JRB Willow Grove provides a closer look at the sales activity and pricing within proximity of subject property. The map shows a large cluster of sales occurring in Philadelphia County. Although there is

a higher volume of sales activity, the average sales price is quite a bit lower than sales prices in Montgomery County.

The data indicate there are wide sales price disparities within Montgomery County. The zip code for NAS-JRB Willow Grove had an average sale price of $277,484 in 2010. However, just east of the property, home sales average less than $197,500 while south of the property they are close to $400,000. Interviews with local real estate professionals confirm that, in terms of price points, Montgomery County and Horsham Township offer a wide-variety of housing options.

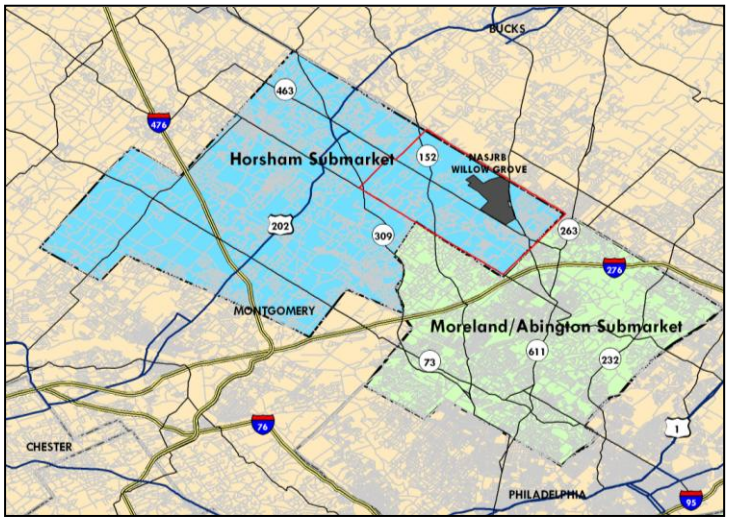
Map 7-1



Source TREND and RKG Associates, Inc., 2011

6. Apartment Overview

Map 7-2

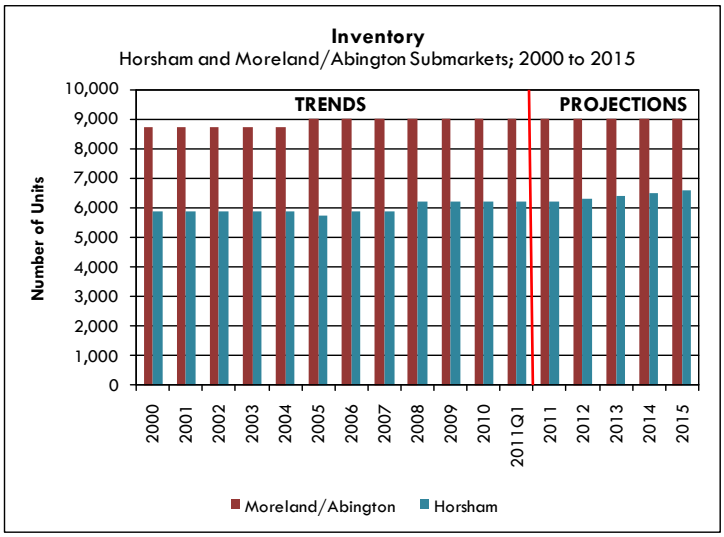


Source: REIS, Inc. and RKG Associates, Inc., 2011

The above MLS sales overview is for ownership units only, and does not reflect multi-family housing. In order to analyze the apartment market the consultants obtained inventory, vacancy, absorption and asking rent data from REIS, a national commercial real estate performance information service. In addition to providing trend information through the first quarter of 2011, RIES provides apartment submarket projections for 2011 (full-year) through 2015. The methodology for their projections are made by analyzing specific projects coming online within the next 18 to 36 months, and integrating that information with a complex forecasting model. The REIS econometric model takes into account responses from an apartment survey, macroeconomic forecasts, and local industry references. It should be noted that the REIS database only includes information for apartment complexes with 40 or more units (Map 7-2).

a.) Apartment Inventory

Figure 7-7



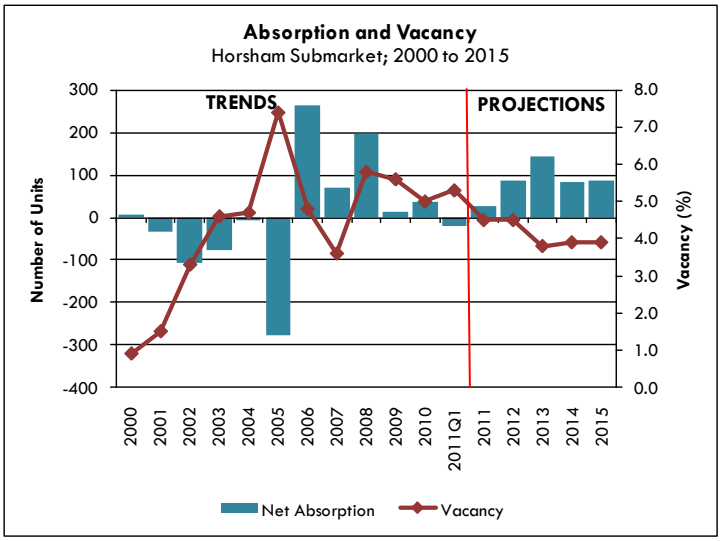
Source: REIS, Inc. and RKG Associates, Inc., 2011

The apartment unit inventory in the previous housing inventory section included the number of apartment units in Horsham and Montgomery County (1,562 and 40,892, respectively). However, the following analysis reflects data for different apartment submarkets, whose boundaries differ from the Township and County lines. REIS determines apartment submarkets based upon natural, manmade, and economic boundaries. The submarkets are sensitive to the contiguous areas of real estate that tend to "move together." As such, the consultant obtained information for the "Horsham Submarket" which contains the NAS-JRB Willow Grove study area site as well as the "Moreland & Abington Submarket" which borders Horsham Township (Map 7-2).

The Horsham apartment submarket is smaller than the Moreland/Abington submarket. In the first quarter of 2011, Horsham had an inventory of 6,205 units and Moreland/Abington had 8,993 units (Figure 7-7). General trends indicate that the apartment inventory in

Moreland/Abington has remained relatively flat since 2005. However, the Horsham submarket experienced a rise in inventory in 2008, when 346 new units came on-line. Since then, there has been no new development of apartment units in buildings with more than 40 units in either submarket. Apartment projections indicate that the Moreland/Abington inventory will remain flat into the future. However, the Horsham submarket is projected to steadily increase in units into the next five years. In total, there are 373 new units projected to come on-line from 2011 through 2015.

Figure 7-8

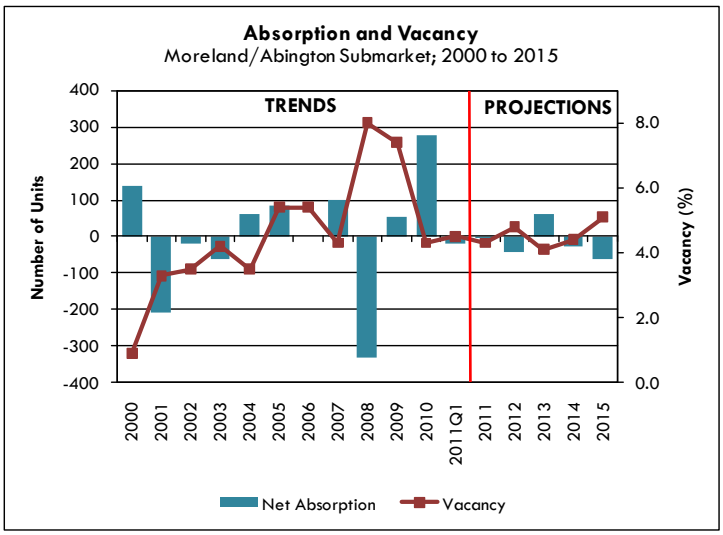


Source: REIS, Inc. and RKG Associates, Inc., 2011

b.) Net Absorption

A strong indicator of market health is net absorption, which reflects the change in occupied housing units from one time period to the next, less space that was vacated. Positive absorption indicates demand is increasing in the market, whereas negative absorption indicates falling demand, as unit occupancy declines.

Figure 7-9



Source: REIS, Inc. and RKG Associates, Inc., 2011

Historic trends indicate the Horsham market experienced negative absorption from 2001 through 2005 (Figure 7-8). However, since 2005, absorption has remained generally positive (aside from a slight dip of 18 units in 2011Q1). Projections show that absorption will continue to be positive through 2015, with 426 total additional units being absorbed into the market. Positive absorption is an indicator of increasing demand for apartment units. If properly positioned, new apartments at the NAS-JRB Willow Grove site could capture a portion of this increasing demand.

The Moreland/Abington apartment submarket absorption has greatly varied. In 2008, the area experienced a negative absorption of 332 units (Figure 7-9). However, the area experienced positive absorption in the following two years, indicating improved market fundamentals (54 units in 2009 and 278 units in 2010). Future projections for this market are mixed, with 2011 experiencing a zero sum gain and a total negative absorption of 72 units over the five year period.

c.) Rental Vacancy

Vacancy is another indicator of market health as low vacancy rates indicate that there is little excess supply in the market. A submarket with persistent high vacancy indicates that the market fundamentals are not present to support positive absorption of additional units. However, vacancy is only one-factor of market health, and it is important to look at vacancy within the context of the area being studied. For example, a new apartment building in an area that only has older housing stock could lease at a comparatively fast rate, as it offers a new product that's not currently available.

The Horsham submarket experienced a very low apartment vacancy in 2000 of 0.9% (Figure 7-9). Since that time vacancies have increased 5.3%, which is still considered quite low. It should be noted that the 2011Q1 Horsham vacancy rate was below the national vacancy rate for the same time period (6.2% as reported by REIS). Projections indicate that vacancy will continue to decline to 3.9% through 2015.

d.) Asking Rent

In the first quarter of 2011, the average apartment asking rents in Moreland/Abington ranged from $879 for a 462 SF studio apartment to $2,156 for a 1,591 SF three-bedroom (Table 7-10). Asking rents were less in the Horsham submarket, and ranged from $756 for a 547 SF studio to $1,656 for a 1,335 SF three-bedroom.

Table 7-10

Asking Rents By Submarket
First Quarter 2011

	MORELAND/ABINGTON		HORSHAM	
Type	Avg. Asking Rent	Avg. Square Feet	Avg. Asking Rent	Avg. Square Feet
Studio/Efficiency	$879	462	$756	547
One	$993	694	$975	738
Two	$1,254	989	$1,280	1,045
Three	$2,156	1,591	$1,656	1,335

Source: REIS, Inc. and RKG Associates, Inc., 2011

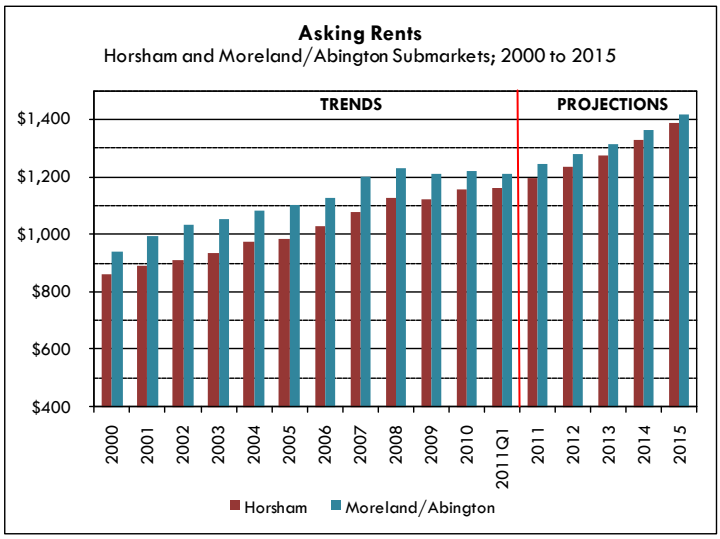
The average asking rent trends were calculated using the weighted average bedroom sizes. Unfortunately, REIS does not provide a breakout of trends by unit size. The Moreland/Abington submarket asking rate in 2011Q1 was $1,209 and the Horsham asking rent rate was $1,162 (Figure 7-10). The Moreland/Abington submarket experienced a small dip in asking rents from 2010 to 2011Q1 ($11), while the Horsham market slightly increased in asking rent rates during the same time ($4).

Generally, asking rents will increase with strengthening markets, as higher demand dictates the ability to charge higher rents. Horsham and Moreland/Abington asking rates are projected to increase through 2015, to $1,419 and $1,389, respectively. Interesting to note, the current gap between the Horsham and Moreland/Abington rates is $47, which is projected to lesson to $30 by 2015.

e.) Conclusions

The last apartment building with 40 or more units to be developed in the submarket area was in 2008. New apartments at varying price points at the NAS-JRB property would provide more options for those preferring rent rather than own. The positive absorption and decreasing vacancies from the last full year of data (2009 to 2010) for both submarkets are indications of an improving apartment market. Also, with mortgage financing constraints and a reduced number of homebuyers in the market, apartment development is on the rise nationwide and development financing for multi-family projects is loosening.

Figure 7-10



Source: REIS, Inc. and RKG Associates, Inc., 2011

The Horsham market, in particular, is projected to add units, show positive absorption, and increased asking rents through 2015 while vacancy is projected to decline. Although it is currently a smaller apartment submarket than Moreland/Abington, the analysis indicates that it is growing and will become more competitive with other submarkets into the future. The Township's interest in approving such projects is one factor that will determine the role that multi-family development plays in the reuse of NAS-JRB. It is the consultant's opinion that the subject property lends itself to higher density housing options as part of a unique mixed-use development.

7. Interview Findings

The consultant spoke with residential brokers and developers in order gain an "in-field" perspective of the residential market. The following are main highlights from those interviews, which occurred during 2011.

a.) Comparatively Stable Market

More than one broker interviewed mentioned that although Horsham and Montgomery County have experienced decreased activity in recent years, residential activity has remained higher here than in other regions of the State and Country. There have also been fewer foreclosures in Horsham than in other areas.

It was mentioned that Montgomery County usually lags behind national market trends and the worst year for sales activity in the County was in 2010. However, the 1st quarter of 2011 has showed a slight uptick in sales, and most real estate professionals interviewed, believe that sales will continue to increase in the future.

The diverse employment base and large number of corporations in the region have made Horsham an attractive location to live. It attracts a wide variety of homeowners, from young professionals just starting out in their careers, to mid- and upper-level corporate executives with small families. The high-quality of the schools and abundant recreational resources makes the

Township are other factors that attract new residents. In fact, a 2011 CNN/Money magazine ranking of the Top 100 Places to Live ranked Horsham the 31st best place to live in America.

b.) Demand for Less Expensive Homes

The types of homes that are moving quicker are those priced more affordably, in the $150,000 to $290,000 range. One broker mentioned that there is much less demand for the larger and more expensive "McMansions" that were built in the past 10 years. Due to the recession and economic downturn, people have become much more price sensitive and are opting for smaller and less expensive homes. The ability to obtain "jumbo mortgages" up to $417,000 has constrained demand for large and expensive homes, and the U.S. Congress has placed limits on the size of loans that can be purchased by Fannie Mae and Freddie Mac in the secondary market.

c.) Condominium Demand

Although home buyers are becoming more price sensitive, there is comparatively less demand for condominiums (which are typically less expensive units). It was reported that for the price of a condominium, many purchasers can find small single family homes or townhomes. It was mentioned that the added condominium fee has made these types of homes less desirable than others. However, it was noted that most of the condominiums in Horsham are older and contain little amenities. Some thought that a development that offered a different type of product, such as a high-end condominium complex with a pool and exercise room, business center, etc., would attract more demand than do the existing condos. New condominiums would particularly attract a larger percentage of young professional population. It was also mentioned that Horsham needed more senior housing options for those 55 years and older. Although Bucks County has these developments, there is only one dedicated senior living community in Horsham.

7. Residential Market Conclusions and Recommendations

Horsham Township is a desirable place to live. It has a fairly stable employment base, is near the Pennsylvania Turnpike, and is located within a 30 to 45-minute drive of Center City Philadelphia. The NAS-JRB Willow Grove site presents a unique opportunity. The large supply of land (800+ acres) could allow Horsham Township to diversify the types of housing available in the community. A more diverse housing stock, in terms of housing types and price points, will create more opportunities for homebuyers and renters. As such, it is recommended that a mix of housing types and densities be incorporated into the development in order to provide the maximum amount of options for residents. The appropriate number of housing units must be debated among community leaders to achieve a balanced mixed-use community and employment center.

Careful consideration needs to be given to the price points of new homes. Homebuyers have become more price sensitive, and the "McMansions" built during the early 2000s are in less demand. The housing affordability analysis indicates that almost all of the new housing units built in the past ten years were only affordable to those making over $78,081. It is recommended that the housing mix at the NAS-JRB Willow Grove site include homes priced in the $225,000 to $325,000 price range. It should be noted that the construction of more affordably-priced homes does not preclude the development of larger, higher value homes, but demand for this product has declined significantly in recent years.

Currently, condominiums only account for 5% of the total housing units available in Horsham. Condominiums priced more affordably (under $250,000) would provide more options for seniors that wish to remain in Horsham Township in a maintenance-free residential community. The same is true for single-level, smaller lot residential communities that allow seniors to reduce maintenance costs and age in place. Age restricted, 55 and older residential communities have catered to this buying segment and there would appear to be some opportunity for similar development at NAS-JRB. Such housing

would also appeal to middle income homebuyers who cannot afford the larger homes that were constructed in Horsham prior to the previous recession. In addition

Census 2010 data indicate that almost 28% of households in Horsham currently rent. However, traditional apartment units only comprise 16% of the total housing units in the Township. The last apartment building was constructed in the late 1980s and there are no options for renters who would prefer to live in a contemporary, professionally managed apartment community. As stated previously, the Greater Horsham submarket is projected to add units, show positive absorption, and increased asking rents through 2015 while vacancy is projected to decline. As such, the NAS-JRB Willow Grove site would be well positioned for the development of additional rental units.

E. OFFICE MARKET

In order to analyzed the local and regional office market, the consultants obtained data on development trends, office inventories, annual absorption, vacancy, and lease rates by office submarket from CoStar Group, a provider of commercial real estate information, marketing and analytic services. Information gathered from interviews with commercial real estate professionals is included to document the nuances of the regional office market. This section concludes with the conclusions and recommendations of office development at the NAS-JRB Willow Grove study area site.

Table 7-11
Top Employers
Montgomery County; 2011

Company	Employment
1. Main Line Health Systems	14,000
2. Abington Health	6,387
3. Genuardi's Markets	3,520
4. Lockheed Martin	3,500
5. Holy Redeemer Health Systems	3,414
6. ACTS Retirement-Life Communities	2,500
7. Aetna Inc.	2,400
8. Prudential	2,332
9. SunGard	2,000
10. Teva Pharmaceuticals	1,600
11. Dow Advanced Materials	1,590
12. Montgomery County Community College	1,297
13. Unisys Corp.	1,200
14. Harleysville Insurance / Harleysville Group, Inc.	1,100
15. NextGen Healthcare Information Systems, Inc.	630
16. CBIZ Inc. & Mayer Hoffman McCann	445

Source: Montgomery County Economic Development Corporation and RKG Associates, Inc., 2011

1. Office Overview

Montgomery County is a large suburban office market with office parks located all over the County. The Montgomery County Office of Economic and Workforce Development reports that there are over 26,000 businesses located in the region. Horsham Township, in particular, is home to a variety of business parks, including Babylon Business Campus, Horsham Business Center, Commonwealth Corporate Center, and Pennsylvania Business Campus. There are a great variety of office users in the County, with a cluster of office users in life sciences and health-related industries. In fact, the top two employers in Montgomery County are health care related (Table 7-11). There are also five Fortune 1000 companies with headquarters in Montgomery County (Table 7-12).

Table 7-12
Fortune 1000 Company Headquarters
Montgomery County; 2011

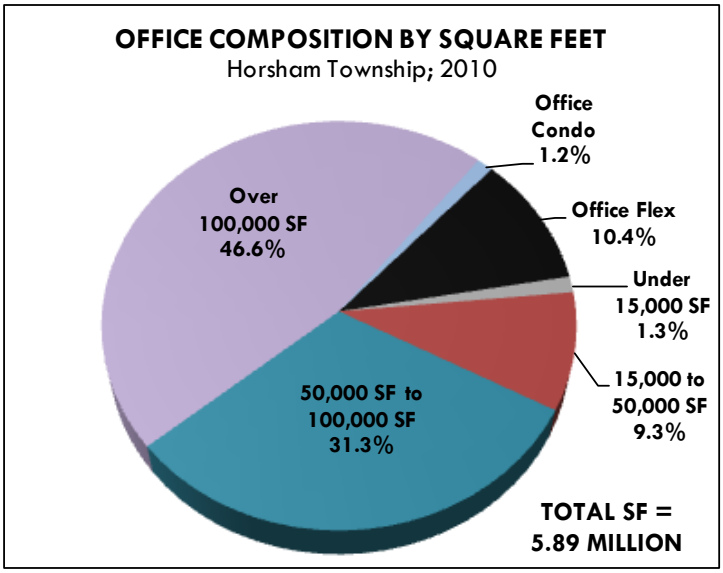
Company	Location
Unisys	Blue Bell
Toll Brothers	Horsham
UGI	King of Prussia
Universal Health Services	King of Prussia
Teleflex	Limerick

Source: Select Greater Philadelphia and RKG Associates, Inc., 2011

2. Office Inventory

Data regarding the office inventory and development trends was obtained from the assessment database provided by the Montgomery County Board of Assessment. There is an estimated 5.9 million square feet of office space in Horsham Township. The majority of this space is in large office buildings located in office park developments. Just less than half (46.6%) of this space is in buildings that are over 100,000 SF (Figure 7-11) and another 31.3% is in buildings over 50,000 SF to 100,000 SF. Office space in buildings under 15,000 SF comprises just 1.3% of the total building stock.

Figure 7-11



Source: Montgomery County Board of Assessment and RKG Associates, Inc., 2011

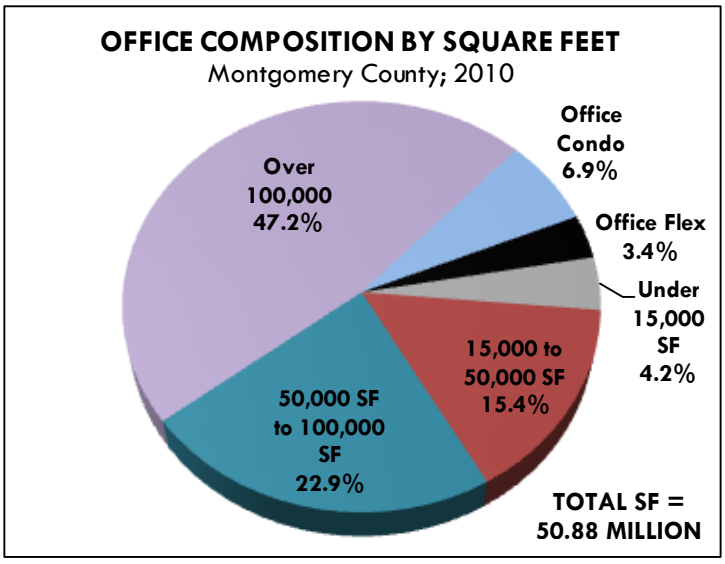
Montgomery County as a whole contains 50.9 million square feet of space, with Horsham accounting for 11.6% of the total office space in the County. The majority of County office space is also in large buildings. About 47% of the total office space is in buildings over 100,000 SF. About 4.2% of office space is in buildings under 15,000 SF. Also of note, the County has a larger percentage of office condominiums, which account for 6.9% of the total office mix (Figure 7-12).

3. Development Trends

a.) Horsham Township

Horsham Township saw strong office development activity between 1990 and 2000 (Appendix Table 7-3). The new developments increased the existing office inventory by 36%. However, development has slowed during the past 10 years. Development during the past decade increased the existing office stock by only 11.1%. There were two offices developed from 2001 to 2005 totaling 268,694 SF. There also was one 321,959 SF office building constructed in 2007. This building is located just south of the NAS-JRB Willow Grove site at 7 Walnut Grove Road.

Figure 7-12



Source: Montgomery County Board of Assessment and RKG Associates, Inc., 2011

b.) Montgomery County

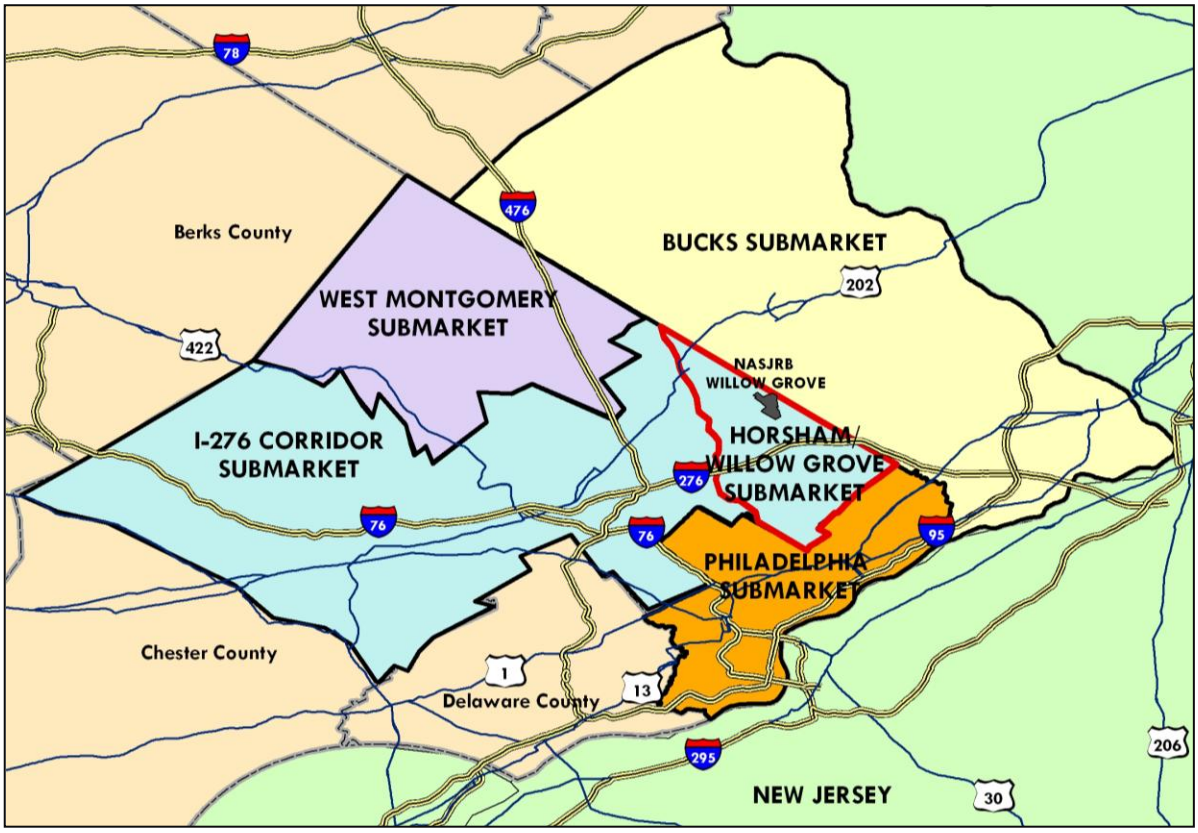
Montgomery County has experienced substantially more office development than Horsham over the past couple decades. During the past decade, roughly 8.9 million SF of space was constructed, which increased the existing office inventory by 19.2% (Appendix Table 7-4). Office development from 2001 to 2005 accounted for the majority (6.32 million SF) of this new space, while another 1.87 million SF was built during the past five years.

Approximately 66.7% of office space constructed in the past five years was in office buildings larger than 50,000 SF (1.25 million square feet). Particularly of note are four large office buildings over 100,000 SF that were built in the last five years. One is located in Horsham (on 7 Walnut Grove Road). Two of the buildings are located in Plymouth Township directly off of the Pennsylvania Turnpike. The last large office building was constructed near the western border of Montgomery County with Upper Merion, just off the Pennsylvania Turnpike.

4. Office Submarket Analysis

The consultant collected inventory, absorption, vacancy and lease rate information from the CoStar Group, a leading provider of real estate information. The data was arranged by office submarkets (Map 7-3). The NAS-JRB Willow Grove property is located in CoStar's Horsham/Willow Grove submarket. The "I-276 Corridor" (Pennsylvania Turnpike) submarket is a larger submarket, including Horsham/Willow Grove, which extends along the Pennsylvania Turnpike (I-276 and I-76) from Montgomery County through Chester County. This market is served by the Pennsylvania Turnpike and

Map 7-3
CoStar Office Submarket Boundaries

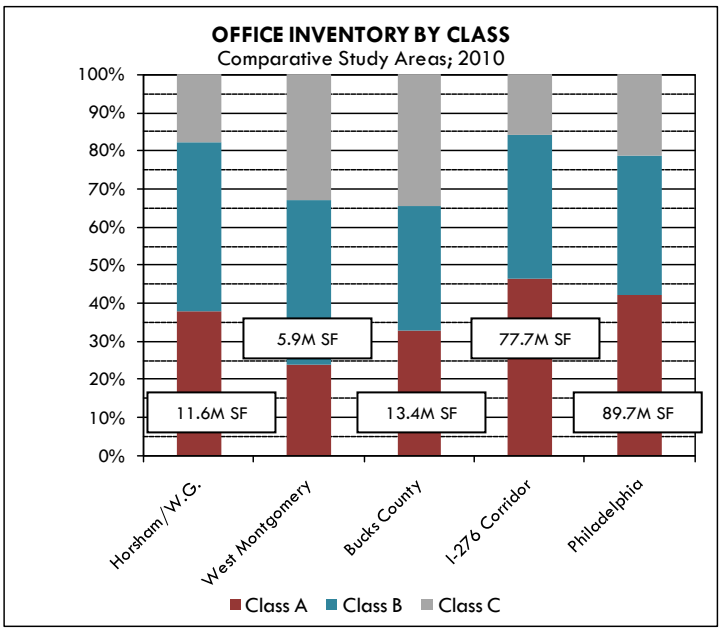


Source: CoStar Group and RKG Associates, Inc., 2011

I-76 and provides a larger regional context to the Horsham/Willow Grove market. Also included is the Philadelphia submarket, located within a 45-minute drive from Horsham Township. Bucks County and West Montgomery County were included to show the trends of nearby submarkets, which would also be competitive with the study area due to their close proximity.

In terms of total office SF, Philadelphia is the largest submarket with 89.7 million SF (Figure 7-13). The I-276 Corridor also has a large office inventory 77.7 million SF. Comparatively, the Horsham/Willow Grove submarket accounts for 11.6 million SF or only 15.0% of the total office space within the Turnpike office submarket. West Montgomery is the smallest comparative submarket (5.9 million square feet).

Figure 7-13



Note: W.G. = Willow Grove
Source: CoStar Group and RKG Associates, Inc., 2011

Office buildings are typically classified as either A, B or C grade space. This classification is somewhat subjective and is based on a combination of location and physical characteristics. The CoStar Group classifies office space in the following manner:

- **Class A** – Office buildings that generally qualify as extremely desirable investment-grade properties and command the highest rents or sale prices compared to other buildings in the same market. Such buildings are well located and provide efficient tenant layouts as well as high quality, and in some buildings, one-of-a-kind floor plans. These buildings contain modern mechanical systems, and have above-average maintenance and management as well as the best quality materials and workmanship in their trim and interior finishes. They are generally the most attractive and eagerly sought by investors willing to pay a premium for quality.

- **Class B –** A classification used to describe buildings that generally qualify as a more speculative investment, and as such, command lower rents or sale prices compared to Class A properties. Such buildings offer utilitarian space without special attractions, and have ordinary design, if new or fairly new; good to excellent design if an older non-landmark building. These buildings typically have average to good maintenance, management and tenants. They are less appealing to tenants than Class A properties, and may be deficient in a number of respects including floor plans, condition and facilities. They lack prestige and must depend chiefly on a lower price to attract tenants and investors.

- **Class C –** A classification used to describe buildings that generally qualify as no-frills, older buildings that offer basic space and command lower rents or sale prices compared to other buildings in the same market. Such buildings typically have below-average maintenance and management, and could have mixed or low tenant prestige, inferior elevators, and/or mechanical/electrical

systems. These buildings lack prestige and must depend chiefly on a lower price to attract tenants and investors.

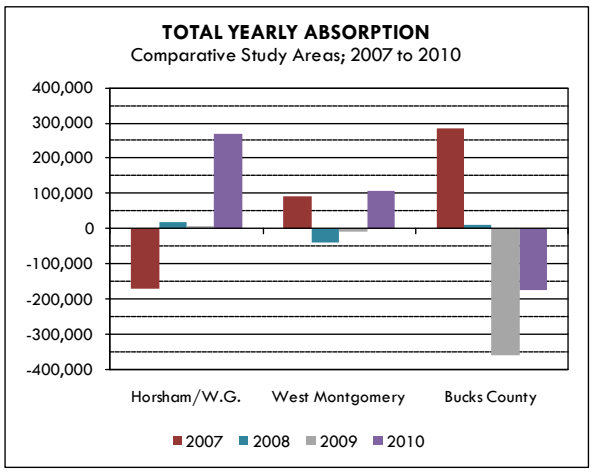
The Horsham/Willow Grove market is an established office market that is primarily comprised of Class A and B space (38% and 45%, respectively). Class C comprises only 17.5% of the total mix. The I-276 or Turnpike Corridor submarket, as well as the Philadelphia submarket, contains a greater share of Class A space (46% and 42%, respectively). In comparison, Bucks County and West Montgomery County have a larger percentage of Class C space than the other submarkets (35% and 33%, respectively). Interviews with commercial real estate professionals indicate that Bucks County is a fairly new office submarket that is not as established as the submarkets in Montgomery County. As such, the amount of Class A office space is not as substantial.

a.) Net Office Absorption

As described in the apartment overview section of the report, net absorption reflects the change in occupied stock from one time period to the next, less space that was vacated. Positive absorption indicates demand is increasing in the market, whereas negative absorption indicates falling demand, as the amount of occupied stock has declined.

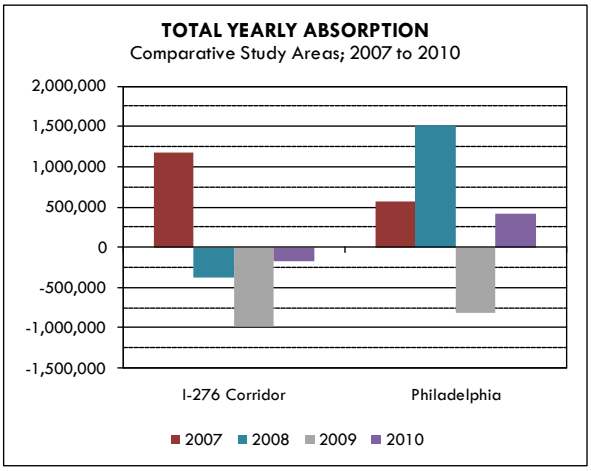
The absorption rate of office space for the Horsham/Willow Grove submarket was negative in 2007 (-172,059 SF), indicating more space was vacated during the year than occupied, but has turned positive from 2008 through 2010 (Figure 7-14). In fact, the Horsham/Willow Grove submarket experienced a substantial positive absorption of 267,724 SF of space in 2010, which is a good indicator that leasing has increased and the market is recovering. In the Turnpike Corridor submarket, annual absorption has been negative over the past three years (-1.53 million square feet total) (Figure 7-15). Bucks County also experienced a negative absorption from 2009 through 2010 (-535,410 SF total). It should be noted that in 2007 and 2008, 832,598 SF of space was constructed in Bucks County. The negative absorption is likely reflective of a large amount of new space being delivered to the market before occupancy levels can ramp up. Absorption has been fairly mixed in the West Montgomery and Philadelphia markets. However, both experienced positive absorption in 2010 (423,803 SF and 108,111 SF, respectively).

Figure 7-14



Note: W.G. = Willow Grove
Source: CoStar Group and RKG Associates, Inc., 2011

Figure 7-15



Source: CoStar Group and RKG Associates, Inc., 2011

- Net Absorption by Office Class

The Horsham/Willow Grove net absorption trends indicate that the market is beginning to recover, as Class A, Class B, and Class C absorption were all positive in 2010 (Table 7-13). However, the Turnpike Corridor has not faired quite as well. Even though 2010 Class B and C space experienced some positive absorption, Class A space in the Turnpike Corridor substantially declined (-318,072 SF), pulling down 2010 office absorption into negative numbers. Bucks County also experienced a net decline in both Class A and Class B occupied space, which resulted in a total negative absorption for 2010. Although absorption was most recently positive in Horsham/Willow Grove, it is important to keep in mind that this area is part of a larger office region that has experienced varied results since 2007.

b.) Vacancy

Vacancy rates have varied across the study areas. Horsham/Willow Grove has experienced a comparatively large drop in vacancy from 2007 (14.4%) to 2010 (10.2%) (Figure 7-16). However the I-276 Corridor as a whole increased in vacancy rates during the same period (1.8% increase) to a current level of 14.1%. The Philadelphia office market vacancy rate has not fluctuated as much as the other comparative markets, and currently is 10.9%, about 0.3% lower than 2007 rates.

Table 7-13

Class A,B, and C Office Market Indicators
Comparative Study Areas; 2010

	Class A	Class B	Class C
ABSORPTION (SQUARE FEET)			
Horsham/W.G.	125,848	86,362	55,514
Bucks County	-61,735	-178,876	64,908
West Montgomery	63,199	71,233	-26,321
I-276 Corridor	-318,072	78,813	64,424
Philadelphia	-278,554	600,385	101,972
VACANCY (PERCENT)			
Horsham/W.G.	8.3%	14.0%	4.6%
Bucks County	26.1%	18.5%	7.4%
West Montgomery	15.7%	11.2%	6.9%
I-276 Corridor	15.4%	15.0%	8.3%
Philadelphia	11.7%	10.4%	10.2%
LEASE RATES ($/SF)			
Horsham/W.G.	$21.71	$20.54	$16.80
Bucks County	$25.80	$20.72	$18.62
West Montgomery	$26.44	$19.69	$15.09
I-276 Corridor	$25.35	$21.93	$19.25
Philadelphia	$26.61	$20.82	$19.00

Source: CoStar Group and RKG Associates, Inc., 2011

The Philadelphia and Horsham/Willow Grove submarkets have performed relatively well during a period of rising vacancy in other submarkets. A drop in vacancy levels is a sign that the local office market is in recovery. Bucks County rising office vacancy rate is largely due to the recent addition of more than 800,000 SF of new space over the past few years.

- Vacancy By Office Class

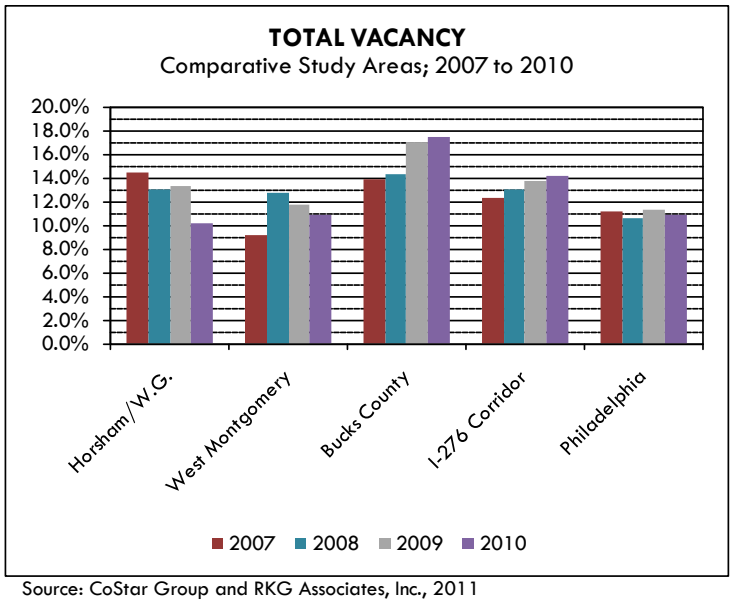
In the Horsham/Willow Grove office market Class A space, in particular, has a comparatively low vacancy rate (8.3%) (Table 7-13). As mentioned previously, Bucks County has a comparatively high A and B vacancy rate due to the new addition of office space in the recent past. However, Bucks County Class C vacancy is lower than the Class A or B vacancy level (7.4%) indicating a stronger Class C office market.

Class A space at the NAS-JRB Willow Grove site would be ideal, as it typically generates higher rent values and therefore value to the Township. The other submarkets have higher vacancies than the Horsham/Willow Grove submarket, although aside from Bucks County, are lower than the national vacancy level of 16.1%.

c.) Lease Rates

Lease rates are another indicator of market health. The Turnpike (I-276) Corridor submarket had the highest quoted lease rates of the comparative study areas in 2010 ($23.49/SF), however the Philadelphia submarket office rents were only $0.02 lower on a per square foot basis (Figure 7-17). Horsham/Willow Grove had lease rates that were $2.78/SF less than in the Turnpike Corridor ($20.71/SF). Interviews with commercial real estate professionals confirm that Horsham/Willow Grove generally offers competitive space within the regional market at a lower cost per square foot.

Figure 7-16



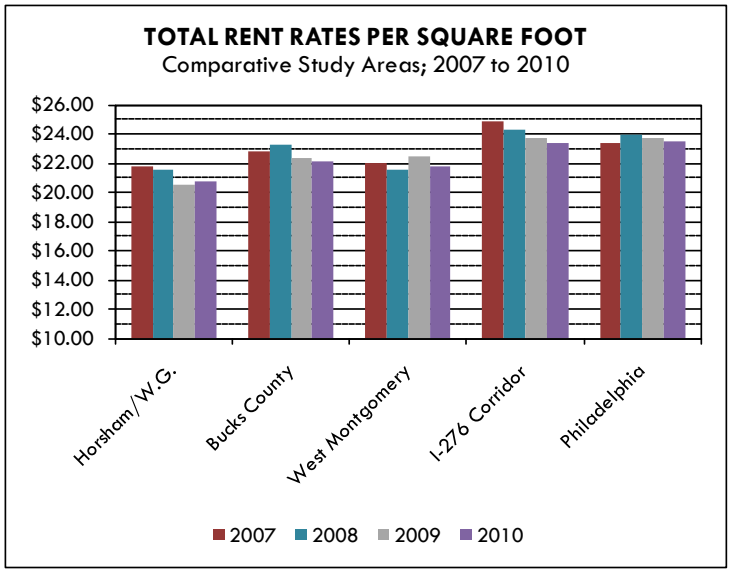
Source: CoStar Group and RKG Associates, Inc., 2011

Historic trends indicate that most of the study area markets have experienced declining lease rates since 2007. As office markets soften, vacancies rise and lease rates typically drop in the face of lower office demand. The exception is the Philadelphia submarket, which experienced a very slight increase in rates ($0.04/SF) during the same time period. The rest of the submarkets experienced declines of less than $1.40/SF, with the I-276 Corridor experiencing the greatest decline ($1.39 decline) to a current level of $23.49/SF.

- ***Lease Rates by Office Class***

Although Class A space is less expensive in Horsham/Willow Grove than the Philadelphia market, this could be considered an opportunity for many businesses that might not be able to afford the higher Center City office rents. Interesting to note, the rent rates for Class B and C space in the Turnpike Corridor was slightly above the Philadelphia market ($1.11/SF and $0.25/SF higher, respectively) (Table 7-13).

Figure 7-17



Note: W.G. = Willow Grove
Source: CoStar Group and RKG Associates, Inc., 2011

d.) Construction Activity

In 2010, CoStar reported that there was 368,500 SF of new office space under construction in the Turnpike

Corridor. The majority of this space was Class A space (350,000 SF) and 18,500 SF is in Class B space. The Class A development is located to the west of the NAS-JRB Willow Grove study area in Chester County. There is also 8,500 SF of Class B space under construction in Chester County. Another 10,000 SF of Class B space is under construction in Norristown. No other submarkets experienced construction activity in 2010. The general lack of construction activity in Montgomery County signals that new space at the study area site would have little competition.

5. Interview Findings

RKG Associates conducted interviews with development professionals, commercial brokers, and developers. Although the opinions varied, most thought that Montgomery County had a diverse office base that is attractive to a wide variety of users. The office users mentioned ranged from larger office users in the financial and pharmaceutical industries to small business owners. Health care and software development were also cited as large users of office space.

The interviews with Bucks County real estate professionals indicated that Bucks County is a less established market than Montgomery County. The vacancy for Class A space is comparatively high for the region, and was cited as ranging from 20% to 30% due to recent deliveries of new office space. Most of the tenants are smaller office users and there are not as many major corporate centers as there are in Montgomery County. One professional noted that Bucks County is not ready for more office space.

The real estate professionals indicated that development slowed when the financial crisis occurred in 2008-2009. It was mentioned that Montgomery and Bucks counties had not experienced much new development, and what was recently built was primarily built-to-suit. Many people thought that the speculative market was still recovering, and was not ready to support larger spec buildings. Instead, it was recommended that targeted recruitment efforts focus on larger companies, such as biotech companies or those in the life sciences that may have a need for larger building spaces. Although there has not been a lot of recent new development, it was a consistently noted by the interviewers that the office market will continue to tighten and recover into the future.

The Greater Horsham office submarket was viewed as a particularly desirable location for office workers. It has an educated workforce from which to draw and has a variety of residential options in terms of price, and has close proximity to the Turnpike and Philadelphia markets. In addition, the Horsham market is a more affordable option, and for those not needing to be directly in the City, Horsham offers an attractive alternative.

6. Office Conclusions and Recommendations

Horsham Township has an existing cluster of business parks. This presents both an opportunity and a constraint. New office development would build upon the existing cluster. It also would be competitive with existing space. However, most of the office development in Horsham Township is older. There were only three office buildings developed during the past 10 years, with the last building constructed in 2007. A new office building would provide options for companies desiring new construction.

Although there are signs the office market is recovering, including reduced vacancy and positive absorption in the Horsham/Willow Grove submarket in 2010, the Township and County as a whole may not be ready for a large (over 100,000 SF) speculative development. However, with the proper targeting and recruitment efforts, the NAS-JRB Willow Grove site would be ideal location for a build-to-suit office building. Target users would be those in the pharmaceutical or life-sciences industry, software developers, and financial companies.

In terms of types of office space, Class A development would bring the highest values to the Township. It is recommended that a targeted recruitment effort focus on users of Class A space, particularly

companies that are showing signs of growth. Horsham is viewed as a desirable location for office workers. It has close proximity to the Philadelphia market and has an educated workforce from which to draw. Incorporating Class A office development into the NAS-JRB Willow Grove redevelopment plan is a natural fit and would further strengthen Horsham's position as an office employment center.

F. INDUSTRIAL MARKET

The following section details the industrial market in Horsham Township and the region. Information for the inventory and development trend analysis was taken from the property assessment database provided by the Montgomery County Assessment Board. The industrial market inventory, vacancy, absorption, and rent rate information was taken primarily from Grubb and Ellis, a commercial brokerage and leasing firm. It should be noted that the consultant received this market information, as well as other industrial data, from Select Greater Philadelphia, an economic development marketing organization dedicated to attracting companies to the Philadelphia region (including Southeastern Pennsylvania, Southern New Jersey and Northern Delaware).

1. Industrial Overview

Anecdotal information obtained from interviews with industrial real estate experts have indicated that Horsham Township and Montgomery County's industrial base is composed of largely of pharmaceutical, food related, and electronic devises and surgical equipment manufacturers. Information obtained from Select Greater Philadelphia confirms this. Although the following manufacturing information does not include non-manufacturing industrial users, it does provide a general sense of the types of industrial users currently operating within the County.

In Horsham Township, the largest number of manufacturing companies is in computer and electronic product manufacturing (23.2%), printing and related support activities (16.1%), fabricated metal product manufacturing (12.5%), and machinery manufacturing (10.7%) (Table 7-14). It should be noted that computer and electronic product manufacturing and machinery manufacturing also contain some surgical and laboratory manufacturers. It is difficult to tease out the exact number of these companies, as components used in surgical instruments could also be used for other uses. Of the chemical manufacturers (7.1%), three are pharmaceutical/biological product manufacturers, and one is a manufacturer of oil additives. Also of note is the comparatively high number of printing-related manufacturers in Horsham (16.1%). These companies specialize in prepress services and commercial printing.

Montgomery County as a whole also has a comparatively high percent of fabricated metal product manufacturers (20.1%), electronic product manufacturing (12.7%), and machinery manufacturing. Many of the companies in the computer and electronic product and machinery manufacturing specialize in electronic components used in surgical devices or laboratory equipment. Fabricated metal product manufacturing includes what is typically thought of as "heavy" industrial uses, such as machine shops, metal coating and engraving, and sheet metal work.

There is a large pharmaceutical manufacturing presence in the County and the companies are categorized within chemical manufacturing. Approximately 31% of the chemical manufacturers (23 companies) are directly related to pharmaceutical or biological product manufacturing. The rest of the chemical manufacturers include adhesive, fertilizer, and paint and coating manufacturing, among others.

Table 7-14
Manufacturers By 3-Digit NAICS Code
Montgomery County; 2010

	HORSHAM TOWNSHIP		MONTGOMERY COUNTY	
Type	Number of Companies	Percent of Total	Number of Companies	Percent of Total
Fabricated Metal Product Manufacturing	7	12.5%	243	20.1%
Computer and Electronic Product Manufacturing	13	23.2%	153	12.7%
Machinery Manufacturing	6	10.7%	137	11.4%
Printing and Related Support Activities	9	16.1%	112	9.3%
Miscellaneous Manufacturing	5	8.9%	79	6.6%
Chemical Manufacturing	4	7.1%	74	6.1%
Food Manufacturing	4	7.1%	59	4.9%
Plastics and Rubber Products Manufacturing	2	3.6%	50	4.1%
Nonmetallic Mineral Product Manufacturing	1	1.8%	42	3.5%
Textile Mills	0	0.0%	42	3.5%
Electrical Equipment, Appliance, and Component Manufacturing	2	3.6%	35	2.9%
Transportation Equipment Manufacturing	2	3.6%	34	2.8%
Paper Manufacturing	0	0.0%	30	2.5%
Furniture and Related Product Manufacturing	0	0.0%	27	2.2%
Primary Metal Manufacturing	0	0.0%	23	1.9%
Leather and Allied Product Manufacturing	1	1.8%	21	1.7%
Apparel Manufacturing	0	0.0%	18	1.5%
Wood Product Manufacturing	0	0.0%	18	1.5%
Petroleum and Coal Products Manufacturing	0	0.0%	7	0.6%
Beverage and Tobacco Product Manufacturing	0	0.0%	2	0.2%
TOTAL	56	100.0%	1,206	100.0%

Source: Select Greater Philadelphia and RKG Associates, Inc., 2011

2. Industrial Space Inventory

a.) Horsham Township

There is approximately 2.3 million SF of industrial space in Horsham Township (Figure 7-18). The majority of this space is in buildings that are 15,000 SF to 100,000 SF in size (65.9%). Approximately 5.9% is in buildings less than 15,000 SF. There is not much diversity in the types of industrial buildings existing in Horsham. There is no cold storage or industrial condominiums in the Township. Industrial condominiums are generally attractive to businesses looking for less than 7,000 SF. They are typically built of concrete, glass and steel, with office space and restrooms in each unit.

b.) Montgomery County

Horsham Township only comprises 3% of the total industrial space in the County, which RKG estimates at 77.2 million SF (Figure 7-19). The largest segment of the industrial building inventory is in building between 15,000 SF and 100,000 SF (43.2%). However Montgomery County contains industrial condominiums (7.9%) and cold storage/meat packing plants (1.4%). The "other" industrial category is primarily rehabilitated mill space.

3. Industrial Development Trends

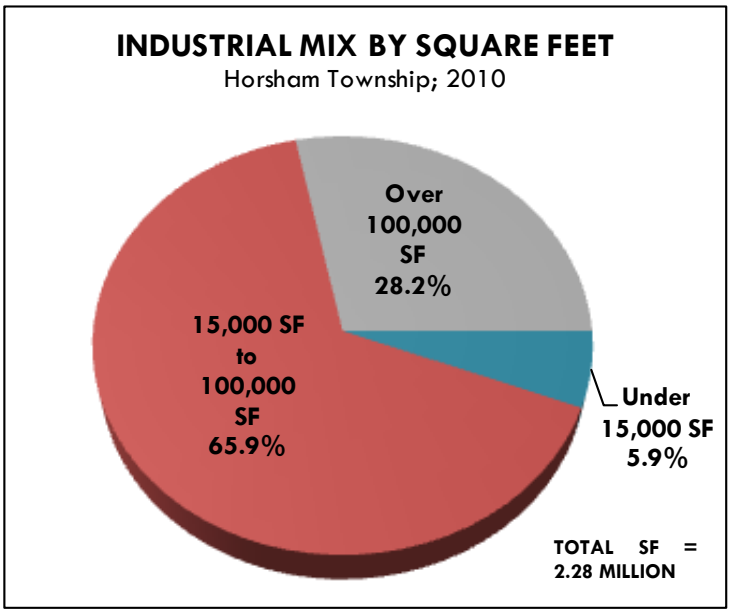
a.) Horsham Township

The majority of industrial space in Horsham Township was built prior to 1990 (Appendix Table 7-5). The exception is a 90,644 SF industrial building constructed between 1990 and 2000. This building increased the total industrial SF in the Township by 4.1%. In terms of value, smaller buildings will cost more per square foot than larger buildings. In Horsham, smaller industrial buildings are valued at $71.61/SF on average, and larger buildings are valued at $60.91/SF.

b.) Montgomery County

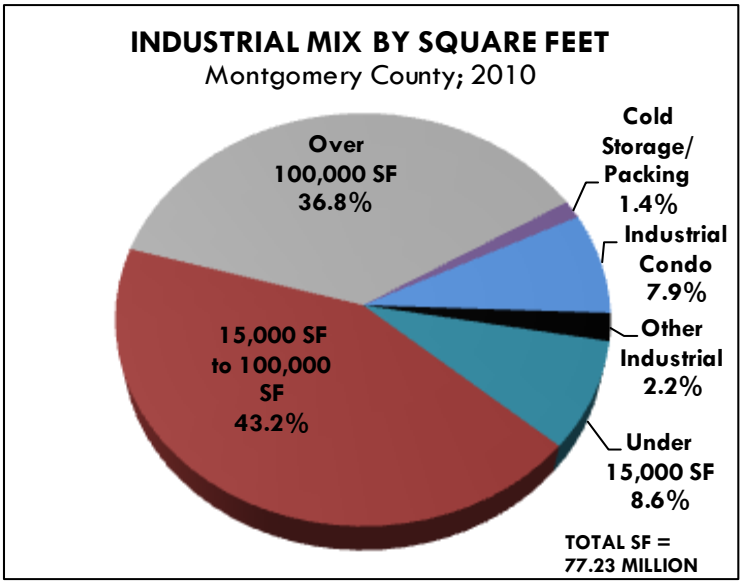
Montgomery County has seen considerably more industrial development activity (Appendix Table 7-6). During the past ten years the County increased its industrial building supply by about 5% or 3.6 million SF. Roughly 61.9% of this new construction was in buildings ranging from 15,000 SF to 100,000 SF. Roughly 24% of recent industrial space has been classified as industrial condominiums, which is not a building type found in Horsham.

Figure 7-18



Source: Montgomery County Board of Assessments and RKG Associates, Inc., 2011

Figure 7-19



Source: Montgomery County Board o Assessment and RKG Associates, Inc., 2011

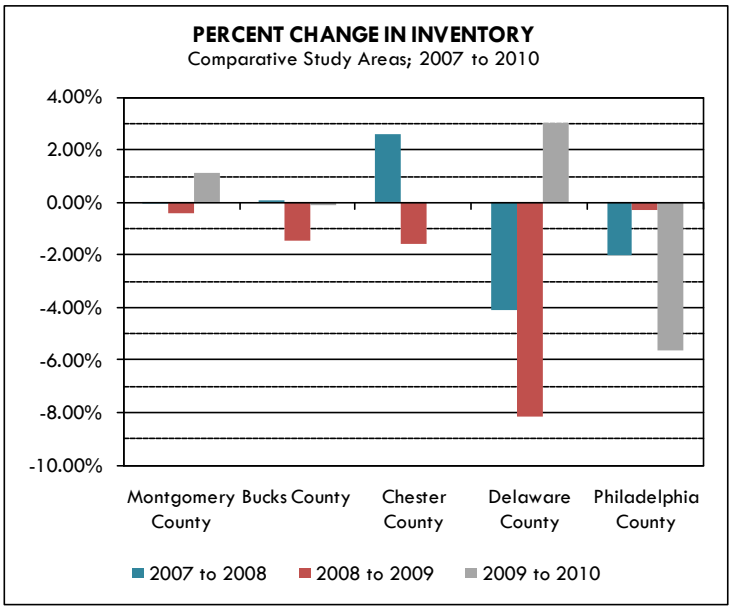
4. Industrial Submarket Analysis

The consultant collected inventory, absorption, vacancy and rent rate information for years 2007 through 2010 from Grubb and Ellis, a national commercial real estate services company. The industrial data is reported by County and includes Montgomery County, Bucks County, Chester County, Delaware County, and Philadelphia County. The information provides a larger context to how the industrial market has performed in the region. It should be noted that the Montgomery County inventory data present above differs from the Grubb & Ellis industrial inventory data. Grubb & Ellis does not track industrial buildings that are less than 20,000 SF.

a.) Industrial Inventory

The Philadelphia submarket contained the largest amount of industrial inventory in the study region at 94.6 million SF in 2010. However, the Montgomery County submarket is a comparatively large submarket as well, and contained 71.1 million SF of space. Delaware County was the smallest industrial market at 29.2 million SF.

Figure 7-20



Source: Grubb & Ellis Company and RKG Associates, Inc., 2011

Industrial inventory trends indicate that Montgomery County has increased its industrial building inventory by 1.1% or 798,426 SF within the past year (Figure 7-20). In contrast, the Philadelphia submarket decreased by 5.61% (5.6 million square feet). The Philadelphia decline in inventory is likely a result of decreasing demand for industrial uses, a trend being experienced across the nation. Although Delaware County decreased in inventory in 2008 and 2009, the market may be in recovery, as 859,329 SF of space was added in 2010.

It should be noted that there is a discrepancy in the Chester County inventory, which was reported to have increased by 9.1 million SF over the past year to 36.75 million SF. That amount of new inventory has not been added to the market and has not been under construction. Discussions with Grubb & Ellis indicated they changed the way they reported data in 2010. Previous years did not include owner-occupied inventory. Although previous years did not include owner occupied inventory, all other trends, such as absorption, vacancy, and rent rates are representative of what occurred in the market. However, the change in inventory for 2010 was not included in Figure 7-20 for Chester County, as it is not indicative of the true amount of SF that was added to the market from 2009 to 2010.

b.) Industrial Vacancy

According to Grubb & Ellis, industrial vacancy in Montgomery County was 11.5% in 2010 (Figure 7-21). Philadelphia had roughly the same vacancy rate (11.6%) during the same time period. The vacancy rates for these two areas are slightly higher than the national vacancy rate, which was reported to be 10.5%. Chester (6.1%), Delaware (7.8%), and Bucks County (8.5%) all have low vacancy rates compared to both Philadelphia/Montgomery County and the nation.

c.) Absorption

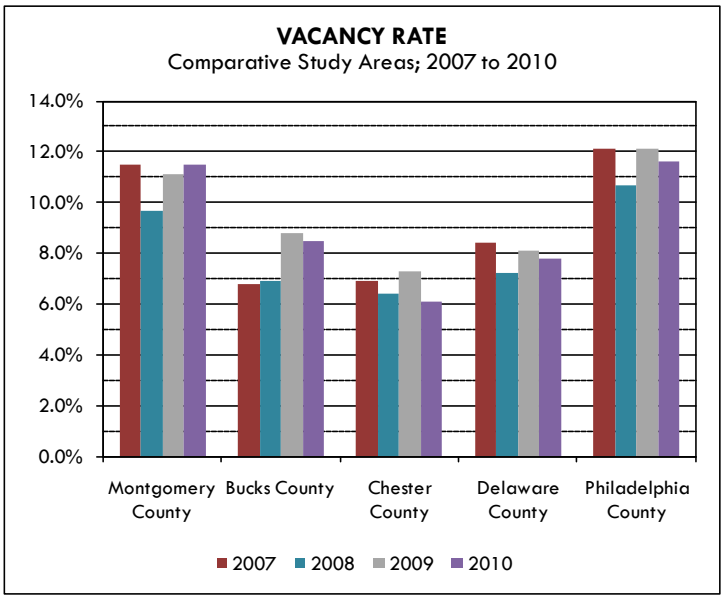
Industrial absorption in 2009 was negative across all submarkets (Figure 7-22). Grubb & Ellis reported that in 2009 industrial space bore the brunt of the economic recession. Furthermore, the Philadelphia Federal Reserve Bank reported that new goods orders in the Philadelphia region dropped steadily from the beginning of 2008 into 2009, and began negatively affecting the local industrial real estate market beginning in the second quarter of 2008.

However, there are signs that the market may have "bottomed-out" and is in the early stages of recovery. The net absorption in 2010 was positive in Bucks County (559,571 SF) Philadelphia (279,405 SF), and Delaware County (565,922 SF). However, it remained negative in both Montgomery (-185,545 SF) and Chester Counties (-43,141 SF).

d.) Construction Activity

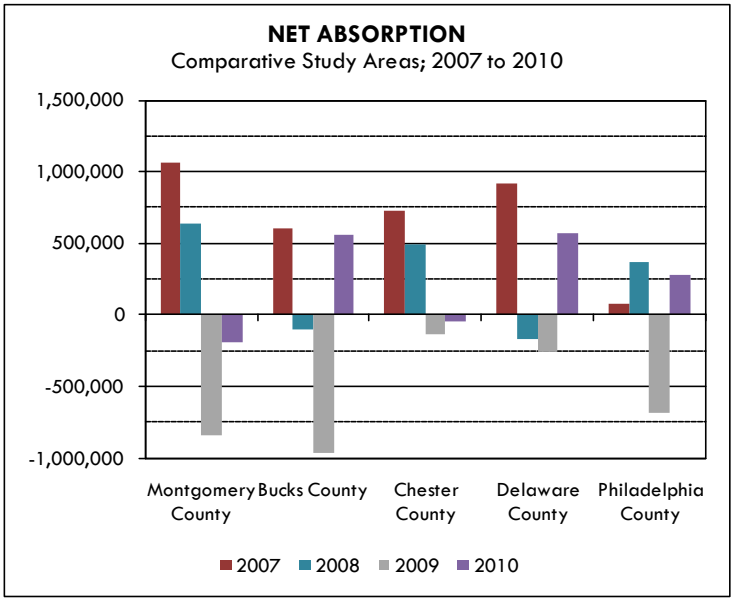
Aside from the Philadelphia and Delaware submarkets, construction activity decreased from 2007 levels (Figure 7-23). Bucks County has experienced no new industrial construction. Montgomery County has experienced some activity, but at reduced levels (166,600 SF in 2010 compared with 229,000 SF in 2007). In contrast, the Philadelphia submarket added over 1.1 million square feet added in 2010, almost all of which was pre-leased. The majority of this activity (700,000 SF) was related to the Wholesale Produce Market Building. It is a warehouse building that replaced the old Wholesale Produce Market in South Philly. The new building is located in Grey's Ferry neighborhood and contains the country's largest refrigerated system (over 500,000 SF). Some of the construction activity in 2010 is also related to the Navy Yard Commerce Center development, where over 100,000 SF of flex-space is under development. Roughly half of this space is speculative development. This is the first large speculative development the area has experienced in the past few years.

Figure 7-21



Source: Grubb & Ellis Company and RKG Associates, Inc., 2011

Figure 7-22



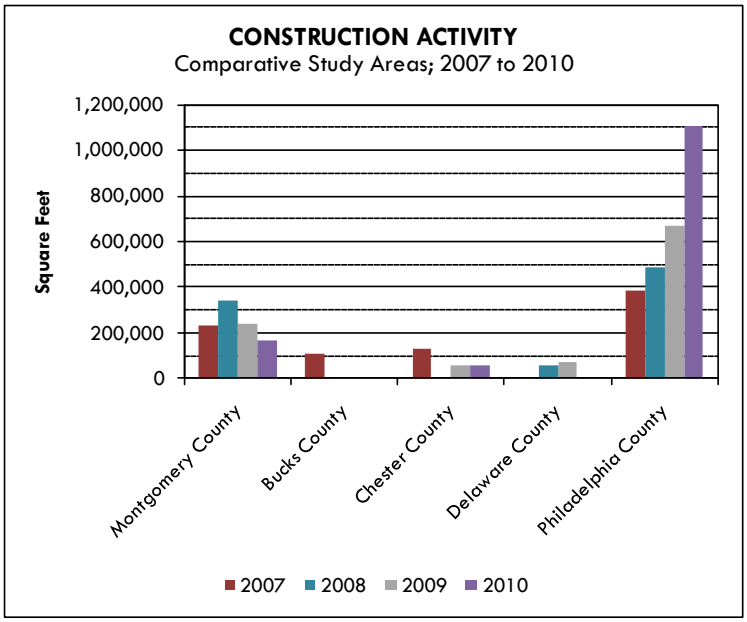
Source: Grubb & Ellis Company and RKG Associates, Inc., 2011

e.) Industrial Asking Rents

Grubb & Ellis separate warehouse/distribution rent rates from research & development/flex rent rates. Rents are reported as triple net where all costs including, but not limited to, real estate taxes, insurance and common area maintenance are borne by the tenant.

Research & development (R&D) lease rates are higher than warehouse space as these buildings generally have a higher level of finish (such as specialized facilities, office space, etc.). In 2010, Philadelphia had the highest asking rents at $10.07/SF for R&D/flex space (Figure 7-24). Other market indicators, such as positive absorption, increased construction activity, and falling vacancy rates from 2009 to 2010 are positive signs that the Philadelphia industrial submarket is recovering from the recession. The asking rents for the other submarkets were in the $8.00/SF to $9.00/SF range, excluding Delaware County which had the lowest asking rent of $7.78/SF.

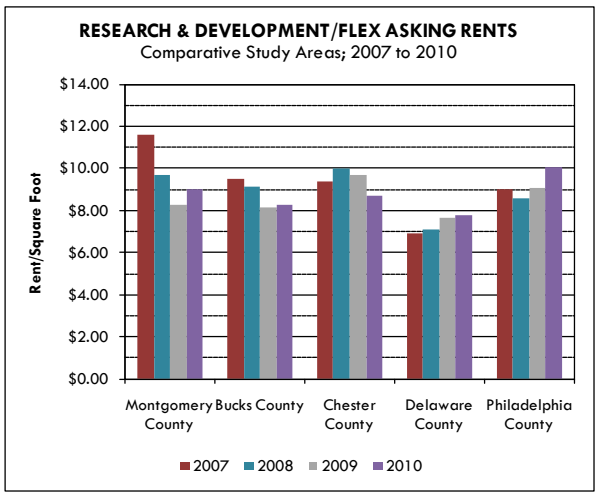
Figure 7-23



Source: Grubb & Ellis Company and RKG Associates, Inc., 2011

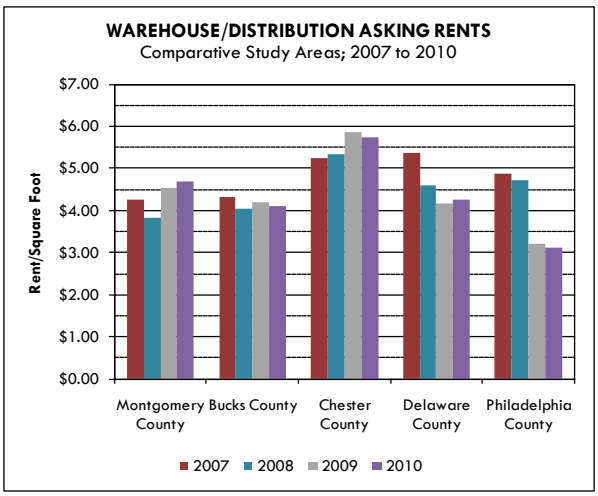
Conversely, Philadelphia had one of the lowest ($3.13/SF) warehouse/distribution asking rents of all the submarkets in 2010 (Figure 7-25). The highest rate for this kind of space was in Chester County ($5.73/SF). Montgomery County rent rates fell between the two, at $4.69/SF.

Figure 7-24



Source: Grubb & Ellis Company and RKG Associates, Inc., 2011

Figure 7-25



Source: Grubb & Ellis Company and RKG Associates, Inc., 2011

5. Navy Yard Redevelopment

The Navy Yard, located in Philadelphia, is a 1,200 acre, redeveloped former Naval facility that is home to 115 companies. The types of buildings at the Navy Yard range from industrial and distribution facilities, office complexes, to research laboratories. The Navy Yard accounts for a large share of new industrial activity within Philadelphia. In 2010, ground broke for two LEED buildings at the Navy Yard that account for 103,137 SF of new space.

In 2010, the U.S. Department of Energy announced the "Greater Philadelphia Innovation Cluster for Energy-Efficient Buildings" (GPIC) facilities be located at the Navy Yard site. The Greater Philadelphia Innovation Cluster (GPIC) is led by Penn State and is a consortium of academic institutions, federal laboratories, global industry partners, regional economic development agencies and other stakeholders. The goals of the GPIC are to improve energy efficiency and operability and reduce carbon emissions of new and existing buildings, and to stimulate private investment and quality job creation in the Greater Philadelphia region. The Navy Yard campus in Philadelphia will function as a "living laboratory" for the GPIC, serving as a test bed for energy-efficient building system technology development and integration at the single building, building cluster and district energy levels.

The largest research project at the site is the retrofit of Building 661. A new, advanced integrated building sciences laboratory will also be constructed. According to GPIC, "These two buildings will house GPIC personnel and will function as living laboratories – from design through construction, commissioning and operation – for developing the tools, methods and policies necessary to transform the building industry into a model of energy independence, operating efficiency and economic sustainability." The GPIC at the Navy Yard is helping to make Philadelphia a leader in sustainability, and is one of only three "Energy Innovation Hubs" within the United States.

6. Industrial Interview Findings

The interviews with industrial real estate experts revealed that Montgomery County has a large industrial base that is in an attractive location. It is near the Pennsylvania Turnpike, which provides access to the western markets as well as central and northern New Jersey. Industrial users in Montgomery County were cited as being very diverse. Some also noted that the County was the top manufacturing County within the Commonwealth. Pharmaceuticals, food manufacturers, electronic, and medical devise manufacturing were noted as being prominent industrial operations. However, those interviewed also mentioned that the pharmaceutical manufacturing sector has been declining in Montgomery County. There have been consolidations and buy-outs of pharmaceutical companies within the County that have led to some lay-offs and closings.

In terms of demand, most felt that the industrial market in Horsham Township was not ready for a large speculative development (over 100,000 SF). However, most thought that speculative industrial developments created for smaller users (less than 10,000 SF) would work well at the site and be absorbed into the market at a reasonable rate.

Alternative energy industrial uses were also cited as a possibility at the NAS-JRB Willow Grove site. Green energy industrial uses are not currently prominent in Montgomery County. However, those interviewed believed there was potential to partner or expand upon the interest being generated from the Navy Yard industrial development. This development, which is designated as an "Energy Innovation Hub," will focus on new energy efficient building systems. A focus on solar energy industrial recruitment was also mentioned as a green industrial user that could be targeted for the NAS-JRB Willow Grove study area site.

7. Conclusions

Montgomery County has a large and well established industrial base. The NAS-JRB Willow Grove site would be a good location new industrial development. The site provides access to the Pennsylvania Turnpike and is near existing manufacturing clusters, including pharmaceutical, food processing, and surgical and medical devises. It is recommended that a portion of the development at the site include industrial uses. However, the industrial market in Montgomery County is still in recovery. During the past year Montgomery County experienced negative absorption and rising vacancy rates. Any large industrial users will need to be strategically targeted for the site. As mentioned in the industrial interview section, most recent industrial development has been built-to-suit. It was widely thought that the market would not be ready for a large speculative building for another few years.

However, smaller speculative industrial buildings (less than 10,000 SF) would likely be absorbed in the market much quicker than a large speculative building. Although Horsham Township has smaller industrial users, there are no industrial condominiums available. These types of buildings combine office and warehouse space. Industrial condominium buildings would provide more options to those searching for a mix of space.

The "Greater Philadelphia Energy Cluster for Energy Efficient Buildings" (GPIC) is drawing national attention to the Philadelphia sustainability market. Although solar energy manufacturing is not prominent in Montgomery County, there could be potential for this, or other manufacturing companies of sustainable products, to locate to the County. There could be partnership opportunities available with the academic institutions, partners, and stakeholders of GPIC. The sustainable industry is a growing industry, and there is potential for the NAS-JRB Willow Grove site to capitalize on this rising momentum.

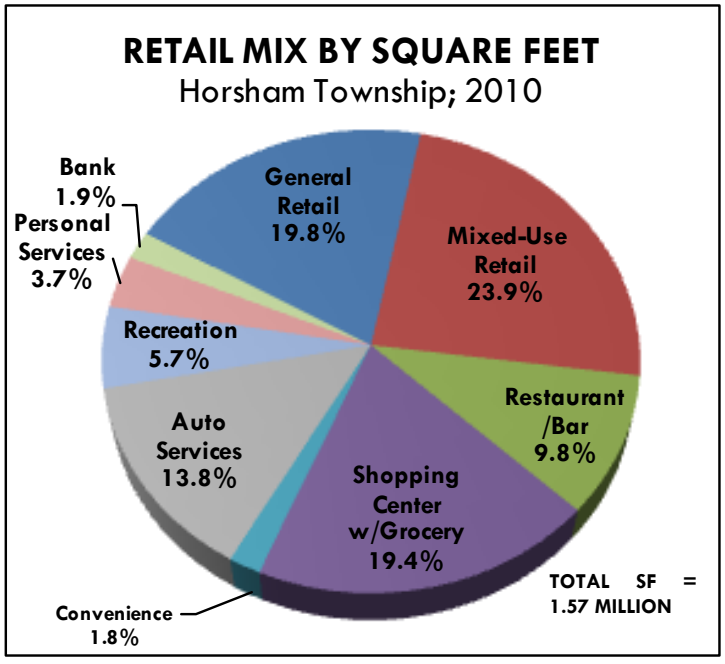
G. RETAIL

The following analysis examines the retail market in Montgomery County. Unfortunately, development trend and absorption/vacancy data was not available for Bucks County. However, an analysis of the competing retail establishments in Bucks County located within the 10-mile radius of the site is included.

1. Retail Inventory

The assessment database received from Montgomery County Board of Assessment includes property information for a variety of retail uses. The consultant grouped certain retail types together in order to more easily document retail trends. The retail inventory data is only for Horsham Township and Montgomery County. Bucks County retail is presented later in this section.

Figure 7-26



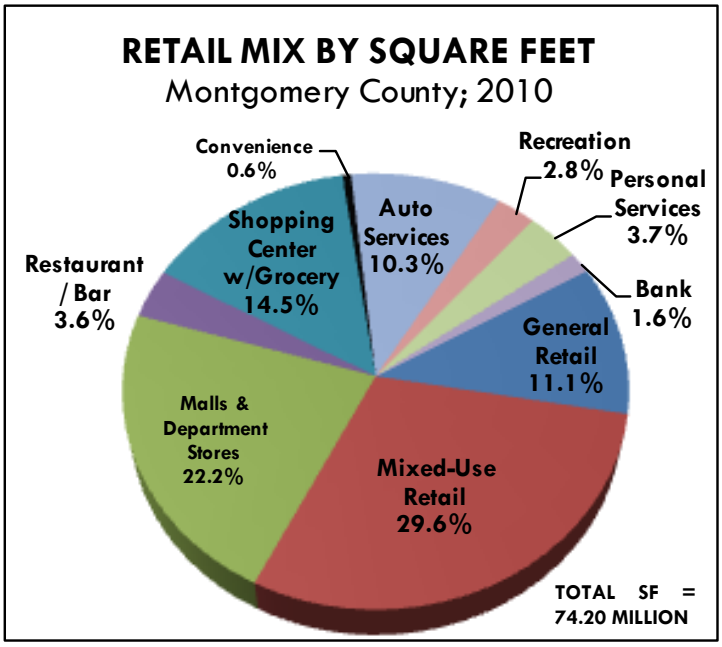
Source: Montgomery County Board of Assessment and RKG Associates, Inc., 2010

a.) Horsham Township

RKG estimates that roughly 1.6 million square feet of retail space currently exists in Horsham Township (Figure 7-26). The majority of this space (375,559 SF) is located in mixed-use retail developments. Unfortunately, the exact SF of retail uses is difficult to discern from the data. It is likely the SF devoted to solely retail uses is below the amounts shown.

There are no malls or department stores in Horsham Township. However, there are shopping centers that are anchored by grocery stores. The closest grocery-anchored shopping center to NAS-JRB is the Horsham Point Shopping center. It is anchored by a Giant grocery store and is located less than a mile south of the study area site on Horsham Road.

Figure 7-27



Source: Montgomery County Board of Assessment and RKG Associates, Inc., 2011

General retail accounts for almost 20% of the total retail SF (311,405 SF). The types of retail establishments in Horsham include "mom and pop" stores and national chain pharmacy and drug stores. The large big-box or national chain stores (other than pharmacies) are found just outside of the Township within 5 miles of the subject property.

b.) Montgomery County

Montgomery County contains approximately 74.2 million SF of retail (Figure 7-27). Horsham Township accounts for only 2.1% of the total retail SF in the County. Unlike Horsham Township, Montgomery County contains malls and department stores. Much of the larger retail spaces, including malls, are concentrated near the Pennsylvania Turnpike.

A common way retailers assess potential consumer demand is by examining the amount of retail space available on a per capita basis. This is expressed as the number of retail building square feet for every person in the population. Using Census 2010 population data, RKG estimates that both Horsham and Montgomery County are over-supplied with retail space. According to the International Council of Shopping Centers, a retail trade organization, there were 47 square feet of retail space per capita in the United States. Based on current inventories, retail space per capita in Montgomery County was 93 SF and Horsham Township was 60 SF.

In addition to malls and large retail centers, Montgomery County has a variety of general retail establishments. Almost all of the national chain brands, such as Lowe's, Toys R Us, Staples, etc. can be found in Montgomery County. The County has a comparatively large share (29.6%) of mixed-use retail developments. However some of this space is likely apartment or office SF.

2. Retail Development Trends

a.) Horsham Township

Horsham Township has seen a fair amount of retail development in the past 10 years (Appendix Table 7-7). The Township increased its existing retail SF base by 22.8% or 291,532 SF during this time. Roughly 61.3% of the new development was in shopping centers anchored by grocery stores. A Trader Joes was constructed at the English Village Shopping Center, at the southwestern border of Horsham Township. A shopping center was constructed at the corner of Welsh Road and Blair Mill Road, near the Pennsylvania Turnpike.

Other new retail SF includes restaurant and bar space (19,927 SF). A Burger King, at County Line Road and Easton Road proximate to the study are site, and a Wendy's just south of the study area on Horsham road, account for this new restaurant space. There was also a 1,870 SF restaurant developed at Horsham Road and Privet Road (adjacent the study area site) in 2010. However, this restaurant has closed at the time of report writing.

There have not been any entertainment or recreation developments since the 1990s. The last entertainment development was the Lower State Road Driving Range, located a few miles west of the study area site. The driving range does not include any heated building space and is therefore not included in the building SF totals.

b.) Montgomery County

During the past ten years Montgomery County experienced a slower rate of new development than Horsham (9.1%). However the existing retail base was much larger and 9.1% equated to an increase 6.2 million square feet of new space (Appendix Table 7-8). Approximately 2.4 million square feet of the new space (38.3%) was mall and department store development. As will be discussed in more detail in the Shopping Center section of the report, Montgomery County contains six super regional malls (malls over 500,000 SF) and over 100 big box stores, department stores, and shopping centers. Other retail development in Montgomery County has included general retail space (923,737 SF), shopping centers with grocery stores (1,013,243 SF) and auto services (502,356 SF).

3. Shopping Center Inventory

a.) Montgomery County

The Montgomery County Planning Commission conducted a shopping center inventory in 2010. The types of centers examined included neighborhood centers, community centers, regional centers, super regional centers and big box/department stores. Definitions are included in Table 7-15.

The report found that there were 136 shopping centers within the county that accounted for 28.3 million SF. This represents an increase of 3.5 million SF (14.1%) since the last inventory was completed in 2005. The largest number of centers are located in Abington Township, located just south of the Turnpike from Horsham (13 centers) and Montgomery Township (11 centers), which borders Horsham Township to the West. Upper Merion Township, which includes King of Prussia, had the most gross floor area, with more than 3.9 million square feet. In terms of new development, the report cites that retail concentrations continue to be located in areas around the enclosed shopping malls in King of Prussia, Plymouth Meeting, Willow Grove, and Montgomery Township.

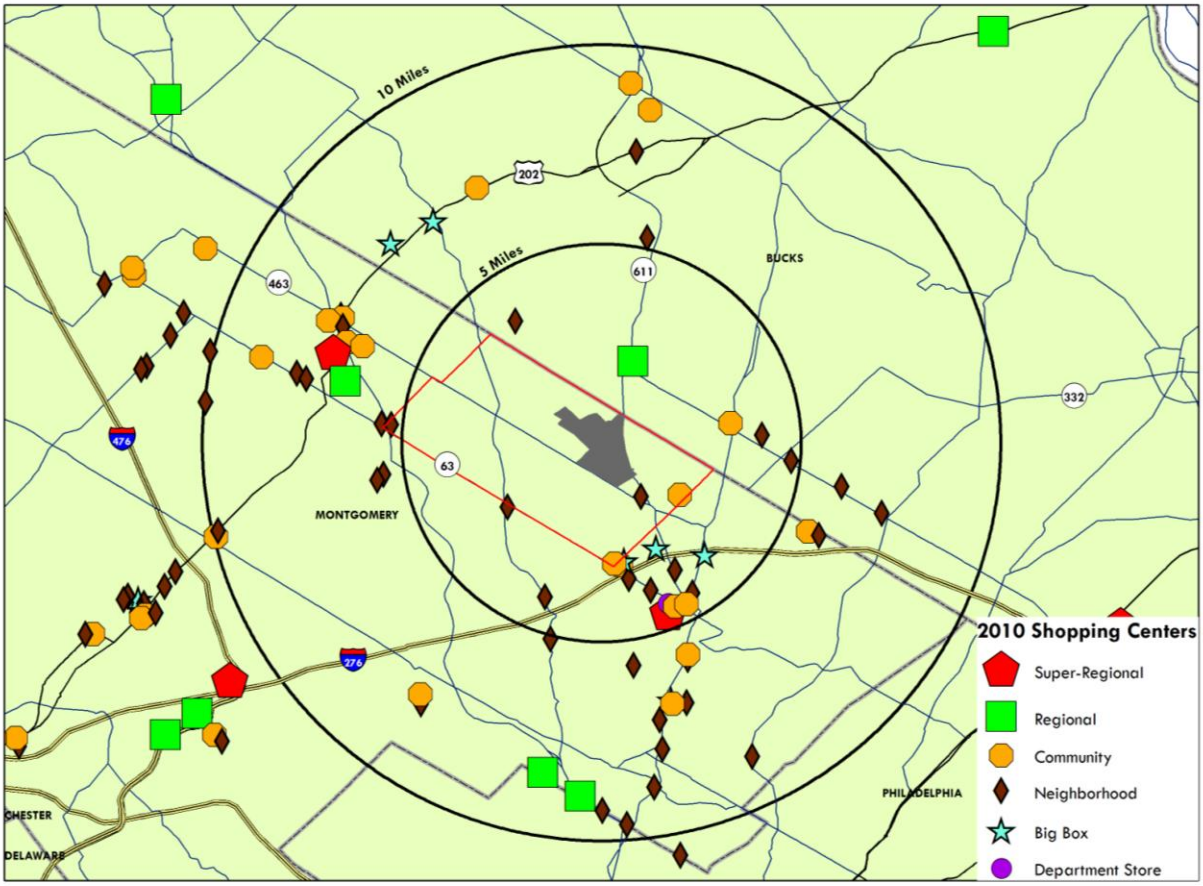
There are six super-regional shopping centers in Montgomery County. Three of these centers, including Willow Grove Park Mall (1.42 million SF), Montgomery Mall (1.12 million SF), and Plymouth Meeting Mall (1.02 million SF), are within ten miles of the NAS-JRB site (Map 7-4). There are also four regional centers (with one or more department stores) located within ten

Table 7-15
Shopping Center Definitions
Montgomery County; 2010

Center Type	Typical Tenants	Typical Range in Gross Floor Area
Neighborhood Center	Supermarket and small tenants	30,000 to 150,000
Community Center	Discount department stores, supermarket, home improvement store, and large category dominant stores (e.g. Office Max)	100,000 to 350,000
Regional Center	One or more full-line department stores with many small tenants or a large collection of category dominant stores (e.g. Toys R Us)	400,000 to 1,000,000
Super Regional Center	Fully-enclosed mall with three or more full-line department stores with many small tenants, or a unique center with a large regional draw, such as an outlet mall.	500,000 to 2,000,000
Big Box/Department Store	Stand-alone big box stores or department stores (e.g. Target)	60,000 to 200,000

Source: Montgomery County Planning Commission and RKG Associates, Inc., 2011

Map 7-4
Shopping Centers in Montgomery and Bucks Counties



Source: RKG Associates, Inc., 2011

miles of the base. Three of these centers are located in Montgomery County, and one is located in Bucks County (Valley Square). The Montgomery County malls include Cedarbrook Mall (632,883 SF), Cheltenham Square Mall (890,703 SF), and Montgomery Square (508,935 SF).

b.) Bucks County

It should be noted that the consultant conducted an inventory of the larger shopping centers in Bucks County. The following map provides a general sense of the shopping center opportunities within Bucks County and that would likely be competitive with retail at the study area site.

As mentioned previously, Valley Square is a regional center, located in Bucks County, less than five miles from the study area site. It is a 120-acre lifestyle center that includes office, retail, restaurants, and age-restricted condominiums. The selection of stores includes: Ann Taylor Loft, EMS, Jos. A. Bank, Chico's, and others. The restaurants at this center include Chipotle, The Melting Pot, Panera, PF Chang's, Ted's Montana Grill, and Peace A Pizza. It should be noted that this shopping center would be a main retail competitor with the study area site.

Other shopping in Bucks County located within 10 miles of the site include Doylestown Shopping Center, Warrington Crossing, Cross Keys Place, and New Britain Shopping Center. These three centers are community shopping centers that are generally anchored by a grocery store. In terms of entertainment options, there is a Regal movie theater located just north of the base at the intersection of Easton Road and Titus Ave. There is also a bowling alley within 5-miles of the base just east of Easton Road on W Street Road. It should be noted there is also a super-regional in Bucks County (Neshaminy Mall). However, it is located more than 10 miles away from the study area site.

4. Restaurants

Restaurants at NAS-JRB Willow Grove site would serve not only local residents living on site but also workers commuting into Horsham for employment, as well as visitors attracted to the development. The consultants specifically looked at restaurants to assess the potential for this type of space at the study area site. Information was collected from the Site To Do Business (STDB), a resource tool for Certified Commercial Investment Members. STDB tracks the MPI (Market Potential Index) for certain restaurants. The MPI measures the relative likelihood of the adults in a specified trade area (Horsham Township) to exhibit certain consumer behavior or purchasing patterns compared to the U.S. average. These data are based upon national propensities to use various products and services, applied to the local demographic composition. An MPI of 100 represents the U.S. average (Table 7-16). Anything over 100 indicates a demand greater than the U.S. average and preliminary potential for locating to the study site. It should be noted that the

Table 7-16

Family Restaurant Potential
Horsham Township; 2010

Restaurant	Expected Number of Adults	MPI
Went to family restaurant/steak house in last 6 months	14,964	108
T.G.I. Friday`s	2,808	139
Friendly`s	948	133
Cheesecake Factory	1,634	132
Chili`s Grill & Bar	2,682	126
Olive Garden	4,046	126
Red Robin	1,182	126
Applebee`s	5,755	118
Ruby Tuesday	1,990	118
Bennigan`s	625	115
Intl Hse of Pancakes	2,379	113
Outback Steakhouse	2,482	110
Red Lobster	2,983	109
Denny`s	1,874	105
Lone Star Steakhouse	608	105
Old Country Buffet	620	104
Perkins	724	102

Source: Site to Do Business and RKG Associates, Inc., 2011

following analysis is meant to identify the initial potential for restaurants, and is not meant to be a substitute for a restaurant marketing study.

The data collected from STDB shows that Horsham Township residents frequent family-style restaurant more than the national average. As a whole, the MPI was 108 for Horsham Township (Table 7-16). It was expected that 14,964 adults visited family style restaurants in the past six months. However, certain restaurants may have greater potential than others. Those with the greatest MPI are T.G.I. Friday's (139), Friendly's (133), and the Cheesecake Factory (132).

Fast food restaurants have a lower MPI (102) (Table 7-17). However, it is still above the national average (100). Some restaurants, in particular, have a very high MPI. Chipotle (151), Boston Market (149), and Panera Bread (148) have the highest MPI. All three of these restaurants are "higher-end" fast-food establishments. These establishments typically cost more than a traditional fast food restaurant such as McDonald's or Burger King. A "higher-end" fast food restaurant could be a potential opportunity at the NAS-JRB Willow Grove site.

Table 7-17
Fast Food Restaurant Potential
Horsham Township; 2010

Restaurant	Expected Number of Adults	MPI
Went to fast food/drive-in restaurant in last 6 months	17,286	102
Chipotle Mex. Grill	1,554	151
Boston Market	1,502	149
Panera Bread	2,622	148
Dunkin` Donuts	3,050	140
Starbucks	3,872	140
Quiznos	2,336	129
Fuddruckers	689	126
Papa John`s	1,925	113
Chuck E. Cheese`s	973	111
Chick-fil-A	2,618	110
Del Taco	674	110
Wendy`s	6,752	110
A & W	1,048	109
Carl`s Jr.	1,216	109
Burger King	7,411	106
Jack in the Box	2,187	106
Subway	6,302	105
Taco Bell	6,369	105
Arby`s	4,089	103
Domino`s Pizza	2,746	102
McDonald`s	10,944	102
Steak n Shake	1,045	101

Source: Site to Do Business and RKG Associates, Inc., 2011

5. Retail Submarket Analysis

The consultant obtained absorption, vacancy, new construction and asking rent information from REIS, a national provider of commercial market information. The retail information is for the Montgomery County market. The retail information is limited to neighborhood and community centers only and does not include stand-alone retail, regional, or super-regional shopping centers.

a.) Net Absorption

The county experienced positive net absorption in 2010 (21,000 SF) (Figure 7-28). However, in 2009, the County experienced its largest drop in absorption since 1995 (a decline of 420,000 SF). This indicates that more retail space has been vacated during this year than occupied. Although absorption was negative in 2009, the positive 2010 absorption could indicate that the market "bottomed-out" during this year. Forecast data indicates that absorption will return to positive levels in 2012 through 2015.

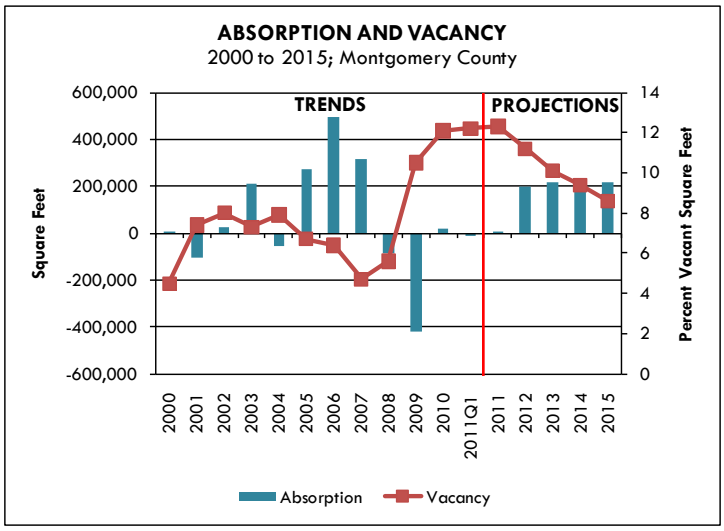
b.) Vacancy

Vacancy generally has a converse relationship with absorption. In other words, vacancy tends to decrease when absorption increases and will increase when absorption decreases. In fact, Figure 7-28 shows that vacancy declined from 2005 to 2007, but increased again once the economic slowdown began to take effect. In the first quarter of 2011, vacancy was at 12.2%. The vacancy in Montgomery County was slightly above the national rate, which REIS reported to be 11.3% in the first quarter of 2011.

c.) Lease Rates

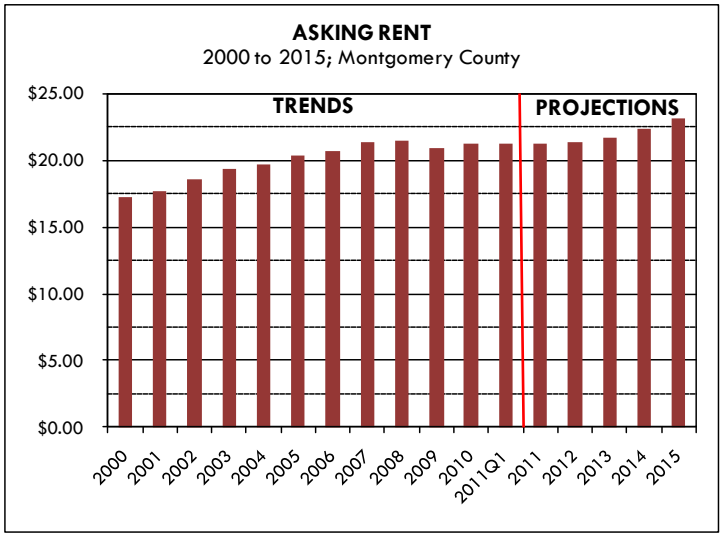
REIS reports rent rates on a triple-net (NNN) basis. This means the tenant must pay for all operating expenses, including real estate taxes, in addition to rent. Montgomery County rent rates steadily increased from 2000 to 2008, and peaked at $21.47/SF in 2008. In 2009, the asking rents dropped by less than a dollar ($0.57) to $20.90/SF (Figure 7-29). However, rates have increased in the past year, and by the end of first quarter of 2011, the asking rates were just below 2008 levels ($21.28/SF). Rent rates are forecasted to continue to increase through 2015, to $23.17/SF.

Figure 7-28



Source: REIS, Inc. and RKG Associates, Inc., 2011

Figure 7-29



Source: REIS, Inc. and RKG Associates, Inc., 2011

6. Conclusions

There are a great variety of shopping opportunities in Montgomery County, including large malls to stand-alone neighborhood serving retail. Although the retail market experienced a downturn due to the national recession, there are signs the market has started to recover. Vacancy is projected to decline as absorption is expected to return to positive levels.

However, it is important that retail development at the NAS-JRB Willow Grove site be taken into context with the surrounding community. There are three malls within 10 miles of the study area site that contain over 1 million square feet of retail space each. There is also a smaller "life-style" center located in Bucks County, about a ten minute drive from the site.

Due to the large amount of competition, it is recommended that retail at the study area site should be neighborhood serving retail. Restaurant uses, in particular, would compliment office or residential space that would also be built at the study area site. Although there is a Giant grocery center located just south of the NAS-JRB Willow Grove site, there could be potential for small specialty grocery stores or convenience stores.

Retail uses should not be precluded from development, as it generates revenue for the Township (through property taxes, local services taxes, earned income taxes, etc.). Retail at the site would also better serve local residents and workers. It is therefore recommended that a portion of the site be devoted to retail development.

Chapter 7 Appendix Section

Appendix Table 7-1
Residential Development Trends
Horsham Township

Land Use	Units	Housing Composition (% of Total)	Acreage/Unit	Avg. SF/Building	Avg. Fair Market Value/SF	Avg. Fair Market Value/Unit
PRE 1990	**7,685**	**--**	**0.342**	**1,507**	**$137.86**	**$207,698**
Single Family	4,053	52.7%	0.584	1,941	$143.36	$278,290
Townhouse	1,317	17.1%	0.101	1,464	$135.96	$199,104
Duplex	276	3.6%	0.150	1,073	$114.07	$122,353
Triplex	12	0.2%	0.208	1,013	$115.83	$117,346
Quadraplex	8	0.1%	0.071	850	$79.31	$67,444
Condominium	457	5.9%	0.023	1,105	$135.26	$149,523
Single Detached Condominium	1	0.0%	0.050	2,223	$116.42	$258,806
Townhouse Condominium	150	2.0%	0.024	1,157	$133.66	$154,632
Condo (2-5 Units)	6	0.1%	0.020	1,089	$104.15	$113,417
Garden Style Condominium	300	3.9%	0.022	1,076	$136.87	$147,327
Mid to High Rise Condominium	0	0.0%	0.000	0	$0.00	$0
Apartment	1,562	20.3%	0.048	616	$106.07	$65,287
Townhouse Apartment	50	0.7%	0.107	851	$127.48	$108,436
Low-Rise Apartment	1,434	18.7%	0.001	597	$107.37	$64,131
High-Rise Apartment	0	0.0%	0.000	0	$0.00	$0
Mixed-Use Apartment [1]	78	1.0%	0.871	800	$73.60	$58,880
1990 to 2000	**1,313**	**--**	**0.571**	**3,061**	**$166.15**	**$508,575**
Single Family	1,146	87.3%	0.637	3,201	$166.38	$532,634
Townhouse	138	10.5%	0.126	2,233	$165.81	$370,270
Duplex	4	0.3%	0.113	1,121	$122.83	$137,634
Triplex	0	0.0%	0.000	0	$0.00	$0
Quadraplex	0	0.0%	0.000	0	$0.00	$0
Condominium	25	1.9%	0.036	1,511	$151.28	$228,528
Single Detached Condominium	0	0.0%	0.000	0	$0.00	$0
Townhouse Condominium	21	1.6%	0.034	1,524	$150.00	$228,654
Condo (2-5 Units)	4	0.3%	0.045	1,439	$158.41	$227,870
Garden Style Condominium	0	0.0%	0.000	0	$0.00	$0
Mid to High Rise Condominium	0	0.0%	0.000	0	$0.00	$0
Apartment	0	0.0%	0.000	0	$0.00	$0
Townhouse Apartment	0	0.0%	0.000	0	$0.00	$0
Low-Rise Apartment	0	0.0%	0.000	0	$0.00	$0
High-Rise Apartment	0	0.0%	0.000	0	$0.00	$0
Mixed-Use Apartment [1]	0	0.0%	0.000	0	$0.00	$0
2001 to 2005	**356**	**--**	**1.069**	**4,230**	**$179.20**	**$757,995**
Single Family	343	96.3%	1.108	4,331	$179.67	$778,172
Townhouse	1	0.3%	0.061	1,281	$202.51	$259,412
Duplex	2	0.6%	0.170	1,938	$101.95	$197,576
Triplex	0	0.0%	0.000	0	$0.00	$0
Quadraplex	0	0.0%	0.000	0	$0.00	$0
Condominium	10	2.8%	0.030	1,515	$150.41	$227,872
Single Detached Condominium	0	0.0%	0.000	0	$0.00	$0
Townhouse Condominium	10	2.8%	0.030	1,515	$150.41	$227,872
Condo (2-5 Units)	0	0.0%	0.000	0	$0.00	$0
Garden Style Condominium	0	0.0%	0.000	0	$0.00	$0
Mid to High Rise Condominium	0	0.0%	0.000	0	$0.00	$0
Apartment	0	0.0%	0.000	0	$0.00	$0
Townhouse Apartment	0	0.0%	0.000	0	$0.00	$0
Low-Rise Apartment	0	0.0%	0.000	0	$0.00	$0
High-Rise Apartment	0	0.0%	0.000	0	$0.00	$0
Mixed-Use Apartment [1]	0	0.0%	0.000	0	$0.00	$0
2006 to 2010	**79**	**--**	**1.084**	**3,800**	**$166.40**	**$632,326**
Single Family	70	88.6%	1.214	4,095	$167.91	$687,637
Townhouse	1	1.3%	0.061	1,537	$186.72	$286,988
Duplex	4	5.1%	0.128	1,653	$120.77	$199,577
Triplex	0	0.0%	0.000	0	$0.00	$0
Quadraplex	0	0.0%	0.000	0	$0.00	$0
Condominium	4	5.1%	0.023	1,345	$136.39	$183,480
Single Detached Condominium	0	0.0%	0.000	0	$0.00	$0
Townhouse Condominium	4	5.1%	0.023	1,345	$136.39	$183,480
Condo (2-5 Units)	0	0.0%	0.000	0	$0.00	$0
Garden Style Condominium	0	0.0%	0.000	0	$0.00	$0
Mid to High Rise Condominium	0	0.0%	0.000	0	$0.00	$0
Apartment	0	0.0%	0.000	0	$0.00	$0
Townhouse Apartment	0	0.0%	0.000	0	$0.00	$0
Low-Rise Apartment	0	0.0%	0.000	0	$0.00	$0
High-Rise Apartment	0	0.0%	0.000	0	$0.00	$0
Mixed-Use Apartment [1]	0	0.0%	0.000	0	$0.00	$0
TOTAL	**9,433**	**--**	**0.401**	**1,838**	**$148.73**	**$273,415**
Single Family	5,612	59.5%	0.635	2,371	$154.29	$365,887
Townhouse	1,457	15.4%	0.104	1,537	$140.14	$215,418
Duplex	286	3.0%	0.150	1,087	$114.19	$124,173
Triplex	12	0.1%	0.208	1,013	$115.83	$117,346
Quadraplex	8	0.1%	0.071	850	$79.31	$67,444
Condominium	496	5.3%	0.023	1,136	$136.75	$155,359
Single Detached Condominium	1	0.0%	0.050	2,223	$116.42	$258,806
Townhouse Condominium	185	2.0%	0.025	1,222	$137.16	$167,617
Condo (2-5 Units)	10	0.1%	0.030	1,229	$129.56	$159,198
Garden Style Condominium	300	3.2%	0.022	1,076	$136.87	$147,327
Mid to High Rise Condominium	0	0.0%	0.000	0	$0.00	$0
Apartment	1,562	16.6%	0.004	576	$108.32	$62,347
Townhouse Apartment	50	0.5%	0.107	851	$127.48	$108,436
Low-Rise Apartment	1,434	15.2%	0.001	597	$107.37	$64,131
High-Rise Apartment	0	0.0%	0.000	0	$0.00	$0
Mixed-Use Apartment [1]	78	0.8%	0.872	800	$73.60	$58,880

[1] Square Feet for mixed-use apartments was estimated to be 800 SF per unit. Fair Market Value/SF was calculated based on the price/SF for all uses.
Source: Montgomery County Assessment Board and RKG Associates, Inc., 2011

Appendix Table 7-2
Residential Development Trends
Montgomery County

Land Use	Units	Housing Composition (% of Total)	Acreage/Unit	Avg. SF/Building	Avg. Fair Market Value/SF	Avg. Fair Market Value/Unit
PRE 1990	**240,011**	**--**	**0.394**	**1,741**	**$135.01**	**$235,027**
Single Family	161,507	67.3%	0.540	2,013	$145.13	$292,168
Townhouse	14,210	5.9%	0.074	1,532	$130.61	$200,096
Duplex	9,460	3.9%	0.156	1,058	$100.50	$106,354
Triplex	2,721	1.1%	0.096	909	$86.84	$78,961
Quadraplex	1,868	0.8%	0.128	855	$82.38	$70,449
Condominium	13,733	5.7%	0.023	1,199	$135.81	$162,818
Single Detached Condominium	104	0.0%	0.077	1,541	$133.43	$205,564
Townhouse Condominium	4,618	1.9%	0.027	1,372	$118.81	$163,026
Condo (2-5 Units)	64	0.0%	0.030	1,326	$121.53	$161,186
Garden Style Condominium	5,137	2.1%	0.019	1,002	$141.76	$142,018
Mid to High Rise Condominium	3,810	1.6%	0.023	1,243	$152.43	$189,470
Apartment	36,512	15.2%	0.108	1,105	$69.14	$76,414
Townhouse Apartment	517	0.2%	0.150	947	$87.26	$82,673
Low-Rise Apartment	23,564	9.8%	0.073	1,036	$70.55	$73,110
High-Rise Apartment	7,655	3.2%	0.039	1,393	$60.00	$83,608
Mixed-Use Apartment [1]	4,776	2.0%	0.390	1,000	$80.51	$80,510
1990 to 2000	**35,754**	**--**	**0.447**	**2,397**	**$149.52**	**$358,419**
Single Family	21,648	60.5%	0.689	2,858	$156.37	$446,946
Townhouse	9,112	25.5%	0.075	1,859	$135.11	$251,125
Duplex	74	0.2%	0.137	1,101	$122.39	$134,760
Triplex	0	0.0%	0.000	0	$0.00	$0
Quadraplex	4	0.0%	0.125	1,517	$111.83	$169,586
Condominium	2,786	1.2%	0.028	1,518	$142.30	$216,054
Single Detached Condominium	100	0.3%	0.047	1,524	$151.94	$231,594
Townhouse Condominium	1,665	4.7%	0.032	1,771	$143.81	$254,670
Condo (2-5 Units)	7	0.0%	0.034	1,223	$151.55	$185,363
Garden Style Condominium	1,014	2.8%	0.020	1,105	$136.97	$151,326
Mid to High Rise Condominium	0	0.0%	0.000	0	$0.00	$0
Apartment	2,130	0.9%	0.144	1,210	$92.58	$112,026
Townhouse Apartment	12	0.0%	0.103	842	$82.88	$69,816
Low-Rise Apartment	2,081	5.8%	0.107	1,216	$92.35	$112,289
High-Rise Apartment	0	0.0%	0.000	0	$0.00	$0
Mixed-Use Apartment [1]	37	0.1%	2.243	1,000	$110.88	$110,880
2001 to 2005	**13,325**	**--**	**0.494**	**2,781**	**$156.26**	**$434,520**
Single Family	8,705	65.3%	0.727	3,313	$162.60	$538,641
Townhouse	2,350	17.6%	0.052	2,019	$144.03	$290,848
Duplex	12	0.1%	0.106	1,291	$128.17	$165,404
Triplex	9	0.1%	0.372	1,119	$103.53	$115,851
Quadraplex	0	0.0%	0.000	0	$0.00	$0
Condominium	859	0.4%	0.039	1,934	$157.36	$304,341
Single Detached Condominium	18	0.1%	0.074	3,469	$146.63	$508,643
Townhouse Condominium	453	3.4%	0.048	2,346	$147.25	$345,458
Condo (2-5 Units)	37	0.3%	0.040	1,902	$149.30	$284,026
Garden Style Condominium	340	2.6%	0.025	1,298	$173.55	$225,249
Mid to High Rise Condominium	11	0.1%	0.045	2,224	$355.02	$789,731
Apartment	1,390	0.6%	0.069	1,283	$85.85	$110,182
Townhouse Apartment	0	0.0%	0.000	0	$0.00	$0
Low-Rise Apartment	1,014	7.6%	0.086	1,238	$97.46	$120,664
High-Rise Apartment	375	2.8%	0.021	1,407	$58.15	$81,822
Mixed-Use Apartment [1]	1	0.0%	0.160	1,000	$116.00	$116,000
2006 to 2010	**8,375**	**--**	**0.340**	**2,636**	**$149.01**	**$392,773**
Single Family	4,298	51.3%	0.619	3,398	$158.12	$537,327
Townhouse	1,555	18.6%	0.056	2,163	$124.20	$268,700
Duplex	18	0.2%	0.092	1,437	$115.23	$165,593
Triplex	3	0.0%	0.550	2,123	$158.53	$336,613
Quadraplex	12	0.1%	0.098	830	$148.52	$123,324
Condominium	1,629	0.7%	0.035	1,780	$160.72	$286,009
Single Detached Condominium	35	0.4%	0.067	3,255	$145.94	$475,090
Townhouse Condominium	545	6.5%	0.045	2,280	$127.48	$290,678
Condo (2-5 Units)	2	0.0%	0.030	1,649	$128.44	$211,800
Garden Style Condominium	362	4.3%	0.030	1,577	$149.59	$235,840
Mid to High Rise Condominium	685	8.2%	0.027	1,413	$211.80	$299,363
Apartment	860	0.4%	0.049	1,354	$77.99	$105,618
Townhouse Apartment	12	0.1%	0.122	2,562	$57.42	$147,120
Low-Rise Apartment	848	10.1%	0.048	1,337	$78.55	$105,031
High-Rise Apartment	0	0.0%	0.000	0	$0.00	$0
Mixed-Use Apartment [1]	0	0.0%	0.000	0	$0.00	$0
TOTAL	**297,465**	**--**	**0.403**	**1,891**	**$139.17**	**$263,236**
Single Family	196,158	65.9%	0.566	2,194	$148.35	$325,559
Townhouse	27,227	9.2%	0.072	1,719	$133.14	$228,925
Duplex	9,564	3.2%	0.155	1,060	$100.76	$106,759
Triplex	2,733	0.9%	0.097	911	$87.09	$79,365
Quadraplex	1,884	0.6%	0.128	856	$82.90	$70,996
Condominium	19,007	6.4%	0.026	1,329	$141.18	$187,575
Single Detached Condominium	257	0.1%	0.063	1,903	$143.80	$273,626
Townhouse Condominium	7,281	2.4%	0.031	1,592	$128.71	$204,888
Condo (2-5 Units)	110	0.0%	0.034	1,519	$134.90	$204,964
Garden Style Condominium	6,853	2.3%	0.020	1,062	$143.56	$152,481
Mid to High Rise Condominium	4,506	1.5%	0.024	1,271	$163.33	$207,641
Apartment	40,892	13.7%	0.107	1,122	$71.33	$80,031
Townhouse Apartment	541	0.2%	0.148	981	$85.45	$83,817
Low-Rise Apartment	27,507	9.2%	0.075	1,067	$73.89	$78,811
High-Rise Apartment	8,030	2.7%	0.038	1,394	$59.92	$83,524
Mixed-Use Apartment [1]	4,814	1.6%	0.404	1,000	$80.75	$80,751

[1] Square Feet for mixed-use apartments was estimated to be 1,000 SF per unit. Fair Market Value/SF was calculated based on the price/SF for all uses.

Source: Montgomery County Assessment Board and RKG Associates, Inc., 2011

Appendix Table 7-3

Office Development Trends

Horsham Township

Land Use	Buildings	Office Composition (% of Total)	Building SF	Acreage/Unit	Avg. SF/Building	Avg. Fair Market Value/SF	Avg. Fair Market Value/Building
PRE 1990	**59**	**--**	**3,904,725**	**7.257**	**66,182**	**$115.34**	**$7,633,442**
Office Under 15,000 SF	6	10.2%	38,998	0.688	6,500	$114.60	$744,875
Office 15,000 to 50,000 SF	15	25.4%	456,180	4.040	30,412	$119.62	$3,637,740
Office 50,000 SF to 100,000 SF	19	32.2%	1,385,338	7.799	72,913	$126.58	$9,229,525
Office Over 100,000	11	18.6%	1,425,271	14.489	129,570	$115.64	$14,983,147
Office Condominium	2	3.4%	58,051	1.075	29,026	$66.03	$1,916,506
Office: Flex Building	6	10.2%	540,887	8.957	90,148	$87.50	$7,888,185
1990 to 2000	**14**	**--**	**1,392,909**	**11.946**	**99,494**	**$138.10**	**$13,740,136**
Office Under 15,000 SF	3	21.4%	35,184	2.043	11,728	$159.65	$1,872,377
Office 15,000 to 50,000 SF	2	14.3%	91,304	5.485	45,652	$122.70	$5,601,381
Office 50,000 SF to 100,000 SF	4	28.6%	401,097	11.450	100,274	$140.57	$14,095,455
Office Over 100,000	3	21.4%	784,550	32.230	261,517	$138.42	$36,198,520
Office Condominium	1	7.1%	11,515	0.260	11,515	$66.14	$761,604
Office: Flex Building	1	7.1%	69,259	7.400	69,259	$141.54	$9,803,030
2001 to 2005	**2**	**--**	**268,694**	**7.855**	**134,347**	**$96.20**	**$12,923,547**
Office Under 15,000 SF	0	0.0%	0	0.000	0	$0.00	$0
Office 15,000 to 50,000 SF	0	0.0%	0	0.000	0	$0.00	$0
Office 50,000 SF to 100,000 SF	1	50.0%	56,034	6.710	56,034	$130.20	$7,295,651
Office Over 100,000	1	50.0%	212,660	9.000	212,660	$87.24	$18,551,444
Office Condominium	0	0.0%	0	0.000	0	$0.00	$0
Office: Flex Building	0	0.0%	0	0.000	0	$0.00	$0
2006 to 2010	**1**	**--**	**321,959**	**0.000**	**0**	**$0.00**	**$0**
Office Under 15,000 SF	0	0.0%	0	0.000	0	$0.00	$0
Office 15,000 to 50,000 SF	0	0.0%	0	0.000	0	$0.00	$0
Office 50,000 SF to 100,000 SF	0	0.0%	0	0.000	0	$0.00	$0
Office Over 100,000	1	100.0%	321,959	10.630	321,959	$55.36	$17,823,209
Office Condominium	0	0.0%	0	0.000	0	$0.00	$0
Office: Flex Building	0	0.0%	0	0.000	0	$0.00	$0
TOTAL	**76**	**--**	**5,888,287**	**8.181**	**77,477**	**$116.57**	**$9,031,648**
Office Under 15,000 SF	9	11.8%	74,182	1.140	8,242	$135.97	$1,120,709
Office 15,000 to 50,000 SF	17	22.4%	547,484	4.210	32,205	$120.13	$3,868,756
Office 50,000 SF to 100,000 SF	24	31.6%	1,842,469	8.363	76,770	$129.74	$9,959,935
Office Over 100,000	16	21.1%	2,744,440	17.231	171,528	$112.88	$19,361,552
Office Condominium	3	3.9%	69,566	0.803	23,189	$66.05	$1,531,539
Office: Flex Building	7	9.2%	610,146	8.734	87,164	$93.64	$8,161,734

Source: Montgomery County Board of Assessment and RKG Associates, Inc., 2011

Appendix Table 7-4
Office Development Trends
Montgomery County

Land Use	Buildings	Office Composition (% of Total)	Building SF	Acreage/Unit	Avg. SF/Building	Avg. Fair Market Value/SF	Avg. Fair Market Value/Building
PRE 1990	**946**	**--**	**32,952,039**	**2.765**	**34,833**	**$121.53**	**$4,233,412**
Office Under 15,000 SF	184	19.5%	1,528,745	0.902	8,308	$118.92	$988,053
Office 15,000 to 50,000 SF	260	27.5%	6,192,399	2.255	23,817	$125.21	$2,982,141
Office 50,000 SF to 100,000 SF	104	11.0%	8,990,243	6.108	86,445	$121.40	$10,494,123
Office Over 100,000	65	6.9%	13,401,424	16.098	206,176	$121.51	$25,052,404
Office Condominium	311	32.9%	1,721,656	0.181	5,536	$134.72	$745,768
Office: Flex Building	22	2.3%	1,117,572	5.690	50,799	$85.83	$4,360,015
1990 to 2000	**237**	**--**	**9,739,387**	**3.175**	**41,094**	**$115.06**	**$4,728,460**
Office Under 15,000 SF	27	11.4%	249,519	1.123	9,241	$141.38	$1,306,511
Office 15,000 to 50,000 SF	32	13.5%	930,952	3.641	29,092	$136.13	$3,960,360
Office 50,000 SF to 100,000 SF	23	9.7%	1,987,562	7.735	86,416	$134.61	$11,632,423
Office Over 100,000	17	7.2%	5,008,485	20.286	294,617	$100.68	$29,662,381
Office Condominium	131	55.3%	1,025,943	0.286	7,832	$144.94	$1,135,077
Office: Flex Building	7	3.0%	536,926	6.480	76,704	$71.03	$5,448,054
2001 to 2005	**79**	**--**	**6,322,648**	**3.904**	**80,034**	**$115.90**	**$9,275,825**
Office Under 15,000 SF	28	35.4%	251,930	2.097	8,998	$139.16	$1,252,059
Office 15,000 to 50,000 SF	10	12.7%	258,474	2.702	25,847	$139.29	$3,600,390
Office 50,000 SF to 100,000 SF	5	6.3%	364,783	5.222	72,957	$166.32	$12,133,861
Office Over 100,000	10	12.7%	4,766,818	16.235	476,682	$108.13	$51,544,276
Office Condominium	24	30.4%	600,835	0.750	25,035	$133.38	$3,339,128
Office: Flex Building	2	2.5%	79,808	8.095	39,904	$68.63	$2,738,725
2006 to 2010	**47**	**--**	**1,868,561**	**3.418**	**39,757**	**$106.03**	**$4,215,211**
Office Under 15,000 SF	11	23.4%	83,922	1.164	7,629	$117.47	$896,189
Office 15,000 to 50,000 SF	13	27.7%	380,705	2.203	29,285	$110.87	$3,246,783
Office 50,000 SF to 100,000 SF	5	10.6%	386,920	13.216	77,384	$126.00	$9,750,096
Office Over 100,000	4	8.5%	860,083	11.968	215,021	$90.50	$19,458,333
Office Condominium	13	27.7%	147,931	0.212	11,379	$124.61	$1,417,967
Office: Flex Building	1	2.1%	9,000	2.500	9,000	$114.59	$1,031,266
TOTAL	**1,309**	**--**	**50,882,635**	**2.931**	**38,871**	**$119.03**	**$4,626,706**
Office Under 15,000 SF	250	19.1%	2,114,116	1.071	8,456	$123.93	$1,047,973
Office 15,000 to 50,000 SF	315	24.1%	7,762,530	2.408	24,643	$126.29	$3,112,064
Office 50,000 SF to 100,000 SF	137	10.5%	11,729,508	6.609	85,617	$125.18	$10,717,915
Office Over 100,000	96	7.3%	24,036,810	16.682	250,383	$113.41	$28,395,238
Office Condominium	479	36.6%	3,496,365	0.239	7,299	$137.06	$1,000,421
Office: Flex Building	32	2.4%	1,743,306	5.913	54,478	$80.63	$4,392,670

Source: Montgomery County Board of Assessment and RKG Associates, Inc., 2011

Appendix Table 7-5
Industrial Development Trends
Horsham Township

Land Use	Buildings	Industrial Composition (% of Total)	Building SF	Acreage/ Building	Avg. SF/Building	Avg. Fair Market Value/SF	Avg. Fair Market Value/Building
PRE 1990	**56**	**--**	**2,194,074**	**4.318**	**39,180**	**$64.61**	**$2,531,266**
Industrial Under 15,000 SF	19	33.9%	133,788	1.566	7,041	$71.61	$504,240
Industrial 15,000 SF to 100,000 SF	32	57.1%	1,415,210	4.778	44,225	$65.63	$2,902,503
Industrial Over 100,000 SF	5	8.9%	645,077	11.828	129,015	$60.91	$7,858,056
Cold Storage and Meat Packing Plants	0	0.0%	0	0.000	0	$0.00	$0
Industrial Condominium	0	0.0%	0	0.000	0	$0.00	$0
Other Industrial	0	0.0%	0	0.000	0	$0.00	$0
1990 to 2000	**1**	**--**	**90,644**	**7.960**	**90,644**	**$58.24**	**$5,279,421**
Industrial Under 15,000 SF	0	0.0%	0	0.000	0	$0.00	$0
Industrial 15,000 SF to 100,000 SF	1	100.0%	90,644	7.960	90,644	$58.24	$5,279,421
Industrial Over 100,000 SF	0	0.0%	0	0.000	0	$0.00	$0
Cold Storage and Meat Packing Plants	0	0.0%	0	0.000	0	$0.00	$0
Industrial Condominium	0	0.0%	0	0.000	0	$0.00	$0
Other Industrial	0	0.0%	0	0.000	0	$0.00	$0
2001 to 2005	**0**	**--**	**0**	**0.000**	**0**	**$0.00**	**$0**
Industrial Under 15,000 SF	0	0.0%	0	0.000	0	$0.00	$0
Industrial 15,000 SF to 100,000 SF	0	0.0%	0	0.000	0	$0.00	$0
Industrial Over 100,000 SF	0	0.0%	0	0.000	0	$0.00	$0
Cold Storage and Meat Packing Plants	0	0.0%	0	0.000	0	$0.00	$0
Industrial Condominium	0	0.0%	0	0.000	0	$0.00	$0
Other Industrial	0	0.0%	0	0.000	0	$0.00	$0
2006 to 2010	**0**	**--**	**0**	**0.000**	**0**	**$0.00**	**$0**
Industrial Under 15,000 SF	0	0.0%	0	0.000	0	$0.00	$0
Industrial 15,000 SF to 100,000 SF	0	0.0%	0	0.000	0	$0.00	$0
Industrial Over 100,000 SF	0	0.0%	0	0.000	0	$0.00	$0
Cold Storage and Meat Packing Plants	0	0.0%	0	0.000	0	$0.00	$0
Industrial Condominium	0	0.0%	0	0.000	0	$0.00	$0
Other Industrial	0	0.0%	0	0.000	0	$0.00	$0
TOTAL	**57**	**--**	**2,284,718**	**4.382**	**40,083**	**$64.35**	**$2,579,480**
Industrial Under 15,000 SF	19	33.3%	133,788	1.566	7,041	$71.61	$504,240
Industrial 15,000 SF to 100,000 SF	33	57.9%	1,505,854	4.874	45,632	$65.19	$2,974,531
Industrial Over 100,000 SF	5	8.8%	645,077	11.828	129,015	$60.91	$7,858,056
Cold Storage and Meat Packing Plants	0	0.0%	0	0.000	0	$0.00	$0
Industrial Condominium	0	0.0%	0	0.000	0	$0.00	$0
Other Industrial	0	0.0%	0	0.000	0	$0.00	$0

Source: Montgomery County Board of Assessment and RKG Associates, Inc., 2011

Appendix Table 7-6
Industrial Development Trends
Montgomery County

Land Use	Buildings	Industrial Composition (% of Total)	Building SF	Acreage/ Building	Avg. SF/Building	Avg. Fair Market Value/SF	Avg. Fair Market Value/Building
PRE 1990	**1,851**	**--**	**67,789,214**	**4.009**	**36,623**	**$42.33**	**$1,550,115**
Industrial Under 15,000 SF	727	39.3%	5,726,776	1.165	7,877	$55.88	$440,186
Industrial 15,000 SF to 100,000 SF	779	42.1%	28,448,017	3.961	36,519	$48.55	$1,772,995
Industrial Over 100,000 SF	113	6.1%	26,146,336	26.444	231,384	$35.08	$8,117,023
Cold Storage and Meat Packing Plants	14	0.8%	1,069,261	7.676	76,376	$43.33	$3,309,410
Industrial Condominium	188	10.2%	4,717,374	1.412	25,092	$35.03	$879,104
Other Industrial	30	1.6%	1,681,451	4.227	56,048	$23.35	$1,308,587
1990 to 2000	**196**	**--**	**5,816,730**	**3.385**	**29,677**	**$60.83**	**$1,805,117**
Industrial Under 15,000 SF	57	29.1%	532,871	2.153	9,349	$70.58	$659,843
Industrial 15,000 SF to 100,000 SF	70	35.7%	2,640,062	4.552	37,715	$61.39	$2,315,227
Industrial Over 100,000 SF	11	5.6%	2,127,627	18.200	193,421	$55.90	$10,811,793
Cold Storage and Meat Packing Plants	0	0.0%	0	0.000	0	$0.00	$0
Industrial Condominium	58	29.6%	516,170	0.377	8,899	$68.19	$606,830
Other Industrial	0	0.0%	0	0.000	0	$0.00	$0
2001 to 2005	**82**	**--**	**2,309,595**	**3.288**	**28,166**	**$61.00**	**$1,718,031**
Industrial Under 15,000 SF	15	18.3%	201,953	3.357	13,464	$69.40	$934,395
Industrial 15,000 SF to 100,000 SF	31	37.8%	1,721,589	6.212	55,535	$56.71	$3,149,258
Industrial Over 100,000 SF	0	0.0%	0	0.000	0	$0.00	$0
Cold Storage and Meat Packing Plants	0	0.0%	0	0.000	0	$0.00	$0
Industrial Condominium	36	43.9%	386,053	0.741	10,724	$75.73	$812,099
Other Industrial	0	0.0%	0	0.000	0	$0.00	$0
2006 to 2010	**57**	**--**	**1,319,389**	**2.823**	**23,147**	**$65.67**	**$1,520,049**
Industrial Under 15,000 SF	19	33.3%	145,338	1.900	7,649	$84.04	$642,860
Industrial 15,000 SF to 100,000 SF	15	26.3%	525,879	5.011	35,059	$61.26	$2,147,687
Industrial Over 100,000 SF	1	1.8%	160,000	21.160	160,000	$55.65	$8,903,922
Cold Storage and Meat Packing Plants	0	0.0%	0	0.000	0	$0.00	$0
Industrial Condominium	22	38.6%	488,172	1.295	22,190	$68.23	$1,514,056
Other Industrial	0	0.0%	0	0.000	0	$0.00	$0
TOTAL	**2,186**	**--**	**77,234,928**	**3.895**	**35,332**	**$44.52**	**$1,572,906**
Industrial Under 15,000 SF	818	37.4%	6,606,938	1.291	8,077	$56.25	$454,330
Industrial 15,000 SF to 100,000 SF	895	40.9%	33,335,546	4.102	37,246	$50.19	$1,869,353
Industrial Over 100,000 SF	125	5.7%	28,433,963	25.676	227,472	$36.75	$8,360,458
Cold Storage and Meat Packing Plants	14	0.6%	1,069,261	7.676	76,376	$43.33	$3,309,410
Industrial Condominium	304	13.9%	6,107,769	1.127	20,091	$43.06	$865,173
Other Industrial	30	1.4%	1,681,451	4.227	56,048	$23.35	$1,308,587

Source: Montgomery County Board of Assessment and RKG Associates, Inc., 2011

Appendix Table 7-7
Retail Development Trends
Horsham Township

Land Use	Buildings	Retail Composition (% of Total)	Building SF	Acreage/ Building	Avg. SF/Building	Avg. Fair Market Value/SF	Avg. Fair Market Value/Building
PRE 1990	**174**	**--**	**1,112,812**	**3.085**	**6,395**	**$110.07**	**$703,979**
General Retail [1]	27	15.5%	238,048	2.368	8,817	$102.55	$904,142
Mixed-Use Retail (Retail, Office, Apts.)	78	44.8%	375,559	0.871	4,815	$73.60	$354,361
Mall Stores and Department Stores [2]	0	0.0%	0	0.000	0	$0.00	$0
Restaurants/Bars	18	10.3%	128,299	1.499	7,128	$128.91	$918,837
Shopping Center with Grocery	0	0.0%	0	0.000	0	$0.00	$0
Stand-Alone Grocery	0	0.0%	0	0.000	0	$0.00	$0
Convenience [3]	4	2.3%	11,088	0.575	2,772	$162.67	$450,949
Auto Services [4]	31	17.8%	216,750	0.965	6,992	$82.58	$577,418
Entertainment/Golf/Recreation [5]	8	4.6%	89,445	42.078	11,181	$302.08	$3,377,447
Personal Services [6]	5	2.9%	31,302	1.118	6,260	$117.70	$736,845
Bank	3	1.7%	22,320	1.157	7,440	$156.52	$1,164,557
1990 to 2000	**11**	**--**	**165,422**	**4.335**	**15,038**	**$169.00**	**$2,541,518**
General Retail [1]	4	36.4%	73,357	2.835	18,339	$118.94	$2,181,310
Mixed-Use Retail (Retail, Office, Apts.)	0	0.0%	0	0.000	0	$0.00	$0
Mall Stores and Department Stores [2]	0	0.0%	0	0.000	0	$0.00	$0
Restaurants/Bars	2	18.2%	6,205	1.170	3,103	$323.98	$1,005,134
Shopping Center with Grocery	1	9.1%	75,164	8.140	75,164	$176.22	$13,245,223
Stand-Alone Grocery	0	0.0%	0	0.000	0	$0.00	$0
Convenience [3]	1	9.1%	2,344	1.280	2,344	$347.06	$813,458
Auto Services [4]	1	9.1%	576	1.900	576	$1,414.48	$814,742
Entertainment/Golf/Recreation [5]	1	9.1%	0	22.520	0	$0.00	$1,105,169
Personal Services [6]	1	9.1%	7,776	0.170	7,776	$159.80	$1,242,602
Bank	0	0.0%	0	0.000	0	$0.00	$0
2001 to 2005	**6**	**--**	**136,631**	**4.595**	**22,772**	**$200.17**	**$4,558,161**
General Retail [1]	0	0.0%	0	0.000	0	$0.00	$0
Mixed-Use Retail (Retail, Office, Apts.)	0	0.0%	0	0.000	0	$0.00	$0
Mall Stores and Department Stores [2]	0	0.0%	0	0.000	0	$0.00	$0
Restaurants/Bars	1	16.7%	5,316	0.840	5,316	$91.44	$486,114
Shopping Center with Grocery	1	16.7%	110,113	13.350	110,113	$179.79	$19,797,415
Stand-Alone Grocery	0	0.0%	0	0.000	0	$0.00	$0
Convenience [3]	2	33.3%	9,374	4.575	4,687	$404.21	$1,894,537
Auto Services [4]	0	0.0%	0	0.000	0	$0.00	$0
Entertainment/Golf/Recreation [5]	0	0.0%	0	0.000	0	$0.00	$0
Personal Services [6]	1	16.7%	8,128	2.160	8,128	$164.88	$1,340,125
Bank	1	16.7%	3,700	2.070	3,700	$523.31	$1,936,239
2006 to 2010	**7**	**--**	**154,901**	**2.354**	**22,129**	**$164.41**	**$3,638,095**
General Retail [1]	0	0.0%	0	0.000	0	$0.00	$0
Mixed-Use Retail (Retail, Office, Apts.)	0	0.0%	0	0.000	0	$0.00	$0
Mall Stores and Department Stores [2]	0	0.0%	0	0.000	0	$0.00	$0
Restaurants/Bars	2	28.6%	14,611	1.090	7,306	$142.03	$1,037,629
Shopping Center with Grocery	2	28.6%	119,637	3.620	59,819	$155.17	$9,281,791
Stand-Alone Grocery	0	0.0%	0	0.000	0	$0.00	$0
Convenience [3]	1	14.3%	5,725	2.660	5,725	$372.24	$2,131,087
Auto Services [4]	0	0.0%	0	0.000	0	$0.00	$0
Entertainment/Golf/Recreation [5]	0	0.0%	0	0.000	0	$0.00	$0
Personal Services [6]	1	14.3%	10,371	2.300	10,371	$162.06	$1,680,731
Bank	1	14.3%	4,557	2.100	4,557	$222.96	$1,016,007
TOTAL	**198**	**--**	**1,569,765**	**3.174**	**7,928**	**$129.49**	**$1,026,589**
General Retail [1]	31	15.7%	311,405	2.428	10,045	$106.41	$1,068,938
Mixed-Use Retail (Retail, Office, Apts.)	78	39.4%	375,559	0.871	4,815	$73.60	$354,361
Mall Stores and Department Stores [2]	0	0.0%	0	0.000	0	$0.00	$0
Restaurants/Bars	23	11.6%	154,431	1.407	6,714	$136.70	$917,857
Shopping Center with Grocery	4	2.0%	304,914	7.183	76,229	$169.25	$12,901,555
Stand-Alone Grocery	0	0.0%	0	0.000	0	$0.00	$0
Convenience [3]	8	4.0%	28,531	1.924	3,566	$299.23	$1,067,177
Auto Services [4]	32	16.2%	217,326	0.994	6,791	$86.11	$584,834
Entertainment/Golf/Recreation [5]	9	4.5%	89,445	39.904	9,938	$314.44	$3,124,971
Personal Services [6]	8	4.0%	57,577	1.278	7,197	$138.04	$993,460
Bank	5	2.5%	30,577	1.528	6,115	$210.81	$1,289,184

[1] General Retail includes stand alone retail, home center, nurseries, strip stores w/o grocery, misc. commercial, and farmer's market

[2] Mall and Department Stores include mall stores, department stores, discount department stores, regional shopping center

[3] Convenience includes convience store, dairy store, and gas stations with a mini market

[4] Auto services includes auto service center, car wash, gas station (no market) repair shop, used car dealer, auto showroom

[5] Entertainment/Golf/Recreation includes bowling alley, golf courses, private recreational facilities and pools, skating rinks, tennis, theaters, and health spa. Some entertainment uses do not have heated building space (i.e. driving ranges, outdoor theaters, etc.).

[6] Personal Services includes animal hosptial, medical-dental care, funeral home, day care center, laundromat

Source: Montgomery County Board of Assessment and RKG Associates, Inc., 2011

Appendix Table 7-8
Retail Development Trends
Montgomery County

Land Use	Buildings	Retail Composition (% of Total)	Building SF	Acreage/ Building	Avg. SF/Building	Avg. Fair Market Value/SF	Avg. Fair Market Value/Building
PRE 1990	**6,861**	**--**	**60,658,582**	**1.232**	**8,841**	**$98.55**	**$871,260**
General Retail [1]	466	6.8%	6,408,341	2.156	13,752	$88.81	$1,221,267
Mixed-Use Retail (Retail, Office, Apts.)	4,229	61.6%	21,252,556	0.441	5,025	$80.51	$404,620
Mall Stores and Department Stores [2]	37	0.5%	12,462,245	16.025	336,817	$107.33	$36,149,595
Restaurants/Bars	461	6.7%	2,379,046	0.840	5,161	$131.60	$679,144
Shopping Center with Grocery	61	0.9%	6,591,089	9.698	108,051	$110.76	$11,967,413
Stand-Alone Grocery	15	0.2%	405,662	6.399	27,044	$166.73	$4,509,033
Convenience [3]	99	1.4%	254,361	0.579	2,569	$233.26	$599,303
Auto Services [4]	978	14.3%	6,738,289	1.115	6,890	$87.91	$605,658
Entertainment/Golf/Recreation [5]	117	1.7%	1,493,120	19.940	12,762	$128.00	$1,633,548
Personal Services [6]	249	3.6%	1,758,540	1.270	7,062	$133.32	$941,590
Bank	149	2.2%	915,333	0.825	6,143	$187.86	$1,154,043
1990 to 2000	**334**	**--**	**7,362,074**	**4.266**	**22,042**	**$150.13**	**$3,309,108**
General Retail [1]	44	13.2%	904,417	3.375	20,555	$151.07	$3,105,309
Mixed-Use Retail (Retail, Office, Apts.)	61	18.3%	516,119	1.362	8,461	$110.88	$938,138
Mall Stores and Department Stores [2]	20	6.0%	1,632,440	6.509	81,622	$129.56	$10,574,581
Restaurants/Bars	23	6.9%	121,456	2.553	5,281	$279.26	$1,474,697
Shopping Center with Grocery	15	4.5%	2,225,932	19.268	148,395	$139.11	$20,643,214
Stand-Alone Grocery	7	2.1%	297,107	4.761	42,444	$244.62	$10,382,724
Convenience [3]	30	9.0%	80,672	0.915	2,689	$347.07	$933,304
Auto Services [4]	58	17.4%	399,571	2.105	6,889	$168.18	$1,158,605
Entertainment/Golf/Recreation [5]	10	3.0%	287,936	40.220	28,794	$238.90	$6,878,781
Personal Services [6]	39	11.7%	769,190	2.500	19,723	$106.20	$2,094,477
Bank	27	8.1%	127,234			$298.46	$1,406,461
2001 to 2005	**145**	**--**	**2,429,500**	**4.111**	**16,755**	**$167.59**	**$2,808,061**
General Retail [1]	21	14.5%	335,604	4.132	15,981	$148.76	$2,377,431
Mixed-Use Retail (Retail, Office, Apts.)	13	9.0%	128,305	0.912	9,870	$129.03	$1,273,523
Mall Stores and Department Stores [2]	18	12.4%	927,216	5.161	51,512	$146.32	$7,537,058
Restaurants/Bars	21	14.5%	112,049	1.463	5,336	$263.57	$1,406,301
Shopping Center with Grocery	3	2.1%	147,841	7.100	49,280	$197.05	$9,710,808
Stand-Alone Grocery	0	0.0%	0	0.000	0	$0.00	$0
Convenience [3]	14	9.7%	54,275				
Auto Services [4]	20	13.8%	290,746	4.354	14,537	$163.33	$2,374,314
Entertainment/Golf/Recreation [5]	6	4.1%	223,154	31.553	37,192	$171.36	$6,373,443
Personal Services [6]	15	10.3%	157,249	1.762	10,483	$147.32	$1,544,427
Bank	14	9.7%	53,062	1.453	3,790	$398.13	$1,508,979
2006 to 2010	**115**	**--**	**3,752,203**	**5.131**	**32,628**	**$140.52**	**$4,584,966**
General Retail [1]	18	15.7%	588,133	6.722	32,674	$145.53	$4,755,110
Mixed-Use Retail (Retail, Office, Apts.)	5	4.3%	103,019	0.992	20,604	$54.92	$1,131,586
Mall Stores and Department Stores [2]	16	13.9%	1,443,303	11.047	90,206	$123.15	$11,109,225
Restaurants/Bars	17	14.8%	68,226	0.929	4,013	$250.36	$1,004,779
Shopping Center with Grocery	7	6.1%	865,402	19.963	123,629	$126.37	$15,622,906
Stand-Alone Grocery	2	1.7%	254,696	9.200	127,348	$168.93	$21,512,991
Convenience [3]	8	7.0%	31,098	2.724	3,887	$301.41	$1,171,653
Auto Services [4]	16	13.9%	211,610	3.174	13,226	$175.56	$2,321,875
Entertainment/Golf/Recreation [5]	1	0.9%	42,436	5.010	42,436	$122.04	$5,178,877
Personal Services [6]	7	6.1%	83,509	2.066	11,930	$167.86	$2,002,585
Bank	18	15.7%	60,771	1.187	3,376	$379.88	$1,282,545
TOTAL	**7,455**	**--**	**74,202,360**	**1.485**	**9,953**	**$108.05**	**$1,075,439**
General Retail [1]	549	7.4%	8,236,495	2.479	15,003	$102.14	$1,532,354
Mixed-Use Retail (Retail, Office, Apts.)	4,308	57.8%	22,000,000	0.456	5,107	$81.39	$415,640
Mall Stores and Department Stores [2]	91	1.2%	16,465,204	10.909	180,936	$113.11	$20,466,388
Restaurants/Bars	522	7.0%	2,680,777	0.943	5,136	$146.83	$754,055
Shopping Center with Grocery	86	1.2%	9,830,264	12.112	114,305	$119.85	$13,699,455
Stand-Alone Grocery	24	0.3%	957,465	6.155	39,894	$191.49	$7,639,189
Convenience [3]	151	2.0%	420,405	0.901	2,784	$268.88	$748,606
Auto Services [4]	1,072	14.4%	7,640,216	1.260	7,127	$97.40	$694,187
Entertainment/Golf/Recreation [5]	134	1.8%	2,046,646	21.862	15,273	$148.21	$2,263,675
Personal Services [6]	310	4.2%	2,768,488	1.467	8,931	$127.62	$1,139,758
Bank	208	2.8%	1,156,400	0.949	5,560	$219.77	$1,221,819

[1] General Retail includes stand alone retail, home center, nurseries, strip stores w/o grocery, misc. commercial, and farmer's market

[2] Mall and Department Stores include mall stores, department stores, discount department stores, regional shopping center

[3] Convenience includes convience store, dairy store, and gas stations with a mini market

[4] Auto services includes auto service center, car wash, gas station (no market) repair shop, used car dealer, auto showroom

[5] Entertainment/Golf/Recreation includes bowling alley, golf courses, private recreational facilities and pools, skating rinks, tennis, theaters, and health spa. Some entertainment uses do not have heated building space (i.e. driving ranges, outdoor theaters, etc.).

[6] Personal Services includes animal hosptial, medical-dental care, funeral home, day care center, laundromat

Source: Montgomery County Board of Assessment and RKG Associates, Inc., 2011

8 AVIATION MARKET ASSESSMENT

A. INTRODUCTION

The NAS-JRB has been used for aviation purposes for more than sixty years. Given the significant level of aviation infrastructure which exists at the facility, it makes sense to consider aviation as one of the components of the redevelopment plan. The property includes a single 8,000 foot runway, as well as four existing hangars and various taxiways and aprons to accommodate aircraft.

In order to evaluate the potential for aviation uses, the RKG Team has examined the presence of competing airports within the Greater Philadelphia metropolitan region to determine the type of aviation facilities that each airport has. For purposes of this analysis, competing airports were defined as those airports within 40 miles of the NAS-JRB property that have at least one runway in excess of 5,000 feet. In addition, the activity levels and the number and types of based aircraft at each facility are summarized. This information is used to evaluate how the facilities at Willow Grove measure up from a competitive position.

Additional information regarding the number and types of aircraft which are registered to owners in Bucks, Montgomery and Philadelphia counties is also reviewed, to provide context for the potential for organic growth in the number of aircraft to provide a user base for Willow Grove. Finally, the consultants conducted a general survey of existing corporate/civilian aircraft owners to gauge their interest in a corporate air facility at NAS-JRB Willow Grove.

B. SUMMARY OF MAJOR FINDINGS

- Registered Aircraft - The 3-county region of Bucks, Montgomery and Philadelphia counties have more than 1,250 registered aircraft, according to the FAA's (Federal Aviation Administration) ownership database. Of these aircraft, 93% are small, general aviation-style aircraft. Only 7% of aircraft in the 3- county region weigh more than 12,500 lbs.. Philadelphia County has the highest concentration of larger aircraft, which account for almost 18% of registered aircraft in the county. Less than 5% of the aircraft registered in Bucks and Montgomery counties weigh in excess of 12,500 lbs.

- Competitive Airports - There are a substantial number of existing, competing airports in the region. According to AirNav.com, there are a total of 25 existing airports within 30 miles of Horsham. Within forty miles, there are seven competing airports with runways of at least 5,000 feet, a common threshold for business jet aircraft. Competing airports include: (1) Philadelphia Northeast, (2) Trenton/Mercer, (3) Philadelphia International, (4) Lehigh Valley International, (5) Chester County, (6) New Castle (Delaware) and (7) Reading Regional.

- Airport Operations - The overall average number of operations per year for competing

airports is skewed by Philadelphia International, which has 650,000 operations annually. Excluding PHL, the average number of operations for the competing airports is just under 90,000.

- Runway Lengths - Philadelphia International has the longest runway, at more than 10,500 feet. Three of the competing airports have runways of 7,000 feet or more. Chester County Airport has the shortest runway at 5,400 feet. Chester County is also the only competing facility without a crosswind runway similar to NAS-JRB Willow Grove. All of the crosswind runways are at least 4,800 feet long.

- Hangar Demand - Although all of the facilities did not provide specific information regarding their hangars, those that did indicated that they did not have a waiting list for large hangar space to support business jets.

- Aircraft Maintenance - The aircraft maintenance, repair and overhaul sector could offer some employment opportunities if the airfield at NAS-JRB remains active. However, the industry has been impacted by the economic downturn of the past several years, as new aircraft deliveries have declined, as have the number of flight hours that existing aircraft have been used. These factors combine to result in what the FAA indicates is a third consecutive year of declines in the market for general aviation products and services, which was in excess of 20% in 2009.

- Air Cargo - A review of freight and air cargo issues indicates that the NAS-JRB runway might be shorter than required for a significant cargo operation. The PHL runway is expected to be upgraded to 12,000 feet to support more cargo activity, and a planned cargo-only airport in Hazelton, PA envisioned a 13,000 foot runway. It is estimated that for every 50,000 tons of freight moved through a cargo airport in Pennsylvania, 287 jobs direct jobs are created, and almost 4,100 vehicle trips are generated each weekday.

- Economic Impact - In order to estimate the potential job creation associated with passenger service, it was necessary to prepare an evaluation based on factors developed in other impact analyses. Using a study from the Center for Transportation Studies at the University of Minnesota as a benchmark, it is estimated that for every $1 million in small-scale commercial scheduled service activity, roughly 12 total jobs are created .

- Emergency Preparedness - While the redevelopment of NAS-JRB as an emergency preparedness center may provide a valuable public benefit, the fact that the Commonwealth of Pennsylvania was unable to secure the necessary commitments to fund the operation is a significant concern. In particular, the national economy has declined substantially since Governor Rendell's interagency plan was originally conceived, and growing public concern over government spending has increased. As such, any reuse of the facility for an emergency preparedness center would be heavily dependent on the availability of government funding both for annual operations and for capital improvements.

  Exacerbating these financial concerns, the Navy's mothballing of facilities could require between $8 and $24 million to reactivate the existing hangars and airport operations terminal. In addition, the Navy is also removing airport navigational aids, and the runway pavements are likely to require investment if they are unused for an extended period.

C. ANALYSIS OF REGIONAL AIRCRAFT OWNERSHIP

1. Prevailing Trends in Corporate Aircraft Ownership

In order to understand the characteristics of aircraft ownership in the region, a database of aircraft owners was obtained from from the Federal Aviation Administration (FAA). Data for Bucks, Montgomery and Philadelphia counties were obtained in order to document the number and types of aircraft which are registered within the region.

The information from the FAA was used to determine the size characteristics of regional aircraft. The FAA classifies aircraft by weight, using three categories: (1) aircraft up to 12,499 lbs.; (2) aircraft 12,500 lbs. to 19,999 lbs.; and (3) aircraft 20,000 lbs. and over. Aircraft under 12,500 lbs. are defined as small aircraft by the FAA and include all light general aviation aircraft. Some of the larger aircraft in this class include:

- Cessna Citation Jet CJ1, CJ2;
- Beech King Air C90;
- All Very Light Jets (VLJ); and
- Cessna 402 (one of the limited number of general aviation aircraft sometimes used for passenger service.

There are a relatively small number of aircraft between 12,500 and 19,999 lbs.. Examples include some smaller business jets, such as Cessna Citation CJ3, CJ4, XLS, and Beech jet. Some small turboprop airliners (19 passengers) include: Beech 1900D, and JetStream 31.

All remaining aircraft fall into FAA's 20,000 lbs. and up category. This would include most corporate jets, and all airliners in production. Table 8-1 summarizes data related to the distribution of aircraft by weight for Bucks, Montgomery and Philadelphia counties. As shown in the Table, of the 1,253 aircraft registered in the region, 1,165 (93%) weigh less than 12,500 lbs.. Only 3% (37 aircraft) of the aircraft fall in to the largest category (over 20,000 lbs.), with the remaining 51 aircraft (4%) falling into the mid-range weight category.

Table 8-1
Regional Distribution of Aircraft by Weight (2011)

Aircraft Weight	Number	Percentage
Up to 12,499 pounds	1,165	93.0%
12,500 to 19,999 pounds	51	4.1%
20,000 pounds and over	37	3.0%
Total	1,253	100.0%

Source: FAA Aircraft Ownership Database

Corporate Jet (36,000 lbs.)

The FAA data was further evaluated to determine the type of aircraft within the region. As shown in Table 8-1, aircraft under 12,500 lbs., which do not typically require longer runways, account for 93% of aircraft owned in the three counties. According to the AirNav.com aviation database, there are 11 existing airports within 20 miles of Horsham, 25 existing airports within 30 miles of Horsham and 59 existing airports within 50 miles of Horsham (Figure 8-1).

Figure 8-1

The FAA includes data on every registered aircraft, including hot air balloons, helicopters, ultra-lights, gliders and fixed wing aircraft (Table 8-2). From a general aviation perspective, single-engine aircraft are primarily used for recreational flying, though they are sometimes used for business travel for one to four people for trips of 200 to 500 miles. Larger twin-engine piston planes are used for recreational flying as well as business uses, due to their longer range, speed and capacity (4-6 people). Larger aircraft, including business jets (turbofans), are used primarily by businesses and individuals for transporting people over longer distances. However, due to the acquisition and operating costs associated with these larger aircraft, many companies have forsaken sole ownership in favor of shared, or fractional, ownership through services such as Net Jets and Jet Alliance.

Table 8-2
Regional Inventory of FAA Registered Aircraft

Type	Number	% of Total
Balloon	33	2.63%
Gliders	37	2.95%
Helicopters	121	9.66%
Jets	39	3.11%
Miscelleneous	41	3.27%
Single Engine	885	70.63%
Twin Engines	97	7.74%
Total	**1,253**	**100.00%**

Source: FAA Aircraft Ownership Database

The vast majority of aircraft (70.6%) in the three-county region are single engine aircraft (Table 8-2). The 3-county region of Bucks, Montgomery and Philadelphia counties was selected as representative of the supply of aircraft in the region that could utilize NAS-JRB as a basing location. Traditional single engine aircraft account for more than 70% of registered aircraft in the region. Helicopters represent the second largest concentration in the region, accounting for more than 9.6% of the total. There are almost 100 twin engine airplanes in the region, accounting for 7.7% of

the total. Jet aircraft account for just over 3% of the total, with 39 registered jets in the marketplace.

There are three existing airports which can support general aviation within ten miles of NAS-JRB, including Wings Field, Philadelphia Northeast (PNE) and Doylestown airports. These facilities all have the capability to support small general aviation aircraft, and PNE has the capability to support business jet aircraft as well. These facilities have available capacity, though Doylestown reportedly has an extensive waiting list for hangar space for general aviation aircraft. Given the number of existing general aviation airfields in the region, it is anticipated that any aviation use at NAS-JRB Willow Grove will be targeted primarily at the upper end of the market - primarily business jets. Some supporters of aviation use at the former base have indicated that this market segment could easily be supported at the facility.

The data indicate that there are 39 jet aircraft registered within the 3-county region, which represent only 3.8% of the total number of registered planes in the region. Data from AirNav.com indicate that 31 jet aircraft are based at the two Philadelphia airports (the only airports in the three counties with runways in excess of 5,000 feet), meaning at least 8 jet aircraft owned by entities within the three county region are based outside the area.

In the larger context, the FAA indicates that the general aviation industry has been negatively affected by the worldwide economic slowdown, but expects resumed growth in the future. In its FAA Aerospace Forecast for Fiscal Years 2011-2031, the FAA indicates,

> *"The downturn in the economy has dampened the near-term prospects for the general aviation industry, but the long-term outlook remains favorable. We see growth in business aviation demand over the long term driven by a growing U.S. and world economy. As the fleet grows, the number of general aviation hours flown is projected to increase an average of 2.2 percent a year through 2031."*

Furthermore, the FAA notes growth expectations for general aviation aircraft, including jet aircraft. General aviation jet aircraft are projected to grow by 4.2% annually, while the entire general aviation fleet is projected to increase at just 0.9% annually. In the context of the 39 jet aircraft currently owned in the 3-county region, 4.2% annual growth would result in eleven new jet aircraft over a 10-year period.

2. Bucks County Aircraft Ownership

According to data from the FAA's aircraft ownership database, there are almost 600 aircraft registered to owner addresses in Bucks County, PA. Of these aircraft, 95% (565) are smaller aircraft under 12,500 lbs. (Table 8-3). Of the remaining 30 aircraft, the vast majority are helicopters, which account for 23 of the remaining aircraft. Six business jets, including three weighing more than 20,000 lbs., and three weighing less than 20,000 lbs., are also registered in Bucks County.

Table 8-3
Bucks County-Based Aircraft by Weight (2011)

Aircraft Weight	Number	Percentage
Up to 12,499 pounds	565	95.0%
12,500 to 19,999 pounds	27	4.5%
20,000 pounds and over	3	0.5%
Total	**595**	**100.0%**

Source: FAA Aircraft Ownership Database

3. Montgomery County Aircraft Ownership

The FAA aircraft ownership data also indicate that there are 429 aircraft registered to owner addresses in Montgomery County, PA (Table 8-4). Of these 429 aircrafts, 96% (412) are

smaller aircraft under 12,500 lbs.. Of the remaining 17 aircraft, 10 weigh less than 20,000 lbs. and 7 weigh more than 20,000 lbs.. These 17 larger aircraft include 15 jets, one helicopter and one twin engine airplane.

Table 8-4

Montgomery County-Based Aircraft by Weight (2011)

Aircraft Weight	Number	Percentage
Up to 12,499 pounds	412	96.0%
12,500 to 19,999 pounds	10	2.3%
20,000 pounds and over	7	1.6%
Total	**429**	**100.0%**

Source: FAA Aircraft Ownership Database

4. Philadelphia County Aircraft Ownership

According to data from the FAA's aircraft ownership database, there are 229 aircraft registered to owner addresses in Philadelphia County, PA (Table 8-5). Of these 229 aircraft, 82% (188) are smaller aircraft under 12,500 lbs.. This is the lowest concentration of small aircraft among the three counties, with Bucks and Montgomery counties each having at least 95% small aircraft. Of the remaining 41 aircraft, 14 weigh less than 20,000 lbs. and 27 weigh more than 20,000 lbs.. Among these 41 larger aircraft are 24 helicopters, many of which are owned by Augusta Westland, which is headquartered at the Philadelphia Northeast Airport. The remaining 17 aircraft include 15 jets, as well as one single engine airplane and one twin engine airplane.

Table 8-5

Philadelphia County-Based Aircraft by Weight (2011)

Aircraft Weight	Number	Percentage
Up to 12,499 pounds	188	82.1%
12,500 to 19,999 pounds	14	6.1%
20,000 pounds and over	27	11.8%
Total	**229**	**100.0%**

Source: FAA Aircraft Ownership Database

D. COMPETITIVE SUPPLY OF AIRPORTS WITH RUNWAYS EXCEEDING 5,000 FEET

In order to evaluate the potential for aviation uses at NAS-JRB Willow Grove, existing airfields with runways 5,000 feet or longer, which are located within 40 miles of the base were evaluated. These airports are considered competitive based on their ability to support business jets, which typically require a minimum runway length of 5,000 feet. Table 8-6 provides a summary of the airports identified as potential competitors. The consultants contacted each airfield to review their available facilities. In addition, public information on each facility was also reviewed.

Table 8-6

Corporate Airports Serving Greater Philadelphia Market

Airport ID	Airport Name	Location
PNE	Northeast Philadelphia Airport	Philadelphia, PA
TTN	Trenton/Mercer County Airport	Trenton, NJ
PHL	Philadelphia International Airport	Philadelphia, PA
ABE	Lehigh Valley International Airport	Allentown, PA
MQS	Chester County G.O. Carlson Airport	Coastville, PA
ILG	New Castle Airport	Wilmington, DE
RDG	Reading Regional/Carl A Spaatz Field Airport	Reading, PA

Source: AirNav.com

1. NAS-JRB Willow Grove Airfield Facilities, Horsham, PA

The NAS-JRB airfield's dominant feature is a single runway, oriented at 15/33. The runway is 8,000 feet long and 200 feet wide. The NAS- JRB is located just a few miles north of the Pennsylvania Turnpike, with access via Route 611 (Easton Road) or Route 463 (Horsham Road). At the present time, the facility has no based aircraft, as the Navy has relocated its aircraft in accordance with the recommendations of the 2005 Base Realignment and Closure (BRAC) decision, and the facility is not currently open to non-military aircraft.

a.) Aircraft Operations[1]
At the present time, NAS-JRB Willow Grove runway is operationally closed and the base is in a 'cold iron' layaway status

the NAS-JRB has no aircraft operations, as the Navy has relocated its fleet of aircraft, and the facility is not open to non-military aircraft.

b.) Runway Lengths
NAS-JRB Willow Grove has a single runway, measuring 8,000 feet by 200 feet. The facility also has a parallel taxiway located east of the runway. There are also two larger taxiways (G and J), estimated to be 2,500 feet by 300 feet and 3,250 feet by 200 feet respectively, located in the southwest end of the base.

c.) Hangar Facilities
The base has existing hangars, ranging from as small as 19,000 square feet to as large as 129,000. The largest hangar is more than 55 years old. The remaining hangars were reportedly constructed between 1977 and 1989. The facilities were developed to support military aircraft, and generally have ceiling heights which are more than those required for typical non-military aircraft. In addition, the Navy's mothballing program for buildings will leave these facilities without water, sewer, electrical or fire protection service at least until property transfer occurs.

The largest hangar at NAS-JRB is 129,000 SF

d.) Waiting List
Two NOI requests for use of the runway submitted by the Bucks County Airport Authority and Montgomery County were denied by the HLRA Board in July 2011.

e.) Major Tenants
No major tenants exist at the site, as it is not open to non-military uses at the present time.

f.) Aviation-Related Employment
There is no existing aviation-related employment at the site, as it is not open to non-military uses at the present time.

[1] An aircraft operation is either a takeoff or a landing.

2. Philadelphia Northeast Airport (PNE) Philadelphia, PA

The Philadelphia Northeast Airport (PNE) is located approximately 8 miles southeast of NAS-JRB. The facility is regarded as the primary "business airport" for companies which are seeking alternatives to Philadelphia International due to congestion, costs or other issues. The facility has 166 based aircraft, as summarized in Table 8-7. Among the based aircraft are jets, including corporate jets for Crown Cork, Ace Insurance, Keystone Aerial and Dart Swift, among others. Single engine aircraft are the most prevalent on the airfield, representing 65% of all aircraft at PNE. Multi-engine aircraft represent 26% of aircraft, while jets represent 8%.

Table 8-7

Philadelphia NE, PA (PNE) - Based Aircraft (2011)

Philadelphia NE, PA (PNE)	Single Engine	Multi Engine	Jet	Heli	Military	Other	Total
Aircraft	108	43	13	2			166
% of Total	65%	26%	8%	1%	0%	0%	100%

Source: AirNav.com

a.) Aircraft Operations

According to AirNav.com, PNE supported an average of 289 operations per day in 2009, or about 105,000 operations for the year. More than two-thirds of these operations are reported to be transient aircraft (68%), while 26% are reported to be local general aviation aircraft. Air taxi services account for the majority of the remainder (5%), with military operations representing 1%.

b.) Runway Lengths

PNE has two runways. Its primary runway (6/24) is 7,000 feet long and 150 feet wide. The crosswind runway (15/33) is 5,000 feet long and 150 feet wide.

c.) Hangar Facilities

According to the airport manager, the facility has 85 T-hangars, as well as 6 larger hangars, which are under the control of the airport's fixed base operator (FBO). PNE also has a significant number of aircraft tie-downs. In addition, several corporate users have constructed their own hangars on leased land at the airport. The airport reportedly does not have a waiting list for its large hangars.

d.) Major Tenants

The largest employer on the airport is Augusta Westland, a manufacturer of helicopters. The company's US headquarters is located in Reston, Virginia, and the PNE facility is a production plant, although it also provides maintenance services for Augusta clients. The reported employment for Augusta is estimated to be 550. Overall, the airport manager indicates total employment on the airfield of about 800, including 600 aviation-related jobs and 200 non-aviation jobs.

e.) Other Airport Data

The airport manager indicates that the airport operates at an annual deficit of more than $1 million, which is covered primarily through fees paid by air carriers at Philadelphia International Airport.

3. Trenton/Mercer Airport (TTN) Trenton Mercer, NJ

The Trenton/Mercer Airport (TTN) is located approximately 16 miles east of NAS-JRB. The facility has 154 based aircraft, as summarized in Table 8-8. Single engine aircraft represent just under half of the aircraft at TTN. Multi-engine aircraft represent 10% of aircraft, and jets also represent 10%. TTN has one of the highest concentrations of helicopters (21%).

Table 8-8

Trenton/Mercer County Airport (TTN) - Based Aircraft (2011)

Trenton, NJ (TTN)	Single Engine	Multi Engine	Jet	Heli	Military	Other	Total
Aircraft	74	15	16	33	16		154
% of Total	48%	10%	10%	21%	10%	0%	100%

Source: AirNav.com

a.) Aircraft Operations

According to AirNav.com, TTN supported an average of 234 operations per day in 2007, or about 85,000 operations for the year. Almost 60% of these operations are reported to be transient aircraft, while 28% are reported to be local general aviation aircraft. Air taxi services account for the majority of the remainder (9%), with military operations representing 3%. Though TTN also has some scheduled commercial air service, these operations accounted for less than 1% of activity.

b.) Runway Lengths

TTN has two runways. Its primary runway (6/24) is 6,006 feet long and 150 feet wide. The crosswind runway (16/34) is 4,800 feet long and 150 feet wide.

c.) Hangar Facilities

According to the airport manager, TTN has excess hangar capacity for business jets and other large aircraft. One of the FBOs constructed a new 50,000 square foot hangar several years ago, and it is estimated that it is 50% vacant. Additional large hangar space is also available. The airport manager also indicated that he has an 80,000 square foot former Navy hangar, which he referred to as a "white elephant". Though he had a company interested in retrofitting C130 aircraft in the hangar, it could not support the C130, and was not cost effective to renovate. He indicates that he would like to demolish the facility, but does not have a user for the site.

d.) Major Tenants

A number of companies have facilities at TTN, including Hess, Coventry, Pfizer, Unisys, Ronson and the National Guard. The airport manager also indicates that the availability of an airport was a key site selection criterion for Merrill Lynch's development of a 3 million square foot campus in the region.

e.) Other Airport Data

The airport manager indicates that TTN has a limited number of commercial flights. The airport had been without commercial air service for several years, and a new operator has recently begun flying between TTN and Hanscom Field outside Boston.

4. Philadelphia International Airport (PHL) Philadelphia, PA

The Philadelphia International Airport (PHL) is located approximately 38 miles southeast of NAS-JRB. The facility is regarded as the passenger service airport for the metropolitan region, with more than 15 million enplaned passengers in 2010. Due to its focus as an air carrier airport, PHL has relatively few based aircraft. The facility has 26 based aircraft, as summarized in Table 8-9. Jet aircraft are predominant at PHL, accounting for 69% of based aircraft. Multi-engine aircraft represent 23% of based aircraft at PHL, with single engine planes representing the remaining 8%. PHL has no based helicopters.

Table8-9

Philadelphia International Airport, PA (PHL) - Based Aircraft (2011)

Philadelphia, PA (PHL)	Single Engine	Multi Engine	Jet	Heli	Military	Other	Total
Aircraft	2	6	18				26
% of Total	8%	23%	69%	0%	0%	0%	100%

Source: AirNav.com

a.) Aircraft Operations

In its role as a major air carrier airport, PHL has a substantially higher level of activity than other airports in the region. Published data indicates that PHL has more than 650,000 aircraft operations annually. Air carrier operations account for approximately 262,000 operations annually. Air taxi and commuter aircraft operations each represent approximately 185,000 operations annually. General aviation operations account for just 3% of activity at PHL, though this translates to almost 20,000 operations annually.

b.) Runway Lengths

PHL has a total of four runways, including two primary parallel runways (9/27). Runway 9R/27L is 10,506 feet by 200 feet, while 9L/27R is 9,500 feet by 150 feet. PHL also has a shorter runway (8/26) which is 5,000 feet by 150 feet. The crosswind runway (17/35) at PHL is 6,501 feet by 150 feet.

c.) Hangar Facilities

A number of major corporations have aircraft based at PHL, including Comcast, Lincoln Financial, Berwind Realty, and Spectra. Discussions with the FBO indicate that hangar space is available for larger business aircraft, and that there is not a waiting list.

d.) Major Tenants

Due to PHL's position as a major regional air carrier airport and cargo center, the airport has a strong employment base. The PHL website indicates that the airport includes more than 200 businesses employing more than 34,000 people, though there is no company- specific information. PHL is the second largest hub for UPS, and has a reported 2,000 employees on-site.

e.) Other Airport Data

Thirty airlines provide more than 700 departures each day at PHL, with more than 15 million enplaned passengers in 2010. PHL indicates its economic impact exceeds $14 billion annually. The airport has been pursuing expansion, to include an extension of its primary runway, for many years. The expansion/renovation may require the relocation of UPS's facility

to another location on the airfield. The FBO provides hangar space and other services for based corporate aircraft.

5. Lehigh Valley International Airport (ABE) Allentown, PA

The Lehigh Valley International Airport (ABE) is located in Allentown, PA, approximately 32 miles northwest of NAS-JRB. The facility has 158 based aircraft (Table 8-10). Single engine aircraft represent approximately 44% of the aircraft at ABE. Multi-engine aircraft represent 9% of aircraft, while jets represent almost one-third of the based aircraft (31%). With 49 jets based at ABE, the airport has the largest concentration of based jets of the Pennsylvania airports evaluated as part of this analysis. ABE also has 20 based military aircraft (13%), as well as five helicopters (3%).

Table 8-10

Lehigh Valley International Airport, PA (ABE) - Based Aircraft (2011)

Allentown, PA (ABE)	Single Engine	Multi Engine	Jet	Heli	Military	Other	Total
Aircraft	70	14	49	5	20		158
% of Total	44%	9%	31%	3%	13%	0%	100%

Source: AirNav.com

a.) Aircraft Operations

According to AirNav.com, ABE supports an average of 297 operations per day in 2009, or about 108,000 operations for the year. Transient aircraft account for almost one-third of aircraft operations (32%), while 44% are reported to be local general aviation aircraft. Air taxi services account for the majority of the remainder (19%), while commercial operations account for approximately 4% of operations. ABE has a variety of scheduled service carriers, including US Airways, Delta, United and Air Tran. In addition, FedEx operates three flights daily at ABE.

b.) Runway Lengths

ABE has two runways. The primary runway (6/24) is 7,600 feet by 150 feet. The facility's crosswind runway (13/31) is 5,797 feet by 150 feet.

c.) Hangar Facilities

According to the airport manager, the facility has five large corporate hangars, ranging from 23,500 square feet to as large as 72,000 square feet. The airport management indicates that they have lost several based aircraft (business jets) in the past several years due to the economic downturn. The airport manager reports no waiting list for large hangar space.

d.) Major Tenants

The airport manager indicates that the primary airport-related employment at ABE is associated with direct operations. This includes airline counter and ramp personnel, FBO staff (owned/operated by ABE), and airport operations and maintenance staff. The airport manager indicates that there are no companies on the airfield which are considered to have aviation-related employment in terms of manufacturing or other MRO functions.

6. Chester County G.O. Carlson Airport, Coatesville, PA

The Chester County G.O. Carlson Airport (MQS) is located in Coatesville, PA, approximately 36 miles southwest of NAS-JRB and has 94 based aircraft (Table 8-11). Single engine aircraft represent the largest group of aircraft at MQS, accounting for 63% of based aircraft at ABE. Multi-engine aircraft represent 16% of aircraft, while jets represent 20% of the based *aircraft. MQS has a single helicopter based at the airfield.*

Table 8-11

Chester County Airport, PA (MQS) - Based Aircraft (2011)

Coatsville, PA (MQS)	Single Engine	Multi Engine	Jet	Heli	Military	Other	Total
Aircraft	59	15	19	1	-	-	94
% of Total	65%	16%	20%	1%	0%	0%	100%

Source: AirNav.com

a.) Aircraft Operations

According to AirNav.com, MQS supports an average of 142 operations per day in 2010, or about 52,000 operations for the year. Just over half of these operations are reported to be transient aircraft (55%), while 39% are reported to be local general aviation aircraft. Air taxi services account for the majority of the remainder (6%), with military operations representing less than 1%.

b.) Runway Lengths

MQS has a single runway. Runway 11/29 is 5,400 feet long and 100 feet wide. There is a parallel taxiway located north of the runway.

c.) Hangar Facilities

According to the fixed base operator, the facility has three large corporate hangars under the FBO's control. In addition, there are several hangars on the airfield which were constructed by private individuals on land leased from the airport. The airport reportedly does not have a waiting list for its large hangars.

d.) Major Tenants

One of the area's largest employers is Sikorsky helicopter. This Sikorsky facility reportedly completes maintenance, repair and overhaul functions. The plant is located in proximity to the airfield, but does not have through-the-fence access to MQS.

e.) Other Airport Data

The FBO manager indicates that the airport's level of activity is down by more than one-third of 2007 activity levels. The general economic climate has had a negative impact on airport activity, as have high aviation fuel prices.

One of the area's largest employers is Sikorsky helicopter. This Sikorsky facility reportedly completes maintenance, repair and overhaul functions. The plant is located in proximity to the airfield, but does not have through-the-fence access to MQS.

7. New Castle Airport (ILG) Wilmington, DE Area

The New Castle Airport (ILG) is located in New Castle, DE, approximately 37 miles southwest of NAS-JRB. The facility has 189 based aircraft, as summarized in Table 8-12. ILG has the largest number of based aircraft among the airfields evaluated. Single engine aircraft represent almost half (48%) of all aircraft at ILG. ILG has the largest number of jets among the airports reviewed for this analysis. ILG's 53 based jets account for 28% of based aircraft. Multi-engine aircraft represent 11% of aircraft, while military aircraft represent 20% of the based aircraft. ILG has two helicopters based at the airfield.

Table 8-12

Wilmington, DE (ILG) - Based Aircraft (2011)

Wilmington, DE (ILG)	Single Engine	Multi Engine	Jet	Heli	Military	Other	Total
Aircraft	91	21	53	4	20		189
% of Total	48%	11%	28%	2%	11%	0%	100%

Source: AirNav.com

a.) Aircraft Operations

According to AirNav.com, ILG supported an average of 216 operations per day in 2010, or about 79,000 operations for the year. Just under half of these operations are reported to be local aircraft (45%, while 39% are reported to be transient general aviation aircraft operations. Military aircraft operations account for the majority of the remainder (11%), with air taxi operations representing 5%. Commercial operations account for less than 1% of all operations.

b.) Runway Lengths

ILG has three runways, arranged in a triangular configuration. Runway 9/27 is 7,275 feet by 150 feet. Runway 1/19 is 7,012 feet by 150 feet. ILG's shortest runway (14/32) is 4,602 feet by 150 feet.

c.) Hangar Facilities

According to the airport's operations manager, ILG has a variety of hangar options on site, including T-hangars, condo hangars and business jet hangars. In addition, one company has constructed a private hangar on land leased from the airport. The airport has no large hangars available (vacant) at the present time. However, the operations manager indicated that there was no waiting list for large hangars.

d.) Major Tenants

Dassault Falcon has a major facility at ILG, providing FBO services as well as maintenance, repair and overhaul services. In addition, Flight Safety International also has a large operation at ILG, which offers primarily training and simulator learning experiences. In addition to Dassault, ILG has three other FBOs, offering services to based and transient aircraft.

8. Reading Regional/Carl A. Spaatz Airport (RDG) Reading, PA

The Reading Regional/Carl A. Spaatz Airport (RDG) is located in Reading, PA, approximately 40 miles northwest of NAS-JRB, and has 120 based aircraft (Table 8-13). Single engine aircraft

represent more than half (56%) of the aircraft at RDG. RDG has 11 based jets, which represent 9% of based aircraft. Multi-engine aircraft represent 27% of based aircraft, while helicopters account for 5% of the based aircraft. ILG has no military aircraft based at the airfield.

Table 8-13

Reading Regional Airport, PA (RDG) - Based Aircraft (2011)

Reading, PA (RDG)	Single Engine	Multi Engine	Jet	Heli	Military	Other	Total
Aircraft	67	32	11	6	-	4	120
% of Total	56%	27%	9%	5%	0%	3%	100%

Source: AirNav.com

a.) Aircraft Operations

According to AirNav.com, RDG supported an average of 269 operations per day in 2009, or about 98,000 operations for the year. Almost 60% of these operations are reported to be transient aircraft (59%), while 27% are reported to be local general aviation aircraft operations. Air taxi operations account for the majority of the remainder (9%), with military operations representing 4%. Commercial operations and commuter operations each account for less than 1% of all operations.

b.) Runway Lengths

RDG has two runways. Runway 13/31 is 6,350 feet by 150 feet. Runway 18/36 is 5,151 feet by 150 feet.

c.) Hangar Facilities

Airport management at RDG did not provide any information regarding hangar space and demand at RDG.

d.) Major Tenants

RDG's aviation-related tenants are predominantly related to its FBOs and flight school. In addition, RDG houses aircraft for the State Police, Penn National Gaming, and BOSCOV. Adjacent to the airport area is a large industrial and business park. A windshield tour of the business park did not identify any significant aviation-related employers.

9. Competitive Position of NAS-JRB Willow Grove

NAS-JRB Willow Grove's competitive position is difficult to quantify. The lack of a crosswind runway makes the site less competitive than existing airfields which have a second runway available. The base's existing 8,000 foot runway is oriented at 15/33.

E. DEMAND FOR CORPORATE AIRPORT/BUSINESS PARK

In order to understand the potential demand for reuse of the NAS-JRB runway and hangar facilities as a business/corporate aviation facility, a survey of aircraft owners was prepared. A selection of aircraft owners from Bucks, Montgomery and Philadelphia counties was contacted via postcard, to complete an online survey. In addition, the consultants gathered overview information on a variety of airport-related uses that could result in both aviation activity and

aviation-related employment opportunities at NAS-JRB.

1. Survey of Aircraft Owners

In order to understand the potential demand for reuse of the NAS-JRB runway and hangar facilities as a business/corporate airpark, a non-scientific survey of aircraft owners was prepared. While the results cannot be generalized to the larger population, the purpose of survey was to solicit valuable input from the region's aircraft owners. A selection of aircraft owners from Bucks, Chester, Delaware, Montgomery and Philadelphia counties was contacted via postcard, to complete an online survey. In identifying aircraft owners to participate in the survey, the primary focus was on owners of corporate aircraft weighing in excess of 12,500 lbs., as well as aircraft owners that described their ownership as corporate. In addition, the consultants gathered overview information on a variety of airport-related uses that could result in both aviation activity and aviation-related employment opportunities at NAS-JRB.

a.) Survey of Corporate Aircraft Owners

The survey was developed to gain insight into the needs of larger aircraft owners in Greater Philadelphia region. Given the primary focus of this analysis, which is to determine whether NAS-JRB could serve as a "corporate airport", the survey focused on identifying owners of larger aircraft, in order to identify where the aircraft are based; the extent to which the aircraft are used for business; the locational factors considered by the owners in locating their aircraft; and whether NAS-JRB might be considered as a potential location for basing aircraft.

b.) Survey Sample and Response Rate

A total of 403 postcard invitations were mailed out to potential survey participants, based on ownership data from the FAA's aircraft ownership database. Of these, 52 postcards were returned due to inaccurate mailing information or other delivery problems, indicating that 351 postcards were delivered. Of these, 164 recipients (46.7%) started the survey, and 113 (32.2%) completed the survey. Given the focus on the potential for business jet aviation at NAS-JRB, the survey was designed to solicit information on the attractiveness of the base as a potential aircraft basing location for business jets.

- **Question 1** - Of the competing airports with runways in excess of 5,000 feet in proximity to NAS-JRB, PNE was the most prevalent response, accounting for almost 10% of responses. However, 39 respondents (23.8%) indicated their aircraft is based at an airport with a runway in excess of 5,000 feet. The most prevalent response was aircraft based at airports with runways of less than 5,000 feet, which accounted for more than half of all responses (56.7%).

Q1- Where is your aircraft presently based?		
Answer Options	**Response Percent**	**Response Count**
Philadelphia International Airport – PHL	1.2%	2
Philadelphia Northeast Airport – PNE	9.8%	16
Lehigh Valley International Airport - ABE	1.2%	2
Chester County/G.O Carlson Airport - MQS	2.4%	4
Reading Regional/Carl A. Spaatz Field - RDG	0.0%	0
Trenton Mercer Airport - TTN	4.3%	7
New Castle Airport – ILG	0.6%	1
Other airport with a runway of 5,000 feet or more	23.8%	39
Other airport with a runway of less than 5,000 feet	56.7%	93
	answered question	**164**
	skipped question	**0**

- **Question 2** - Only 19% of respondents indicated they used their aircraft principally for business, while about 52% indicated their aircraft was used primarily for recreation.

Q2 - Is your aircraft used primarily for business or recreational purposes?		
Answer Options	**Response Percent**	**Response Count**
Business	19.0%	31
Recreation	52.1%	85
About equally split between business and recreation	28.8%	47
	answered question	**163**
	skipped question	**1**

- **Question 3** - Proximity of aircraft to employment location indicates that less than17% of aircraft is located less than 5 miles for the primary users' place of employment. More than

Q3 - How far is your aircraft stored from the day-to-day place of employment of the primary passengers/users?		
Answer Options	**Response Percent**	**Response Count**
Less than 1 mile	3.0%	2
More than 1 miles but less than 3 miles	1.5%	1
More than 3 miles but less than 5 miles	12.1%	8
More than 5 miles but less than 10 miles	25.8%	17
More than 10 miles but less than 15 miles	30.3%	20
More than 15 miles but less than 20 miles	9.1%	6
More than 20 miles	18.2%	12
	answered question	**66**
	skipped question	**98**

18% are located in excess of 20 miles away from the primary place of employment.

- **Question 4** - In terms of the size of businesses, more than 75% of all businesses were very small, under 50 employees. Only 5 respondents indicated their firm employed more than 250 at the location in proximity to the aircraft.

Q4 - How many employees (full time equivalents) are housed at this location?		
Answer Options	**Response Percent**	**Response Count**
Less than 50	76.9%	50
More than 50 but less than 100	10.8%	7
More than 100 but less than 250	4.6%	3
More than 250 but less than 500	4.6%	3
More than 500 but less than 1,000	1.5%	1
More than 1,000	1.5%	1
	answered question	**65**
	skipped question	**99**

- **Question 5** - The majority of respondents indicated a preference for the aircraft to be closer to the business. Almost 70% of respondents indicated a preference to have their aircraft located less than five miles from their business location. More than 30% would prefer their aircraft to be within one mile of their business, though only 3% are currently located within one mile (See results of Question 3).

Q5 - What would be the ideal location for the aircraft to be based as it relates to the business?		
Answer Options	**Response Percent**	**Response Count**
Less than 1 mile	30.8%	20
More than 1 miles but less than 3 miles	9.2%	6
More than 3 miles but less than 5 miles	29.2%	19
More than 5 miles but less than 10 miles	15.4%	10
More than 10 miles but less than 15 miles	10.8%	7
More than 15 miles but less than 20 miles	1.5%	1
More than 20 miles	3.1%	2
	answered question	**65**
	skipped question	**99**

- **Question 6** - Seventeen of 65 respondents answering question 6 indicated that their primary business is in the aviation industry. This equates to more than one- fourth of respondents.

Q6 - Is the company's primary business directly related to the aviation industry – ie. aircraft maintenance, repair, overhaul and/or aircraft sales?		
Answer Options	**Response Percent**	**Response Count**
Yes	26.2%	17
No	73.8%	48
	answered question	**65**
	skipped question	**99**

- **Questions 7 -** Over 90% of all respondents indicated that they lease less than10,000 square feet of hangar space. Less than 2% of respondents lease more15,000 square feet.

Q7 - How much hangar space (in square feet) do you rent or lease for based aircraft at your current location?		
Answer Options	**Response Percent**	**Response Count**
Less than 5,000 square feet	80.9%	89
More than 5,000 square feet but less than 10,000 square feet	10.9%	12
More than 10,000 square feet but less than 15,000 square feet	6.4%	7
More than 15,000 square feet but less than 20,000 square feet	0.0%	0
More than 20,000 square feet but less than 25,000 square feet	0.0%	0
More than 25,000 square feet	1.8%	2
	answered question	**110**
	skipped question	**54**

- **Question 8 -** Almost 70% of respondents indicated that they consider their current hangar space to be of sufficient size and quality. Thirty four respondents indicated that their hangar was not of sufficient size and/or quality.

Q8 - Do you consider your current hangar space of sufficient size and quality for your aircraft?		
Answer Options	**Response Percent**	**Response Count**
Yes	69.1%	76
No	30.9%	34
	answered question	**110**
	skipped question	**54**

- **Question 9 -** More than half of respondents indicated that location was more important than either cost or airport infrastructure/facilities in determining where an aircraft will be based.

Q9 - Which is more important in determining where your aircraft will be based – cost, location, or airport facilities?		
Answer Options	**Response Percent**	**Response Count**
Cost	25.0%	28
Location	52.7%	59
Airport Infrastructure or Facilities	22.3%	25
	answered question	**112**
	skipped question	**52**

- **Question 10 -** More than 23% of respondents indicated they would not consider Willow Grove as a location to base their aircraft. Less than 15% of respondents indicated they would base their aircraft at Willow Grove if it were more costly than their existing location. The remaining 62% indicated they would consider Willow Grove if it were as cost effective as their current location, or if it were more cost effective.

Q10 - If Willow Grove were converted to a corporate aviation facility, would you consider relocating your based aircraft there?		
Answer Options	**Response Percent**	**Response Count**
I would consider Willow Grove if it were as cost effective as my existing location	51.4%	57
I would consider Willow Grove only if it saved me money	10.8%	12
I would consider Willow Grove even if it was more costly than my existing location	14.4%	16
I would not consider Willow Grove as a location to base my aircraft	23.4%	26
	answered question	**111**
	skipped question	**53**

- **Question 11 -** This question asked respondents to rank the factors they considered most important in deciding where their aircraft will be based. Thus, a lower average rating indicates a higher average preference. Based on the responses, the proximity to an aircraft owner's home was ranked as most important, followed by access to a long runway, proximity to the owner's place of employment and availability of hangar space.

Q11 - Please rank the three most important issues to you in deciding where your aircraft will be based (1 being most important, 2 being second most important and 3 being third most important)			
Answer Options	**Response Average**	**Response Total**	**Response Count**
Availability on low- or no-cost vehicle parking	2.60	52	20
Availability of aircraft fuel	2.21	139	63
Proximity to the aircraft owner's home	1.42	92	65
Proximity to the aircraft owner's place of employment	1.84	46	25
Availability of instrument approaches	2.05	90	44
Availability of a crosswind runway	2.38	19	8
Availability of hangar space for my aircraft	1.97	134	68
Availability of aircraft maintenance services	2.36	66	28
Access to public transit (bus, subway, water taxi, etc.)	2.33	7	3
Access to a 5,000 foot (or more) runway	1.62	21	13
		answered question	**111**
		skipped question	**53**

c.) Conclusions

The need for an airport at NAS-JRB is primarily one of convenience for aircraft owners. Based on the online survey conducted for this report, almost 75% of aircraft owners surveyed travelled less than 15 miles from their place of business to their aircraft. The survey also indicated that the preference of 85% of aircraft owners surveyed would be to have their aircraft located less than ten miles from their business. According to AirNav.com, there are 11 airports within twenty miles of Willow Grove, including three airports which have runways in excess of 5,000 feet. Interviews with airport managers indicate that there is capacity to support additional activity at these competing airports. In this context, the most likely source of demand for an airport at Willow Grove is to relocate existing users from other competing airfields in the region.

The majority of aircraft owners surveyed leased small hangars (under 5,000 square feet), and indicated that their current hangar was of sufficient size and quality to meet their needs. This finding was corroborated by field research at regional airports with runways of 5,000 feet or more. Interviews with airport managers at these airports indicated that there were no waiting lists for large hangars. Most of the hangars at the base are substantially larger than those at competing airports in the region.

While many aircraft owners would prefer to have their aircraft based closer to their place of business, they are very cost-sensitive. Over 60% of respondents to the survey indicated they would consider NAS-JRB if it were at least as cost effective as their current location or if it saved them money. Given high anticipated capital improvement and operating costs at the base, it may be difficult to make the facility as cost effective as existing airfields.

2. Potential Employment Generating Uses

The ability to generate employment opportunities has been identified as a primary concern for the community. As such, any airport-centered redevelopment of NAS-JRB must be considered within the context of its job creation potential. This section summarizes some of the key aviation-related sectors which have been discussed as potential opportunities for NAS-JRB.

a.) Aircraft Maintenance, Repair and Overhaul (MRO)

MRO services for aircraft are big business. Though most major air carriers and airlines have their own MRO facilities, the business aircraft market is more scattered, and therefore more MRO facilities are targeted towards a specific brand. For example, as mentioned previously in this analysis, Dassault Falcon has an MRO facility at ILG in Delaware.

According to data published by AeroStategy, the worldwide fleet of turbine powered business aircraft is reported to include more than 30,000 aircraft. Two-thirds of these aircraft, more than 22,000 units, are located in North America. AeroStrategy estimates the MRO market for business aviation to be $6.2 billion. Estimated revenues for specific sectors include:

- $1.8 billion for maintenance on aircraft component;
- $1.7 billion for engine maintenance;
- $1.4 billion for airframe maintenance; and
- $1.4 billion for modifications.

The North American market is estimated to account for almost 90% of the total MRO market. MRO spending is forecast to increase by almost 100% over the next eight years, as the MRO recovers due to both increased aircraft activity (driving more comprehensive MRO programs) and the ability to fund modifications as the economy improves. The North American MRO market is projected to increase at an average rate of 7.2%, while Asian and Middle Eastern markets experience double digit growth.

The MRO market has been going through a period of consolidation, as leading companies acquire smaller competitors, securing additional market share. This is particularly relevant as aircraft manufacturers, such as Dassault, Gulfstream, Bombardier and Falcon seek to solidify their ability to provide MRO services to their own products. A similar trend is occurring in helicopter maintenance. For example, the Sikorsky MRO facility at Chester County Airport (MQS) was formerly Keystone Helicopter. It is interesting to note that, according to AeroStrategy, none of the major business jet manufacturers have MRO facilities in Pennsylvania, West Virginia, Virginia, or Ohio.

Overall, the MRO business for all aviation sectors, including business jets, airliners and other aircraft is reported to have an economic impact of more than $600 million on Pennsylvania's economy. According to the Aeronautical Repair Station Association (ARSA), the industry employs more than 4,600 people in the Commonwealth. According to ARSA, the average wage for aircraft mechanics and service technicians is almost 20% higher than the average wage for the Commonwealth.

However, Pennsylvania's tax structure is reportedly a factor in keeping the number of aviation maintenance jobs lower in Pennsylvania than in some neighboring states. According to information provided by the Aviation Council of Pennsylvania,

"Sales tax on fixed-wing aircraft sales, parts, maintenance and repairs continues to keep aviation

> *service and sales firms from coming to Pennsylvania. Current aviation sales tax policy has impacted the ability of the state to attract new businesses which operate business aircraft in support of their missions."* [2]

This is considered a significant cause for concern in terms of the ability of NAS-JRB to attract MRO activities.

Further, in the past several years, the number of hours flown by general aviation and air taxi aircraft has declined substantially. The FAA indicates that hours flown by both piston and turbine aircraft declined by more than 15% between 2007 and 2009. This issue also relates to new aircraft deliveries, which have fallen dramatically. According to the FAA's Aerospace Forecast Fiscal Years 2011 – 2031,

> "*The market for general aviation products and services declined sharply in the first three quarters of CY 2010. U.S. manufacturer shipments declined for the third year in a row, down an estimated 20.9 percent, while worldwide billings are estimated to have declined 5.4 percent compared to 2009. Piston and turbine aircraft shipments by U.S. manufacturers fell an estimated 6.7 percent and 35.4 percent, respectively.*"

As stated previously, NAS-JRB has a single runway, which can be a limiting factor in terms of full-time operations, particularly during inclement conditions. Further, many existing airports in the Commonwealth have available capacity, as well as established airport facilities and fueling capabilities. The tax issue is seen as exacerbating the marketability of Willow Grove for MRO uses. Attracting new employment opportunities in this industry, where significant excess capacity is available due to recent reductions in general aviation equipment deliveries and usage for existing aircraft, is considered speculative.

b.) Freight/Air Cargo

The recent downturn in the economy has affected air cargo activity. As the primary cargo facility in the region, PHL has experienced a significant reduction in the volume of activity over the past three years. Between 2008 and 2010, air cargo activity fell from 531,000 tons to 441,000 tons, a reduction in activity of 15%.

Philadelphia International Airport serves as one of UPS's five major hubs. The renovation and expansion of PHL is expected to require the relocation of UPS. If UPS's existing operation at PHL were relocated to NAS-JRB, its 2,000 jobs would also be relocated. UPS reportedly has 21 daily flights into and out of PHL. The primary operating times for UPS cargo flights is late evening and early morning, consistent with many cargo operators. UPS reportedly has a one million square foot facility at PHL. No specific information was available regarding the number of truck trips generated on a daily basis as a result of UPS's activities at PHL.

It should be noted that the 8,000 foot runway is considered less than desirable for larger cargo aircraft. In fact, PHL is expanding its primary runway to 12,000 feet, in part to support larger, wide-body cargo aircraft.

This longer runway is consistent with other airports focusing on cargo. In June 2008, the Pennsylvania Legislature commissioned a study entitled "Economic Impact of the Proposed Greater Hazleton Air Cargo Airport." The study was commissioned because the proponent was seeking Commonwealth funding to support the project, and the Commonwealth was seeking to understand the potential impacts. The proposed Hazelton cargo airport was planned to have

[2] Pennsylvania Aviation News, December 2010

a 13,000 foot runway, which would allow it to accommodate the largest cargo aircraft in use.

The Hazelton project envisioned handling up to 500,000 tons of freight annually, more than the amount handled by PHL in 2010. Further, the proposal estimated that one direct job would be created for every 175 tons of freights handled at the facility. In addition, the analysis assumed 14.24 vehicle trips per day for each employee, though no distinction was included for passenger vehicle trips versus truck trips. Using these figures, it is estimated that for every 50,000 tons of freight moved through a cargo airport in Pennsylvania, 287 jobs will be created, and almost 4,100 vehicles trips will be created each weekday.

c.) Passenger service

A comprehensive impact analysis of passenger service is beyond the scope of the redevelopment planning efforts for NAS-JRB. However, a review of other studies offers some insights as to scheduled air service impacts at small airports. In July 2010, the Center for Transportation Studies (CTS) at the University of Minnesota released a report which summarized the economic impacts of small and medium sized airports. In its analysis, the CTS evaluated commercial scheduled air service at six small and medium sized airports. The six airports studied reported 2,260 visitors during the year, an average of just over 750 visitors per airport. Average spending was $271 per day, and the average length of stay was four days.

Overall, CTS estimated that these visitors supported 36 total jobs in the regional economy, and generated $3.3 million in economic impacts. In addition, because of the need for Transportation Security Administration personnel at airports that have commercial scheduled service, an additional $2.9 million in economic impact was generated, as well as 41 additional direct, indirect and induced jobs. The overall impacts of $6.2 million in economic activity and 77 total jobs translates to an average impact of $1.0 million and 12 total jobs for each of the six airports with commercial scheduled service.

d.) Emergency Preparedness

After NAS-JRB was recommended for closure under the 2005 BRAC round, the Commonwealth of Pennsylvania pursued acquisition of the facility for the development and operation of a joint interagency base, which could support ongoing military and governmental flying needs, while providing additional emergency preparedness, homeland security and national defense capabilities. According to information from Governor Rendell's office at the time,

The Willow Grove Joint Interagency Base will:

- Provide essential capabilities to perform homeland security, national defense and emergency preparedness missions.
- Maintain the 8,000 foot runway, clear zones and associated flight support facilities at Willow Grove so that military and other government flying operations can continue at the site.
- Build on the success of the installation and its units and personnel in responding to past emergencies and contingencies by providing a secure, self-sustaining installation in a key strategic location.
- Support the local economy by keeping a robust military and government presence at Willow Grove for the foreseeable future.
- Be a model homeland security hub and conference and training center leveraging its joint facilities to save costs, improve efficiency and provide for effective mission

accomplishment.

- Be home to the 111th Fighter Wing, the 56th Stryker Brigade Headquarters, several Army Reserve units and numerous government agencies providing an important measure of local and regional security responders.
- Reuse existing government facilities for important governmental functions and activities thereby saving taxpayer money and promoting the vital purposes of the installation.[3]

Public documents indicate that annual projected operating costs would range from $6 to $9 million during the first year to as high as $12 to $18 million in subsequent years. However, the plan was withdrawn in November of 2009. Published reports indicate that operating cost concerns were a primary issue. According to WordPress.com, in a letter to Secretary of Defense Robert Gates, Governor Rendell explained that a strong and lasting commitment by the federal government to be a full partner in the operation and funding of the installation was necessary for the proposal to become reality. The absence of such a commitment, combined with a lack of state funds, resulted in a decision that this federal property should not be transferred to state ownership.[4]

While the redevelopment of NAS-JRB as an emergency preparedness facility may provide a valuable public benefit, the fact that the Commonwealth of Pennsylvania was unable to secure the commitments to fund the operation of an emergency preparedness facility is a significant concern. In particular, the national economy has declined substantially since Governor Rendell's plan was originally considered, and public concern over government spending has increased. As such, any reuse of the facility for an emergency preparedness center would be heavily dependent on the availability of funding both for annual operations and for capital improvements. As discussed elsewhere in the analysis of existing conditions, the Navy's mothballing of facilities could require between $8 and $24 million to reactivate the existing hangars and airport operations terminal. In addition, the Navy is also removing airport navigational aids, and the runway pavements are likely to require investment if they are unused for an extended period.

3. Pennsylvania Aviation Taxation Policy

The Commonwealth of Pennsylvania imposes a sales tax on aircraft sales, as well as maintenance, repair and overhaul services. Many neighboring states have reduced or eliminated their aviation-related sales taxes in recent years, putting Pennsylvania in a less competitive position. For example, New York enacted a temporary exemption for repair and maintenance service for aircraft in 2007. In 2009, New York made this exemption permanent. However, New York State also refined its definition of "commercial aircraft" to aircraft used more than 50% of the time for hire for the transportation of persons or property. Aircraft which are not commercial are not exempt from sales and/or use tax. In New Jersey, aircraft used by commercial air carriers (as well as repair and maintenance to these aircraft) are exempt. In addition, repairs to aircraft with a maximum takeoff weight of 6,000 lbs. or more are also exempt from sales taxes, though the purchase of these aircraft is subject to taxation.

West Virginia also exempts maintenance and repair services by licensed carriers from sales tax. The

[3] http://www.prnewswire.com/news-releases

[4] http://willowgrovepa.wordpress.com/2009/11/13/pennsylvania-governor-rendell-withdraws-plan-for-proposed-interagency-installation-at-willow-grove/

West Virginia law exempts,

> *"Purchases by a licensed carrier of persons or property, or by a government entity, or aircraft repair, remodeling and maintenance services for an aircraft, engine or other component part of an aircraft, or purchases of tangible personal property that is permanently affixed as a component part of an aircraft as part of the repair, remodeling or maintenance of aircraft, aircraft engines or aircraft component parts, and purchases by a licensed carrier of persons or property, or by a government entity, of machinery, tools or equipment, directly used or consumed exclusively in the repair, remodeling or maintenance of aircraft, aircraft engines or aircraft component parts."*

The Aviation Council of Pennsylvania has been promoting a sales tax exemption for aircraft sales, maintenance, and repair and overhaul services since at least 2005. To date, their efforts have been unsuccessful. A measure has been introduced in the current session of the Pennsylvania General Assembly to exempt from aviation taxation,

> *"The sale at retail or use of aircraft parts, including the maintenance and installation of such parts, exclusively in repair, maintenance or rebuilding of aircraft or in overhauling aircraft components. For purposes of this clause, the term 'aircraft' shall include a fixed-wing aircraft, powered aircraft, tilt-rotor or tilt-wing aircraft, glider or unmanned aircraft," and "The sale at retail or use of fixed-wing aircraft, new or used."*

This bill was referred to the Finance Committee in April 2011. It is not clear whether and to what extent passage of this bill would affect aircraft sales and maintenance operations in Pennsylvania. Anecdotal information suggests that some aircraft maintenance and repair goes outside of Pennsylvania due to the impacts of taxation. In 2007, a similar bill was supported by research information developed by the Fels Institute of Government at University of Pennsylvania, while a briefing from the Pennsylvania Budget and Policy Center opposed a tax exemption as "subsidizing private jets."

F. CONCLUSIONS

The future redevelopment of Willow Grove as a public use airport would require substantial funding. The Navy is mothballing buildings and cutting off utilities. As such, future use of the aviation-related buildings at NAS-JRB will require substantial funds. In addition, if no maintenance is performed on the runway until transfer, it is likely to experience significant spalling and cracking. While funding is available from the Federal Aviation Administration's Airport Improvement Program (AIP), the AIP program is competitive, and therefore an airport at NAS-JRB would have to compete against other airports in the Commonwealth for funding. In addition, there are a variety of expenditures that the AIP does not fund, including development of fuel farms hangar buildings, cargo buildings, terminals, facility repairs and maintenance equipment vehicles.

The construction and repair of fuel farms, hangars, cargo buildings and/or terminals may be eligible for funding through FAA's Military Airports Program (MAP). The MAP program is limited to a maximum of 15 airports in a given year, with average funding of approximately $25 million annually, indicating an average grant of less than $2 million. MAP is limited to a single general aviation airport in any given year, such that Willow Grove would have to compete against other general aviation airports seeking to participate in the program.

Based on the aviation market assessment and public input gathered through the community planning process, the HLRA Board decided at their July 27, 2011 meeting to deny both NOIs for the airfield submitted by Bucks County Airport Authority and Montgomery County. Each NOI proposed the use of the airfield and associated aviation buildings and the Bucks County proposal called for the

development of a corporate airpark. The Board's decision to deny the NOIs was based on a number of factors including:

- An airport would consume the majority of the site, eliminating the possibility of many other uses that would address community needs.
- An airport would not produce a significant number of jobs as compared to other competing reuse alternatives,
- The presence of other nearby airport facilities with existing capacity did not support the need for another general aviation or corporate airport,
- An airport would need to be publicly-owned and would not generate significant tax revenues to the local jurisdiction,
- An airport could potentially place financial obligations on local government, potentially making the Township vulnerable to financial losses.
- The operation of the airport would be subject to FAA standards, making the community vulnerable to a level of air traffic and would diminish the local quality of life, and
- The vast majority of local residents participating in the reuse planning process did not support the continuation of airport operations at NAS-JRB Willow Grove.

9 TARGET INDUSTRY ANALYSIS

A. INTRODUCTION

The identification of existing and potential industry clusters is an essential element of any industrial recruitment strategy. Industry "clusters" are strategic groupings of businesses and industries that locate within close proximity of each other, or near a strategic resource, to gain economic benefits. One of the most famous industry clusters in the United States is Silicon Valley in California where technology-related businesses benefit from being located near each other. Most notably, this cluster of businesses attracts job seekers interested in the technology field, increasing the labor pool and thereby providing a wide range of labor skill sets and intellectual capacity.

In order to identify the industry clusters that would be ideal at the NAS-JRB Willow Grove site, the consultants first identified the general characteristics of the workforce as well as the employment and establishment trends in the County and Philadelphia MSA. In addition, the competitive environment was analyzed in order to show the strengths and weaknesses of not only the redevelopment site, but also the region and Commonwealth of Pennsylvania as a place to do business.

Once this information was collected, the consultant then used a screening process to select target industry clusters that should have focused recruitment efforts. It is important to note that the targeted industry clusters are not intended to preclude any industries from being recruited or welcomed into the area. Rather, this list identifies those industries that may have the greatest interest or attraction to the region based on local and regional competitive advantages.

B. SUMMARY OF MAJOR FINDINGS

1. Workforce characteristics

- Montgomery County has high median income levels ($73,869) and Horsham Township is even higher at over $80,300 per year.
- Horsham Township and Montgomery County have a highly educated workforce with roughly 50% of residents possessing a college degree or higher.
- Montgomery County has a slowly growing labor force (10% from 1990 to 2010), but it's expanding faster than the greater region.
- Montgomery unemployment rate (6.2%) is lower than the MSA (8.0%) and national average 8.7% in late 2011.
- Roughly 82.5% of the region's occupational jobs are white-collar occupations.
- High-skilled white-collar positions account for the largest share (35.4%) of occupations.

2. Employment and Establishment Trends

- Both the County and MSA have experienced an employment decline since 2000. However, professional, scientific, and technical services have increased by 35.2% (11,884 jobs) in the County.
- Other economic sectors that experienced an increase in employment include management of companies and enterprises (92.1% increase; 8,085 jobs) and arts, entertainment, and recreation (31.3%; 1,719 jobs). Health care and social assistance also experienced a gain in jobs (5.3%; 3,124 jobs) and is the current largest employment sector in the County (61,609 jobs).
- Establishments decreased at a slower rate than employment over the 2000 to 2010 time period (4.3% decline). This indicates that more companies have downsized rather than fully closed operations.
- The retail trade (518 establishment loss), construction (809 establishment loss), and manufacturing (416 establishment loss) industries all experienced comparatively large declines.
- Some industries fared better since the beginning of the recession than others. In the Philadelphia MSA, the education and health services industry (36,000 new jobs) as well as the leisure and hospitality services (5,000 new jobs) gained in employment since 2007.
- The other industries have experienced employment declines since the recession. Manufacturing experienced the largest decline in employment (37,000 job decline).

3. Competitive Environment

- The corporate income tax and real property taxes are highest in Pennsylvania, as compared to Delaware and New Jersey. This could impact business recruitment efforts.
- However, Pennsylvania offers an array of incentives for businesses, focusing on job creation, entrepreneurship, innovation, and the environment, are competitive with respect to the programs offered in New Jersey and Delaware.
- When examining size, land use, and level of amenities, there are very few comparable sites in the region. However, the Keystone Industrial Port Complex, located in Bucks County, PA, is a comparable site.

4. Target Industry Clusters

- Corporate Headquarters, Management, and Business Services - A corporate park/office facility is a highly desired use at NAS-JRB Willow Grove. This type of facility would be a compatible use with the surrounding area and would generate high paying jobs. The site itself has many strengths that would attract corporate users.
- Senior Living/Senior Health Care Services - The health care industry is a strong and growing industry within the MSA. Health services that cater to the elderly population have experienced positive growth in the recent past. Since 2000, the MSA added 6,428 new jobs in home health services (40.2% increase) and 2,959 new jobs in continuing care retirement communities (17.4% increase). The large amount of available land at the NAS-JRB Willow Grove site lends itself to having assisted living or independent living centers. These centers could work in tandem with a "village center" concept; wherein retail uses would be positioned within close proximity to the senior living units.
- Green Energy R&D and Manufacturing - The NAS-JRB Willow Grove site could help put Pennsylvania on the map, in terms of green energy. The largest solar project in PA is only 26-acres. There are potentially hundreds of acres available at the redevelopment site. Additionally, the Commonwealth of Pennsylvania is well positioned to attract green energy development. There are rebates, industry support programs, and tax credits that are helping to bring green energy to the state.

- Biotechnology, Education, and Research Center - The research and development industry within Montgomery County has grown at a very rapid pace from 2000 to 2010 (259.9%). Currently, there are 9,142 life science related R&D jobs in the County. A research and development park and education center would be a compatible use that builds upon the life science strengths of the region.
- Transportation and Warehousing - There are 9,348 total jobs in transportation and warehousing in Montgomery County. It is not a particularly large employer for the region. However, a portion of the NAS-JRB Willow Grove site would be ideal for these types of uses. The site is located near the PA Turnpike, which provides access to western Pennsylvania markets and New Jersey markets. Warehousing also generates jobs. Given the large amount of available land, the consultant recommends targeting this industry.

C. BASELINE WORKFORCE CONDITIONS

The following section details the baseline characteristics of the region's workforce. The analysis of income levels, education, labor force, and occupational distribution helps to inform the target industry clusters, which will be described in more detail in the Target Industry Cluster section of the report.

1. Median Household Income Trends

Horsham has a household median income level ($80,324) second only to Chester County ($84,284) (Table 9-1). When adjusting for inflation, the median household income in Horsham grew by 6.7% since 1990. Meanwhile, median household incomes fell in Philadelphia, Bucks, and Delaware counties. Philadelphia experienced the largest decline (18.9%).

Table 9-1
Median Household Income (Adjusted to Current Dollars)
Study Region; 1990 to 2015

	Census 1990	Census 2000	Census 2010	Projected 2015
MEDIAN HOUSEHOLD INCOME				
Horsham Township	$75,313	$75,222	$80,324	$94,471
Montgomery County	$75,129	$79,561	$75,448	$93,887
Bucks County	$74,368	$77,912	$70,999	$91,237
Chester County	$78,393	$85,234	$84,284	$101,960
Delaware County	$64,141	$65,333	$59,125	$75,912
Philadelphia County	$42,429	$40,219	$34,400	$48,284

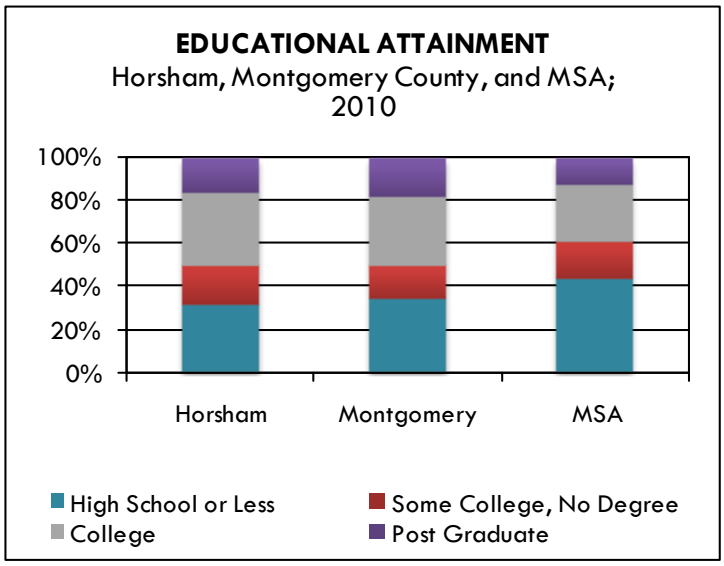
Source: U.S. Census, ESRI, and RKG Associates, Inc., 2011

In terms of households by income level, about half of Montgomery County households make between $50,000 and $149,999 (Table 9-2). The most common household income range resides between $100,000 and $149,999, accounting for 18.5% of households. Households making over $150,000 are projected to increase by 1.8% between 2010 and 2015. The region's robust, highly-skilled labor force contributes substantially to the competitive household incomes in Montgomery County.

2. Education Levels

Horhsam Township and Montgomery County have a much higher share of post-secondary education graduates than the MSA as a whole. Roughly 50.0% of Horhsam Township and Montgomery County residents over the age of 25 have received an associates, bachelor's or graduate degree (compared to 39.0% in the MSA and 35.8% in the nation). Additionally, both Horsham Township and Montgomery County have a lower population of those 25 and over who have not completed high school (5.0% and 7.2%, respectively) compared to the MSA (12.1%) (Figure 9-1). The high levels of educational attainment, across a spectrum of degrees, reflect a skilled, diversified regional workforce.

Figure 9-1



Source: DemographicsNow and RKG Associates, Inc., 2011

Table 9-2
Households, By Income
Study Region; 1990 to 2015

	Census 1990	Census 2000	Census 2010	Projected 2015
HORSHAM	**$43,893**	**$57,703**	**$80,324**	**$94,471**
$0 - $15,000	9.1%	6.6%	5.6%	5.1%
$15,000 - $24,999	11.3%	7.9%	6.8%	6.3%
$25,000 - $34,999	16.4%	11.6%	9.5%	8.7%
$35,000 - $49,999	23.0%	15.5%	12.3%	11.1%
$50,000 - $74,999	26.3%	25.1%	21.3%	19.9%
$75,000 - $99,999	8.7%	15.4%	16.3%	16.6%
$100,000 - $149,999	4.2%	14.1%	21.1%	23.9%
$150,000 +	1.0%	3.8%	7.2%	8.4%
MONTGOMERY COUNTY	**$43,786**	**$61,031**	**$75,448**	**$93,887**
$0 - $15,000	11.4%	8.0%	7.1%	6.8%
$15,000 - $24,999	12.3%	8.1%	7.0%	6.6%
$25,000 - $34,999	13.9%	9.5%	7.5%	6.8%
$35,000 - $49,999	20.2%	14.5%	11.7%	10.7%
$50,000 - $74,999	21.9%	21.6%	17.6%	16.3%
$75,000 - $99,999	9.3%	14.9%	15.1%	15.1%
$100,000 - $149,999	6.1%	13.5%	18.5%	20.4%
$150,000 +	4.8%	9.9%	15.6%	17.4%
BUCKS COUNTY	**$43,342**	**$59,766**	**$70,999**	**$91,237**
$0 - $15,000	11.1%	7.9%	6.5%	6.1%
$15,000 - $24,999	12.0%	8.1%	6.9%	6.5%
$25,000 - $34,999	14.1%	9.6%	7.3%	6.7%
$35,000 - $49,999	21.7%	14.9%	11.9%	11.1%
$50,000 - $74,999	23.8%	22.8%	18.9%	17.8%
$75,000 - $99,999	9.7%	15.1%	14.8%	14.7%
$100,000 - $149,999	5.4%	13.7%	19.2%	20.9%
$150,000 +	2.2%	7.9%	14.4%	16.2%

	Census 1990	Census 2000	Census 2010	Projected 2015
CHESTER COUNTY	**$45,688**	**$65,383**	**$84,284**	**$101,960**
$0 - $15,000	11.0%	7.5%	6.7%	6.3%
$15,000 - $24,999	11.7%	7.1%	6.1%	5.9%
$25,000 - $34,999	13.2%	8.9%	6.2%	5.5%
$35,000 - $49,999	19.3%	13.3%	10.3%	9.4%
$50,000 - $74,999	23.0%	20.5%	17.3%	16.3%
$75,000 - $99,999	10.9%	15.2%	14.9%	14.8%
$100,000 - $149,999	7.2%	15.7%	19.2%	20.3%
$150,000 +	3.7%	11.6%	19.4%	21.5%
DELAWARE COUNTY	**$37,382**	**$50,117**	**$59,125**	**$75,912**
$0 - $15,000	16.6%	12.3%	10.2%	9.5%
$15,000 - $24,999	14.3%	10.5%	8.6%	8.0%
$25,000 - $34,999	15.1%	11.6%	9.4%	8.7%
$35,000 - $49,999	20.1%	15.5%	13.6%	12.9%
$50,000 - $74,999	19.8%	20.8%	18.9%	18.3%
$75,000 - $99,999	7.5%	12.6%	13.0%	13.1%
$100,000 - $149,999	4.2%	10.3%	15.0%	16.7%
$150,000 +	2.3%	6.4%	11.1%	12.8%
PHILADELPHIA COUNTY	**$24,728**	**$30,852**	**$34,400**	**$48,284**
$0 - $15,000	32.4%	26.8%	24.1%	23.1%
$15,000 - $24,999	18.0%	15.1%	13.5%	12.8%
$25,000 - $34,999	15.3%	13.5%	12.2%	11.7%
$35,000 - $49,999	16.5%	15.5%	14.2%	13.8%
$50,000 - $74,999	12.3%	15.6%	16.3%	16.5%
$75,000 - $99,999	3.4%	7.2%	8.8%	9.6%
$100,000 - $149,999	1.4%	4.3%	7.6%	8.7%
$150,000 +	0.8%	2.0%	3.4%	3.9%

Source: ESRI and RKG Associates, Inc., 2011

3. Labor Force Trends

Labor force data was collected from the Bureau of Labor Statistics and represents those over the age of 16 that are active participants in the labor force. According to the Bureau of Labor Statistics, Montgomery County had 416,586 active labor force participants in September 2011 (Table 9-3). This represents an increase of 39,603 labor force participants since 1990. After increasing by 7.7% from 1995 to 2000 and by 3.7% from 2000 to 2005, the county's labor force declined by 1.7% from 2005 to 2011. The Philadelphia MSA and the Commonwealth of Pennsylvania experienced an increase in the labor force (0.8% and 1.49%, respectively).

Table 9-3
Labor Force Trends
Comparative Study Areas; 1990 to 2011

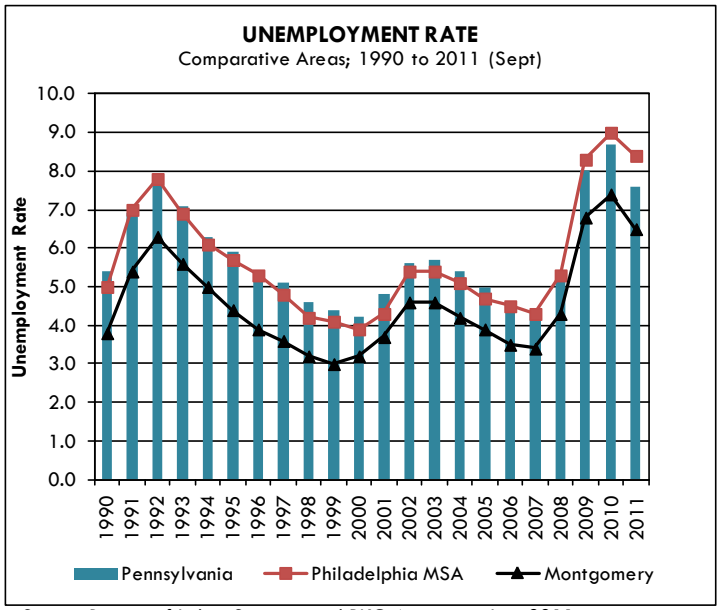
	1990	1995	2000	2005	2010	2011 (Sept)	1990 to 2011 (Sept) Change
NUMBER CHANGE							
Montgomery County	376,983	379,660	408,704	423,851	419,269	416,586	39,603
Philadelphia MSA [1]	2,755,253	2,739,254	2,846,064	2,925,791	2,955,610	2,950,116	194,863
Pennsylvania	5,826,666	5,900,042	6,085,833	6,270,439	6,340,034	6,363,990	537,324
PERCENT CHANGE							
Montgomery County	--	0.7%	7.7%	3.7%	-1.1%	-0.6%	10.5%
Philadelphia MSA [1]	--	-0.6%	3.9%	2.8%	1.0%	-0.2%	7.1%
Pennsylvania	--	1.3%	3.1%	3.0%	1.1%	0.4%	9.2%

Source: Bureau of Labor Statistics and RKG Associates, Inc., 2011
[1] Philadelphia MSA includes Bucks, Chester, Delaware, Montgomery, Philadelphia, Burlington (NJ), Cecil (MD) Camden (NJ), Gloucester (NJ), Salem (NJ), New Castle (DE)

4. Unemployment Rates

The unemployment rate in September, 2011 was 6.5% in Montgomery County, which is the lower than both the MSA unemployment rate (8.4%) and the State unemployment rate (7.6%). While the MSA unemployment levels have typically mirrored those of the state, the September 2011 MSA unemployment is uncharacteristically higher than the state level. Since 1990, the unemployment rates in Montgomery County have been consistently lower than those of the MSA and state (Figure 9-2). On average, the county's unemployment rate has been 1.3% lower than state levels and 1.1% lower than MSA levels.

Figure 9-2



Source: Bureau of Labor Statistics and RKG Associates, Inc., 2011

5. Occupational Distribution

The following occupational analysis provides a summary of the current occupational distribution in the Philadelphia Metropolitan Division, which is defined as Bucks, Montgomery, Chester, Delaware and Philadelphia counties. Occupational data was collected from the Bureau of Labor Statistics (BLS).

RKG Associates categorized this data by general occupational group (e.g., white collar and blue collar) and skill level (e.g. lower skilled, semi-skilled, and higher-skilled). Although BLS has suppressed some occupational categories due to confidentiality reasons, the following analysis provides a general sense of the skill level of the region's workforce.

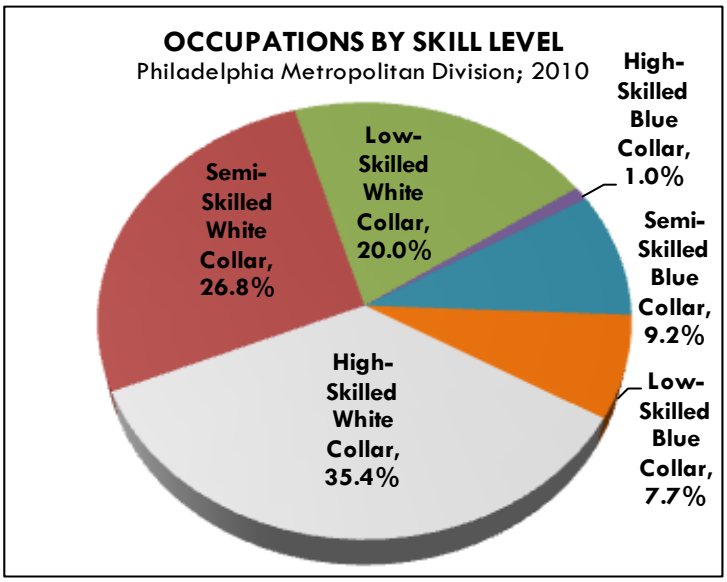
The occupational skill level groupings were derived from the consultant's experience and knowledge regarding the skill and educational requirements of general occupational categories. Although it is difficult to group occupational categories in this manner with great precision, the results provide some indication of the distribution and diversity of skills available within the labor force. The occupational categories and their descriptions are as follows:

- Higher-Skilled White Collar (HSWC) – a professional position requiring a college degree, with supervisory/management responsibility or specialized training while working within a white-collar work environment.
- Higher-Skilled Blue Collar (HSBC) – a trade or non-professional position requiring less than an advanced degree, but some post secondary education, a certificate, or specialized training or skill while working within a blue collar work environment.
- Semi-Skilled White Collar (SSWC) – a professional position requiring less than an advanced degree, but some post secondary education, a certificate, or specialized training or skill while working within a white collar work environment.
- Semi-Skilled Blue Collar (SSBC) – a trade position requiring less than an advanced or trade school degree but requiring some specialized training or skill, while working within a blue collar environment.
- Lower-Skilled White Collar (LSWC) – a position within a white collar work environment requiring no degree or formal schooling beyond high school, but requiring some on-the-job training.
- Lower-Skilled Blue Collar (LSBC) – a position within a trade profession requiring no advanced degree or formal schooling, but requiring some on-the-job training.

Occupations within the region are predominantly white collar in nature, accounting for more than 80% of all jobs (Figure 9-3). Of these white collar occupations, the largest concentration is in high-skilled workers, with registered nurses (44,720) being the largest occupation in this category. Other high-skilled occupations within this category include first-line supervisors of office and administrative support workers (20,020), accounts and auditors (19,970), secondary school teachers (17,840) and elementary school teachers (17,690).

Semi-skilled positions account for 26.8% of all jobs. Office clerks (48,270), administrative assistants (29,460) and sales representatives (27,240) compose roughly 22% of all semi-skilled white collar positions. The low-skilled white collar industries,

Figure 9-3



Source: Bureau of Labor Statistics and RKG Associates, Inc., 2011

composing 20.0% of all jobs, are largely in retail and services. Retail sales persons (54,250) and combined food preparation (35,910) are the top low-skilled white collar positions in the region. Other occupations in this category include janitors (33,090) and customer service representatives (32,550).

Comparatively, high-skilled blue collar positions constitute only 1.0% of the occupations in the Philadelphia Metropolitan Division. The largest blue collar occupational skill level category is in semi-skilled positions (9.2% of all occupations). Maintenance and repair workers (17,040) and carpenters (10,120) are major occupations within the semi-skilled blue collar category. Team assemblers (9,050) and automotive service technicians and mechanics (8,820) are other large occupational categories within the semi-skilled blue collar labor force. These occupations generally require some education beyond a high school diploma, such as a technical certificate. Finally, low-skilled blue collar positions compose roughly 7.7% of all positions.

There is a relatively even distribution of high-skilled, semi-skilled, and low-skilled occupations throughout the region, with high-skilled positions constituting the 36.4% of all occupations. Semi-skilled positions account for 35.9% of the workforce and low-skilled positions account for 27.7% of the total workforce.

The mean annual wage in the Philadelphia Metropolitan Division study region is $49,280, 9.9% higher than the national mean wage of $44,410. Although the area boasts a higher annual mean, the region's three largest occupational categories, retail salespersons ($27,490), office clerks ($31,150), and cashiers ($20,030), exhibit below-average wages. Aside from registered nurses ($72,100) and sales representatives ($69,550), all of the top-ten largest occupational categories fall below the average metropolitan and national wages.

D. EMPLOYMENT AND ESTABLISHMENT TRENDS

Employment and establishment trends were analyzed to help gain a fuller understanding of the industries that have experienced growth in the recent past and therefore may be ideal industries to focus recruitment efforts on. The employment and establishment data was collected from IHS Global Insights, a provider of economic and financial analysis services.

RKG collected data for the years 2000 and 2010 for both Montgomery County and the Philadelphia MSA. The MSA includes Bucks, Chester, Delaware, Montgomery, Philadelphia, Camden (NJ), Gloucester (NJ), Mercer (NJ), Salem (NJ) and New Castle (DE) counties. It is important to note that the IHS Global Insight data are estimates of employment and establishments. All estimates are cross-referenced with U.S. Census County Business Pattern industry data, Bureau of Labor Statistics quarterly employment data, and a variety of other government data sources. The information presented in this analysis is intended to be a representation of market trends, not an exact count. Though there are some limitations to the data, it provides a good sense of what types of industries have been gaining or losing employment and establishments in the recent past.

1. Employment Trends

a.) Montgomery County

Montgomery County has experienced a decline in employment from 2000 to 2010 (9.7% decline) (Table 9-4). The United States as a whole also experienced a decline in employment during this time period, albeit to a lesser extent (3.5% decline). This decline is due in large part to the impacts of the national recession, which began in 2007.

Table 9-4
Employment Trends, By Major Industry Classifications
Montgomery County; 2000 to 2010

NAICS	Description	2000	2010	Change	% Change
---	Total	473,958	428,125	(45,833)	-9.7%
11	Forestry, Fishing, Hunting, and Agriculture Support	842	714	(128)	-15.2%
21	Mining	479	178	(301)	-62.8%
22	Utilities	2,050	2,159	109	5.3%
23	Construction	23,948	18,099	(5,849)	-24.4%
31	Manufacturing	71,550	44,176	(27,374)	-38.3%
42	Wholesale Trade	30,185	27,598	(2,587)	-8.6%
44	Retail Trade	59,728	51,559	(8,169)	-13.7%
48	Transportation and Warehousing	8,312	9,348	1,036	12.5%
51	Information	15,918	10,680	(5,238)	-32.9%
52	Finance and Insurance	44,862	34,348	(10,514)	-23.4%
53	Real Estate and Rental and Leasing	9,160	7,874	(1,286)	-14.0%
54	Professional, Scientific, and Technical Services	33,742	45,626	11,884	35.2%
55	Management of Companies and Enterprises	8,781	16,866	8,085	92.1%
56	Admin., Support, Waste Management & Remediation Services	38,984	32,028	(6,956)	-17.8%
61	Educational Services	13,443	11,224	(2,219)	-16.5%
62	Health Care and Social Assistance	58,485	61,609	3,124	5.3%
71	Arts, Entertainment, and Recreation	5,492	7,211	1,719	31.3%
72	Accommodation and Food Services	27,549	26,172	(1,377)	-5.0%
81	Other Services (except Public Administration)	20,448	20,656	208	1.0%

Source: Select Greater Philadelphia, IHS Global Insight, and RKG Associates, Inc., 2011

However, not all industries in Montgomery County have declined in employment. Professional, scientific, and technical services increased 35.2% (11,884 jobs). Other economic sectors that experienced an increase in employment include management of companies and enterprises (92.1% increase; 8,085 jobs) and arts, entertainment, and recreation (31.3%; 1,719 jobs). Health care and social assistance also experienced a gain in jobs (5.3%; 3,124 jobs) and is the current largest employment sector in the County (61,609 jobs).

In terms of employment losses, the manufacturing economic sector experienced the greatest net decline (27,374 jobs). Even though there was a substantial decline in employment, the manufacturing industry is currently the 4th largest industry in the County, employing 44,176 people. The finance and insurance industry also experienced a comparatively large decline in employment (10,514 job decline; -23.4%).

The consultant analyzed employment shifts among more detailed economic subsectors (3-digit NAICS codes). Much of the employment gains have been in high paying office and professional industries. As mentioned above, professional, scientific, and technical services, as well as management of companies and enterprises, which are in the both 2- and 3- digit NAICS sectors, experienced large net gains in employment (11,884 jobs and 8,085 jobs). Other economic subsectors to experience a large net gain include funds, trusts, and other financial vehicles (4,069 jobs) and social assistance (2,798 jobs). Funds, trusts and other financial vehicles also experienced a comparatively large percentage gain in employment (325.5%).

The largest net losses have been in administrative and support services (6,652 job decline) and securities and other financial investments (6,385 jobs). Within the securities and other financial investment subsector, portfolio management (6-digit NAICS code) declined from 8,109 jobs in 2000 to 1,703 jobs in 2010. The decline in portfolio management accounted for over half of the employment decline in the Finance and Insurance economic sector. Interesting to note, these

losses largely occurred before the national recession. By 2005, portfolio management had declined to 1,604 jobs. Since then, this industry has added about 100 jobs.

Pipeline transportation experienced the largest percentage decline (-92.8%) followed by mining (-80.8%). The manufacturing economic subsectors to experience the greatest percentage decline include apparel manufacturing and leather and allied product manufacturing (-78.0% and -72.3%, respectively). The decline in manufacturing employment is a trend experienced across the country, as the economy continues to move further away from a production-based economy and into a service-based economy.

b.) Philadelphia MSA

Employment trends in the Philadelphia MSA provide a larger context to how the region is performing. Although Montgomery County experienced a 9.7% decline in employment from 2000 to 2010, the MSA has fared better (2.4% decline) (Table 9-5). In fact, the MSA had lower employment decline than the United States as a whole (3.5% decline). Major growth industries include health care and social assistance (79,321 new jobs), educational services (24,600 new jobs), and accommodation and food services (16,269 new jobs). Professional, scientific, and technical services and management of companies and enterprises also experienced an increase (6.6% and 51.5%, respectively) in the MSA, however at a slower rate than in Montgomery County (35.2% and 92.1%, respectively). In terms of employment decline, manufacturing experienced the largest net decline (105,511 job decline). Manufacturing also was the largest net loss industry in Montgomery County. However, manufacturing still has a significant presence in the MSA and is the 4th largest employer (194,490 jobs).

Table 9-5
Employment Trends, By Major Industry Classifications
Philadelphia MSA; 2000 to 2010 [1]

NAICS	Description	2000	2010	Change	% Change
---	Total	2,560,327	2,499,136	(61,191)	-2.4%
11	Forestry, Fishing, Hunting, and Agriculture Support	16,121	13,148	(2,973)	-18.4%
21	Mining	1,415	1,284	(131)	-9.3%
22	Utilities	13,309	10,979	(2,330)	-17.5%
23	Construction	122,279	93,652	(28,627)	-23.4%
31	Manufacturing	300,001	194,490	(105,511)	-35.2%
42	Wholesale Trade	135,312	126,146	(9,166)	-6.8%
44	Retail Trade	331,223	300,741	(30,482)	-9.2%
48	Transportation and Warehousing	79,659	79,720	61	0.1%
51	Information	80,244	59,592	(20,652)	-25.7%
52	Finance and Insurance	190,709	177,864	(12,845)	-6.7%
53	Real Estate and Rental and Leasing	42,358	38,341	(4,017)	-9.5%
54	Professional, Scientific, and Technical Services	209,763	223,710	13,947	6.6%
55	Management of Companies and Enterprises	40,312	61,078	20,766	51.5%
56	Admin., Support, Waste Management & Remediation Services	179,550	160,954	(18,596)	-10.4%
61	Educational Services	117,932	142,532	24,600	20.9%
62	Health Care and Social Assistance	375,731	455,052	79,321	21.1%
71	Arts, Entertainment, and Recreation	35,807	44,899	9,092	25.4%
72	Accommodation and Food Services	170,062	186,331	16,269	9.6%
81	Other Services (except Public Administration)	118,540	128,623	10,083	8.5%

Source: Select Greater Philadelphia, IHS Global Insight, and RKG Associates, Inc., 2011

[1] Philadelphia MSA includes Bucks, Chester, Delaware, Montgomery, Philadelphia, Burlington (NJ), Camden (NJ), Gloucester (NJ), Mercer (NJ), Salem (NJ) and New Castle (DE) counties.

At the economic subsector level, the largest gains have occurred in services. Ambulatory health care services and social assistance experienced the largest net gains (33,794 jobs and 26,773 jobs, respectively). Similar to Montgomery County trends, management of companies and enterprises experienced a large net gain (20,766). Support activities for mining experienced the largest percentage gain (381.7%); however it comprises a comparatively small amount of the total employment in the region (631). Funds, trusts, and other financial vehicles almost doubled the 2000 employment and increased 95.6%.

The largest net loss in the MSA was in administrative and support services (19,166 job decline) and specialty trade contractors (18,765 job decline). The construction industry was heavily impacted by the recession and new building projects sharply declined across the nation. Large percentage losses were in similar categories as Montgomery County. For example the apparel manufacturing and leather manufacturing industries experienced a 67.5% and 69.4% decline, respectively. Textile mills also experienced a comparatively large decline (67.1%).

2. Establishment Trends

a.) Montgomery County

Establishments decreased at a slower rate than employment over the 2000 to 2010 time period (4.3% decline) (Table 9-6). This indicates that more companies have downsized rather than fully shutdown. The retail trade (518 establishment loss), construction (809 establishment loss), and manufacturing (416 establishments) industries all experienced comparatively large declines. However, health care and social assistance (295 new establishments), professional, scientific and technical services (279 new establishments), and finance and insurance (145 new establishments) all experienced large net gains.

Table 9-6
Establishment Trends, By Major Industry Classifications
Montgomery County; 2000 to 2010

NAICS	Description	2000	2010	Change	% Change
---	Total	26,164	25,044	(1,120)	-4.3%
11	Forestry, Fishing, Hunting, and Agriculture Support	419	363	(56)	-13.4%
21	Mining	19	18	(1)	-5.3%
22	Utilities	38	22	(16)	-42.1%
23	Construction	2,465	1,656	(809)	-32.8%
31	Manufacturing	1,339	923	(416)	-31.1%
42	Wholesale Trade	2,048	1,651	(397)	-19.4%
44	Retail Trade	3,661	3,143	(518)	-14.1%
48	Transportation and Warehousing	343	308	(35)	-10.2%
51	Information	579	615	36	6.2%
52	Finance and Insurance	1,917	2,062	145	7.6%
53	Real Estate and Rental and Leasing	895	1,019	124	13.9%
54	Professional, Scientific, and Technical Services	3,437	3,716	279	8.1%
55	Management of Companies and Enterprises	241	278	37	15.4%
56	Admin., Support, Waste Management & Remediation Services	1,637	1,523	(114)	-7.0%
61	Educational Services	292	294	2	0.7%
62	Health Care and Social Assistance	2,589	2,884	295	11.4%
71	Arts, Entertainment, and Recreation	308	360	52	16.9%
72	Accommodation and Food Services	1,592	1,718	126	7.9%
81	Other Services (except Public Administration)	2,345	2,491	146	6.2%

Source: Select Greater Philadelphia, IHS Global Insight, and RKG Associates, Inc., 2011

At the economic subsector level, professional, scientific, and technical services experienced the largest net gains in both employment and establishments (279 new establishments). However, other net gains in establishments differ from the employment gains. Personal laundry services (190 new establishments), securities and other financial investments (168 new establishments) experienced large net gains. Although the securities industries experienced large employment declines, it actually grew in establishments.

The construction industry subsectors experienced a comparatively large net loss in establishments. Specialty trade contractors and construction of buildings declined by 767 total establishments. This is largely a result of the continued difficulty in obtaining financing since the economic downturn in 2007. In terms of percentage losses, apparel manufacturing experienced the fastest establishment decline (-56.3%). Primary metal manufacturing also experienced a comparatively fast decline (-44.8%).

b.) Philadelphia MSA

Establishment losses in the MSA declined at almost the same rate as employment (2.1% establishment decline) (Table 9-7). Construction and retail trade accounted for the top two declining industries, with 3,834 and 2,436 establishments lost, respectively). Manufacturing also declined by 1,870 establishments. Although management of companies and enterprises increased employment by almost 52%, this industry actually declined by 31.5% establishments (1,002 decline). This indicates that more existing companies grew in employment rather than new companies starting operations.

Table 9-7

Establishment Trends, By Major Industry Classifications
Philadelphia MSA; 2000 to 2010 [1]

NAICS	Description	2000	2010	Change	% Change
---	Total	153,590	150,417	(3,173)	-2.1%
11	Forestry, Fishing, Hunting, and Agriculture Support	4,100	3,240	(860)	-21.0%
21	Mining	109	66	(43)	-39.4%
22	Utilities	195	169	(26)	-13.3%
23	Construction	14,627	10,793	(3,834)	-26.2%
31	Manufacturing	6,983	5,113	(1,870)	-26.8%
42	Wholesale Trade	9,926	8,559	(1,367)	-13.8%
44	Retail Trade	22,413	19,977	(2,436)	-10.9%
48	Transportation and Warehousing	2,885	2,839	(46)	-1.6%
51	Information	2,699	2,840	141	5.2%
52	Finance and Insurance	9,712	11,078	1,366	14.1%
53	Real Estate and Rental and Leasing	5,031	5,234	203	4.0%
54	Professional, Scientific, and Technical Services	18,204	19,953	1,749	9.6%
55	Management of Companies and Enterprises	3,176	2,174	(1,002)	-31.5%
56	Admin., Support, Waste Management & Remediation Services	8,481	7,880	(601)	-7.1%
61	Educational Services	1,695	2,197	502	29.6%
62	Health Care and Social Assistance	15,363	18,299	2,936	19.1%
71	Arts, Entertainment, and Recreation	1,815	2,252	437	24.1%
72	Accommodation and Food Services	10,792	12,481	1,689	15.7%
81	Other Services (except Public Administration)	15,384	15,273	(111)	-0.7%

Source: Select Greater Philadelphia, IHS Global Insight, and RKG Associates, Inc., 2011

[1] Philadelphia MSA includes Bucks, Chester, Delaware, Montgomery, Philadelphia, Burlington (NJ), Camden (NJ), Gloucester (NJ), Mercer (NJ), Salem (NJ) and New Castle (DE) counties.

At the subsector level, all establishment growth has been in service or financial industries. Professional, scientific, and technical services (1,749 new establishments) and food services and accommodation (1,748 new establishments) experienced the largest net increase. In terms of largest net loss, the construction industry accounts for the majority of the top losses (3,545 establishment decline). Similar to employment percentage losses, leather and allied product manufacturing as well as apparel manufacturing experienced the fastest declines (-65.4% and -56.0%, respectively).

E. EMPLOYMENT TRENDS SINCE THE 2007 RECESSION

The recent economic recession, which began in 2007, had a great impact on employment levels in the study region as well as the nation. However, not all industries have lost employment since 2007. Table 9-8 shows the Philadelphia MSA employment in certain industries from December 2007 to April 2011. The information was collected from the Philadelphia Federal Reserve Bank.

As seen in the table, the education and health services industry (36,000 new jobs) as well as the leisure and hospitality services (5,000 new jobs) gained in employment since 2007. The other industries have experienced employment declines. Manufacturing experienced the largest decline in employment (37,000 job decline). Trade, transportation and utilities, as well as natural resources and construction also experienced large declines (29,000 job decline and 28,000 job decline, respectively). It should be noted that information (8,000 job decline) and other services (2,000 job decline) declined in jobs, but at a lesser extent than found in the other industry categories.

The consultant received more detailed industry data for Montgomery County for the years 2007 and to 2010 from IHS Global Insights. Table 9-9 shows those 6-digit NAICS industries that have increased by 100 jobs or more since 2007. All industries that experienced an increase of 100 or more jobs over the past three years were in service or financial related industries. No manufacturing or construction industries have experienced an increase in employment of 100 or more in the past three years.

Table 9-8
Employment Change Since Start of Recession
Philadelphia MSA; Dec. 2007 to April 2011

Industry	# Change (In Thousands)	% Change
Education and Health Services	36	6.69%
Leisure and Hospitality Services	5	2.11%
Other Servcies	(2)	-1.71%
Information	(8)	-13.18%
Financial Activites	(20)	-8.91%
Professional & Business Services	(26)	-5.92%
Natural Resources, Mining and Construction	(28)	-22.27%
Trade, Transportation and Utilities	(29)	-5.37%
Manufacturing	(37)	-16.58%

Source: Philadelphia Federal Reserve Bank, Select Greater Philadelphia, and RKG Associates, Inc., 2011

The industry to experience the greatest increase is the health care industry (3,317 jobs). Physicians, ambulance services, elderly services and medical hospitals all added employment. The management of companies and enterprises also experienced a large gain (2,020). Specifically the corporate, subsidiary, and regional managing offices added over 2,000 jobs during the recession period. Although the education sector experienced an overall decline of employment from 2000 to 2010, there were actually 1,142 jobs created in the colleges, universities, and professional schools and junior colleges categories within the past three years. The County has a large college presence, which is reflected in the comparatively high education levels of the residents.

Certain 6-digit categories within the professional, scientific and technical industry also grew in employment during 2007 to 2010 (778 total new jobs). These types of jobs are generally higher-paying jobs and the growth categories ranged from tax preparation to custom computer programming services. Montgomery County has a large office base, and it has continued to grow through recessionary times.

Table 9-9
Employment Change Since Start of Recession [1]
Montgomery County; 2007 to 2010

NAICS	Description	# Change	% Change
HEALTH CARE AND SOCIAL ASSISTANCE		**3,317**	**186.2%**
621111	Offices of Physicians (except Mental Health Specialists)	180	2.4%
621210	Offices of Dentists	164	5.6%
621310	Offices of Chiropractors	155	25.0%
621511	Medical Laboratories	617	23.7%
621610	Home Health Care Services	364	11.2%
621910	Ambulance Services	208	32.4%
622110	General Medical and Surgical Hospitals	101	0.7%
623311	Continuing Care Retirement Communities	221	5.3%
623312	Homes for the Elderly	169	11.7%
624110	Child and Youth Services	103	17.9%
624120	Services for the Elderly and Persons with Disabilities	167	8.5%
624190	Other Individual and Family Services	299	26.5%
624410	Child Day Care Services	569	15.2%
MANAGEMENT OF COMPANIES AND ENTERPRISES		**2,020**	**14.0%**
551114	Corporate, Subsidiary, and Regional Managing Offices	2,020	14.0%
EDUCATION SERVICES		**1,142**	**30.0%**
611210	Junior Colleges	104	13.9%
611310	Colleges, Universities, and Professional Schools	1,038	16.1%
PROFESSIONAL, SCIENTIFIC, AND TECHNICAL SERVICES		**778**	**55.8%**
541213	Tax Preparation Services	167	24.3%
541214	Payroll Services	164	7.4%
541310	Architectural Services	126	15.2%
541511	Custom Computer Programming Services	321	8.8%
RETAIL TRADE		**630**	**15.0%**
445110	Supermarkets and Other Grocery (except Convenience) Stores	201	2.3%
446110	Pharmacies and Drug Stores	195	5.6%
452112	Discount Department Stores	234	7.1%
ACCOMODATION, FOOD SERVICES, AND OTHER SERVICES		**579**	**29.6%**
722213	Snack and Nonalcoholic Beverage Bars	285	17.5%
722310	Food Service Contractors	123	6.1%
812112	Beauty Salons	171	6.1%
ARTS, ENTERTAINMENT, AND RECREATION		**466**	**13.9%**
713940	Fitness and Recreational Sports Centers	466	13.9%
FINANCE AND INSURANCE		**254**	**13.6%**
522110	Commercial Banking	111	3.6%
524292	Third Party Administration of Insurance and Pension Funds	143	10.0%
INFORMATION		**235**	**17.7%**
518210	Data Processing, Hosting, and Related Services	235	17.7%
REAL ESTATE AND LEASING		**170**	**11.6%**
531210	Offices of Real Estate Agents and Brokers	170	11.6%
TRANSPORTATION AND WAREHOUSING		**135**	**10.4%**
485410	School and Employee Bus Transportation	135	10.4%

Source: IHS Global Insight, Select Greater Philadelphia, and RKG Associates, Inc., 2011
[1] Categories with job change of 100 or more.

F. COMPETITIVE ENVIRONMENT

1. Corporate Office Park Competition

The consultant conducted an inventory of large corporate parks (over 250,000 SF) in order to assess where there was existing competition. Montgomery County office park information was collected by utilizing a list from the Montgomery County Industrial Development Corporation. Unfortunately, there was no consistent parcel or square footage information about the office parks available to the consultant. The square footage for office parks was obtained by locating the business parks in Geographic Information Systems and then pulling the square footage of the corresponding parcels from the assessor's database. The information for office parks located outside of Montgomery County was taken directly from the Philadelphia Business Journal. Industrial office parks were not included in the analysis. However, it should be noted that some of the included business parks contain both industrial flex space and corporate office space. It was not possible to separate the flex space out due to limitations of the data.

There are two large office parks located proximate to the NAS-JRB Willow Grove site. The Commonwealth Corporate Center and Babylon Business Campus contain a combined 1.2 million square feet of space. The Commonwealth Corporate Center was built in the late 1990s and is mostly Class A office space. Babylon is an older business center, built in the 1970s, which contains some industrial flex space and a 3-story office tower. Tenants range from high-tech manufacturers to corporate office users. Although located close to the redevelopment site, a new corporate office park would offer a more modern building fit-out and amenities than found at the existing nearby developments.

There are three other office parks located in Horsham, including the Pennsylvania Business Campus, Horsham Business Center, and Walnut Grove Corporate Center. All are located within 5-miles of the redevelopment site near the Pennsylvania Turnpike. The Pennsylvania Business Campus is the largest of the office parks in Horsham, and contains over 1.8 million square feet of space. Tenants include health services companies and technology companies, among others.

In total, there is about 88.5 million square feet of business park space in the region (Table 9-10). It should be noted that much of this space contains both corporate space and flex space. Although the Philadelphia metro region has many existing office parks, many of them are in older buildings. A new office park at the NAS-JRB Willow Grove site will cater to those wishing to have new and modern amenities. Additionally, the site offers the opportunity for large users to build space that specifically matches their needs.

The data in Map 9-1 shows the geographic location of the nearby business parks. As mentioned, Horsham Township contains six business parks larger than 250,000 SF. There are also two office parks just outside of Horsham Township limits located adjacent the Pennsylvania Turnpike. The next large cluster of business parks occurs within the 10- to 15-mile radius rings. The intersection of Interstate 476 and the Pennsylvania Turnpike is a highly desirable office location as it provides access to the east, west, and northern markets. There is also large business parks located in New Jersey, near the Pennsylvania border. Although New Jersey has competitive office parks, there are certain incentives and benefits that make Pennsylvania a highly competitive state for business. A comparison of Pennsylvania's tax and business incentive programs are included in the following section.

Table 9-10
Office Park Inventory
Greater Philadelphia Region; 2010

Number	Total SF
Under 500,000 SF	
20	7,847,755
500,001 to 1 Million SF	
23	16,387,383
Over 1 Million SF	
21	64,183,386
Total (64)	**88,418,524**

Source: Philadelphia Business Journal, Montgomery County Industrial Development Corporation and RKG Associates, Inc., 2011

2. State Comparison of Tax Rates

Pennsylvania's corporate income tax (9.9%) is the highest in the nation, but is fairly commensurate with its regional counterparts (Table 9-11). While Pennsylvania and Delaware (8.7%) corporate tax rates are firmly set, New Jersey's corporate income tax (9.0%) depends on net income levels. For example, corporations with less than $50,000 in net income are taxed at 6.5%, rather than the standard 9.0%. This graduated scale benefits small businesses and potentially incentivizes start-up companies.

Pennsylvania's income tax, set at a 3.07% flat rate, is relatively low compared to other states. New Jersey's income tax ranges from 1.4% to 8.97%, while Delaware's ranges from 2.2% to 5.95%. The Commonwealth of Pennsylvania has a 6% sales tax, with an additional 2% in Philadelphia. New Jersey's sales tax is 7% and Delaware remains one of five states without sales tax. Although real property taxes are jurisdiction-specific, a sample of tax rates from three metropolitan- area towns and cities provides some basis for comparison. Horsham Township's 28.342 mill rate is 14% higher than that of the City of Bordentown, New Jersey (24.84 mills) and significantly higher (224%) than that of the Town of Elsmere, Delaware (8.75 mills). Pennsylvania and New Jersey do not levy gross receipts taxes on net revenues. In Delaware, the assessment depends on the tax class.

Table 9-11
State Tax Comparison
PA, NJ, DE

	PENNSYLVANIA	NEW JERSEY	DELAWARE
Corporate Income Tax	9.99%	9.0% [3]	8.70%
Personal Income Tax	3.07%	Range: 1.4% to 8.97%	Range: 2.2% to 5.95%
State Sales Tax	6% [1]	7%	No sales tax
Real Property Tax [2]	28.342 mills in Horsham	24.84 mills in City of Bordentown	8.75 mills in Town of Elsmere
State Gross Receipts Tax	No state-level gross receipt tax	No state-level gross receipt tax	Depends on Type [4]

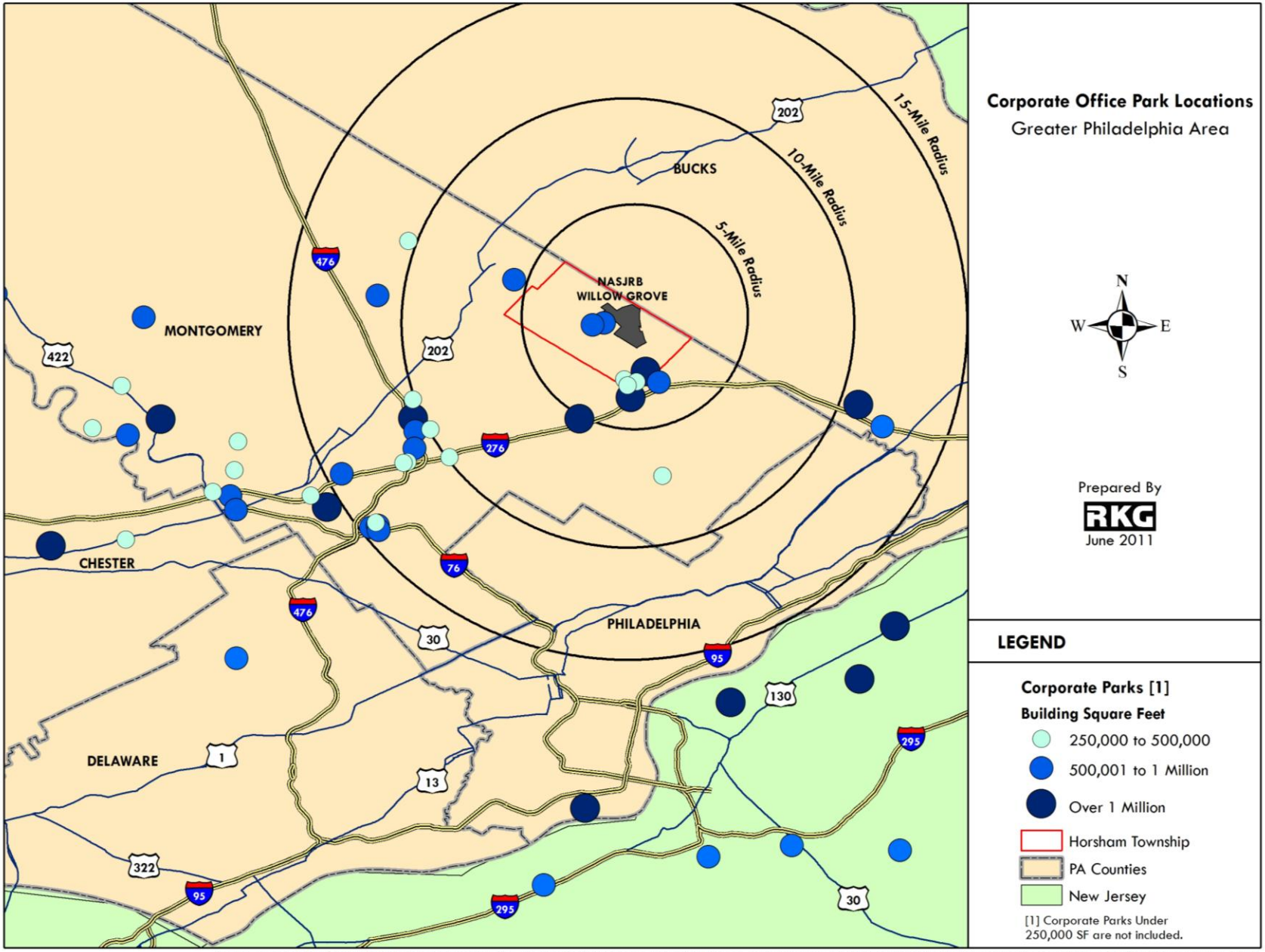
Source: Select Greater Philadelphia and RKG Associates, Inc., 2011
[1] Philadelphia imposes an additional 2% sales tax
[2] Examples of tax rates, expressed in mills. The county, municipal and school districts determine property tax.
[3] 7.5% for corporations w/net income $50,000 to $100,000; 6.5% for corporations with less than $50,000 net income.
[4] Rate depends on tax class. Commercial & industrial properties are .10312%
[4] Manufacturerers (0.180%), Wholesalers (0.384%), Retailers (0.720%), Restaurants (0.624%), Professional (0.384%)

3. State Comparison of Business Tax Incentive Programs

Pennsylvania offers an array of incentives for businesses (Table 9-12). The Commonwealth's programs, focusing on job creation, entrepreneurship, innovation, and the environment, are competitive with respect to the programs offered in New Jersey and Delaware.

Pennsylvania's research and development (R&D) tax credit can be claimed against the following taxes: the capital stock and franchise tax (CSFT), the corporate net income tax (CNIT) and the personal income tax (PIT). The credit enables taxpayers to reduce their tax liability by up to 100 percent. In addition, the credits can be sold and can carry over for up to fifteen succeeding taxable years.

Map 9-1



Source: Montgomery County Board of Assessments, Select Greater Philadelphia, Philadelphia Business Journal, Montgomery County Industrial Development Corporation, and RKG Associates, Inc., 2011

Table 9-12
Business Tax Incentives [1] [2]

PENNSYLVANIA	NEW JERSEY	DELAWARE
JOB RETENTION AND JOB GROWTH		
Job creation and job retention loans	Camden's Urban Enterprise Zone Program	
Enterprise zone tax credits community investment	Business employment incentive grants (BEIP)	
Keystone Opportunity Zones (KOZ)		
Keystone Innovation Zones (KIZ)		
ENTREPRENEURSHIP		
Small business first	Statewide loan pool for business	
PA minority business development authority (PMBA)	Financing for small and minority-owned bus.	
PA Capital Access Program (PennCAP)	Direct loans on Export financing	
Export finance program (EFP)		
CORPORATE INCOME AND GROSS RECEIPTS		
No state-level gross receipts tax	No state-level gross receipts tax	Corporate income tax credits
		Gross receipts tax reductions
TECHNOLOGY AND INNOVATION		
Research and development tax credits	Local devel. fund - commerical/indust.	
Technical assistance and technology investments	NJ technology funding program	
	NJ seed capital program	
COMMUNITY AND ECONOMIC DEVELOPMENT		
Community economic development loan program (CED)	Downtown beautification program	
	Real estate development program	
	Smart growth pre-development funding	
ENVIRONMENT AND GREEN INDUSTRY		
Underground storage tank upgrade loan prog. (USTULP)	Underground storage tank remediation	Green Industries
Industrial sites reuse program (ISRP)	Brownfield redevelopment loan program	Brownfield facility credit
Pollution prevention assistance account (PPAA)	Haz. discharge site remediation loan program	
INFRASTRUCTURE		
PA infrastructure investment authority (PENNVEST)		Public utility tax rebates
CONSTRUCTION, REPLACEMENT AND EQUIPMENT		
Machinery and Equipment Loan Fund (MELF)	Building/equipment loans	Replacement facilities tax credit
INDUSTRY TARGETING		
		Targeted industry tax Incentives
		Targeted area tax credits

Source: Select Greater Philadelphia and RKG Associates, Inc., 2011
[1] This is not an exhaustive list of incentive programs.
[2] In some cases, programs overlap multiple sectors.

The Industrial Sites Reuse Program (ISRP), utilized by the Montgomery County Economic Development Corporation, provides grants and low-interest loan financing for environmental assessment (up to $200,000) and remediation (up to $1 million) at former industrial sites. Pennsylvania's ISRP, coupled with other environmental remediation programs, are comparable to those offered in New Jersey, but seemingly more substantial than those offered in Delaware.

Keystone Opportunity Zones (KOZs) and Keystone Innovation Zones (KIZs) represent a small network of incentive areas across the Commonwealth of Pennsylvania. KOZs eliminate specific state and local taxes within designated areas, while KIZs facilitate loans and grants to community/university partnerships. While the programs are still viable, their inception involves tremendous lobbying, both at the local and state levels. The local tax revenue void, resulting from the tax-exempt companies in KOZs, remains a major obstacle when garnering public support. Both programs ultimately depend on approval from the state legislature.

4. Site Availability

Willow Grove, given its scale and redevelopment potential, offers very unique opportunities. When examining size, land use and level of amenities, there are very few comparable sites in the region. The Keystone Industrial Port Complex, located in Bucks County, near Trenton, NJ, remains a competitive, comparable site (Table 9-13). Once a steel mill and coke production plant, the facility is now a success story in renewable energy manufacturing, specifically with respect to Polysilicon for solar PV panels and wind turbines. The transition to a renewable energy manufacturing facility was made possible through $14 million in loans, grants and tax incentives, as well as through critical partnerships with the Pennsylvania Department of Community and Economic Development, the EPA, Select Greater Philadelphia, Bucks County and Falls Township.

The other large-scale comparable sites lack the capacity and available amenities that is offered at the Keystone facility. While it covers 388 acres, the Atwater property, located at Route 29 and Yellow Springs Road in Chester County, offers sites from 3 to 100 acres. It is currently being marketed for office uses, lab facilities, and a corporate campus. Meanwhile, the Philadelphia Navy Yard lacks utilities and its development prices are based on the type of land uses. Finally, the Woodstown, New Jersey property (119 Hackett Road) is predominately pastureland with a series of disconnected structures. Most of the metropolitan-area office parks are located along major highways, particularly at the interchanges of I-476, I-276 and I-76. The nearby, existing office parks have various commercial and light industrial specializations.

Table 9-13
Comparative Available Land Sites

County	Name	Address	Acreage	Price/Acre	Water	Sewer	Electric
PENNSYLVANIA							
Bucks	Keystone Indust. Port Complex	One Ben Fairless Drive	2,400	$125,000	yes	yes	yes
Philadelphia	Navy Yard	South Philadelphia	350	TBD [1]	no	no	no
Chester	Atwater	Rte. 29 & Yellow Springs Road	388	$35/Buildable SF	yes	yes	yes
NEW JERSEY							
Salem [2]	119 Hackett Road	119 Hackett Road, Woodstown	275	$10,909	yes	yes	yes
DELAWARE							
None							

Source: PA SiteSearch, Loopnet, and RKG Associates, Inc., 2011
[1] Land is unimproved, quote on price per acre contingent on specific needs
[2] Working farm/pasture

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G. PENNSYLVANIA'S TARGETED INDUSTRY CLUSTERS

Before establishing targeted clusters at the NAS-JRB Willow Grove site, the consultant reviewed the targeted industry clusters as defined by the Commonwealth of Pennsylvania. In 2008, the Pennsylvania Department of Labor & Industry and Center for Workforce and Information & Analysis published a report that reflects those clusters which drive the direction on all workforce development strategies in Pennsylvania. The 11 targeted industry clusters, as well as their performance from 2000 to 2010 within the Philadelphia MSA, are shown in Table 9-14.

Those target industry clusters that have grown in the MSA since 2000 include health care (38,412 new jobs), education (36,723 new jobs), business and financial services (15,033 new jobs), and bio-medical (13,661 new jobs). These growing clusters would all serve as compatible uses at the study area site. A more detailed description of these clusters is described below.

Table 9-14
Target Industries as Identified by the Commonwealth of Pennsylvania
Philadelphia MSA; 2000 to 2010 [1]

	Employment				Establishments			
Target Industry	**2000**	**2010**	**# Change**	**% Change**	**2000**	**2010**	**# Change**	**% Change**
Health Care	350,069	388,481	38,412	11.0%	11,935	13,610	1,675	14.0%
Education	149,325	186,048	36,723	24.6%	3,258	4,249	991	30.4%
Business and Financial Services	439,128	454,161	15,033	3.4%	32,525	34,380	1,855	5.7%
Bio-Medical	43,382	57,043	13,661	31.5%	1,075	1,135	60	5.6%
Logistics & Transportation	55,106	52,891	(2,215)	-4.0%	2,416	2,391	(25)	-1.0%
Lumber, Wood and Paper	21,413	14,448	(6,965)	-32.5%	659	567	(92)	-14.0%
Agriculture and Food Production	47,722	40,593	(7,129)	-14.9%	1,729	1,499	(230)	-13.3%
Energy	32,464	24,892	(7,572)	-23.3%	762	644	(118)	-15.5%
Building & Construction [2]	63,215	53,152	(10,063)	-15.9%	6,776	5,562	(1,214)	-17.9%
Information and Communication Services	159,098	125,057	(34,041)	-21.4%	8,227	8,563	336	4.1%
Advanced Materials & Diversified Manufacturing	160,013	96,808	(63,205)	-39.5%	3,578	2,495	(1,083)	-30.3%

Source: PA Dept. of Labor & Industry, Select Greater Philadelphia, Global Insights, and RKG Associates, Inc., 2011
[1] Philadelphia MSA includes Bucks, Chester, Delaware, Montgomery, Philadelphia, Burlington (NJ), Camden (NJ), Gloucester (NJ), and New Castle (DE) counties.
[2] Construction contracting positions were recategorized between 2000 and 2010. These positions were not included in the analysis.

1. Health Care

The Health Care cluster includes industries that provide for the health and well-being of PA residents. Direct patient care forms the cornerstone of this cluster. Also included are industries that support direct patient care, such as ambulance services, retail drug stores and health insurance carriers, as well as public agencies that oversee health programs. Specific health care categories that showed comparatively large gains in employment within the MSA include home health care services (6,428 new jobs) and continuing care retirement communities (2,959 new jobs). Providing services for the retired and elderly populations has been a noted priority of the Horsham Township community.

2. Education

The education cluster provides a full view of educational institutions in the Commonwealth. Education encompasses elementary schools through universities, as well as technical schools and junior colleges. Museums and historical sites are included, as they provide a rich source of educational material for residents. Support services, such as school bus transportation and child day care services are included given their vital roles in early educational pursuits and/or providing a valuable service to working parents. In the Philadelphia MSA, the most growth occurred within higher education institution categories, such as colleges, universities, and professional schools, as well as junior colleges, and other

technical and trade schools. The employment within these higher-learning categories added 18,400 jobs to the area.

3. Business and Financial Services

The Business and Financial Services cluster includes a wide range of services, from business support services to waste management. Included in this cluster are banking and credit institutions, insurance carriers and brokers, and personal and professional business services, advertising and marketing agencies and an assortment of business and support services. In 2008, the Targeted Industry Clusters Report, published by the Pennsylvania Department of Labor & Industry, sites that Montgomery had the highest location quotient in this cluster (1.50). Chester was the next highest, at 1.44. Additionally, the professional and management industries have both grown in the MSA from 2000 to 2010. Corporate, subsidiary, and regional managing offices had top employment gains during this time period (21,251 new jobs). Other industries to experience gains were direct health and medical insurance carriers (5,701), payroll services (4,899 new jobs) and insurance agencies and brokerage (3,994 new jobs).

4. Bio-Medical

The Bio-Medical cluster includes industries that develop and use technology to enhance life from a health perspective. Industries in this cluster are research laboratories, pharmaceutical manufacturing, surgical and medical equipment manufacturing and imaging centers. This cluster largely represents industries that employ advanced technology and serve as a foundation for enhanced medical services. The Commonwealth report on targeted industry clusters makes special mention of Montgomery County. It is stated that in 2008, Montgomery County had an employment concentration in this cluster five times the national average (location quotient of 5.46).

H. REGIONAL TARGET INDUSTRY SELECTION

1. Overview

The target industry screening process was a multi-level approach that incorporated an analysis of positive market growth trends, wage competitiveness, and compatible presence and fit at the study area site. A wide range of primary and secondary source materials, as well as interviews with industry experts was conducted in order to identify potential industries that appear to be either compatible with the region's location/labor assets or not negatively impacted by known constraints. This process, which is often described as a "target industry analysis," has several purposes when undertaken as part of a redevelopment strategy for a former military installation. These purposes and objectives include:

- Establishing a framework for matching the facility's available "product" (land, utilities, intangibles, etc.) to potential markets;
- Identifying a receptive "audience" for a focused marketing campaign;
- Understanding the characteristics, size and long-term growth potential of compatible markets;
- Establishing priorities for the allocation of marketing resources; and
- Identifying prospect industries for further consideration.

2. Target Industry Clusters

The following target industry clusters represent those industries upon which to focus recruitment efforts. It should be noted that it does not preclude any industries from locating to the NAS-JRB Willow Grove

property site. However, it is meant to provide focus and direction to the Horsham Township Authority for NAS-JRB (HLRA) as they pursue redevelopment plans of the former military base.

a.) Senior Living/Health Care Services Cluster

As mentioned previously, the health care industry is a strong and growing industry within the MSA. The health care cluster, as identified by the Commonwealth, grew by 11.0% (38,412 jobs) from 2000 to 2010. In the County, the Health and Social Assistance 2-digit NAICS industry grew by 5.3% (3,124 jobs) during the same time period. Although there is no hospital located directly in Horsham, the area is well-served by Montgomery County Hospital in Norristown and Abington Memorial Hospital, located just south of the PA Turnpike in Abington, PA. There are also additional smaller private hospitals located throughout the County. It should be noted the Albert Einstein Healthcare Network is constructing a new hospital in East Norriton that will replace the Montgomery Hospital Medical Center. It is set to open in September of 2012.

It is unlikely that a new hospital will be constructed at the property site. There is nearby competition as well as a new hospital development occurring about 15 miles away from the redevelopment site. However, there are other health care uses that would be a good fit and would build upon the existing health care resources of the region. In particular, health services that cater to the elderly population have experienced positive growth in the recent past. Since 2000, the MSA experienced 6,428 new jobs in home health services (40.2% increase) and 2,959 new jobs in continuing care retirement communities (17.4% increase). In Montgomery County, home health care increased by 759 jobs (26.5%) and continuing care retirement communities increased by 886 jobs (25.2%). In fact, both these industries experienced positive growth trends during the recession, and added 364 and 221 jobs, respectively, from 2007 to 2010.

Horsham is an aging community. According to the U.S. Census Bureau, those aged 65 and over increased by 3.3% from 1990 to 2010. The need for assisted-living or independent living retirement facilities was cited by the community as a priority need at each of the public meetings. Currently, the only age-restricted (55+) independent living community in Horsham is the Carriage House Manor, a townhome development located near Horsham Road. There is also one assisted living facility, the Abramson Center, and one facility under construction on Horsham Road. The large amount of available land at the NAS-JRB Willow Grove site lends itself to having assisted living or independent living centers. These centers could work in tandem with a "village center" concept; wherein retail uses would be positioned within close proximity to the senior living units.

As mentioned previously, there are certain industries within health care and social assistance that recruitment efforts should focus on. Table 9-15 shows those employment industries that relate to senior health services. Most of these industries have experienced strong growth and would compliment senior living facilities at the study area site.

Table 9-15
Senior Living/Health Services Target Industries
NAS-JRB Willow Grove Property Site [1]

NAICS	Industry	2010 Employment	2000 to 2010 Change	Annual Wages
621610	Home Health Care Services	2,859	Strong Growth	$38,475
623110	Nursing Care Facilities	7,437	Decline	$35,538
623311	Continuing Care Retirement Communities	3,522	Strong Growth	$27,075
624120	Services for the Elderly and Persons with Disabilities	746	Strong Growth	$18,373
623312	Homes for the Elderly	1,616	Growth	$26,643

Source: IHS Global Insight, Bureau of Labor Statistics, and RKG Associates, Inc., 2011
[1] Employment and wage data for Montgomery County

b.) Life Science R&D, Manufacturing & Education Cluster

Montgomery County has a strong life science presence. According to information received from Select Greater Philadelphia and IHS Global Insights, there are 217 life science companies in Montgomery County. For the purposes of this analysis, life sciences were defined as pharmaceutical and medical manufacturers, laboratories, diagnostic imaging centers, and research and development. In total, almost 20% of the life science companies in the Greater Philadelphia Region are located in Montgomery County (Table 9-16). Even more impressive, 38.3% of the total regional employment in life sciences is in Montgomery County.

Much of the employment is in pharmaceutical and medical supply manufacturers (42.3%). Major companies such as Johnson & Johnson, Merck, and Pfizer have facilities in the County. It should be noted that there were some consolidations and recent lay-offs in the pharmaceutical industry. For example, Pfizer acquired Wyeth and closed some facilities in Collegeville, Montgomery County. Drug companies across the nation are consolidating and focusing resources. Although there have been some recent pharmaceutical lay-offs in Montgomery County, there are also companies that continue to move to the area. In May, an Irish pharmaceutical company named Almac opened a new North American headquarters in Souderton, Montgomery County. This facility will add 262 jobs within the next three years.

Of the total life science companies within Montgomery County, there are 110 that have a NAICS code specifically within research and development (R&D). Montgomery County accounts for 21.6% of the establishments, and 32.7% of the R&D employment within the entire Philadelphia Region, which includes parts of New Jersey and Delaware. Furthermore, four of the research and development companies are located in Horsham Township (Argus Research Laboratories, Materials Sciences Corp., Nucleonics, Inc., and Scirex LLC).

Table 9-16
Life Science Companies by Industry
Montgomery County and Philadelphia MSA

	MONTGOMERY COUNTY				SHARE OF PHILADELPHIA MSA	
	2010 Employment	% of Total	2010 Establishments	% of Total	2010 Employments	2010 Establishments
MANUFACTURING	**9,234**	**42.3%**	**47**	**21.7%**	**44.9%**	**20.3%**
325411 Medicinal and botanical manufacturing	20	0.2%	1	2.1%	3.2%	10.0%
325412 Pharmaceutical preparation manufacturing	8,488	91.9%	10	21.3%	65.9%	29.4%
325413 In-vitro diagnostic substance manufacturing	0	0.0%	0	0.0%	0.0%	0.0%
325414 Other biological product manufacturing	81	0.9%	3	6.4%	16.9%	30.0%
333314 Optical instrument and lens manufacturing	121	1.3%	4	8.5%	44.6%	36.4%
334510 Electromedical apparatus manufacturing	64	0.7%	5	10.6%	9.3%	35.7%
339111 Laboratory apparatus and furniture	39	0.4%	2	4.3%	15.5%	22.2%
339112 Surgical and medical instrument manufacturing	280	3.0%	7	14.9%	14.3%	16.3%
339113 Surgical appliance and supplies manufacturing	52	0.6%	7	14.9%	4.2%	13.2%
339114 Dental equipment and supplies manufacturing	81	0.9%	7	14.9%	20.6%	29.2%
339115 Ophthalmic goods manufacturing	8	0.1%	1	2.1%	1.2%	7.1%
LABORATORIES	**3,363**	**15.4%**	**43**	**19.8%**	**59.9%**	**19.5%**
339116 Dental laboratories	147	4.4%	14	0.4%	23.0%	15.1%
621511 Medical laboratories	3,216	95.6%	29	0.9%	64.7%	22.7%
RESEARCH AND DEVELOPMENT	**9,142**	**41.8%**	**110**	**50.7%**	**32.7%**	**21.6%**
541711 R&D in physical, engineering and life sciences	9,084	99.4%	101	91.8%	33.7%	22.3%
541720 Social science/humanities research	58	0.6%	9	8.2%	5.9%	15.8%
DIAGNOSTIC IMAGING CENTERS	**112**	**0.5%**	**17**	**7.8%**	**3.9%**	**9.8%**
621512 Diagnostic imaging centers	112	0.5%	17	0.5%	3.9%	9.8%
TOTAL	**21,851**	**100.0%**	**217**	**100.0%**	**38.3%**	**19.1%**

Source: Select Greater Philadelphia, Global Insights, and RKG Associates, Inc., 2011

There research and development industry within Montgomery County has grown at a very rapid pace from 2000 to 2010 (259.9%). Currently, there are 9,142 life science related R&D jobs in the County. Interviews with industry professionals have indicated that most of the research and development employment in Montgomery County are private companies that are not directly

affiliated with a university or college. Although there are major research universities within the Philadelphia MSA, such as University of Pennsylvania, Temple University, and Thomas Jefferson University, these institutions have R&D facilities in close proximity to their campuses. They generally have not expanded research and development facilities into Montgomery County.

The consultant reached out to the major research universities within the Commonwealth of Pennsylvania in order to gauge potential interest in having a research and development campus or facilities at the study area site. The goal was not to receive a definitive answer, but to gain a fuller understanding of how a research facility would need to be positioned in order to attract university interest. The initial findings indicate that in order for there to be university interest, a very unique program needs to be created. Although the NAS-JRB Willow Grove site represents a unique opportunity, the universities contacted mentioned they would not be interested in expanding their presence based on location alone. A very specific program or opportunity would need to be created in order to attract their attention.

The North Carolina Research Center (NCRC) is an example of a research and development "super center" that is located in Kannapolis, NC. This facility was championed by Mr. David Murdock, the sole owner of Dole Foods. In 2005, he announced a partnership with the University of North Carolina, Duke University, and most of the state's research university, as well as City of Kannapolis. His vision is to create a bioscience research center that is focused on nutrition and health. At full build-out, the campus will contain 3.2 million square feet of office, laboratories, civic space and 1,000 on-campus dwelling units at a cost of over $1.5 billion. To-date, eight universities have a presence on the campus and are conducting research. More than 300 people currently work on the campus and there is growing interest from private industry to develop in and around the campus.

While a research complex on this scale may be extremely ambitious, a smaller initiative with a research focus on pharmaceutical or bio-medical sciences may be possible at NAS-JRB Willow Grove. There is already a strong private pharmaceutical presence in the County. This type of development would require private industries and educational facilities to partner with state and county government to create and implement a vision. The large amount of land and significant life science presence would make this an ideal fit for the site. However, partnerships with educational institutions will be critical to making this type of facility a reality.

In terms of specific industries to focus recruitment efforts on, Table 9-17 shows those research and development and education industries. Of note, research and development jobs in the life sciences have a very high annual wage ($105,283). All industries in this cluster have annual wages above $44,000.

Table 9-17
Biotechnology, Education, and Research Center Target Industries
NAS-JRB Willow Grove Property Site [1]

		2010 Employment	2000 to 2010 Change	Annual Wages
541711	R&D in physical, engineering and life sciences	9,084	Strong Growth	$105,283
541720	Social science/humanities research	58	Decline	$61,988
339116	Dental laboratories	147	Decline	$44,173
621511	Medical laboratories	3,216	Strong Growth	$57,301
611310	Colleges, Universities, and Professional Schools	86,646	Strong Growth	$52,390

Source: IHS Global Insight, Bureau of Labor Statistics, and RKG Associates, Inc., 2011
[1] Employment and wage data for Montgomery County

c.) Corporate Headquarters, Management and Business Services

There is a large office/corporate base in Montgomery County. There are 62,492 jobs within the county in the professional and management industries. Other industries, such as real estate, finance and insurance, administration and support contribute to the corporate employment base. These industries comprise another 74, 250 jobs within the County.

Of particular note, the Management of Companies and Enterprises has experienced tremendous growth in Montgomery County since 2000. This industry grew by 92.1% (8,085 jobs). Almost all of this growth has been in the corporate, subsidiary, and regional managing offices sector (97.5%). The management of companies and enterprises is an industry that has also experienced growth in Montgomery County since the 2007 recession. From 2007 to 2010, there were 2,020 jobs added in this industry (14.0% growth).

A corporate park/office facility is a highly desired use at the NAS-JRB Willow Grove. This type of facility would be a compatible use with the surrounding area and would generate high paying jobs. The site itself has many attributes that would attract corporate users. These strengths include:

- Located near Pennsylvania Turnpike, Route 309 Expressway, and Route 202 Parkway (easy access to Philadelphia, New Jersey, and Western Pennsylvania markets),
- Approximately 862-acres of competitively-priced land,
- Opportunities for large end users to locate at the site,
- Among the lowest real estate tax rates in the region and no business privilege or mercantile tax,
- About 40 minutes from the regional employment center of Center City Philadelphia,
- Located within 150 miles of other major population and employment centers (less than 100 miles from New York City and about 150 miles from Washington, DC),
- Educated workforce,
- Strong existing corporate presence,
- A variety of nearby colleges and research universities,
- High quality of Life,
- Low Crime,
- Range of regional housing options,
- Well recognized Blue Ribbon school system,
- Variety of parks, open space and recreational opportunities,
- Horsham ranked in the "Top 50 Communities in the United States" by CNN Money Magazine in 2007 and 2011, and
- Horsham was recognized in 2007 as a Best Place to Live in Pennsylvania by U.S. News and World Report

The consultant narrowed down those industries that would be an ideal fit within a Corporate Headquarters, Management, and Business Services cluster (Table 9-18). It should be noted that some of the listed industries have experienced a recent decline in employment. These industries are included in the cluster so as not to preclude any potential business and management companies from recruitment efforts. Many of these industries were specifically impacted by the 2007 recession. Development of a corporate office park would occur into the future, when financial conditions will likely have improved.

Table 9-18
Corporate Headquarters, Management, and Business Services Target Industries
NAS-JRB Willow Grove Property Site [1]

		2010 Employment	2000 to 2010 Change	Annual Wages
522	Credit Intermediation and Related Activities	9,193	Decline	$75,998
523	Securities, Commodity Contracts, and Other Financial	4,029	Decline	$132,647
524	Insurance Carriers and Related Activities	15,807	Decline	$80,264
525	Funds, Trusts, and Other Financial Vehicles	5,319	Strong Growth	$80,498
531	Real Estate	6,510	Growth	$61,069
532	Rental and Leasing Services	1,242	Decline	$43,425
533	Lessors of Nonfinancial Intangible Assets	122	Decline	$126,687
541	Professional, Scientific, and Technical Services	45,626	Strong Growth	$99,226
551	Management of Companies and Enterprises	16,866	Strong Growth	$98,839
561	Administrative and Support Services	30,837	Decline	$38,819

Source: IHS Global Insight, Bureau of Labor Statistics, and RKG Associates, Inc., 2011
[1] Employment and wage data for Montgomery County

d.) Green Energy Research Station Cluster

Green energy is defined as energy which comes from natural resources, such as sunlight, wind, rain and geothermal heat. The large amount of contiguous land available at the NAS-JRB Willow Grove site presents a unique opportunity for green energy-related uses. These uses could range from manufacturing of solar panels and other products necessary for delivery of sustainable energy, a research and development facility devoted to renewable energy innovation, to a large solar farm, where solar panels convert the sun's energy into electricity.

- **Green Energy Research –** Renewables and green energy is a growing field. The installation of solar, wind, and geothermal facilities have all increased in the recent past. There could be an opportunity to foster green energy innovation at the NAS-JRB Willow Grove site. This type of use would likely occur in partnership with public education institutions as well as private industry. As noted in the "Life Science R&D, Manufacturing & Education Cluster," in order to attract university research and development, the right program or needs to be created. A program focused on green energy innovation could provide this type of educational draw to the site.

- **Manufacturing of Renewable Products -** Manufacturing is declining across the nation, as the United States moves further into a service economy rather than a production economy. In Montgomery County, the manufacturing sector has also declined by 27,374 jobs (38.3%) since 2000. This industry was particularly hard hit by the 2007 recession. In Montgomery County, there were 6,526 manufacturing job losses from 2007 to 2010 (12.9% decline).

  Even though there has been a decline in manufacturing employment, there is great potential to target manufacturing companies that produce goods or components related to sustainability. Although employment has recently declined, manufacturing is still the 4th largest employer in the County (44,176). According to interviews with industry professionals, the greater Philadelphia region does not currently have a large sustainable manufacturer presence. This new target industry cluster would allow the region to enter a new and growing market. Manufacturing facilities of sustainable products would compliment any large-scale green energy projects that may occur at the project site.

Interviews with industry professionals have indicated that the renewable energy field is a highly specialized field. Special training needs to occur in all aspect of the industry, from the manufacturing level, to installation and maintenance of renewable energy products, such as solar panels. There could be an opportunity at the study area site to create a workforce development program and training center that supports the renewable energy industry. Before this could happen, partnerships would need to be formed between private industry and training and education facilities, such as Montgomery County Community College. Students would go to the new "renewable energy workforce and education center" to learn the skills needed for job placement in this field. Programs could range from manufacturing training that is needed by specific private industries, to programs on the installation and maintenance of solar energy panels. Although the solar industry has been growing, the expertise needed on the installation and maintenance of such products has lagged behind the demand. A "renewable energy workforce and education center" would help to fill this demand while providing a unique educational asset to the Township.

The NAS-JRB Willow Grove site could help elevate Pennsylvania's green energy profile. The largest solar project in PA is only 26-acres. There are potentially many applications for solar deployment available at the NAS-JRB site. Additionally, the Commonwealth of Pennsylvania is positioning itself to be competitive in developing new green energy advancements. The state offers rebates, industry support programs, and tax credits which are helping to bring green energy to the state. Efforts should therefore be make to target efforts on both energy production and manufacturing of products needed for sustainable energy production.

e.) Transportation, Warehousing & Distribution Cluster

There are 9,348 total jobs in transportation and warehousing in Montgomery County. It is not a particularly large employer for the region. However, a portion of the NAS-JRB Willow Grove site would be ideal for these types of uses. The site is located near the PA Turnpike, which provides access to western Pennsylvania markets and New Jersey markets. Warehousing also generates jobs. Given the large amount of available land, the consultant recommends targeting this industry. Specific sectors within transportation and warehousing that should received targeted efforts include truck transportation, support activities for transportation, and warehousing and storage (Table 9-19).

Table 9-24

Transportation and Warehousing
NAS-JRB Willow Grove Property Site [1]

		2010 Employment	2000 to 2010 Change	Annual Wages
484	Truck Transportation	2,383	Growth	$50,914
488	Support Activities for Transportation	258	Growth	$50,656
493	Warehousing and Storage	1,332	Decline	$60,956

Source: IHS Global Insight, Bureau of Labor Statistics, and RKG Associates, Inc., 2011

[1] Employment and wage data for Montgomery County

3. Target Industry Cluster Conclusions

The redevelopment opportunity at NAS-JRB Willow Grove is unprecedented. The large amount of contiguous and developable land is one of the only sites available within the greater Philadelphia region. The target industry clusters identified in this analysis will all help to fill certain needs of the community while increasing the jobs and tax-base. The programming of the site could include a mix of all of the above target industries, thereby creating a new and unique asset to the community.

10 BASE REUSE ALTERNATIVES

A. INTRODUCTION

The planning team created three Base Reuse Alternatives (A, B, and C) from which the Preferred Redevelopment Plan evolved. The reuse plan alternatives were not intended as independent "solutions" for reuse of NAS-JRB Willow Grove. Instead, they presented a collection of plan "elements" in different combinations, locations, and configurations, intentionally varied across the three alternatives to illuminate multiple reuse opportunities. The final Preferred Redevelopment Plan is a mix of all these concepts and elements from the different base reuse alternatives presented in this chapter.

The following principles of the community, as summarized by the HLRA, were used in creation of the three base reuse alternatives:

- Encourage a mixed-use plan that allows people to live, work and recreate, in the same location, in order to reduce traffic moving on and off the site.
- Maximize its employment/tax base benefits to the township or achieve a more balanced plan that meets a variety of community needs.
- Create a sense of place and community with a Town Center.
- Consider traffic congestion impacts and circulation in and around NAS-JRB.
- Secure viable sources for water and wastewater utilities to support development.
- Incorporate the latest green and sustainable design principles where appropriate (e.g., LEED buildings, LID, complete streets, energy efficiency/renewable energy, etc.).

B. SUMMARY OF MAJOR FINDINGS

1. Land Use and Employment

- A Town Center or Town Green concept is programmed into all Base Reuse Alternatives. However, the design and presence of development within each Town Center or Town Green ranges from 47,600 SF in Base Reuse Alternative A to 193,005 SF in Base Reuse Alternative B.
- The employment generated by the Town Center is estimated to range from 47 in Base Reuse Alternative A to 598 in Base Reuse Alternative B. Town Center alternatives that include higher amounts of retail and office uses will generate greater employment.
- In addition to the retail programmed into the Town Center, Base Reuse Alternatives A and B contain additional retail that would have frontage on various portions of Horsham Road and Easton Road. The retail uses in Base Reuse Alternatives A and B are estimated to generate 507 and 312 jobs, respectively.
- The largest single employment generating use proposed is a corporate office park. The size of the office park varies from 1.0 million SF (Base Reuse Alternative A) to 1.4 million SF

(Base Reuse Alternative B). An estimated 4,064 to 5,723 jobs will b e created upon build-out.

- A range of residential types include: single family, both large and small lots, attached townhomes, age-restricted 55+ homes, Continuing Care Retirement Community (CCRC), condominiums, and apartments were programmed into the Base Reuse Alternatives. The number of residential units range from 1,200 (Base Reuse Alternative A) to a high of 2,200 (Base Reuse Alternative B), depending on the amount of acreage, unit mix, and density assumptions.
- All three scenarios contain parks and open space. The amount of parks/open space programmed into the Base Reuse Alternatives ranges from 160 (Base Reuse Alternative B) to 177 acres (Base Reuse Alternative C).

2. Infrastructure

- The water and wastewater infrastructure systems on-base will not be transferred to the HLRA. As such, there will need to be public investments in providing these services to the site.
- Base Reuse Alternative B has the highest associated utility and infrastructure cost ($43.2 million), due to higher number of residential units programmed into plan.
- Base Reuse Alternative C has the lowest estimated infrastructure costs of $38.1 million.
- The infrastructure cost estimates do not include the removal of the runway, taxiways and apron areas, nor does it account for building demolition costs. These costs are assumed to be the same under all three reuse alternatives.

3. Road Network

- Each Base Reuse Alternative road network includes a main boulevard that extends from the southern portion of the base through the northern boundary. However, Base Reuse Alternative C proposes a grand boulevard that becomes a signature road element running north/south through the entire development.
- In Base Reuse Alternative A, the connector streets link Privet Road to Gate 1, Precision Road to Moreland Avenue, and Norristown Road to Maple Avenue. The AM peak hour traffic increases 17% and the PM peak hour traffic increases 11% over current operating volumes. Base Reuse Alternative A has potentially the lowest traffic impacts of the three alternative scenarios.
- In Base Reuse Alternative B, the connector streets link Privet Road to Gate 1, Precision Road connects to an area just south of Gate 1, and Norristown Road connects to Moreland Avenue. The AM and PM peak hour traffic in Base Reuse Alternative B would show a greater increase than shown in Base Reuse Alternative A (23% AM peak hour and 13% PM peak hour traffic increases).
- The street network in Base Reuse Alternative C is the same as in Base Reuse Alternative B. However, Base Reuse Alternative C has a different internal road structure. It is estimated that the road network in Base Reuse Alternative C will increase AM peak hour traffic 26% over current conditions and 15% over peak PM current conditions. This scenario would have the greatest impact on current traffic levels.

4. Fiscal Impacts

- The office park development potentially generates the largest tax revenues alternative, ranging from $3.2 million to $4.5 million annually. The office park revenues are primarily a result of the real estate tax and earned income tax collection.
- As in most communities, the greatest projected municipal expenditure item is related to education costs driven by higher school enrollments. In Base Reuse Alternative B, the school-

related expenditures were estimated to be approximately $10 million. Base Reuse Alternative A had the lowest school expenditures ($5.2 million) due to the lower number of planned residential units.

- Total school impacts are positive in all three scenarios. The school district collects property taxes from residential/commercial development and a portion of the earned income taxes from commercial uses. This results in a potential positive impact of $1.6 million to $4.5 million for the Hatboro-Horsham School District.
- While all three base reuse alternatives appear to result in a net positive fiscal impact to the Township and School District, these early estimates only account for the project's ability to support the provision of municipal services.
- From a development finance perspective, all three reuse alternatives currently produce a large gap between projected real estate revenues and the cost of infrastructure. In order to realize future tax revenues, this financial gap must be closed.

C. LAND USE AND EMPLOYMENT SUMMARY

This section describes the various land uses that were programmed into the Base Reuse Alternatives as well as estimates of the employment that will be generated upon build-out (15 years). In addition to the principles listed in the Introduction section, the three plans were based on several more specific key planning principles that reflect the interests of the Horsham community and HLRA Board and take advantage of the site's competitive strengths:

- The highest land values are likely to be along Horsham and Easton Roads and south of Norristown Road. Where possible, these areas should be preserved for employment generating uses.
- There is a preference for locating higher-traffic generating uses on Horsham Road as opposed to Easton Road, given the higher traffic volumes on Easton Road.
- Residential development should be located in the interior of the site and away from the main roads.
- The northern portion of the site should be the lowest density development with significant open space due surface flooding issues and limited capacity of Keith Valley Road.
- Provide for the creation of a corporate/education campus setting and create opportunities to accommodate larger campus-style users on 50-acres or more. However, this area should be planned to meet the needs of smaller users, should a larger corporate user not be identified.
- Create up to three new site crossing between Horsham Road and Easton Road.
- Avoid development on or near known landfill sites and other contaminated areas until remediation can occur.
- Incorporate green connections and walkways into all development scenarios.

A comparison table of the three Base Reuse Alternative land uses, acreage, building square feet, and jobs is included at the end of this section (Table 10-1). Concept Plan maps, which detail the layout and design of the land uses are also included (Maps 10-1 to 10-3).

1. Town Center

The consultants programmed varying levels of development within each of the three Base Reuse Alternatives. All alternatives contain a Town Center or Town Green, however the design and layout varies in each plan. In Base Reuse Alternative A, there is a traditional Town Green with a very small presence of retail uses lining the park space (7,600 SF). A short "Boulevard" street leads into a town green at the southern end. There are no residential or office uses programmed into this alternative. Due

to the lack of employment generating uses, this Town Green alternative is projected to only generate a total of 30 jobs at build-out.

Base Reuse Alternative B contains the greatest level of commercial development in Town Center development. The Town Center is developed around a 7-acre rectangular park, which is located in the middle of the commercial district and becomes a public gathering space. Retail uses such as restaurants and neighborhood-serving shops would line all sides of the (109,000 SF). This alternative also includes 405 residential units and 43,600 SF of office space, in many cases located above ground floor retail space. This alternative is projected to generate as many as 581 jobs at build-out, with the majority of jobs (382 jobs) classified as retail. Given the larger development program, the town center is oriented to the Horsham Road side of the property where traffic levels are lower.

Base Reuse Alternative C Town Center does not contain park or open space and represents a "middle ground" development program. There is a moderate level of retail space programmed into this alternative (75,200 SF), as well as 30,080 SF of office space and 279 residential units. It should be noted that all three town center alternatives include 40,000 SF of cultural & recreation uses. This use could include a small performing arts center, indoor recreation center, ice-skating rink, athletic fields, etc. Base Reuse Alternative C Town Center is projected to generate 401 jobs upon build-out and is oriented to the Easton Road side of the property for maximum visibility.

2. Retail

In addition to the retail programmed into the Town Center, Base Reuse Alternatives A and B contain additional retail development along existing road frontage at various portions on Horsham Road and Easton Road. There is a larger amount of in-line retail programmed into Base Reuse Alternative A (22 acres and 144,950 SF) than Base Reuse Alternative B (14 acres and 89,050 SF). Base Reuse Alternative C contains no retail in addition to the retail programmed into the Town Center. Retail is generally a comparatively large generator of employment. The retail uses in Base Reuse Alternatives A and B are estimated to generate 507 and 312 jobs, respectively.

3. Light Industrial

Base Reuse Alternatives A and C have light industrial uses programmed into the scenarios. Base Reuse Alternative A includes about double the industrial acreage and square feet (150 acres and 1,347,300 SF) as Base Reuse Alternative C (75 acres and 670,500 SF). As such, the number of jobs created by industrial uses in Base Reuse Alternative A is also about double the amount (1,347 jobs) than in Base Reuse Alternative C (671 jobs). The light industrial land use is not entirely consistent with the community's development vision for the property and may generate additional truck traffic that is seen as undesirable by the community.

4. Office Park

All three alternatives contain an office park. The largest amount of office park development is in Base Reuse Alternative C, which includes 1.2 million SF of office space. The least amount of office park development is in Base Reuse Alternative A at just over 1 million SF. The number of jobs generated by the office park also varies from 4,064 jobs under Base Reuse Alternative A to an estimated 5,723 jobs under Base Reuse Alternative B. Base Reuse Alternative C falls in the middle of the three scenarios with an estimated 4,891 jobs at build-out.

5. Hotel/Conference Center

A hotel/conference center is programmed into Base Reuse Alternatives A and C. The hotel/conference center in Base Reuse Alternative A is a little smaller (111,200 SF) than the center programmed in Base Reuse Alternative C (142,400 SF). The hotel/conference center is projected to create about 78 jobs in Base Reuse Alternative A and 100 jobs in Base Reuse Alternative C.

6. Residential

A range of residential types, including single family (both large and small lot), townhomes, age-restricted 55+ homes, Continuing Care Retirement Community units (CCRC), condominiums, and apartments were programmed into the three alternatives. The density of units ranged from a low of 7 units/acre for single family homes to a high of 14 units/acre for apartments and CCRC units. A CCRC is a type of retirement community where a number of senior care needs, from assisted living, independent living and nursing home care, may all be met in a single development. Housing types within CCRC's can include attached and detached single family homes on small lots, duplexes, quadraplexes, townhomes, apartments, and nursing care units.

Base Reuse Alternatives B and C include Town Center residential units of 405 and 279 units respectively. These units will help to support retail establishments that may locate in the Town Center, as well as creating a vibrant and attractive area for residents and visitors. The Town Center residential units could include loft-style apartments and condominiums over retail shops, as well as other condominium/apartment units.

Base Reuse Alternative A contains the least amount of residential development (1,235 total units). There are no Town Center residential units or townhomes included. Base Reuse Alternative B has the largest number of residential units (2,282 units). The 55+ homes and CCRC homes account for almost half of the total units (1,117 units). Base Reuse Alternative B is the only alternative scenario to include townhomes (702 units). Base Reuse Alternative C residential development falls in between the two alternatives with 1,811 units programmed into the site.

7. Parks/Open Space

All three reuse alternatives contain parks and recreational spaces, trails and passive open space. This category includes both public park/open space as well as open space that may be part of a private development (such as open space that surrounds an office park). All three scenarios have very similar amounts of park/open space which range from 160 acres in Base Reuse Alternative B to 177 acres in Base Reuse Alternative A. The uses that could be programmed into park/open space could include active recreation uses such as athletic fields and natural environmental areas with walking trails, ponds and viewing areas.

Table 10-1
Land Use, Building, and Employment Characteristics
Base Reuse Alternatives

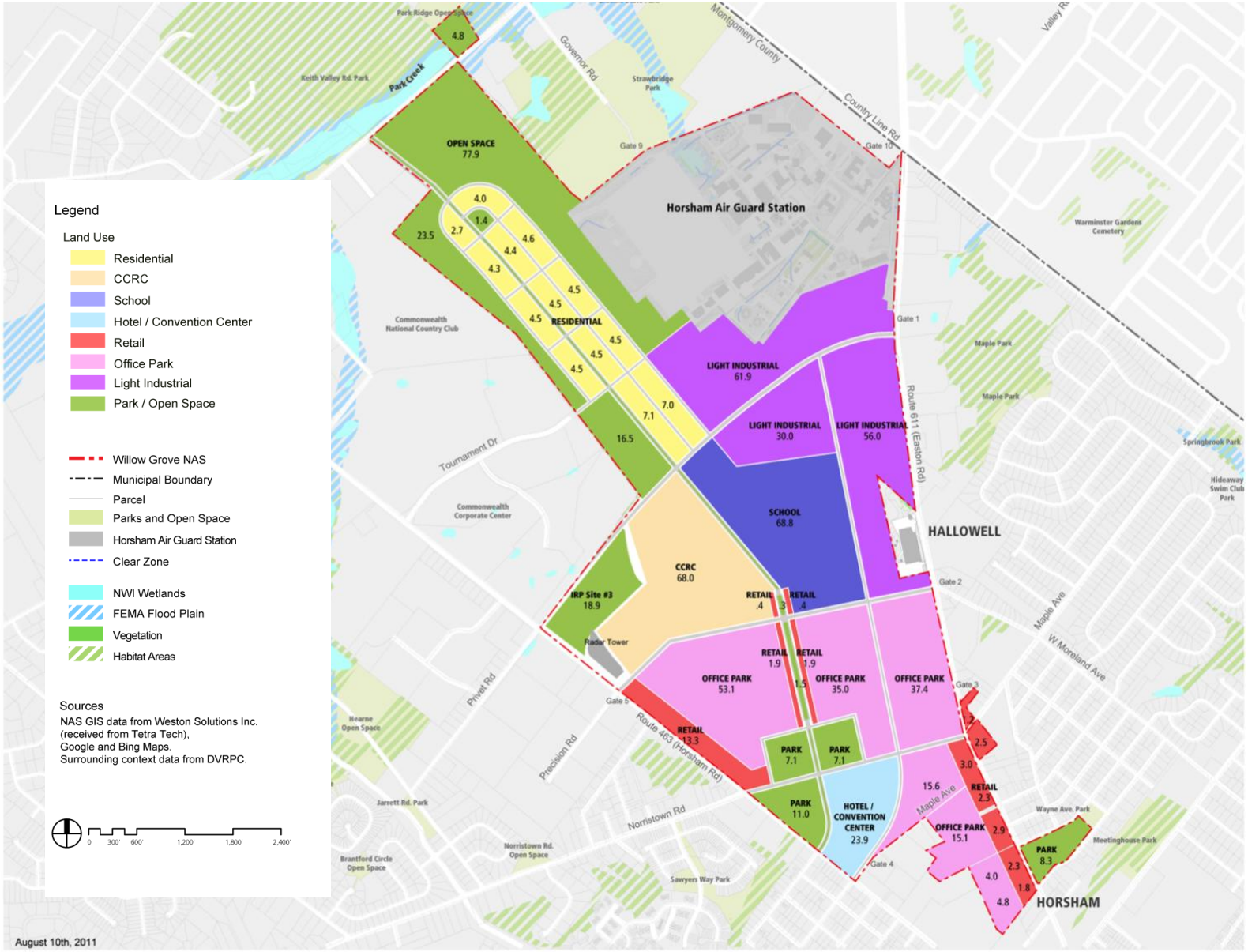
Land Use Category	Base Reuse Alternative A			Base Reuse Alternative B			Base Reuse Alternative C		
Land Use	Acres	Building SF/Units [1]	Jobs (At Build-Out)	Acres	Building SF/Units [1]	Jobs (At Build-Out)	Acres	Building SF/Units [1]	Jobs (At Build-Out)
Single Family	69	481	--	8	58	--	51	360	--
Townhomes	--	--	--	70	702	--	--	--	--
55+	30	390	--	42	550	--	60	780	--
CCRC	26	364	655	41	567	1,021	28	392	706
CCRC/Med Office/Amenities	12	60,000	222	28	138,000	511	15	75,000	278
Hotel/Conference	14	111,200	78	--	--	--	18	142,400	100
Town Center	14	47,600	30	65	193,005	581	48	145,559	401
Town Center Retail	--	7,600	27	--	109,000	382	--	75,200	263
Town Center Office	--	--	--	--	43,600	196	--	30,080	135
Town Center Residential	--	--	--	--	405	--	--	279	-
Cultural & Recreation	--	40,000	3	--	40,000	3	--	40,000	3
Office Park	156	1,015,950	4,064	220	1,430,650	5,723	188	1,222,650	4,891
Light Industrial	150	1,347,300	1,347	--	--	--	75	670,500	671
Retail	22	144,950	507	14	89,050	312	--	--	--
School	69	240,800	--	73	254,100	--	73	256,200	--
Park/Open Space	177	--	--	160	--	--	176	--	--
Total [2]	**739**	**2,967,800 SF/ 1,235 Units**	**6,903**	**720**	**2,297,405 SF/ 2,282 Units**	**8,148**	**731**	**2,512,309 SF/ 1,811 Units**	**7,047**

[1] Residential development is expressed as units

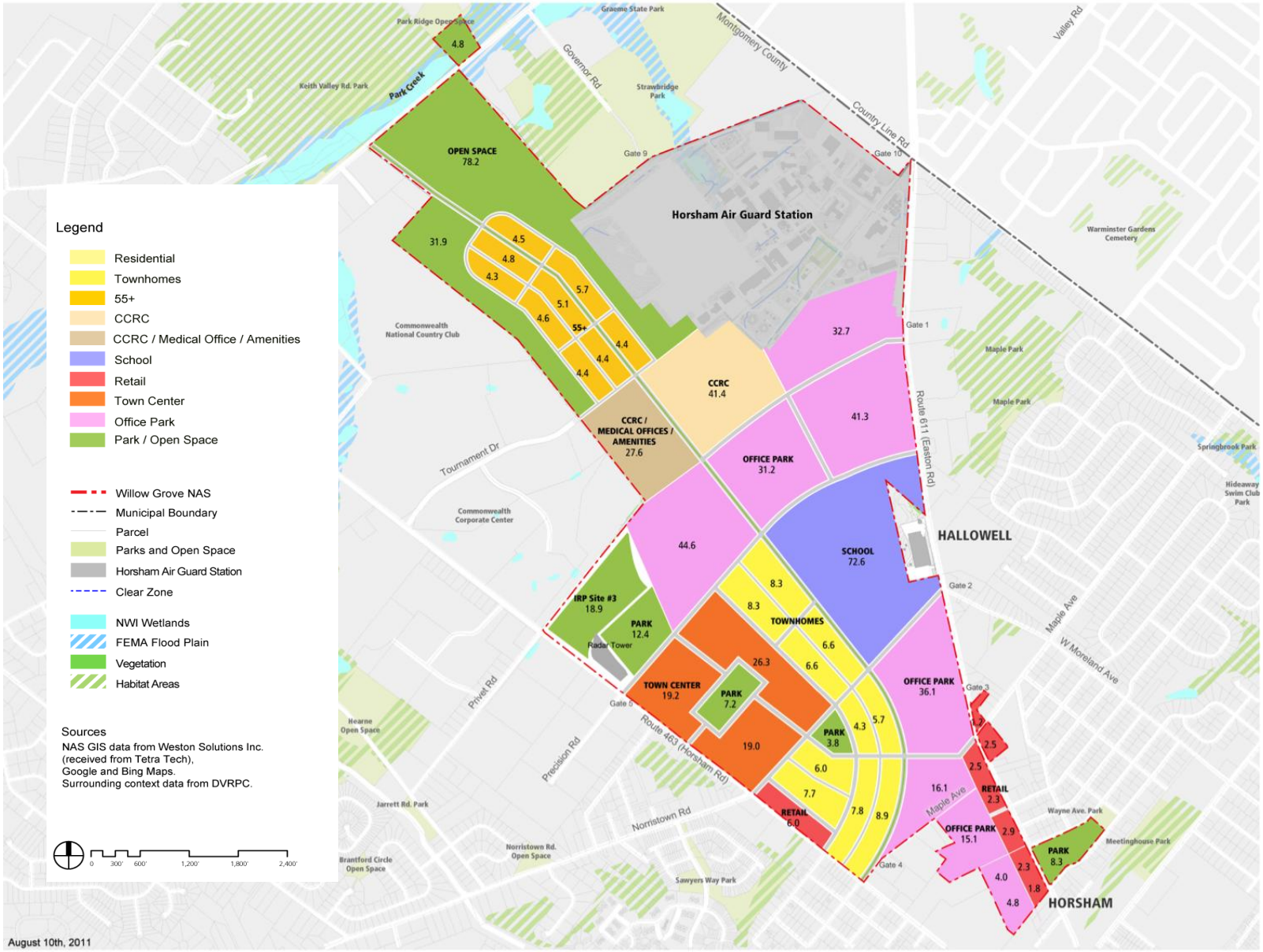
[2] Total acres shown equates to total programmed development. "Other Uses" such as infrastructure, water, streets, etc. is not shown.

Source: JDA Inc, and RKG Associates, Inc., 2011

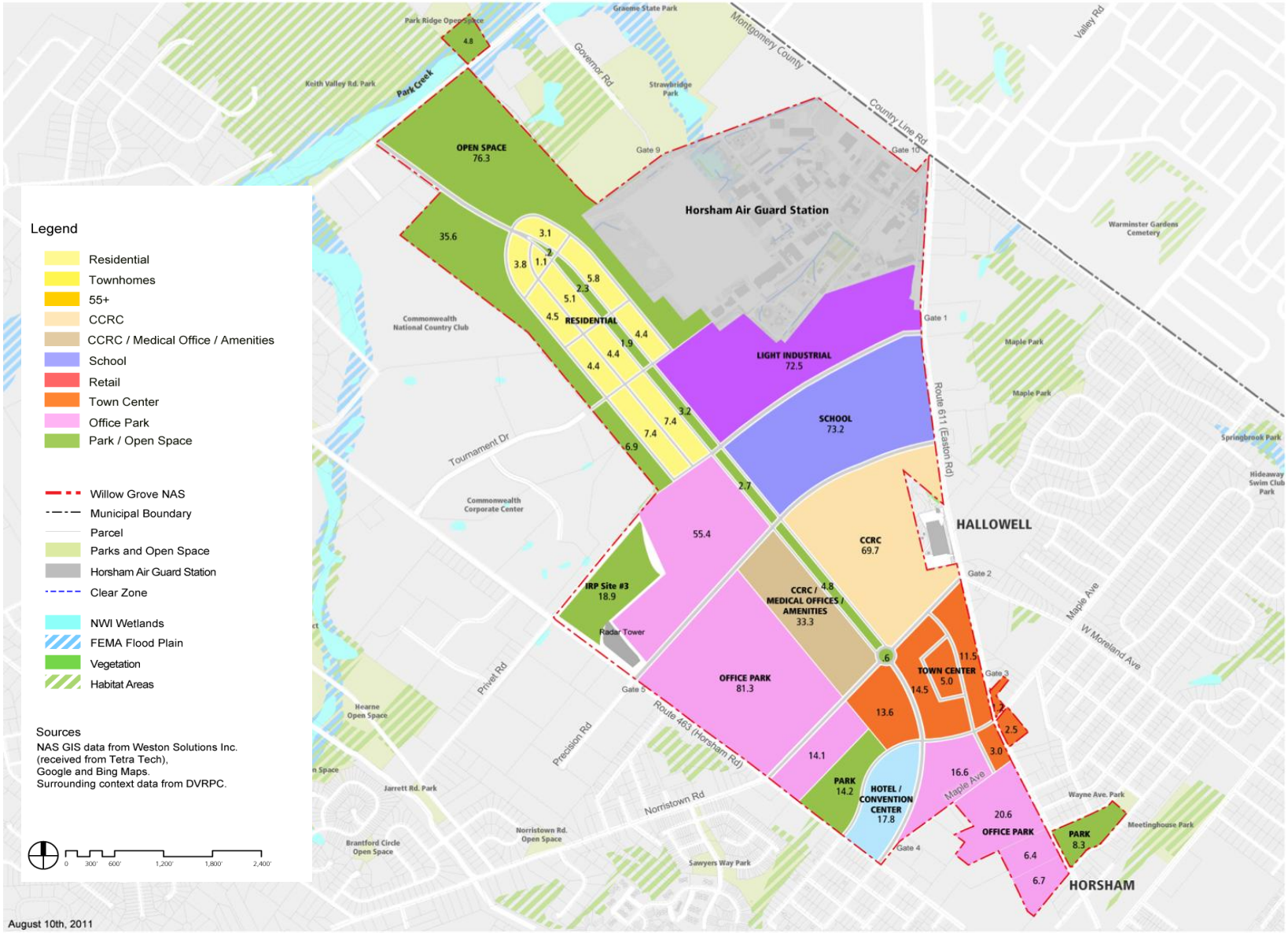
Map 10-1
Base Reuse Alternative – Option A



Map 10-2
Base Reuse Alternative – Option B



Map 10-3
Base Reuse Alternative – Option C



D. INFRASTRUCTURE

The potable water wells and wastewater infrastructure systems on-base will not be transferred to the HLRA and the wastewater treatment facility has been closed and dismantled by the Navy. As such, there will need to be early public investments in providing these services to the site. Although the extent of water and sanitary sewer mains to be provided have yet to be determined, it is assumed for this cost comparison that public investment will be required provide the trunk infrastructure serving the entire property. For the purposes of comparing Base Reuse Alternatives A, B, and C, water and sanitary sewer mains were assumed to be located within the proposed road right-of-ways for each reuse alternative. Table 10-2 presents estimates for total costs (both public and private investments) to construct road, water and sanitary sewer mains along these roads. Since the total length of roads is substantially similar for each alternative, the total estimated costs for water and sanitary sewer mains are also fairly similar.

Table 10-2
Utilities/Infrastructure Costs

	ALTERNATIVE A			ALTERNATIVE B			ALTERNATIVE C		
	Req.	Utility	Cost (Millions)	Req.	Utility	Cost (Millions)	Req.	Utility	Cost (Millions)
Water	882,248 gpd	4" & 6" mains	$11.7	994,802 gpd	4" & 6" mains	$13.0	970,767 gpd	4" & 6" mains	$11.7
Wastewater	749,911gpd	15" (avg) gravity main	$16.4	845,582 gpd	15" (avg) gravity main	$18.2	825,152 gpd	15" (avg) gravity main	$16.4
Roads	58,350 LF	2-lane 24' wide w/curb	$10.8	64,500 LF	2-land 24' wide w/curb	$11.9	53,950 LF	2-land 24' wide w/curb	$10.0
Total Cost		**$38.9**			**$43.2**			**$38.1**	

Source: Weston and RKG Associates, Inc., 2011

The consultants prepared conceptual-level infrastructure estimates associated with each base reuse alternative. The utility/infrastructure systems analyzed included water, wastewater, and roads. Base Reuse Alternative B has the highest associated costs ($43.2 million). This is due to the higher amount of residential units programmed into Base Reuse Alternative B. Base Reuse Alternative C has the least amount of associated costs ($38.1 million) and Base Reuse Alternative A has $38.9 million in associated costs. In Chapter 11 of this plan, a more detailed description of infrastructure costs associated with the Preferred Redevelopment Plan is presented. That section includes refined assumptions regarding trunk and collector road networks, water and sewer lines, building demolition, and runway removal costs.

E. ROAD NETWORK

Each reuse alternative street network includes a main boulevard that extends from the southern portion of the base near Maple Avenue through the northern end of the property connecting to Keith Valley Road. Although Base Reuse Alternatives B and C have the same network of connector streets, the internal secondary and local streets are different in each alternative because of the different land use mix and configuration. The differing road networks produce different traffic impacts, which are described below.

All three alternatives contain multiple east/west road crossings through the property linking Horsham Road and Easton Road. These links will eliminate some of the traffic that is forced to go around the property through the various signalized intersections.

In Base Reuse Alternative A, the connector streets link Privet Road to Gate 1, Precision Road to Moreland Avenue, and Norristown Road to Maple Avenue. These were considered to be the preferred connections by the HLRA Board. The AM and PM peak traffic impacts for Base Reuse Alternative A are shown in Map 10-4 and 10-5. In this option, the AM peak hour traffic increases 17% and the PM peak hour traffic increases 11% over current traffic volumes. Base Reuse Alternative A has the lowest traffic impacts of the three alternative scenarios.

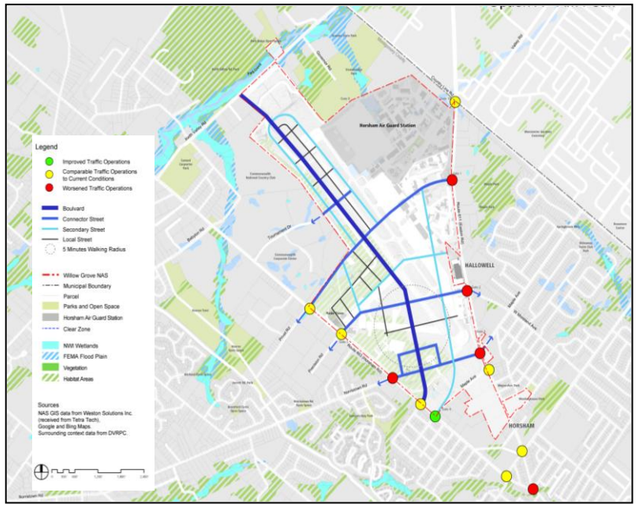
In Base Reuse Alternative B, the connector streets link Privet Road to Gate 1, Precision Road connects to an area just south of Gate 1, and Norristown Road connects to Moreland Avenue. The road network and traffic impacts are shown in Maps 10-6 and 10-7. The AM and PM peak hour traffic in Base Reuse Alternative B would show a greater increase than shown in Base Reuse Alternative A (23% AM peak hour and 13% PM peak hour traffic increases).

The connector street network in Base Reuse Alternative C is the same as in Base Reuse Alternative B. However, Base Reuse Alternative C has a different internal road structure because of its different land use mix and configuration. It is estimated that the road network in Base Reuse Alternative C will increase AM peak hour traffic 26% over current conditions and 15% over peak PM current conditions (Maps 10-8 and 10-9). This alternative would potentially have the greatest impact on current traffic levels.

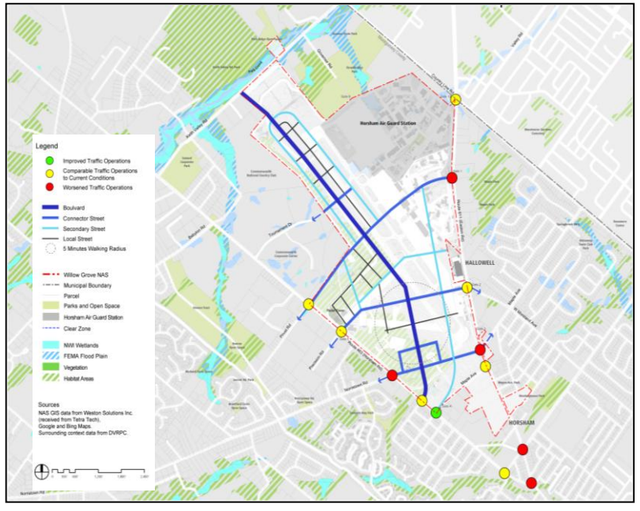
The street network maps on the following page show the difference in AM and PM peak traffic conditions and the color-coding shows how three reuse alternatives would impact each of the intersections surrounding the base. A green dot denotes improved conditions, a yellow dot denotes similar conditions to current levels and a red dot denotes worse conditions. However, these future traffic conditions do not reflect any road or intersection improvements or traffic management technology to mitigate these increased traffic levels.

It's worth noting that projected traffic volume increases for AM and PM peak periods, reflect traffic volumes above the current baseline conditions. Unfortunately, with a vacant military base, the current baseline traffic volumes are below historic levels when the base was at full operation. This inadvertently overstates the future traffic impacts over what local residents have experienced in the past.

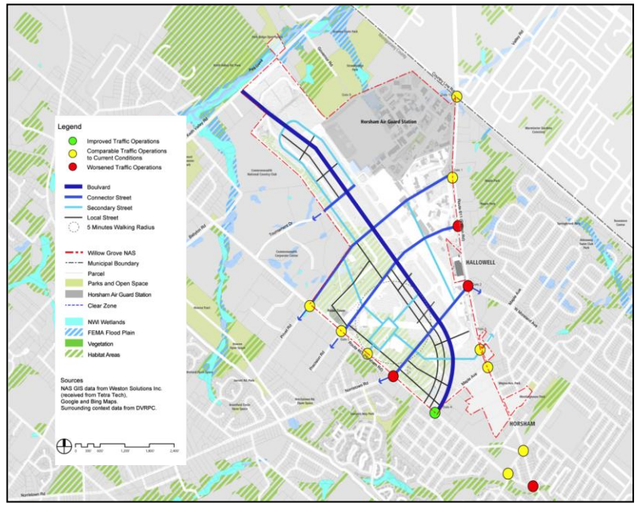
Map 10-4
Alternative A Traffic Impacts – Peak AM



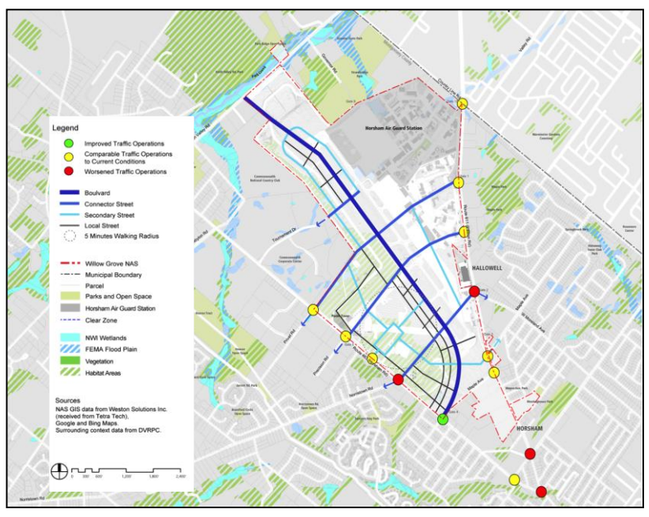
Map 10-5
Alternative A Traffic Impacts – Peak PM



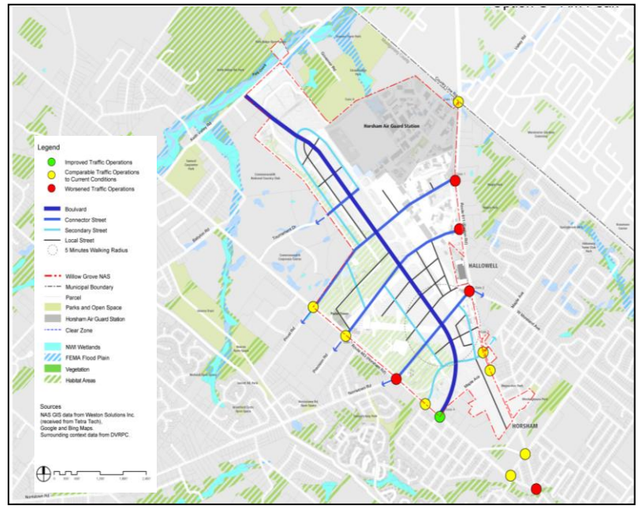
Map 10-6
Alternative B Traffic Impacts – Peak AM



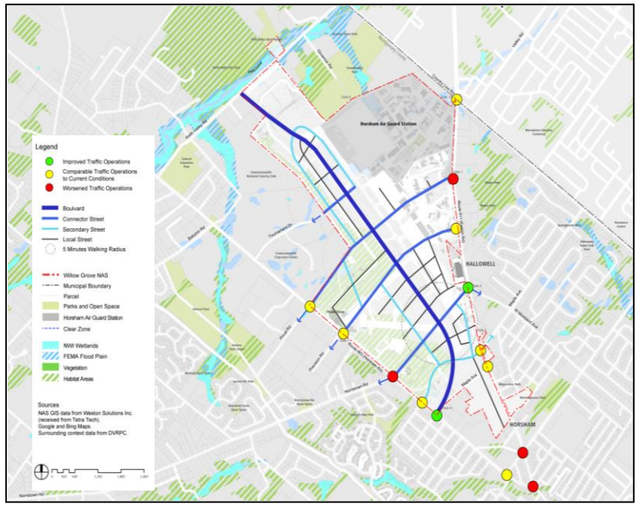
Map 10-7
Alternative B Traffic Impacts – Peak PM



Map 10-8
Alternative C Traffic Impacts – Peak AM



Map 10-9
Alternative C Traffic Impacts – Peak PM



F. FISCAL IMPACTS

RKG Associates examined the rough fiscal impacts associated with the three reuse alternatives on the township's ability to provide additional municipal services once the property has reached build out. The fiscal impact analysis is considered a generalized assessment of how the varying land use mixes will impact municipal revenue and expenditures. It should be noted that the fiscal impacts need to be taken into consideration with all planning principles and goals. For example, residential uses require a greater amount of Township and School District expenditures than commercial uses. However, residential units also help to support commercial development and help contribute to a balanced and thriving community. The fiscal impact analysis does not address the financial feasibility of developing the property in accordance with the three alternatives. It simply relates the future cost of providing municipal services with the potential local tax revenues that could be generated at final build-out, which could take as long as 20 years to achieve.

1. Municipal Revenues

Revenues generated from real estate taxes, earned income taxes, and "all other" revenue sources (such as fees and permits) were included in the revenue analysis. Real estate taxes were calculated by applying the Township and School District millage rates (1.0 mills and 24.992 mills, respectively) to the estimated assessed value of each development. The earned income tax, levied on local incomes of residents and people who work in Horsham and live outside the community, was calculated by applying the local tax rate (0.5% towards the Township and 0.5% towards the School District) to future estimated payroll at the base.

Table 10-3
Revenues by Base Reuse Alternative

Land Use Type	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
RESIDENTIAL REVENUES			
Single Family	$3,467,258	$418,806	$2,594,237
Townhomes	$0	$3,649,627	$0
Town Center Residential	$0	$888,196	$612,439
55+	$1,240,480	$1,749,158	$2,480,961
CCRC	$798,498	$1,243,814	$859,920
Total Residential Revenues	**$5,506,236**	**$7,949,602**	**$6,547,557**
COMMERCIAL REVENUES			
CCRC/Med Office/Amenities	$221,441	$484,300	$270,617
Hotel/Conference	$247,055	$0	$313,799
Town Center Retail	$16,170	$231,262	$159,625
Town Center Office	--	$118,302	$81,731
Cultrual & Recreation	$595	$580	$585
Office Park	$3,231,037	$4,532,264	$3,878,379
Light Industrial	$1,625,106	$0	$761,481
Retail	$308,063	$188,931	$0
School	$11,381	$11,894	$12,164
Park/Open Space	--	$0	$0
Total Commercial Revenues	**$5,660,849**	**$5,567,533**	**$5,478,381**
TOTAL REVENUES	**$11,167,085**	**$13,517,135**	**$12,025,938**

Source: RKG Associates, Inc., 2011

Total payroll is a function of the number and types of jobs to be created at NAS-JRB. Adjustments were made to account for non-resident workers who typically pay earned income tax to their town of residence rather than Horsham Township. However, those workers that live in communities that do not levy the earned income tax are not exempt from Horsham's earned income tax. Lastly, "all other" revenue was assessed by obtaining the 2010 General Fund Budget Revenues. The total incremental revenue/$1,000 in assessed value for "all other" revenues were then applied to the estimated assessed value of the proposed developments.

The revenues generated from the proposed developments within each alternative range from $11.2 million in Alternative A to $13.5 million in Base Reuse Alternative B (Table 10-3). A comparatively large share of municipal revenues would be generated from the office park development in each scenario. The office park revenues are primarily a result of real estate tax and earned income tax collection. The residential uses also generate a comparatively high amount of revenue for the Township, primarily derived from the real estate taxes.

2. Expenditures

The provision of public education services is often the most costly expenditure for communities. As such, the consultant separated the expenditures of the proposed developments for both the Township and the Hatboro-Horsham School District. The residential, commercial, and school-related expenditures are shown in Table 10-4.

RKG calculated the average cost of educating each child in local public schools at $13,005 per year, based on 2010 enrollment and actual local expenditures. This average cost per pupil was determined after making adjustments for intergovernmental transfers or other cost reimbursements. In order to estimate the number of students that would reside within the proposed developments in each Base Reuse Alternative, RKG used general planning figures provided by the Hatboro-Horsham School District (e.g., 0.75 school-age children per single family unit and 0.40 school-age children per multi-family unit). The expenditures were then calculated by applying the number of children within each housing type to the costs of education. It should be noted that the CCRC retirement community was assumed to have no impact on schools due to its older households.

The Township expenditures were calculated and reported as residential and non-residential. This accounts for the fact that certain municipal expenditures for services are more closely linked to residential households as compared to businesses or other non-residential taxpayers. To assess these expenditures, the consultant first separated the costs generated by commercial uses and those by residential uses by using proportional assessed values for commercial and residential property. Assessment data received from the County indicates that 70% of Horsham's real property assessed value is classified as residential. Approximately 30% of the Township's total assessed value is classified as commercial or other non-residential uses. These percentages were then applied to various municipal expenditure categories as appropriate, with the exception of some expenditures categories that primarily in support residential households (i.e., education, recreation, etc.).

Table 10-4
Expenditures by Base Reuse Alternative

Land Use Type	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
RESIDENTIAL EXPENDITURES			
Single Family	$535,133	$64,652	$400,376
Townhomes	$0	$535,657	--
Town Center Residential	$0	$97,311	$67,136
55+	$160,697	$226,583	$321,394
CCRC	$138,874	$216,323	$149,557
Total Residential Expenditures	**$834,704**	**$1,140,526**	**$938,462**
COMMERCIAL EXPENDITURES			
CCRC/Med Office/Amenities	$12,951	$29,786	$16,188
Hotel/Conference	$18,001	--	$23,052
Town Center Retail	$1,107	$15,881	$10,956
Town Center Office	$0	$7,058	$4,869
Cultrual & Recreation	$6,475	$6,475	$6,475
Office Park	$202,839	$285,636	$244,108
Light Industrial	$109,052	--	$54,271
Retail	$21,118	$12,974	$0
Park/Open Space	$0	--	$0
Total Commercial Expenditures	**$371,544**	**$357,810**	**$359,920**
SCHOOL EXPENDITURES			
Single Family	$4,691,697	$565,735	$3,511,457
Townhomes	$0	$6,847,341	$0
Town Center Residential	$0	$1,451,402	$1,451,402
55+	$532,571	$1,100,647	$1,065,142
CCRC	$0	$0	$0
Total School Expenditures	**$5,224,268**	**$9,965,125**	**$6,028,001**
TOTAL EXPENDITURES	**$6,430,515**	**$11,463,461**	**$7,326,383**

Source: RKG Associates, Inc., 2011

The results indicate that total expenditures range from $6.4 million in Base Reuse Alternative A to $11.5 million in Base Reuse Alternative B (Table 10-4). The majority of expenditures are school-

related. In Base Reuse Alternative B, the school-related expenditures were estimated to be approximately $10 million. Base Reuse Alternative A had the lowest school expenditures ($5.2 million) due to the lower amount of planned residential units.

The majority of Township expenditures are a result of providing municipal services to the residential units. Residential Township expenditures ($834,704 to $1.1 million), account for about 70% to 76% of total Township expenditures depending on the Base Reuse Alternative. Total Township expenditures ranged from $1.2 million in Base Reuse Alternative A to $1.5 million in Base Reuse Alternative B.

3. Net Fiscal Impact

It is estimated that all Base Reuse Alternatives result in a net positive impact to the Township and School District. The revenues generated from the alternatives effectively cover the municipal and School District costs. The total positive impacts range from $2.1 million in revenue in Base Reuse Alternative B to $4.7 million in revenue in Base Reuse Alternative A (Table 10-5).

In terms of impacts directly to the Township, Base Reuse Alternative B produces the most net revenue ($478,025). Although the residential units in Base Reuse Alternative B will result in $87,000 in expenditures, the revenue collected from the office park ($469,441), CCRC/Medical Office/Amenities ($58,551) and other commercial uses offsets the residential costs. Base Reuse Alternatives A and C also show a negative residential net impact (-$219,545 and -$68,405, respectively). However, the commercial uses produce enough revenue to off-set the residential costs.

The residential impacts to the school district range from a negative $350,502 in Base Reuse Alternative C to a negative $3.0 million in Base Reuse Alternative B. The comparatively large amount of townhomes (702) compared to the number of other residential units in the three alternatives largely accounts for the high school expenditures in Base Reuse Alternative B. However, it is important to note that total school impacts are positive in all three scenarios. The school district collects property taxes and a portion of the earned income taxes from commercial uses. At the same time, these uses do not cost the school in expenditures. This has resulted in a total positive impact of $1.6 million to $4.5 million to the School District.

Table 10-5
Net Fiscal Impacts

	TOWNSHIP			SCHOOL DISTRICT			TOTAL		
	Alternative A	**Alternative B**	**Alternative C**	**Alternative A**	**Alternative B**	**Alternative C**	**Alternative A**	**Alternative B**	**Alternative C**
RESIDENTIAL									
Single Family	($172,159)	($20,845)	($128,755)	($1,587,411)	($190,736)	($1,188,840)	($1,759,571)	($211,580)	($1,317,596)
Townhomes	--	($82,843)	--	$0	($3,650,528)	$0	--	($3,733,371)	--
Town Center Residential	--	$97,541	$67,127	$0	($758,057)	($973,225)	--	($660,517)	($906,099)
55+	$47,943	$67,640	$95,886	$499,269	$354,288	$998,538	$547,212	$421,929	$1,094,424
CCRC	($95,329)	($148,493)	($102,662)	$754,952	$1,175,984	$813,026	$659,623	$1,027,490	$710,364
Total Residential Impacts	($219,545)	($87,000)	($68,405)	($333,190)	($3,069,049)	($350,502)	($552,735)	($3,156,049)	($418,907)
COMMERCIAL									
CCRC/Med Office/Amenities	$34,014	$58,551	$37,768	$174,476	$395,962	$216,660	$208,490	$454,513	$254,429
Hotel/Conference	($2,160)	--	($5,307)	$231,214	--	$296,054	$229,054	--	$290,747
Town Center Retail	$660	$9,062	$6,283	$14,403	$206,319	$142,386	$15,063	$215,381	$148,669
Town Center Office	$0	$16,788	$11,631	--	$94,456	$65,231	--	$111,244	$76,862
Cultrual & Recreation	($5,991)	($5,999)	($5,996)	$111	$103	$106	($5,880)	($5,896)	($5,891)
Office Park	$339,628	$469,441	$403,719	$2,688,569	$3,777,187	$3,230,552	$3,028,198	$4,246,628	$3,634,272
Light Industrial	$91,450	--	($1,139)	$1,424,605	--	$708,350	$1,516,054	--	$707,210
Retail	$12,302	$7,401	$0	$274,644	$168,556	$0	$286,945	$175,957	--
School	$9,263	$9,780	$9,967	$2,118	$2,114	$2,197	$11,381	$11,894	$12,164
Park/Open Space	--	--	--	--	--	--	--	--	--
Total Commercial Impacts	$479,165	$565,025	$456,926	$4,810,140	$4,644,697	$4,661,536	$5,289,305	$5,209,722	$5,118,461
TOTAL IMPACTS	**$259,620**	**$478,025**	**$388,521**	**$4,476,950**	**$1,575,649**	**$4,311,034**	**$4,736,570**	**$2,053,673**	**$4,699,555**

Source: RKG Associates, Inc., 2011

G. IMPLICATIONS

The land uses and transportation networks in each of the base reuse alternatives provide various elements (i.e., road network, land use mix, etc.) that will make up the final preferred redevelopment plan. Each land use will have varying impacts, and the evaluation of these impacts needs to be weighed carefully against the community's reuse planning goals and principles. The major highlights from each land use are described below.

- Residential – The creation of residential units generally has an associated school expenditure cost, as additional units will mean some amount of additional school-age children. However, a lower number of residential units will make it more difficult to sustain retail activity in the a Town Center and to create a vibrant mixed-use development. Not only do residential units above and near retail establishments help to support the stores, these units activate the Town Center at night, which can help attract additional visitors to the area.

  It is also important to note that revenue generated from commercial development, such as an office park, retail establishments, and hotel/conference center can help to off-set the expenditures generated from residential development. In fact, Base Reuse Alternative B has the highest amount of programmed residential units (2,282 units), but due to a balanced development program, this alternative still generates a positive net impact of $2.1 million to the Township and School District.

- Town Center – A Town Center is programmed into Base Reuse Alternatives B and C, and a Town Green is programmed into Base Reuse Alternative A. However, the uses that comprise each Town Center/Town Green vary greatly. Base Reuse Alternative A does not include residential units, whereas Base Reuse Alternative B and C include 405 and 279 units, respectively. As mentioned above, these residential units help to support the retail components of the Town Center. If no residential uses are incorporated into the Town Center, it is likely that the on-site support for new retail stores will be minimal.

- Hotel/Conference Center – A hotel/conference center is included in Alternatives A and C. It is likely that a hotel/conference center would complement the corporate office park and would help serve the needs of various other large corporations in town. However, the demand for this use is dependent on the successful implementation of the office campus and to a lesser extent the Town Center.

  In general, hotel/conference centers would require limited municipal services but would generate revenues from real estate taxes, earned income tax, restaurant sales and spending from hotel guests and conference attendees. The hotel/conference center in Base Reuse Alternative A is estimated to have a positive net fiscal impact of $229,054 per year at full build-out. The Base Reuse Alternative C hotel/conference center is larger than the Base Reuse Alternative A center, and therefore has a greater net fiscal impact ($290,747). Another benefit to a hotel/conference center is job creation. Although hotel/conference centers are not one of the largest employment generators included in the alternatives, it is estimated that 78 to 100 jobs could be created.

- Office - In all alternatives, the office park is one of the largest employment generators. The office park alone is estimated to create 4,064 to 5,732 jobs, depending on the size of the facility. In addition to the office park, all alternatives have CCRC office space programmed into the site and Alternatives B and C have Town Center office space programmed into the site. The office uses will result in a positive net fiscal impact to the Township. It is estimated the office park results in a net impact of $3.0 million to $4.2 million, depending on the size.

The additional Town Center and CCRC office space is estimated to have a positive net fiscal impact of $208,490 to $565,758.

- Light Industrial – Light Industrial uses are programmed into Base Reuse Alternatives A and C. The industrial uses are estimated to generate 1,347 jobs in Base Reuse Alternative A and 671 jobs in Base Reuse Alternative C. It is also estimated to have a positive net-fiscal impact of $1.5 million in Base Reuse Alternative A and $707,210 in Base Reuse Alternative C. However, the job and tax-base benefits of light industrial uses will need to be considered with the impacts on adjacent land uses as well as the overall vision for the site.

- Retail – Base Reuse Alternatives A and B have retail programmed along Easton Road and Horsham Road in addition to retail in the Town Center. In general, retail uses are comparatively large generators of employment. Retail is estimated to add 507 and 312 jobs to the area. Retail is also a driver of revenues. The total fiscal impact from the retail programming of the site (excluding Town Center retail) results in $175,957 to $286,945 of revenues to the Township.

- Continuing Care Retirement Community (CCRC) – A CCRC provides a continuum level of care for the elderly. Typically, a CCRC contains independent living single-family homes, duplexes, condominiums, or apartments. They may also include assisted living apartment units for when living independently becomes too difficult. Nursing home facilities are also a common feature within a CCRC.

  Generally, a privately owned non-religious affiliated CCRC is not tax exempt from real estate taxes. Therefore, the Township could collect property tax revenue from the facility. However, a CCRC can file for tax exemption if it qualifies under Title 53, Chapter 88, and Section 8812 of the Pennsylvania Consolidated County Assessment Law.

  Although a CCRC may not produce a direct net positive fiscal impact to the community, it could be an important service that is needed by the aging population within Horsham. In addition, a CCRC generally does not contain children and would not place a strain on the school system. Lastly, a CCRC will generate employment. It is estimated that the CCRC could produce anywhere from 655 to 1,021 jobs.

- Park/Open Space – The three Base Reuse Alternatives incorporate 160 to 177 acres of public and private open space. Open space provides people space to recreate, enjoy nature, and generally adds to the quality of life in an area. However, the amount and placement of open space needs to be balanced with other income-producing and residential uses.

11 PREFERRED REDEVELOPMENT PLAN

A. INTRODUCTION

The Final Preferred Redevelopment Plan represents a culmination of months of research and public input from the HLRA Board and Horsham community. The resulting plan seeks a balance of land uses that capitalize on the region's strengths, as well as the needs and wants of the community. The following chapter includes the land use and building program, as well as the infrastructure, transportation, and fiscal impacts of the building program upon the Township. The chapter concludes with an overview of zoning that will be needed to help implement the final vision.

B. SUMMARY OF MAJOR FINDINGS

- Job Creation - A number of jobs will be created as a result of this plan. At full build-out, it is estimated that 7,057 jobs will be created. The majority of jobs are a result of the office park (4,652 jobs) and Town Center retail (1,198 jobs) developments.

- Payroll Impact - The consultant used the Quarterly Census of Employment and Wages for Montgomery County to assess the associated payroll impacts. In total, there will be about $457.0 million in annual payroll benefits in Year 20 as a result of the Preferred Redevelopment Plan. Office park payroll accounts for the largest share ($368.9 million). This is primarily due to the fact that professional office jobs are typically higher-paying jobs.

- Building Program - The Final Preferred Redevelopment Plan incorporates a variety of uses which will give a sense of place and unique identity to Horsham Township. Highlights of the plan include an open space and recreation system that connects and extends the Township's Open Space Plan; a new Town Center development that will become a central gathering area for local events and festival and will contain retail, restaurant and entertainment options, loft-style apartments and condominiums; and employment generating uses such as office parks and retail establishments fronting Easton Road. In total, there are 1,446 residential units, 1.8 million commercial SF, and 452,727 SF of municipal uses programmed at the site.

- Public Infrastructure Improvements – In order to realize the redevelopment vision, the implementation LRA and future developers, will need to invest in certain infrastructure improvements including water and wastewater, roads, runway demolition, and building demolition. The cost for these improvements is estimated at more than $60 million. The largest cost items include:

  - Roads – Construction of the four major road connections (including Precision Road, Privet Road, Norristown Road, and Runway Boulevard) are a needed public investment that will spur development. Construction of these four roads would cost ~$11 million. The

remaining network of local streets would be funded and constructed by private developers.

- Water and Wastewater Improvements - It is anticipated that the major trunk lines for the potable water and wastewater infrastructure would be provided by Horsham Township along the four major roads. In 2011 dollars, the estimated public infrastructure costs for water and wastewater infrastructure is estimated at $21.4 million.
- Runway - Although it may be possible to use some of the runway as a portion of the central boulevard of the preferred plan, it is anticipated that most of the runway and all of the taxiways and aprons will be demolished. Removal of the runway and aprons is estimated to cost roughly $17 million.
- Building Demolition - Most of the existing buildings will need to be demolished. The exceptions are the Navy Lodge (to be reused by the Bucks County Housing Group) and the Fire Station (to be reused by the Township or Greater Philadelphia Search and Rescue). In total, it is estimated that building demolition could cost as much as $15 million.

- Traffic – Overall, the proposed land uses within the Redevelopment Plan are projected to increase traffic between 15% and 20% over current levels at signalized intersections surrounding the site. However, future traffic congestion can be partially mitigated through reconfigured intersections, dedicated turning lanes and synchronized traffic lights. With the current baseline reflecting a vacant Naval Air Station, the actual projected traffic volumes over historical levels (e.g., before the base closure) are projected to be much less on a percentage basis.

- Fiscal Impacts - It is estimated that the Preferred Redevelopment Plan results in a net positive impact to the Township and School District. The revenues generated from the proposed developments all cover the municipal and School District costs. The total net fiscal impact results in $5.1 million in annual net revenues at full build-out.

C. PREFERRED REDEVELOPMENT PLANNING PRINCIPLES, ISSUES, AND DIRECTIVES

1. Principles and Issues

As part of the April 2011 community meeting, Horsham residents were asked to discuss and rank a series of redevelopment planning issues and principles that would help shape the development of the land plan. For breakout groups discussed issues related to: (1) land use, (2) economic development, (3) environmental and (4) transportation. During the summer, the planning team assembled the public comments and ranking results from that meeting and presented to the HLRA for their internal review and ranking. Prior to the July 2011 public meeting, RKG Associates reconciled the public's ranking of redevelopment planning issues and principles with those of the HLRA board members. The results of this exercise establish the baseline principles that would guide the development of the three reuse plan alternatives, as well as the final preferred redevelopment plan and they were presented to the public on July 27, 2011 (Table 11-1).

The most important planning principle was that the redevelopment plan must secure viable sources for water and wastewater utilities to support development. Unfortunately, existing water and wastewater facilities will not be transferred to the HLRA. The Township will need to invest in the infrastructure to put these systems in place. The cost of providing the infrastructure for the final Preferred Redevelopment Plan is discussed in the Infrastructure Improvements section of this chapter. Other principles which received high rankings largely dealt with creating a sense of place, being sensitive to traffic circulation and congestion issues, incorporating employment uses into the final plan, and incorporating the latest

green and sustainable design principles, where appropriate.

The top ranked planning issues that the public and Board wanted the plan to address included the future environmental clean of the property. The community thinks the Navy should clean up the contaminated sites to the appropriate standards before conveyance, or convey the with use restrictions. Federal law requires that the Navy address the remediation needs of certain contaminated properties before conveyance can occur. Other issues that were important include encouraging a mixed-use development plan, consideration and sensitivity towards traffic congestion, creating an employment base, and the creation of a Town Center development as the new center-piece of the community.

Table 11-1
Planning Principles and Issues
Ranked by HLRA Board and Public

Rank	Principle/Issue	HLRA	Public
PRINCIPLES			
1	The reuse plan must secure viable sources for water and wastewater utilities to support development	1	1
2	The final land plan should create a sense of place and community	1	2
3	Future reuse alternatives for NAS-JRB should seek to improve cross-circulation of traffic through the site where appropriate	1	2
4	All employment generating uses should be sensitive to the impacts of traffic congestion and traffic flow around and through the base property and attempt to mitigate these impacts	2	1
5	Improved transportation management technology and signal coordination should be used	2	1
6	Employment generating uses should be integrated into a larger, mixed-use development plan	1	3
7	The reuse plan should incorporate the latest green and sustainable design principles where appropriate	2	2
8	All future reuse alternatives for NAS-JRB should seek to improve cross-circulation of traffic through the site where appropriate	3	1
ISSUES			
1	Should the Navy clean up contaminated sites to the highest standards before conveyance, or convey with land use restrictions?	1	1
2	The reuse plan should encourage a mixed-use plan that allows people to live, work and recreate, in the same location, in order to reduce traffic moving on and off the site?	1	1
3	Traffic congestion and circulation in and around NAS-JRB is an important planning consideration	1	1
4	Creating an employment base at NAS-JRB is an important redevelopment goal	1	2
5	The 'Town Center' concept is one that should be explored for Horsham	2	1
6	The reuse land plan should seek to maximize its employment/tax bas benefits	2	2
7	The HLRA and Water & Sewer Authority should take steps to ensure the provision of water and sewer to the site	2	3
8	The plan should seek to mitigate traffic impacts through sound land use planning	1	4

Source: RKG Associates, Inc., 2011

2. Preferred Base Reuse Alternative - Option D

Following the August 17, 2011 Presentation of the Three Base Reuse Alternatives, the consultant received directives and recommendations from the HLRA Board and public on certain land use elements, including the Town Center, hotel/conference center, residential, open space, and road network. These directives were used in formation of the consultant's land use plan "Alternative D." Those included:

a.) Town Center Directives
- Layout the Town Center to have park space in the middle with retail/entertainment ground-floor uses lining the park (Alternative B)
- Locate Town Center between Horsham Road and Easton Road - just north of Maple Avenue
- Incorporate entertainment uses into the Town Center (i.e. bowling alley, movie theater, ice-skating, indoor sports complex, etc.)
- Create a water feature within the Town Center
- Include high-end apartment units and condominiums above retail shops
- Provide for "bare minimum" of townhome/condominium/apartment housing in and around the Town Center
- Do not exceed four-story height limit
- Create a pedestrian friendly and interconnected Town Center

b.) Hotel/Conference Center Directives
- Include a high quality hotel/conference center in the preferred redevelopment plan
- Locate hotel/conference center proximate Easton Road on the southern-portion of base (high elevation of land will maximize visibility and views)
- Hotel height may exceed Township height limitations if necessary to attract the right hotel with a maximum of 10 stories
- Locate proximate to Town Center and the office park

c.) Residential Directives
- Include the minimum amount of residential units needed to make the Town Center project economically viable
- Include a range of housing types and price points, but do not denote age-restricted units on plan (55+ community)
- Place townhomes/condominiums/small single family units closer to the Town Center
- Locate higher-end single family housing in northern portion of site near the golf course on ¼ to 1/3-acre lots

d.) Road Network Directives
- Include a "Runway Boulevard" running north/south in the final preferred plan
- Design road connections using reuse alternative - Option A (Norristown Road to Maple Ave, Precision Road to Moreland Ave., and Privet Road to the Main Gate)
- Describe how traffic improvements will be made
- Address Keith Valley Road flooding issues
- Discuss with property owner a connection to Horsham Road via Tournament Drive in the northern portion of the property

e.) Open Space Directives
- Differentiate between public and private open space on the final preferred plan map
- Allow for more active parkland (~30-acre sports fields)

- Locate sports fields near school site and consider introducing a regional recreation center
- Notate existing and proposed trail connections on final preferred plan
- Include site for DVHAA museum
- Include water features in Town Center and near Keith Valley Road (to assist with storm-water management)

f.) General Directives
- Make final recommendations on NOI submissions
- Incorporate green elements into the final design of the plan
- Include information on environmental remediation, timeline, and cost

After receiving these directives, the consultant team created a new base reuse alternative that addressed the above input while incorporating best practices in planning and design. The new plan, Alternative D, was created to allow for a walkable and pedestrian-oriented Town Center, road connections that incorporated traffic calming techniques, and a variety of residential units that would help to make this site a vibrant and attractive place to live. The land use layout within Alternative D is shown in Map 11-1.

3. Preferred Base Reuse Alternative - Option E

The HLRA reviewed the consultant's Option D, and recommended a series of final changes to the land plan. The resulting Option E reflects the HLRA design recommendations and was prepared by the HLRA staff and was illustrated by the planning team (Map 11-2). The Option E plan was discussed during the HLRA's January 18, 2012 public meeting.

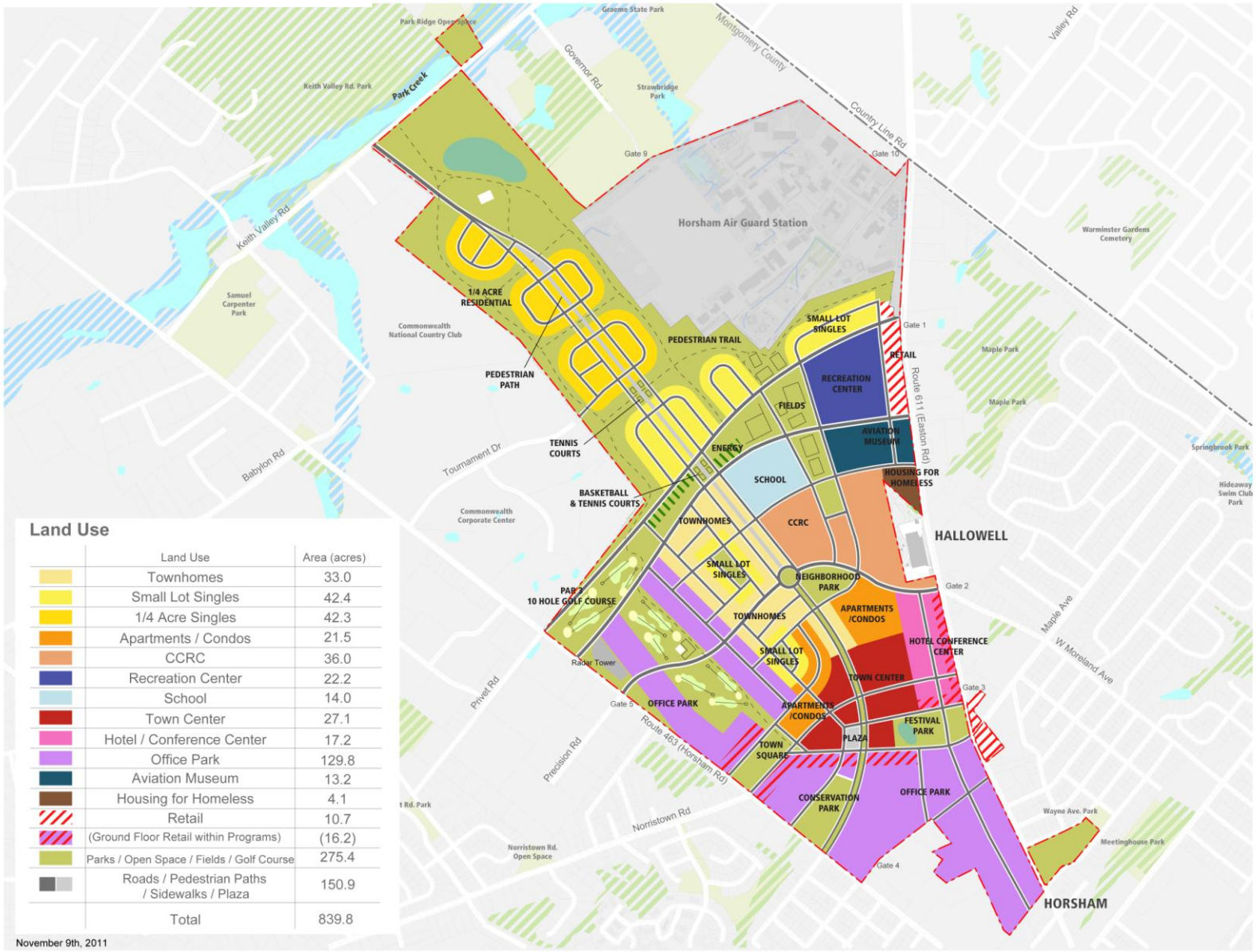
a.) Road Network Directives
- Straighten the proposed road crossing between Norristown Road to Maple Avenue to expedite traffic through the site
- Show the location of the four main roadways (Norristown Road to Maple, Precision Road to Moreland, Privet Road to Main Gate, and Runway Boulevard)
- The Runway Boulevard should terminate at the corner of Maple Avenue and Horsham Road
- Make sure extended Privet Road is out of range of errant golf balls being hit on Commonwealth Golf Course and the Horsham Chip and Putt. Also avoid impact to the Commonwealth Golf Course

b.) Residential Directives
- Remove open space between the Large Lot Single Family units and the property line
- Reduce total units from 1,999 units to 1,416 units. Specifically:
  - Reduce the number of other apartments/condos from 645 units to 300 units
  - Increase the lot size of the Large Lot Single Family to an average size of 23,000 square feet or roughly ½ acre. Reduce the yield of Large Lot Single Family units from 169 to 90
  - Decrease the number of Small Lot Single Family units from 297 to 250 units
  - Decrease the CCRC Assisted Living/Nursing Home units from 252 units to 200 units
  - Reduce the number of townhome units from 396 to 350.
  - Reduce the number of apartments and condominium units from 645 to 300, and in the Town Center 114 units to 100 units

Map 11-1

Preferred Base Reuse Plan Alternative

Option D



Land Use

Land Use	Area (acres)
Townhomes	33.0
Small Lot Singles	42.4
1/4 Acre Singles	42.3
Apartments / Condos	21.5
CCRC	36.0
Recreation Center	22.2
School	14.0
Town Center	27.1
Hotel / Conference Center	17.2
Office Park	129.8
Aviation Museum	13.2
Housing for Homeless	4.1
Retail	10.7
(Ground Floor Retail within Programs)	(16.2)
Parks / Open Space / Fields / Golf Course	275.4
Roads / Pedestrian Paths / Sidewalks / Plaza	150.9
Total	839.8

November 9th, 2011

Legend

- Willow Grove NAS
- Municipal Boundary
- Parcel
- Parks and Open Space
- Horsham Air Guard Station
- Clear Zone
- NWI Wetlands
- FEMA Flood Plain
- Vegetation
- Habitat Areas

Sources

NAS GIS data from Weston Solutions Inc. (received from Tetra Tech), Google and Bing Maps.
Surrounding context data from DVRPC.

0 300' 600' 1,200' 1,800' 2,400'

c.) Public Use Directives

- Increase the school acres from 14 acres to 40 acres.
- The Par 3 golf course area should be consolidated with no road crossings.
- The Aviation Museum/Park should be located on Easton Road on receive approximately14 acres.
- Give attention to buffering the school, residential property, and the CCRC.
- Include the Navy Lodge site as a location for homeless housing services.

d.) Environmental Directives

- Make sure open space/parks on or near contaminated sites are either remediated or capped in accordance with accepted practices

D. LAND USES AND PROPOSED DEVELOPMENT PROGRAM

The RKG planning team adjusted the land plan in accordance with the Board and staff recommendation and prepared the Option E plan. The full development program is presented in Table 11-2.

The plan was designed to incorporate best management practices (BMPs) for storm water management and to include the latest green and sustainable design principles. Examples include LEED buildings, Low Impact Design (LID), green infrastructure, complete streets and a range of energy efficiency and renewable energy options. An overview of renewable energy applications as well as federal and state funding opportunities is included in Appendix 11-1.

Table 11-2
Land Use and Building Program

Land Use	Acres	Units/Building Square Feet
RESIDENTIAL		**UNITS**
Large Lot Single Family	64.6	90
Small Lot Single Family	34.3	250
Townhomes	36.2	350
Apartments/Condos	13.3	300
Town Center Apartment/Condos	7.9	100
CCRC Independent Living	19.4	141
CCRC Assisted Living/Nursing	8.0	185
Total Residential	183.7	1,416
COMMERCIAL		**SQUARE FEET**
CCRC Med Office/Amenities	3.0	25,000
Hotel/Conference	6.3	137,000
Town Center Retail/Service/Restaurants	11.0	239,580
Town Center Office	3.0	65,340
Movies/Entertainment	5.0	54,450
Office Park	133.5	1,163,052
Retail	6.9	96,180
Total Commercial	168.7	1,780,602
OTHER USES		**SQUARE FEET**
Regional Recreation Center	20.2	100,000
Housing for Homeless	7.4	30 (Units)
School	40.0	152,727
Aviation Museum	13.1	200,000
Shared Lot	5.6	--
FAA Tower	3.0	--
Park/Open Space	204.8	--
Roads, Sidewalks, Paths, Etc.	215.5	--
Total Other Uses	509.6	452,727
TOTAL	**862.0**	**1,446 Res. Units/ 1.8 Million Com. SF/ 452,727 Other SF**

Source: HLRA and RKG Associates, Inc., 2011

1. Town Center

Option E includes a mixed-use, pedestrian-oriented Town Center that is accessible from both Horsham Road (Route 463) and Easton Road (Route 611). The Town Center will include retail, office, entertainment, and residential uses. The Town Center also provides a sense of place with gathering spaces and a plaza incorporated into the design. The plaza can accommodate a water feature or recreational uses such as an ice skating rink.

2. Residential Uses

The plan provides for distinct residential neighborhoods that include a broad range of housing types and price levels. These neighborhoods are connected together through a network of streets, including a central Runway Boulevard, which provide access to parks and open space. The street network encourages walking and connectivity with the surrounding neighborhoods as well as other uses in the site, such as the Town Center. Residential neighborhoods are centered on a neighborhood park and have easy access to recreational uses including pedestrian and bicycle trails.

3. Office Park

Office and business parks are proposed along Horsham Road and south of Maple Avenue and are in close proximity to the proposed Town Center. The office parks are also positioned to take advantage of public open space and golf course amenity that is located in the middle of the office development off Horsham Road.

4. Hotel/Conference Center

A hotel and a conference center are located near the proposed office parks and mixed-use town center. The proposed hotel and convention center facility will have visibility from Easton Road. The hotel is positioned to draw upon the demand that will be generated from the proposed office parks.

5. Congregate Care Retirement Community (CCRC)

A Continuing Care Retirement Community (CCRC) is proposed in the northeast portion of the study area site between the Runway Boulevard and Easton Road. A CCRC is a type of retirement community where a number of senior care needs, from assisted living, independent living and nursing home care, may all be met. Housing types within CCRC's can include detached and attached single family homes, duplexes, quadraplexes, apartments, and assisted living center and nursing care units. Medical office and other support facilities are also proposed in proximity to the CCRC.

6. School

A 40-acre site is proposed for the Hatboro-Horsham School District for replacement of existing school facilities and future expansion. The proposed school site would include a future middle school, administrative and recreational uses. The school site is centrally located near the intersection of Runaway Boulevard and Privet Road extension and within walking distance of the residential neighborhoods. The school site is adjacent to the recreation center, which allows for the sharing of recreational facilities.

7. Retail

In addition to the retail programmed into the Town Center, the final Preferred Redevelopment Plan has retail frontage along Easton Road. Easton Road is a well-travelled road, and retail located in this area is well-positioned to capture sales support from drive-by traffic.

8. Regional Recreation Center

A regional indoor recreation center with several outdoor recreation fields is proposed near the existing Gate 1 area with visibility from Easton Road and adjacent to the proposed middle school. The indoor recreation center will include multiple athletic features such as a gymnasium, swimming pool, basketball courts, climbing halls, multi-purpose hall, health and fitness club, tennis and racquetball courts. An outdoor recreational area is also proposed, and will include a range of active recreational fields including soccer, baseball, lacrosse, softball and others. It is hoped that these fields will be used to

attract high school and collegiate tournaments for soccer and lacrosse, among others. The recreation center, school, and aviation museum/park were all carefully planned to be clustered together so they could share common facilities and open space features. This allows for a shared parking area between the three uses and shared recreational/field space.

9. Aviation Museum/Park

A 13.1-acre site is proposed for the future aviation museum and park located on the eastern edge of the property with direct visibility from Easton Road. The aviation museum and park are being sponsored by Montgomery County, on behalf of the Delaware Valley Historical Aircraft Association (DVHAA). The DVHAA is a nonprofit entity currently operating the existing aviation museum on site. The proposed museum and park will include a number of restored aircraft within new hanger facilities and will include the existing Harold F. Pitcairn Wings of Freedom Air Museum located within the NAS-JRB site on Easton Road. In the recent past, the museum operated on 2.6 and more recently the HLRA provided additional access to 4.3 acres through a lease agreement between the Navy and the HLRA.

10. Homeless Housing

A 7.4-acre site is proposed to accommodate housing for homeless. The site is located adjacent to the aviation museum and would include the existing Navy Lodge building and adjacent single family homes. This site is proposed for homeless service providers to provide permanent supportive housing under provisions of the McKinney-Vento Act. The site will accommodate permanent supportive housing for 30 one and two bedroom apartments plus space for provision of support services for qualified individuals and families.

11. Parks/Open Space

The Redevelopment Plan includes a network of parks and open spaces which will be able to provide for a range of recreational uses and activities. A total of 205 acres of open space is proposed within the land use plan, which comprises about 24% percent of the total land area. The parks and open spaces will be able to support natural resources and vegetation. The park and open space network also will be designed to be part of a comprehensive stormwater management system and provide controls to address localized flooding issues at the property boundaries, especially along Keith Valley Road. Pedestrian and bicycle trails will connect the study area with existing local and regional trails within Horsham Township (Samuel Carpenter Park Trail and Power Line Trail, etc.).

- Neighborhood Parks – Small park areas located within residential neighborhoods.
- Community Parks **-** Located throughout the study area. They include:
  - **Nature Park** – This park is located near Keith Valley Road / Stonebridge Park and Graeme State Park. The nature park will include the low lying floodplain area near Keith Valley Road east of the existing Strawbridge property and Graeme State Park. The nature park could be used to provide educational opportunities.
  - **Festival Park** – The proposed Festival Park is located near the Town Center along Easton Road. This park will be a central gathering place where celebrations, festivals, and other public events can be held. A water feature and ice-skating rink is also proposed within the Festival Park.
  - **Conservation Park** - The park is located along Horsham Road close to the proposed Town Center. It is envisioned as a place where Township residents and visitors can relax and enjoy the natural beauty and wildlife of the area.
  - **Town Square and Town Center Main Street** - The proposed Town Center will include a town square and a Main Street connecting Festival Park and Conservation Park. The Town

Center Main Street will be lined with retail establishments. The Town Square will provide for additional public gathering/meeting space.

- Community Golf Course - A 9-hole, Par 3 golf course is proposed within the middle of the property adjacent to the Commonwealth National Country Club. The golf course will include the existing pond. This "chip & putt" facility will be a recreational amenity open to the public and will also serve as an open space amenity for the office park.
- Green Corridors and Trails - The Runway Boulevard is also proposed as a green corridor that will connect the entire development together and serve as a central road through the site. It will feature a wide median that will include pedestrian and bicycle trails and bio-swales as well as best management practices for storm water management. A network of walking paths will traverse the property and connect with the township's existing public trail/bike path network.
- Open Space near Office Parks - Open space is proposed near the office parks along Horsham Road as an amenity to the office uses.

E. INFRASTRUCTURE IMPROVEMENT PLAN

1. Water, Sewer and Stormwater

Projections for daily wastewater generation and potable water demand were developed based on the Final Preferred Redevelopment Plan. Daily wastewater volumes were estimated for each land use category based upon the type and size or extent of the projected use. Data on unit wastewater production rates (e.g., gallons per capita or gallons per acre of development) were derived from standard references. In addition, input was obtained from the Horsham Water & Sewer Authority on typical generation rates in the currently served areas. Based on these data sources, the estimated wastewater projection for the Preferred Redevelopment Plan is approximately 539,000 gallons per day (average flow).

Wastewater flow is typically lower than potable water use because of non-consumptive water uses and losses which do not result in discharge of wastewater to sewers. In general 60-85% of the potable water consumption may be generated as wastewater. For this evaluation it was assumed that the projected wastewater value (539,000 gallons per day) is 85% of the potable water demand. This results in an estimated potable water demand of approximately 634,000 gallons per day (gpd). These projections, and the data on which they are based, are summarized in the Appendix of this Chapter (Appendix Table 11-2).

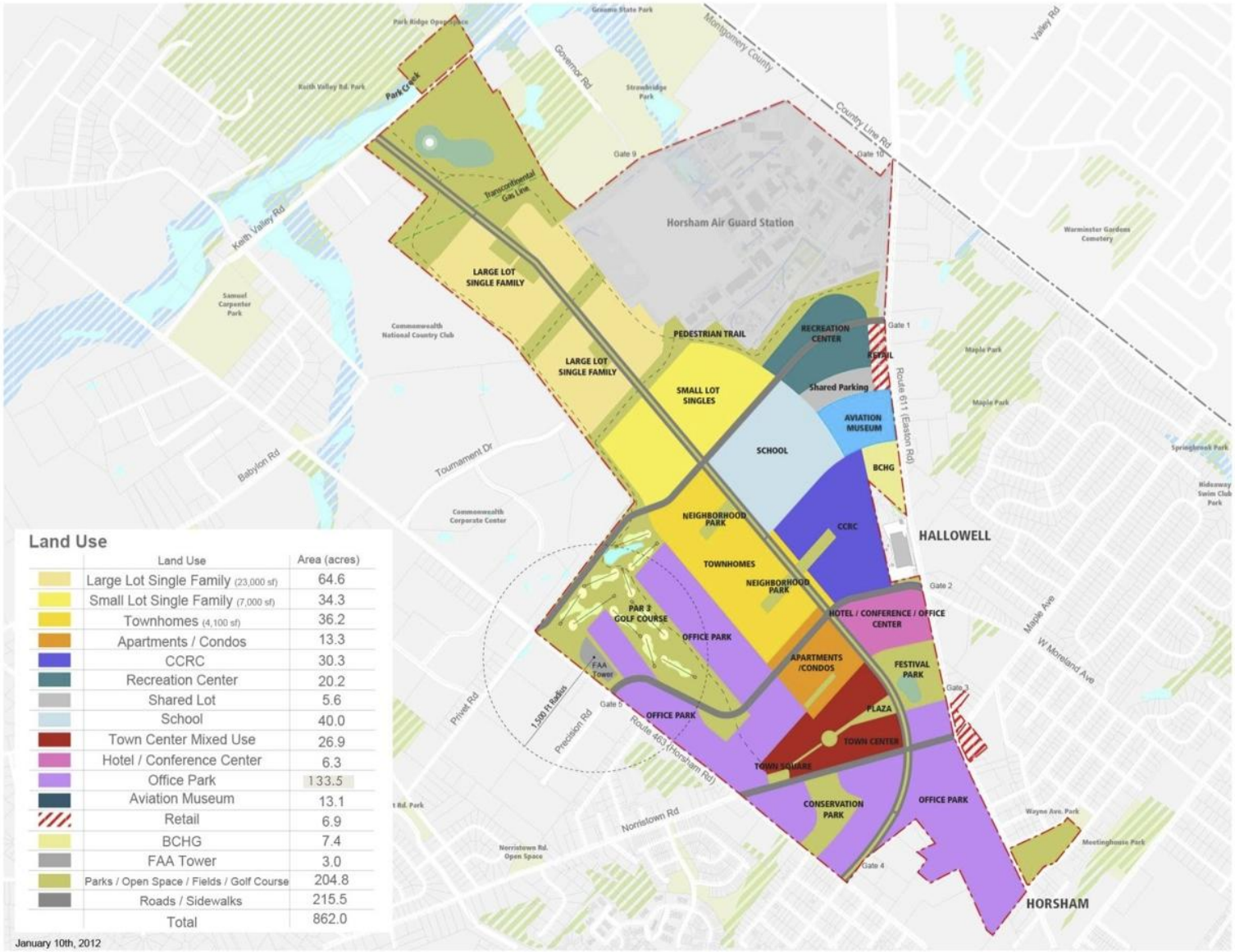
Wastewater generated from the redevelopment at NAS-JRB Willow Grove would be discharged to the Horsham Water & Sewer Authority's Park Creek Sewage Treatment Plant on Keith Valley Road in Horsham Township. Potable water would be provided by the Horsham Water & Sewer Authority from their existing capacity and distribution network. However, the Authority is currently negotiating with the Horsham Air National Guard Station concerning access to excess water capacity from the Navy water supply wells that have been transferred to the U.S. Air Force. In addition, a new reinforced concrete water storage tank would be constructed for the potable supply that would have sufficient capacity for one day's demand.

Horsham Water and Sewer Authority is currently expanding the Park Creek Sewage Treatment Plant and the expanded capacity will handle flows from NAS-JRB Willow Grove. The Authority purchases water from adjoining water systems and will provide sufficient water for the redevelopment either through water produced from their own system, purchased water, water obtained from the former Navy water supply wells, or a combination of each.

Map 11-2

Preferred Base Reuse Plan Alternative

Option E



Land Use

Land Use	Area (acres)
Large Lot Single Family (23,000 sf)	64.6
Small Lot Single Family (7,000 sf)	34.3
Townhomes (4,100 sf)	36.2
Apartments / Condos	13.3
CCRC	30.3
Recreation Center	20.2
Shared Lot	5.6
School	40.0
Town Center Mixed Use	26.9
Hotel / Conference Center	6.3
Office Park	133.5
Aviation Museum	13.1
Retail	6.9
BCHG	7.4
FAA Tower	3.0
Parks / Open Space / Fields / Golf Course	204.8
Roads / Sidewalks	215.5
Total	862.0

January 10th, 2012

Legend

- Willow Grove NAS
- Municipal Boundary
- Parcel
- Parks and Open Space
- Horsham Air Guard Station
- Transcontinental Gas Line
- NWI Wetlands
- FEMA Flood Plain
- Vegetation
- Habitat Areas

Sources

NAS GIS data from Weston Solutions Inc. (received from Tetra Tech), Google and Bing Maps. Surrounding context data from DVRPC.

0 300' 600' 1,200' 1,800' 2,400'

Prepared by HLRA, 2012

Over the past few years, the Township has been particularly proactive in planning for its future wastewater treatment needs. The Township revised its 537 plan to incorporate the surplus property and the Air Guard Station needs into its future planning and capital improvements. The permitting process for the wastewater plant expansion is well under way and will provide for the needs of both the military enclave and the remainder of the redevelopment site.

In order to address stormwater run-off issues in the northern end of the property, it's estimated that roughly $2.4 million in improvements are likely to capture stormwater run-off in a retention basin and to use this infrastructure feature as a major open space amenity.

a.) Public Infrastructure Costs

It is estimated that major trunk lines for water and sewer will follow the same rights of way as the road network. In total, an estimated $21.4 million will be required to extend water and sewer trunk lines throughout the development, which would include $2 million for a municipal water tank and $2.4 million for a stormwater retention pond.

b.) Private Infrastructure Costs

The total estimated cost in 2011 dollars to install the water and wastewater mains along the network of local streets is substantially hire and will be borne by private developers. It's estimated that nearly 200,000 LF of water and sewer lines will cost close to $60 million.

Table 11-3
Public and Private Infrastructure Cost Estimates
Preferred Redevelopment Plan NAS-JRB Willow Grove

Type of Infrastructure	Length (ft)	Width (ft) of paving	Area of paving (sf)	Area of paving (sy)	Costs [1]
PUBLIC INFRASTRUCTURE COSTS					
Roads					
Runway Blvd	13,107	70	917,490	101,943	$4,802,550
Privit Road Connection	6,669	60	400,140	44,460	$2,094,511
Precision Road Connection	5,603	60	336,180	37,353	$1,759,716
Norristown Road Connection	3,019	70	211,330	23,481	$1,106,195
Total Roads	28,398				$9,762,972
Curbs	56,796				$1,249,512
Stormwater Retention Pond	1				$2,400,000
Water Mains	28,398				$7,099,500
Water Storage Tank (850,000 gal)	1				$2,000,000
Sewer Mains	28,398				$9,939,300
Runway Demolition	---				$17,000,000
Building Demolition	---				$15,000,000
Total Public Infrastructure Costs					**$64,451,284**
PRIVATE INFRASTRUCTURE COSTS					
Internal Collector Streets	99,369	30	2,981,070	331,230	$15,604,245
Curbs	198,738				$4,372,236
Interior Water Lines	99,369				$24,842,250
Interior Sewer Lines	99,369				$34,779,150
Total Private Infrastructure Costs					**$79,597,881**

Source: Weston Solutions, Inc., 2012
[1] Roads = $47.11/sy; Curbs = $22/ft; Water Distribution = $250/ft; Wastewater Distribution = $350/ft

2. Roads, Sidewalks and Curbs

The network of roads and sidewalks proposed in the Preferred Base Reuse Plan Alternative – Option E is extensive, composed of minor arterial, collector, and local street types. The total length of all of the proposed streets is 127,767 ft or approximately 24 miles.

c.) Public Infrastructure Costs

It is anticipated that the implementation LRA will be responsible for finding the resources required to construct the basic trunk network of roads that includes the Runway Boulevard, Privet Road crossing, Precision Road crossing, and the Norristown Road crossing. The remaining network of local streets would be funded and constructed by private developers. The total estimated cost in 2011 dollars for the construction of the major roads, sidewalks and curbs is approximately $11 million (Table 11-3).

d.) Private Infrastructure Costs

The remaining 99,369 ft of local streets would be provided by private developers. The total estimated cost for the construction of these streets is $20 million.

3. Runway, Taxiway & Apron Removal

The existing runway is approximately 8,000 feet long by 200 feet wide. Although design drawings from 1953 indicate that the newer section (northern half) of the main runway was constructed using 12 or 18 inches of base material and 3 inches of bituminous asphalt paving, subsequent milling and overlays may have increased the thickness of the paved surface. The runway ends are 10 inches of reinforced concrete over 12 inches of base material. The aprons are of different thicknesses, varying from 10 inches of reinforced concrete with base to 14 inches of unreinforced concreted slabs (with interlocking dowels) and base. Due to the uncertainty of the method of construction and subsequent repairs/overlays, a suitable number of borings should be taken from the runway, runway ends, taxiways, and aprons to determine the actual thickness, method of construction, and condition of this infrastructure.

Although it may be possible to use some of the runway as a portion of the "Runway Boulevard" of the preferred plan, it is anticipated that most of the runway and all of the taxiways and aprons will be removed to make way for other development and roadways. However, it is recommended that the road base and paving and concrete materials be recycled onsite for use in new road construction and site regrading. It is estimated that removal of the asphalt runway and associated taxiways would cost approximately $5 million in 2011 dollars. Removal of the concrete sections of the runway and aprons would cost approximately $12 million, for a total estimated demolition cost of $17 million.

4. Building Demolition

a.) Development Program Impact on Existing Buildings

In order to realize the long-term vision of the redevelopment site, most of the existing buildings will be razed to make way for new development. The exceptions are the Navy Lodge, to be reused by the Bucks County Housing Group, and the Fire Station to be reused by the Township or Greater Philadelphia Search and Rescue. The remaining square footage of building space that will need to be demolished is 972,874 SF.

In total, it is estimated that building demolition will cost approximately $15 million. However, these costs will be incurred over the first 10 years of redevelopment. It should be understood that there will be a premium charged for demolition of buildings that contain asbestos. The cost of asbestos removal can vary greatly depending on the type and condition of materials. A recent survey completed in December 2011 for the Department of the Navy, by Michael Baker Jr., Inc., identified those buildings that contained positive Asbestos Containing Material (ACM) or were

assumed to contain this material. In total, 745,521 SF of building space was identified to contain ACM. A complete table of the buildings that contain ACM is included in the Appendix of this Chapter (Appendix 11-3).

b.) Buildings with Potential Interim Uses

Development of the vision plan may take several years to complete. During the interim, many of the buildings at the site have reuse potential. Reusing these buildings until the area is ready to be developed could generate revenues for the HLRA. These revenues would contribute to the annual cash flow and help defray other costs associated with the project. Unfortunately, the existing buildings are not served by water, wastewater, heat or air conditioning, which could make reuse financially infeasible

The following section provides an overview of the buildings that could be reused if utilities were extended. It should be noted that there is no easy way to bring these buildings on-line. Before these buildings can be reused, water and sewer will need to be provided. Although there is anticipated reuse of some of the buildings, it is not part of the overall strategy.

There are a total of 81 buildings at the NAS-JRB Willow Grove site. However, not all of these buildings would be suitable for reuse. Many are small utility structures that have no marketable reuse potential. Examples include an

Table 11-4
Buildings with Potential for Interim Reuse
NAS-JRB Willow Grove

#	Facility Name	Overall Condition	SF
HANGARS			
175	AIRCRAFT MAINTENANCE HANGAR	Good	107,768
680	MARINE HANGAR	Moderate	58,251
177	MAINTENANCE HANGAR ARMY	Good	18,950
Total			184,969
WAREHOUSE/INDUSTRIAL			
652	HAZMAT COVERED STORAGE	Moderate	14,220
13	AUTO HOBBY SHOP	Moderate	11,687
180	AVIONICS ENGINE SHOP	Moderate	32,224
635	GROUND SUPPORT EQUIP BLDG	Moderate	10,117
606	MARINE GENERAL WAREHOUSE	Moderate	16,098
650	HAZ FLAM MATERIAL STORAGE	Good	8,364
636	MARINE TRAINING BLDG	Good	1,000
375	PA ANG MUNITIONS STORAGE	Moderate	4,000
370	PA ANG MUNITIONS & SUPPORT	Moderate	10,198
630	MATCS MOTOR TRANSPORT	Moderate	2,336
178	AUTO VEH MAINT NON COMB ARMY	Moderate	4,583
639	MARINE MAINTENANCE GARAGE	Moderate	4,425
Total			119,252
OFFICE			
677	PERSONNEL SUPPORT ACTIVITY	Moderate	10,000
174	ENLISTED DINING CLUB	Moderate	11,290
1	ADMINISTRATION BLDG	Moderate	12,828
626	ADMINISTRATION BUILDING	Good	14,250
137	DISPENSARY	Moderate	14,890
601	RESERVE TRAINING BUILDING	Moderate	18,024
780	OPS PASSENGER TERMINAL	Moderate	19,087
140	RESASWTRACEN APPLIED INSTR.	Moderate	59,260
140A	RESASWTRACEN APPLIED INSTR. (A)	Moderate	50,000
648	HOUSING OFFICE	Moderate	1,500
118	TRANSMITTER BUILDING	Moderate	3,240
638	MARINE TRAINING CENTER	Moderate	27,717
176	ARMY RESERVE TRAINING BLDG.	Moderate	45,670
Total			242,086
COMMUNITY USE			
608	FIRE AND RESCUE STATION	Good	12,720
660	NAVY LODGE	Moderate	36,000
Total			48,720
GRAND TOTAL			**595,027**

Source: Urban Engineers and RKG Associates, Inc., 2011

electrical voltage plant, boiler house, and emergency generator facility. In total, there are 29 utility buildings totaling 21,342 SF that have little interim use potential. There were also a few buildings in addition to the utility buildings that were determined to have no marketable uses. These buildings include the Navy Barracks, dog kennel, and chapel, among others. In total, there are eight buildings (41,580 SF) in addition to the utility buildings that have little reuse potential due to low marketability.

There were other buildings that were rated as being in extremely poor condition. It is likely that the cost to rehabilitate these buildings would be too high to substantiate reuse. These 13 buildings total 316,135 SF. The remaining buildings at the NAS-JRB Willow Grove site could be suitable for reuse. The majority of these buildings are located on the eastern portion of the base, just south of the Horsham Air Guard Station property and near the Main Gate on Easton Road. The square footage, condition, and type of the buildings that could potentially be reused are located in Table 11-4.

F. ENVIRONMENTAL REMEDIATION

1. Assessment of General Environmental Constraints

Environmental constraints currently exist at the NAS-JRB Willow Grove facility, which are expected to affect, limit, and/or put conditions upon the redevelopment plan at specific locations. These constraints are listed in the following matrix. The environmental features are discussed in more detail in the Appendix (Tables 11-5, 11-6 and Appendix 11-4).

Table 11-5
Potential Environmental Constraints to Redevelopment
Preferred Base Reuse Plan Alternative – Option E

Feature	Constraints
Potable Water Supply Wells	Future redevelopment would need to ensure maintenance of the wells and treatment system, and maintain testing to determine that the treatment is effective.
Radon	Only Room 122 in building #137, contained radon concentrations above the USEPA action level of 4 picoCuries per liter. It is recommended that radon screening be conducted in any buildings that would be retained for reuse.
Lead-Based Paint	Lead-based paint was removed from NAS-JRB Willow Grove on-base housing and other buildings frequented by children. Recent information on the facilities that contain led-based paint can be found in the Navy's Lead-Based Paint Inspections and Risk Assessment Summary Report, dated December 11, 2011.
Asbestos	Recent information on the facilities that contain asbestos can be found in the Navy's Asbestos Inspection Summary Report, dated December 11, 2011.
Wetlands	If the proposed redevelopment would cause any adverse impacts to the 14.3 acres of wetlands, including filling or other disturbance, a permit may be required from U.S. Army Corps of Engineers and/or PADEP.
Cultural/Historic Resources	A Cultural Resources Survey was conducted by Louis Berger and Associates for NAS-JRB in 1996. The survey did not identify any buildings or structures that meet National Register criteria for an historic district or individual cultural resources.

Table 11-6
IRB Site Impacts to Redevelopment Plan
Preferred Base Reuse Alternative – Option E

Site	Description	Containing Land Use	Constraints
1	Privet Road Compound Groundwater	Parks, Retail, Recreation Center	Development of parks or pedestrian trail in the area should not be affected by LUCs or site contamination. If a habitable building were built, then a vapor mitigation system may need to be installed.
2	Antenna Field Landfill	Conservation Park/Office	No constraints
3	Ninth Street Landfill	Parks, Office Park	Development may be impeded by soil cap, or access to treatment equipment and groundwater monitoring wells to track the progress of remediation. A vapor mitigation system may need to be installed.
4	North End Landfill	Parks and Open Space	No constraints
5	Fire Training Area	Office Park/Golf Course	Development may be impeded by the need to maintain integrity of groundwater monitoring/injection wells to implement and track the progress of remediation. If a habitable building were built, then a vapor mitigation system may need to be installed.
6	Abandoned Rifle Range 1	Office Park	No constraints
7	Abandoned Rifle Range 2	Parks and Open Space	No constraints
8	Abandoned Fuel Tank	Office Park	No constraints
9	Steam Plant Building	Air Guard Station	No constraints
10	Navy Fuel Farm	Air Guard Station	No constraints
11	Aircraft Parking Apron	Air Guard Station	No constraints
12	South Landfill	Town Center, Office, Parks, Apar	Development may be impeded by access to treatment equipment, soil cap, groundwater monitor wells, and/or injection wells. A vapor mitigation system may need to be installed.

2. Installation Restoration Program Sites

There are certain areas at the NAS-JRB Willow Grove Facility where development could be affected or limited due to existence of sites with environmental contamination. The Navy has been investigating and remediating, as necessary, environmental contamination at the NAS-JRB Willow Grove facility via the Installation Restoration Program (IRP). The restrictions and considerations presented in the following Table 11-6 are based on the status of the IRP sites as of the December 2011 Restoration Advisory Board meeting. The sites are discussed in more detail in Appendix 11-4.

G. TRANSPORTATION IMPACTS AND MITIGATION STRATEGIES

1. Traffic Impacts

The following section details the traffic impacts the Preferred Plan will have on the surrounding road network.

a.) Traffic Impacts

The preferred development program and its specific land uses, sizes, and locations within the overall site were studied to determine the impact that the new development would have on the area. New trips were derived based on the "Trip Generation Manual – 8th Edition" that is published by the Institute of Transportation Engineers (ITE). This manual compiles data based on developments that have been studied nationwide and presents reasonable assumptions regarding the amount of traffic a development can be expected to bring to an area. The traffic volumes can be based on a variety of factors that are specific to the use, but for our purposes the primary variables are the square footage of the building (primarily of office and commercial uses), the number of units (primarily for residential uses), and the number of rooms (primarily for the hotel).

For the purposes of our study we focused on the AM and PM peak hours of the adjacent roadway system. There are also standard trip reductions for multiple destination trips and "pass-by" trips. Multiple destination trips are people who visit more than one location internal to the site. In this scenario, although there may be distinct uses or locations, the trip that is generated serves multiple establishments and should not be double-counted. Pass-by trips refer to individuals who use an amenity during the course of their normal travels. This is often the case for things such as gas stations, convenience stores, and drive thru restaurants where people stop along their trip to make a specific purchase and then continue. In this case the development did not generate a new trip, but was merely temporarily diverted from the original path.

Based on the Final Preferred Land Use Plan the primary trip generators are:

- Office Park
- Residential Uses (Single Family Homes, Townhomes, Condominiums, and CCRC)
- Elementary School
- Retail
- Hotel/Conference Center

The analysis focused primarily on the signalized intersections along the network and projected traffic to the year 2026 based on available growth factors. The comparisons are made between 2026 projected AM and PM peak hour traffic with no development on the site and 2026 AM and PM peak hour traffic with full build-out of the site. Overall the signalized intersections generally experience traffic increases between 15-20% between the 2026 Full Build and the 2026 No Build scenarios.

b.) AM/PM Peak Traffic

A Synchro/Sim-Traffic traffic simulation model was completed for the 2026 No-Build condition and the 2026 Full-Build condition. This comparison was done using the existing geometry (i.e., no widening or lane changes). Signal timings were modified as appropriate to limit the negative impact of the new development trips. The AM analysis (Table 11-7) revealed that two intersections improved, four remained relatively the same, and three intersections worsened. The PM analysis indicates that two intersections improved, three remained relatively the same, and four intersections worsened.

c.) Change Over Current Volumes

As a result of the closure of the base and the limited activities that now encompass this area it is noted that there is currently much less traffic generated at the site as compared to when the base was an active base. Although the plan will likely increase traffic 15% to 20% over a no-build scenario, the change would likely not be as much of an increase over traffic levels that occurred when the base was open and active.

Table 11-7
Traffic Comparison
NAS-JRB Willow Grove

Intersection	AM Peak	PM Peak
Easton Road/County Line Road	Comparable	Comparable
Easton Road/Gate 1	Worse	Worse
Easton Road/Moreland Avenue	Worse	Worse
Easton Road/Upper Maple Avenue	Comparable	Worse
Easton Road/Lower Maple Avenue	Better	Better
Horsham Road/Maple Avenue	Better	Better
Horsham Road/ Norristown Road	Worse	Worse
Horsham Road/Precision Road	Comparable	Comparable
Horsham Road/Privet Road	Comparable	Comparable

Source: Urban Engineers, 2011

d.) Traffic Mitigation Strategies

Based on the analysis of the intersections using the Synchro/Sim Traffic program a series of localized improvements were studied that could be implemented at specific locations. Generally the improvements included widening to allow additional turning lanes at intersections. The order-of-magnitude cost estimates are intended for planning purposes only, and do not include estimated costs for property acquisition, if necessary. Map 11-3 shows the AM/PM traffic change with mitigation.

- **Horsham Road/Norristown Road Intersection** - The Norristown Road connection becomes a primary access road across the site and serves as means to access the internal elements of the site (Figure 11-1). Since Norristown Road already carries a high volume of traffic it was evaluated to determine what improvements could be made to the area. The proposed improvements include the additional of an eastbound right turn lane and the redesignation of the eastbound lanes as a left only, through lane, and right turn. These improvements increased the overall Level of Service of F and E in the AM and PM peaks respectively to a Level of Service (LOS) C in both peaks.

  Approximate Mitigation Cost:

Addition of Right Turn Lane	$250,000
Upgrade of Traffic Signal	$125,000
Total:	$375,000

- **Easton Road/Meetinghouse Road Intersection** - The Easton Road/Meetinghouse Road intersection experiences large volumes of traffic due to the limited cross connections and are further complicated by the fifth leg at the intersection (Figure 11-2). The proposed improvements include the additional of a southbound right turn. This improvement increased the overall Level of Service from F to E in both peaks.

Approximate Mitigation Cost:

Addition of Right Turn Lane	$75,000
Upgrade of Traffic Signal	$50,000
Total:	$125,000

- **Easton Road/Upper Maple Road Intersection -** The Easton Road/Upper Maple Road intersection is the other side of the Norristown Road connection and experiences large volumes of traffic (Figure 11-3). It is further complicated by the skew angle of Maple Avenue. The proposed improvements include the additional of a southbound channelized right turn lane. This improvement increased the overall Level of Service from E to D in the PM peak.

  Approximate Mitigation Cost:

Addition of Right Turn Lane	$75,000
Upgrade of Traffic Signal	$125,000
Total	$200,000

- **Easton Road/Main Gate Intersection** - The Easton Road/Main Gate intersection is the connection to Privet Road on Horsham Road. It is currently signalized but rarely sees side street traffic due to the base closure (Figure 11-4). The proposed improvements include the additional of a southbound channelized right turn lane. This improvement increased the overall Level of Service from D to C in the AM peak.

  Approximate Mitigation Cost:

Addition of Right Turn Lane	$75,000
Upgrade of Traffic Signal	$125,000
Total	$200,000

- **Easton Road/Moreland Avenue Intersection** - The Easton Road/Moreland Avenue intersection is the connection to Precision Road on Horsham Road (Figure 11-5). It is currently unsignalized so and entire new traffic signal will be constructed. The proposed improvements include the additional of a southbound channelized right turn lane and a northbound left turn lane. These improvements increased the overall Level of Service from E to D in the PM peak.

  Approximate Mitigation Cost:

Addition of Right Turn Lane	$400,000
Upgrade of Traffic Signal	$250,000
Total	$650,000

- **Horsham Road/Dresher Road Intersection** - The Horsham Road/Dresher Road intersection is currently over congested and additional traffic to the area will further compromise its situation (Figure 11-6). The proposed improvements include the additional of a southbound channelized right turn lane. This improvement increased the overall Level of Service from F to E in the PM peak.

  Approximate Mitigation Cost:

Addition of Right Turn Lane	$75,000
Upgrade of Traffic Signal	$75,000
Total	$150,000

Figure 11-1
Horsham Rd/Norristown Rd

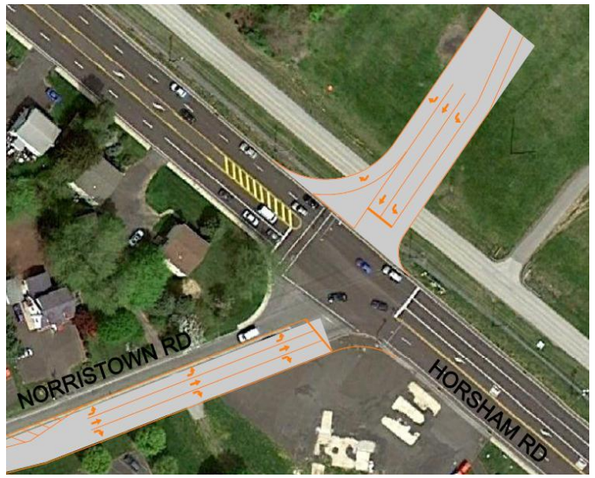


Figure 11-2
Easton Rd/Meetinghouse Rd

Figure 11-3
Easton Rd/Upper Maple Rd

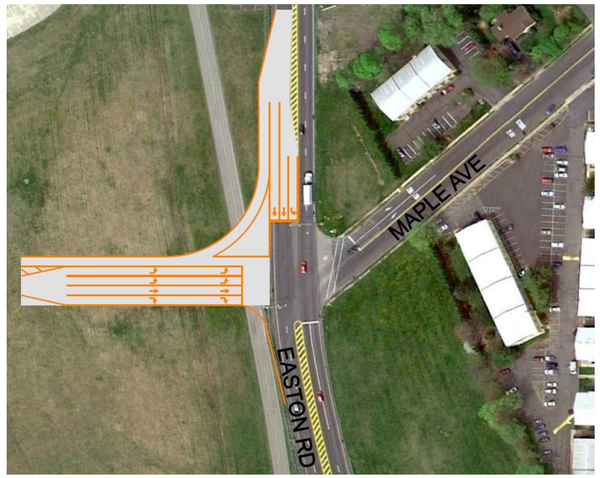


Figure 11-4
Easton Rd/Main Gate

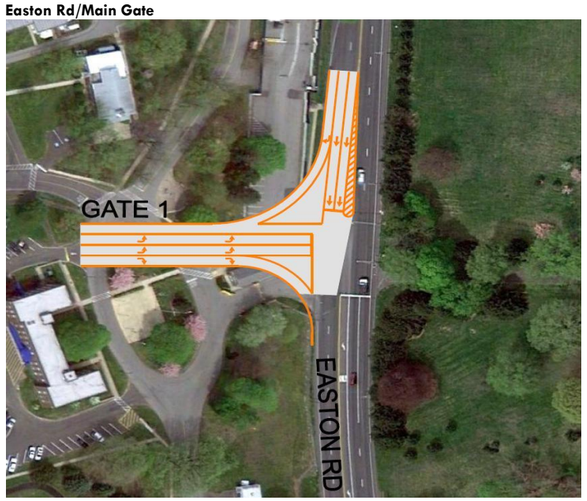


Figure 11-5
Easton Rd/Moreland Ave

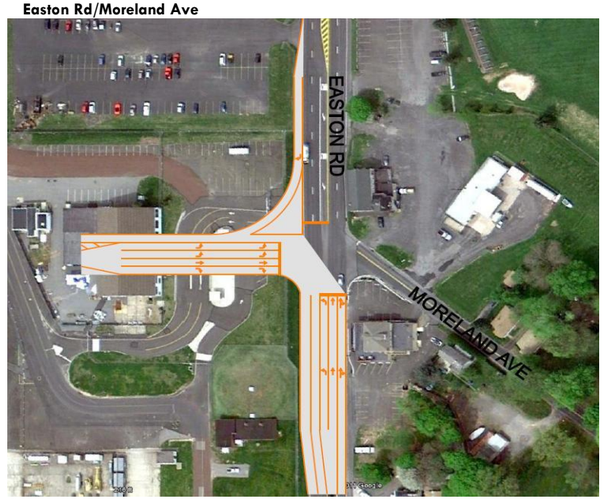


Figure 11-6
Horsham Rd/Dresher Rd

e.) System Wide Improvements

Due to the orientation of the site and the roadway network surrounding it, traffic is forced to go around the NAS-JRB property as if it were a traffic obstacle. This forces large numbers of vehicles to use Dresher Road and Meetinghouse Road to get to the east or west of the base and also forces many cars into the Horsham Road/Easton Road intersection. There are currently limited network options running in an east/west direction. However, providing an interior network of roads at NAS-JRB, as well as providing major road crossings through the base should provide greater vehicular options and reduce the demand on some existing intersections.

These connections could include an extension of Norristown Road, Precision Drive and Privet Road across the current property and into new connections along Easton Road (PA 611). Also, a primary north-south connection running in the area of the existing airstrip could further facilitate traffic movement and help disperse both local and regional traffic.

Further off the base, there are a number of transportation improvement projects that are linked to the future redevelopment of NAS-JRB Willow Grove. These projects are of local and regional significance and are worthy for inclusion in this plan.

- **Implementation of Adaptive Signal Technology** - Adaptive traffic signals are a relatively new innovation that allows signals to adapt to changing traffic demands and patterns in real time. This thereby optimizes the signals on a minute by minute basis. They have been deployed nationally and locally to great initial success. Locally they have been installed by PennDOT along Route 202 in King of Prussia, PA adjacent to the King Of Prussia Mall with initial success. Future deployments are planned in the area.

- **Improved Access Control** - Businesses in the area and primarily along Easton Road have multiple driveways that are often times adjacent to one another. This creates situations where patrons and employees entering businesses reduce the capacity and potentially lead to unsafe conditions. By combining driveways and using shared access points these locations can be evaluated and better handled through the installation of turn lanes or other measures.

- **Widening of County Line Road** - The intersection of County Line Road and Easton Road experiences substantial delays in the peak hours. Widening County Line Road to the west and east of Easton Road to Route 202 would allow modifications to the signal timing and may improve the overall operations of the intersection.

- **Widening of Easton Road north of Blair Mill Road** - North of Blair Mill Road, Easton Road is two lanes per direction while south of Blair Mill Road it is three lanes per direction. Widening Easton Road would remove this bottleneck and improve the overall capacity of the roadway. This improvement is a long term project that would require right-of-way purchases, utility relocations, access modifications, and environmental clearances.

- **Maple Glen Triangle** - This project has been on and off the Transportation Improvement Program (TIP) over the last two decades and involves improvements to the following intersections: Welsh and Norristown, Welsh and Limekiln and Limekiln and Welsh, as well as the road way between the intersections. These improvements will expedite traffic to the southbound 309 Expressway.

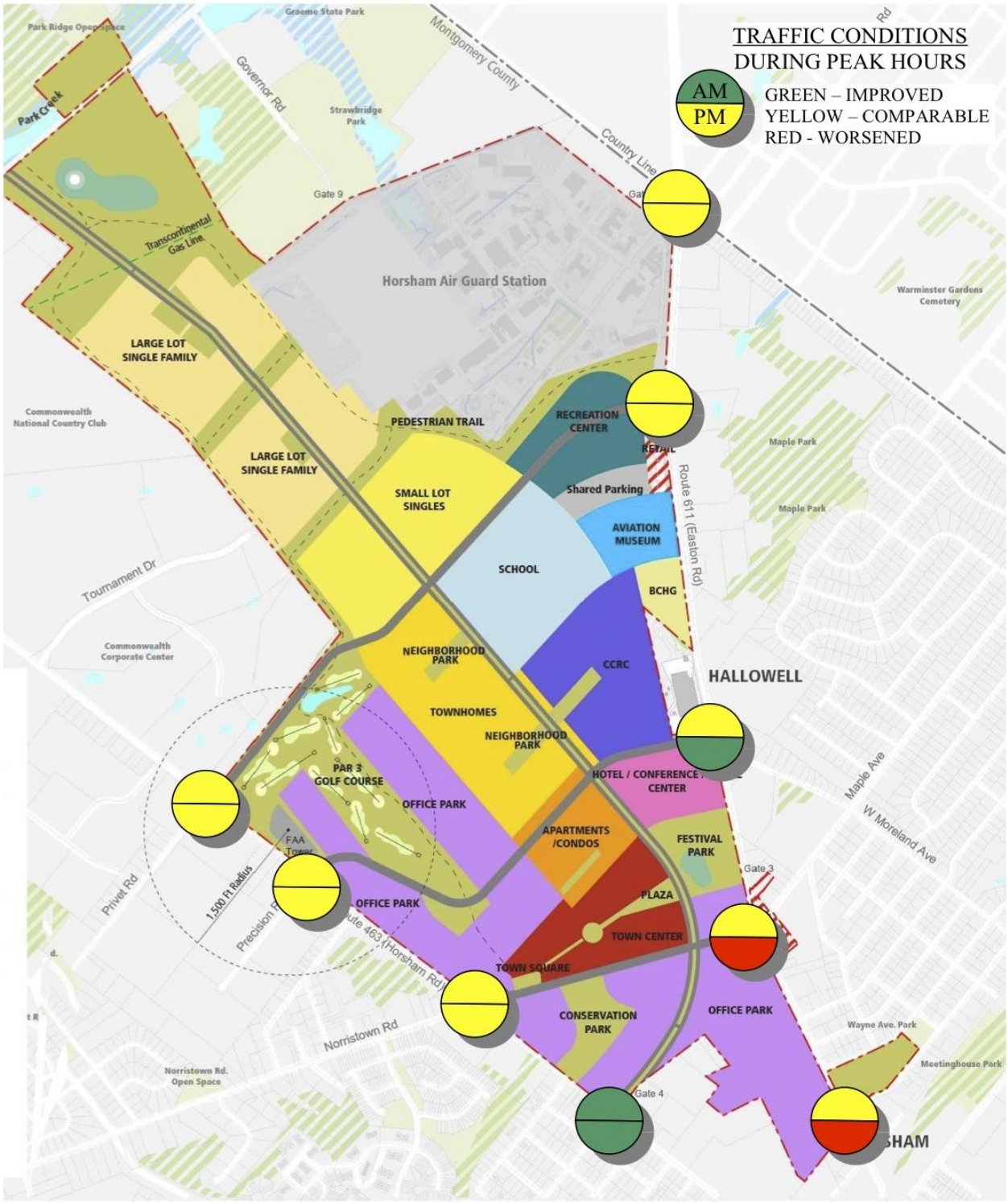
- **Horsham/Route 202 Parkway** - Horsham Road from Babylon out to where the Route 202 Parkway improvements terminate in Montgomery Township. This will enable access to Northbound 309 and the 202 Parkway.

- **Easton Road/Route 202** - County Line between Easton Road and to where the Route 202 Parkway improvements terminate in Montgomery Township (lower State Road). There are significant drainage, elevation and capacity issues currently. This project has been long overdue and was funded previously.

- **Easton Road Widening**- Easton Road needs to be improved to 6 lanes from County Line to the Turnpike along with various intersection improvements to include Blair Mill Road and Easton Road.

- **PA Turnpike Interchange** - The turnpike interchange needs to be improved to allow for two southbound on Easton Road lanes to the toll Plaza and upgrade of the toll plaza with more booths and high speed EZ pass. This project requires the replacement of the PennDOT bridge overpass for the turnpike ramp.

Map 11-3
No Build 2026 vs Full Build 2026



H. FISCAL AND ECONOMIC IMPACTS

RKG Associates prepared a preliminary economic and fiscal impact analysis of the Final Preferred Redevelopment Plan. The fiscal impacts are reported Township and School District level at full build-out (Year 20). The fiscal impact analysis is intended to be a rough estimate of municipal revenues and expenditures over the life project. The methodology used to prepare this analysis was described in Chapter 10, with some refinements.

1. Municipal Revenues

Tax revenue generated from real estate taxes to the Township and School District, earned income taxes to the Township and School District, and "all other" revenue sources (such as fees and permits) were included in the revenue analysis. Information in Table 11-8 shows that at full build-out the Final Preferred Redevelopment Plan generates over $13.6 million in municipal revenues to the combined Township and School District. The single highest revenue generator is the office park, which produces roughly $4.3 million at build-out. The high value of office property, as well as the earned income tax revenue collected from higher earning office workers, helps to contribute to the comparatively large revenue stream by this use. The residential uses also account for a significant share of revenues ($8.0 million). This revenue is primarily driven by property tax collections.

2. Municipal Expenditures

The provision of public education is often the most costly municipal expenditure for communities. Over 80% of the expenditures shown in Table 11-8 are school related at $6.9 million. The rest of the expenditures are a result of providing municipal services to the residential, commercial, and public uses. Examples of these services include fire protection, police, administration costs, road maintenance, etc. In total, the preferred redevelopment plan results in $8.6 million in expenditures.

3. Net Fiscal Impact

It is estimated that the Final Preferred Land Use Plan results in a net positive impact to the combined Township and School District of roughly $5.1 million (Table 11-8). The school district expenditures for educating children from the new single family, townhome, apartments, and Town Center residential units are the greatest among the proposed development uses ($6.7 million). However, it is important to note that total school impacts are positive. The school district collects property taxes and a portion of the earned income taxes from employees working at the NAS-JRB development. At the same time, the "other uses" do not contribute tax revenues at comparable levels because they are either tax exempt municipal uses or nonprofit entities.

4. Permanent Employment Generation

It is estimated that approximately 7,059 jobs are created through the preferred land use plan at build-out. The job creation estimates were made by applying employees per square foot estimates from the Urban Land Institute and the U.S. Energy Information Administration to the total square feet for each land use. It should be noted that the jobs generated at the site will be phased over the 20-year period. It is estimated that the first ten years of development will generate approximately 1,676 jobs or 24% of the total (Table 11-9). The remaining jobs (5,382) will be created as development of the office park and town center gains momentum. At full build-out the office park (4,652 jobs) and Town Center retail (1,198 jobs) developments account for roughly 83% of total jobs.

The consultant used the Quarterly Census of Employment and Wages for Montgomery County to assess the associated payroll impacts. In total, there will be about $457.0 million in payroll in Year 20 once all jobs have been created (Table 11-10). Office park payroll accounts for the largest share ($368.9

million) of annual payroll, due to the number of jobs and the comparatively high annual payroll of office workers. Over the first 20 years of the project, it is estimated that total payroll could approach $3.3 billion.

Table 11-8
Total Net Fiscal Impacts
NAS-JRB Preferred Redevelopment Plan

Land Use	Revenue	Expenditure	Net Impact
RESIDENTIAL			
Large Lot Single Family	$1,461,018	$1,119,264	$341,754
Small Lot Single Family	$1,563,651	$602,443	$961,208
Townhomes	$2,951,139	$3,877,782	($926,644)
Apartments	$904,796	$1,675,667	($770,871)
Town Center Apartment/Condos	$348,545	$566,721	($218,176)
Independent Living	$563,399	$78,086	$485,313
Assisted Living/Nursing	$266,342	$46,323	$220,020
Total Residential	$8,058,889	$7,966,285	$92,604
COMMERCIAL			
CCRC Med Office/Amenities	$56,047	$3,821	$52,226
Hotel/Conference	$338,311	$24,686	$313,625
Town Center Retail/Service/Restaurants	$456,411	$29,909	$426,502
Town Center Office	$160,955	$9,615	$151,340
Movies/Entertainment	$114,796	$8,431	$106,365
Office Park	$4,264,607	$274,434	$3,990,173
Retail	$199,293	$13,193	$186,101
Total Commercial	$5,590,420	$364,090	$5,226,331
OTHER USES			
Regional Recreation Center	$882	$18,427	($17,545)
Housing for Homeless	$375	$168,490	($168,114)
School	$17,933	$30,024	($12,091)
Aviation Museum	$294	$14,081	($13,787)
Park/Open Space	$0	$0	$0
Total Other Uses	$19,485	$231,022	($211,537)
TOTAL NET IMPACT	**$13,668,795**	**$8,561,397**	**$5,107,398**

Source: RKG Associates, Inc., 2011

Table 11-9
Final Preferred Redevelopment Plan - Permanent Employment

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Total
RESIDENTIAL																					
Large Lot Single Family	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Small Lot Single Family	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Townhomes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apartments/Condos	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Town Center Apartment/Condos	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Indpendent Living	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Assisted Living/Nursing	0	0	0	0	0	0	10	10	21	0	0	0	0	0	0	0	0	0	0	0	40
Sub-Total	0	0	0	0	0	0	10	10	21	0	0	0	0	0	0	0	0	0	0	0	40
COMMERCIAL																					
CCRC Med Office/Amenities	0	0	0	0	0	0	0	0	36	0	0	0	0	0	0	0	0	0	0	0	36
Hotel/Conference	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	48	48	96
Town Center Retail/Service/Restaurants	0	0	0	0	0	0	0	0	0	0	120	175	180	180	180	180	183	0	0	0	1,198
Town Center Office	0	0	0	0	0	0	0	0	0	0	0	0	52	52	52	52	52	0	0	0	261
Movies/Entertainment	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	15	0	0	0	30
Office Park	0	0	0	120	120	120	120	120	252	252	252	252	252	399	399	399	399	399	399	399	4,652
Retail	0	0	72	72	144	144	48	0	0	0	0	0	0	0	0	0	0	0	0	0	481
Sub-Total	0	0	72	192	264	264	168	120	288	252	372	427	484	631	631	646	649	399	447	447	6,754
PUBLIC																					
Housing for Homeless	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
Regional Recreation Center	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	15	0	0	0	30
School	0	0	0	0	0	0	0	0	0	0	0	0	0	0	109	109	0	0	0	0	218
Aviation Museum	0	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
Park/Open Space	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-Total	0	3	3	0	5	5	0	0	0	0	0	0	0	0	109	124	15	0	0	0	263
Annual Totals	**0**	**3**	**75**	**192**	**269**	**269**	**178**	**130**	**308**	**252**	**372**	**427**	**484**	**631**	**740**	**770**	**664**	**399**	**447**	**447**	**7,057**
Cumulative Totals	**0**	**3**	**77**	**269**	**539**	**808**	**986**	**1,115**	**1,424**	**1,676**	**2,048**	**2,475**	**2,959**	**3,590**	**4,330**	**5,101**	**5,765**	**6,164**	**6,611**	**7,057**	

Source: RKG Associates, Inc., 2011

Table 11-10
Final Preferred Redevelopment Plan - Annual Permanent Payroll

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Total
RESIDENTIAL																					
Large Lot Single Family	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Small Lot Single Family	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Townhomes	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Apartments/Condos	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Town Center Apartment/Condos	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Indpendent Living	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Assisted Living/Nursing	$0	$0	$0	$0	$0	$0	$306,438	$612,876	$1,259,800	$1,259,800	$1,259,800	$1,259,800	$1,259,800	$1,259,800	$1,259,800	$1,259,800	$1,259,800	$1,259,800	$1,259,800	$1,259,800	$16,036,914
Sub-Total	$0	$0	$0	$0	$0	$0	$306,438	$612,876	$1,259,800	$1,259,800	$1,259,800	$1,259,800	$1,259,800	$1,259,800	$1,259,800	$1,259,800	$1,259,800	$1,259,800	$1,259,800	$1,259,800	$16,036,914
COMMERCIAL																					
CCRC Med Office/Amenities	$0	$0	$0	$0	$0	$0	$0	$0	$1,621,191	$1,621,191	$1,621,191	$1,621,191	$1,621,191	$1,621,191	$1,621,191	$1,621,191	$1,621,191	$1,621,191	$1,621,191	$1,621,191	$19,454,292
Hotel/Conference	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,280,936	$2,561,873	$3,842,809
Town Center Retail/Service/Restaurants	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$3,461,040	$8,508,390	$13,699,950	$18,891,510	$24,083,070	$29,274,630	$34,549,832	$34,549,832	$34,549,832	$34,549,832	$236,117,917
Town Center Office	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$4,144,908	$8,289,816	$12,434,725	$16,579,633	$20,724,541	$20,724,541	$20,724,541	$20,724,541	$124,347,247
Movies/Entertainment	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$185,235	$370,470	$370,470	$370,470	$370,470	$1,667,115
Office Park	$0	$0	$0	$9,515,398	$19,030,797	$28,546,195	$38,061,593	$47,576,992	$67,559,328	$87,541,665	$107,524,002	$127,506,338	$147,488,675	$179,118,548	$210,748,420	$242,378,293	$274,008,166	$305,638,039	$337,267,912	$368,896,833	$2,598,407,195
Retail	$0	$0	$2,080,518	$4,161,035	$8,322,071	$12,483,106	$13,870,118	$13,870,118	$13,870,118	$13,870,118	$13,870,118	$13,870,118	$13,870,118	$13,870,118	$13,870,118	$13,870,118	$13,870,118	$13,870,118	$13,870,118	$13,870,118	$221,228,379
Sub-Total	$0	$0	$2,080,518	$13,676,434	$27,352,867	$41,029,301	$51,931,711	$61,447,110	$83,050,637	$103,032,974	$126,476,350	$151,506,037	$180,824,842	$221,791,183	$262,757,524	$303,909,100	$345,144,318	$376,774,191	$409,685,000	$442,594,858	$3,205,064,954
PUBLIC																					
Housing for Homeless	$0	$126,828	$253,655	$253,655	$253,655	$253,655	$253,655	$253,655	$253,655	$253,655	$253,655	$253,655	$253,655	$253,655	$253,655	$253,655	$253,655	$253,655	$253,655	$253,655	$4,692,618
Regional Recreation Center	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$298,155	$596,310	$596,310	$596,310	$596,310	$2,683,395
School	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$6,060,589	$12,121,178	$12,121,178	$12,121,178	$12,121,178	$12,121,178	$66,666,481
Aviation Museum	$0	$0	$0	$0	$99,385	$198,770	$198,770	$198,770	$198,770	$198,770	$198,770	$198,770	$198,770	$198,770	$198,770	$198,770	$198,770	$198,770	$198,770	$198,770	$3,080,935
Park/Open Space	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Sub-Total	$0	$126,828	$253,655	$253,655	$353,040	$452,425	$452,425	$452,425	$452,425	$452,425	$452,425	$452,425	$452,425	$452,425	$6,513,014	$12,871,758	$13,169,913	$13,169,913	$13,169,913	$13,169,913	$77,123,428
Annual Totals	**$0**	**$126,828**	**$2,334,173**	**$13,930,089**	**$27,705,907**	**$41,481,726**	**$52,690,574**	**$62,512,410**	**$84,762,862**	**$104,745,199**	**$128,188,575**	**$153,218,262**	**$182,537,067**	**$223,503,408**	**$270,530,338**	**$318,040,658**	**$359,574,031**	**$391,203,904**	**$424,114,713**	**$457,024,571**	**$3,298,225,296**

Source: RKG Associates, Inc., 2011

I. ZONING COMPATIBILITY

1. Existing Zoning

The main NAS-JRB Willow Grove property is currently zoned industrial. The majority of the land immediately adjacent to the site is zoned light industrial and commercial, however some parcels to the north of the property are zoned residential (Map 11-4). It should be noted that there are currently Airport Crash and Noise Overlay Districts located to the north and south of the base. However, these districts are no longer necessary, as airport uses have been discontinued.

The proposed land uses for the site were created to fit within the context of the adjacent zoning and land uses. For example, residential uses are generally adjacent other residential zones, or planned for the interior of the site. All proposed single family uses are also buffered by green space. The retail bordering the site is generally adjacent other commercially zoned areas. The office parks planned for the southern and western portion of the site are adjacent to other commercial and industrial zoned parcels and is consistent with these proximate land uses.

2. Zoning Applicable to Preferred Redevelopment Plan Land Uses

Some of the proposed land uses fit within the existing Horsham Township zoning ordinance (with no special exception hearing required). These proposed uses that could fit within existing Horsham Township zones include the Large Lot Single Family, CCRC uses, Office Park, Retail (excluding Town Center Retail), Regional Recreation Center and Park (Table 11-11). The School land use could be compatible with existing zoning; however it must be authorized by the Township Zoning Hearing Board as a special exception. Some uses, such as the Regional Recreation Center, Retail, and Park can fit within more than one existing zoning code. It should be noted that final determination of these zones will be made through discussions with the Horsham Township Council and the implementation LRA, subsequent to redevelopment plan approval.

3. Land Uses Not Compatible with Current Zoning

There are some proposed land uses which would not fit with existing Horsham zoning code. The land uses within the Town Center, including retail, movies/entertainment, office, and residential, would require zoning that allows for a mix of different land uses to be located on the same parcel. Currently, there is no existing mixed-use zone in the existing code. In terms of residential zoning, the proposed small lot single family, townhomes and apartments/condominiums would require zoning that allows for a higher density of units than currently exists.

Other uses which do not fit the current zoning code include Hotel/Conference and Museum. The land plan calls for a hotel that is likely to be taller than 4-stories, which exceeds the current permitted height limits. The Business Campus District (BC) currently allows for a museum use, which is likely the zoning to be used for the corporate office development. However, the code states that the building, or collection of buildings, must be on lots no smaller than 30 acres. Since the museum property is not contiguous to the proposed office development. Accordingly, the museum development may need a special exception or a zoning overlay district at its current location.

Map 11-4
Existing Zoning at Site

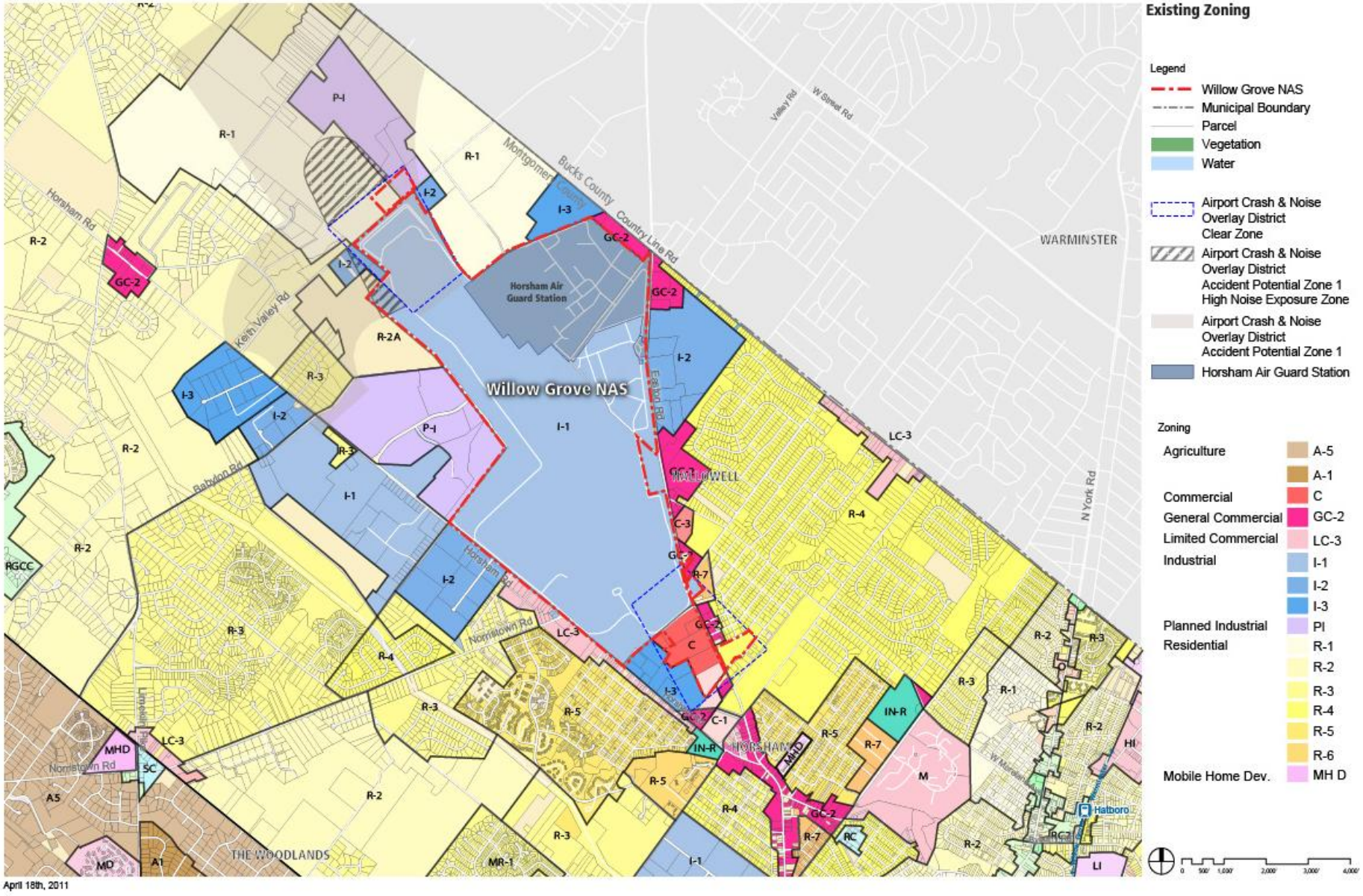


Table 11-10
Development Plan and Zoning Compatability
NAS-JRB Willow Grove Preferred Reuse Plan

	Acres	Units (SF) Proposed	Applicable Zoning	Minimum/Maximum Lot Size According to Existing Zoning
RESIDENTIAL				
Large Lot Single Family	65	90	None	--
Small Lot Single Family	34	250	None	--
Townhomes	36	350	None	--
Apartments/Condos	13	300	None	--
Town Center Apartment/Condos	8	100	None	--
Indpendent Living [1]	19	141	O-1	Minimum 10 acres
Assisted Living/Nursing [1]	8	185	O-1	Minimum 10 acres
COMMERCIAL				
CCRC Med Office/Amenities [1]	3	25,000	O-1	Minimum 10 acres
Hotel/Conference [4]	6	137,000	I-1, I-2, I-3	--
Town Center Retail/Service/Restaurants	11	239,580	None	--
Town Center Office	3	65,340	None	--
Movies/Entertainment	5	54,450	None	--
Office Park	134	1,163,052	BC	Minimum 30 acres
Retail	7	96,180	C-1, SC-1, SC-2, C-2, GC-2	Varies
PUBLIC				
Regional Recreation Center	20	100,000	R-1, R-2, R-2A, R-3, R-4	Varies
Housing for Homeless [2]	7	30	--	--
School [3]	40	152,727	R-2, R-2A	Minimum 43,560 SF
Aviation Museum	13	200,000	None	--
Park/Open Space	205	--	R-1, R-2, R-2A, R-3, R-4, FP	--

Source: Horsham Township Zoning Ordinance and RKG Associates, Inc., 2011
[1] CCRC uses (independent living, assisted living, medical offices/amenties) would be grouped together, with total acres exceeding the minimum according to exisiting zoning
[2] Lot size of homeless housing is currently undetermined
[3] Permitted use when authorized by Township Zoning Hearing Board as a special exception
[4] A hotel as high as 10 floors is not allow in any zoning district in Horsham

Zoning Code Key
R-1 - Low Density Residential District
R-2 - Low Density Residential District
R-4 - Medium Density Residential District
MR-2 - Mixed-Residential District
O-1 - Office/Nonmanufacturing District
BC - Business Campus District
C-1 - Shopping Center District
SC-1 - Shopping Center District
C-2 - General Commercial District
GC-2 - Genearl Commercial and Highway Commercial
FP - Floodplain Conservation District

Chapter 11 Appendix Section

Appendix 11-1 Renewal Energy Applications and Federal Incentives for Renewables

Appendix 11-2 Preferred Redevelopment Plan Water and Wastewater Flows

Appendix 11-3 Existing Buildings with Asbestos Containing Material (ACM)

Appendix 11-4 Environmental Remediation and Natural Resources

APPENDIX 11-1

RENEWABLE ENERGY APPLICATIONS

Renewable or "green" energy is defined as energy which comes from natural resources, such as sunlight, wind, and geothermal heat. The large amount of contiguous land available at the NAS-JRB Willow Grove site presents a unique opportunity for green energy-related uses. The following section provides an overview on renewable energy applications at the redevelopment site as well as federal and state funding opportunities.

1. Solar Energy

Solar capacity across the country is growing. The U.S. Solar Market Trends publication, produced by the Interstate Renewable Energy Council, reports that the number of all solar installations completed in 2010 grew by 22% (124,000 installations) over 2009 levels. Pennsylvania has been a leader in this field. According to Solar Energy Industries Associates, in 2010 Pennsylvania ranked 8th in the nation for cumulative installed solar capacity.

Top 10 States with Cumululative Installed Solar Capacity (As of 2010)

Rank	State	Megawatts
1	California	971
2	New Jersey	293
3	Colorado	108
4	Arizona	101
5	Nevada	97
6	Florida	73
7	New York	54
8	Pennsylvania	54
9	New Mexico	45
10	North Carolina	42

Source: Solar Energy Industries Association and RKG Associates, Inc., 2011

Harnessing solar energy can be achieved a variety of ways. Passive solar building design, (in which windows, walls, and floors are designed to collect, store distribute solar energy), photovoltaic (PV) technology, and solar thermal technology are the most common.

a.) Photovoltaic (PV) Technology

PV power generation employs solar panels to generate electricity. These solar panels can be placed directly on the building or assembled as a solar array, whereby large rows of interconnected solar panels work together to capture sunlight and turn it into electricity. It is becoming more common for corporate offices and commercial buildings to build solar arrays which power their facilities. Some corporate parks or industrial buildings are surrounded by vacant land, which are appropriate sites for solar array developments that are created specifically to power nearby buildings. An example of this type of solar farm occurs at the Crayola campus in Forks Township, Pennsylvania. The Crayola Solar farm includes over 30,000 panels on 20-acres of land. According to Crayola representatives, the power generated at this array will satisfy about one-third of the companies energy needs. There are plans to expand the solar farm to 30-acres by 2013.

b.) Solar Thermal Technology

PV technology directly converts sunlight into electricity. However, solar thermal technology uses solar collectors to captures the sun's heat and then distribute it. Solar thermal technology is generally used for heating water or air for residential and commercial uses. Solar water heating installations have been growing in popularity. These installations grew in the United States by 6% from 2009 to 2010 (Interstate Renewable Energy Council). Although they usually cost more to purchase and install then conventional water heating systems, the U.S. Department of Energy reports that solar hot water heaters can reduce water heating bills 50% to 80%. It is estimated that on-average one solar water heater can prevent 4,000 pounds of carbon dioxide from entering the atmosphere. It is envisioned that solar water heaters can be integrated into building development at the NAS-JRB Willow Grove site.

2. Geothermal Energy

Geothermal energy is generated below the surface of the earth. There are two primary geothermal energy production types, Geothermal Heat Pumps (GHPs) and Geothermal Power Plants. GHPs can be installed underneath buildings at depths of about 10 feet to 300 feet. GHPs can be used at almost any location. The Environmental Protection Agency considers them to be one of the most efficient heating systems available and can produce 30% to 40% lower energy bills. Geothermal heat pumps could be added underneath new buildings at the redevelopment site in order to promote greener and environmentally conscious development.

3. Wind energy

The wind industry is experiencing fairly rapid growth in the U.S. In the past four years, the wind industry has added over 35% of new generating capacity, to a total of 43,461 megawatts as of September 2011 (American Wind Energy Association). The Commonwealth of Pennsylvania ranks 16th nationally in total wind capacity installed (751 MW). There are currently ten counties with installed wind capacity.

According to a resource assessment from the National Renewable Energy Lab, Pennsylvania's wind resource could provide 6.4% of the state's current electricity needs. However, there are some drawbacks to wind energy that should be considered. Wind turbines produce noise when they operate. In addition, large wind turbines can rise to 300 feet in height and are highly visible. Depending on where they are installed, some wind farms become the source of public opposition based on their aesthetic impact.

Small wind turbines, which have lower energy output (<100 kilowatts) than large commercial wind turbines, have been growing in popularity. According to the American Wind Energy Association, there was a 26% growth in small wind turbine capacity in the United States from 2009 to 2010 to a current capacity of 179 MW. These turbines are found most commonly on farms, but can be used for residential purposes. While residential turbines can help to power the home, they are also very visible and may not be the best fit with the surrounding neighborhoods.

4. Federal Incentives for Renewable Energies

There are some federal incentives available to private companies or public entities looking to install renewable energies. The Crayola solar development utilized a $1.5 million grant from the American Recovery and Reinvestment Act or Stimulus Act. Other examples of federal incentives include tax credits, loan programs, and industry recruitment/support. Appendix Table 11-1 includes federal incentives that are available to the private and public sector.

5. State Financial Incentives for Renewable Energies

Part of the growing solar farm interest in Pennsylvania is due to the "Solar Energy Alternative Energy Credit." These credits allow for the owner to sell the clean energy "credits" to companies that want to avoid penalties levied by the state on generators of polluting energy. New Jersey and Delaware also have similar tax credit programs.

Below is a summary of how the incentives in Pennsylvania compares with competitive states (Table 5). New Jersey and Delaware were included because they represent immediate competition. California, Michigan, and Nevada were also included, because these states are known to be solar energy leaders. It should be noted the following table is incentives for all renewable energies, and not just solar.

New Jersey, in particular, has made large gains in solar energy production in the past ten years. New Jersey ranks second only to California in total installed solar capacity (over 293 megawatts). Much of these gains are due to state financial incentives designed to encourage solar development. The State's "Solar Energy Advancement and Fair Competition Act of 2010" calls for adding 4,000 megawatts of electricity output from solar by 2026 (over a 13-fold increase from current levels). Although New Jersey is a competitive state, it should be possible for Pennsylvania to capitalize on this growing momentum for solar energy.

In fact, Pennsylvania has the most state financial incentives of the comparison states. The "performance-based" category includes incentives such as the Solar Energy Alternative Tax Credits. Industry Support category includes programs available for industry-recruitment. In Pennsylvania, these programs include an Alternative Clean Energy Program and a Wind and Geothermal Incentives Program. Both of these programs offer manufacturers loans per job created, and grants for wind energy production projects, distribution projects, energy savings contracts, and feasibility studies. It should be noted that Delaware has no similar industry support program. The available incentives in Pennsylvania help to make the NAS-JRB Willow Grove site a very competitive location for new renewable energy uses.

Type and Number of Incentives for Renewable Energy Investments
Competitive States

	Sales Tax	Property Tax	Rebates	Grants	Loans	Industry Support	Performance-Based Incentive	TOTAL
Pennsylvania		1	1	6	6	2	1	17
New Jersey	1	2	6		1	3	2	15
Michigan		2		2	4	5		13
California		1	7		1	1		10
Deleware			3	2	2		1	8
Nevada	1	3	2		1		1	8

Source: Database of State Incentives for Renewables & Efficiency and RKG Associates, Inc., 2011

Appendix 11-1, Table 1

Federal Incentives for Renewables

Type	Incentive	Description
Corporate Tax Deduction/Credit		
Energy-Efficient Commercial Buildings Tax Deduction	$1.80/SF	Tax Deduction of $1.80/SF available to owners of new or existing buildings who install interior lighting, building envelope, or heating, cooling, ventilation or hot water systems that reduce the building's total energy and power cost by 50% or more.
Business Energy Investment Tax Credit	30% for solar and wind; 10% for geothermal	Tax credit equal to 30% of expenditures for active solar or wind installations; 10% for geothermal. There is no maximum credit.
Energy-Efficient New Homes Tax Credit for Home Builders	$2,000	Site-built homes qualify for $2,00 credit if they are certified to reduce heating and cooling energy consumption by 50%.
Renewable Electricity Production Tax Credit	2.2 cents/kWh for wind, 1.1 cents/kWh for geothermal	Per-kilowatt hour tax credit for electricity generated by qualified energy resources and sold by taxpayer to an unrelated person during the taxable year.
Federal Grant Programs		
Tribal Energy Program Grant	Varies by solicitation	Financial assistance, technical assistance, education, and training to tribes for evaluation and development of renewable energy resources and energy efficiency measures.
U.S. Department of Treasury Renewable Energy Grants	30% of property that is part of a qualified solar or wind facility; 10% all other	Grant is equal to 30% of basis of property for active solar or small wind turbines (100kWh capacity maximum)
High Energy Cost Grant Program	$75,000 to $5 million	Grant for communities that have energy costs 275% above national average. Grants available for electric generation, natural gas storage or distribution, renewable energy facilities used for on-grid or off-grid power generation, water or space heating, backup emergency power generation or weatherization of residential and community property.
Federal Loan Programs		
Qualified Energy Conservation Bonds	Financing tool	Borrower who issues bond pays back only principal of bond and the bondholder receives federal tax credits in lieu of traditional bond interest.
U.S. Department of Energy Loan Guarantee Program	Loan guarantees	Loan guarantees for projects that "avoid, reduce or sequester air pollutants or anthropogenic emissions of greenhouse gases; and employ new or significantly improved technologies as compared to commercial technologies in service in the United States at the time the guarantee is issued." The focus is on projects with total costs over $25 million.
Industry Recruitment/Support		
Energy-Efficient Appliance Manufacturing Tax Credit	Tax Credits	Tax credits for manufacturers of high-efficiency residential clothes washers, refrigerators, and dishwashers
Renewable Energy Production Incentive	2.2 cents/kWh	Provides incentive payments for electricity generated and sold by new qualifying renewable energy facilities.

Source: Database of State Incentives for Renwables and Efficiency and RKG Associates, Inc., 2011

Appendix 11-2

Preferred Redevelopment Plan Water and Wastewater Flows

	LAND USE PROGRAM			WASTEWATER				WATER		
	Land Use	**Built-Up Area (Units or SF)**	**Area in Acres**	**USE**		**Estimated Average Daily Flow (gpd)**	**Source**	**Percent**	**Estimated Average Daily Flow (gpd)**	**Source**
1	Larger Lot Single Family (23,000+ sf lots)	90	64.6	228	gal/unit/day	**20,520**	Used HSWA value for EDUs	85%	**24,141**	M&E, 4th Edition, 2003, page 155; see note 2.
2	Small Lot Single Family (7,000+ sf lots)	250	34.3	228	gal/unit/day	**57,000**	Used HSWA value for EDUs	85%	**67,059**	M&E, 4th Edition, 2003, page 155; see note 2.
3	Townhomes (4,100+ sf lots)	350	36.2	228	gal/unit/day	**79,800**	Used HSWA value for EDUs	85%	**93,882**	M&E, 4th Edition, 2003, page 155; see note 2.
4	Apartments/Condos	300	13.3	228	gal/unit/day	**68,400**	Used HSWA value for EDUs	85%	**80,471**	M&E, 4th Edition, 2003, page 155; see note 2.
5	CCRC Independent Living (6,200+ sf)	141	19.3	152	gal/unit/day	**21,432**	Used HSWA value for EDUs and 0.7 EDU for over 55 housing	85%	**25,214**	M&E, 4th Edition, 2003, page 155; see note 2.
6	CCRC Assisted Living/Nursing [3]	185	8.0	1780	gpd/acre	**14,240**	Used HSWA's value based on Abrahamson facility	85%	**16,753**	M&E, 4th Edition, 2003, page 155; see note 2.
7	Homeless (BCHG) [3]		7.4	1780	gpd/acre	**13,172**	Used HSWA's value based on Abrahamson facility	85%	**15,496**	M&E, 4th Edition, 2003, page 155; see note 2.
8	CCRC/Med Office/Amenities	25,000	3.0	960	gpd/acre	**2,880**	Used HSWA's measured value for industrial development	85%	**3,388**	M&E, 4th Edition, 2003, page 155; see note 2.
9	Hotel/Conference Center	137,000	6.3	0.25	gpd/sf	**34,250**	MDE Guidance Document, Wastewater Capacity Management Plans, 2006, Table II, Hotel ; agrees with HSWA calculation	85%	**40,294**	M&E, 4th Edition, 2003, page 155; see note 2.
10	Town Center							85%	**0**	M&E, 4th Edition, 2003, page 155; see note 2.
	Retail/Service/Restaurants	239,580	11.0	960	gpd/acre	**10,560**	Used HSWA's measured value for industrial development	85%	**12,424**	M&E, 4th Edition, 2003, page 155; see note 2.
	Office	65,340	3.0	960	gpd/acre	**2,880**	Used HSWA's measured value for industrial development	85%	**3,388**	M&E, 4th Edition, 2003, page 155; see note 2.
	Residential	100	7.9	228	gal/unit/day	**22,800**	Used HSWA value for EDUs	85%	**26,824**	M&E, 4th Edition, 2003, page 155; see note 2.
	Movies/Entertainment	54,450	5.0	960	gpd/acre	**4,800**	Used HSWA's measured value for industrial development	85%	**5,647**	M&E, 4th Edition, 2003, page 155; see note 2.
11	Regional Recreation Center	100,000	20.2	960	gpd/acre	**19,392**	Used HSWA's measured value for industrial development	85%	**22,814**	M&E, 4th Edition, 2003, page 155; see note 2.
12	Office Park	1,163,052	133.5	960	gpd/acre	**128,160**	Used HSWA's measured value for industrial development	85%	**150,776**	M&E, 4th Edition, 2003, page 155; see note 2.
13	Retail	96,180	6.9	960	gpd/acre	**6,624**	Used HSWA's measured value for industrial development	85%	**7,793**	M&E, 4th Edition, 2003, page 155; see note 2.
14	School [1]	152,727	40.0	13	gpcd	**19,500**	PADEP Domestic Wastewater Manual value for public school with cafeteria and gym; Total volume agrees with HSWA data for high school	85%	**22,941**	M&E, 4th Edition, 2003, page 155; see note 2.
15	Aviation Museum		13.1	960	gpd/acre	**12,576**	Assume this uses HSWA's 960 gpd/acre for commercial/industrial	85%	**14,795**	M&E, 4th Edition, 2003, page 155; see note 2.
16	Parks/Open Space [2]	0	204.8	0		**0**		85%	**0**	M&E, 4th Edition, 2003, page 155; see note 2.
17	Roads, sidewalks, paths, etc.		215.5	0		**0**		85%	**0**	
18	FAA Tower		3.0	0		**0**		85%	**0**	
	TOTAL		**856.3**			**538,986**			**634,101**	**M&E, 4th Edition, 2003, page 155; see note 2.**

Source: Weston, Inc., 2012

[1] Assumes 1,500 students and faculty

[2] Assumes no wastwater from parks

[3] Assumes 1.5 persons per unit

Additional Notes:

1 PADEP 362-0300-002, Small Flows Treatment Facilities Manual, Appendix A

2 M&E, 4th Edition, 2003, page 155; 60-90% of the per capital water consumption becomes wastewater (lower percentages applicable to semiarid region in southwest US.)

3 M&E 4th edition indicates 800 - 1500 gpd/acre for commercial development. This is 0.018-0.034 gpd/sf

Appendix 11-3

Buildings with Asbestos Containing Material (ACM) [1]

#	Facility Name	Square Feet
BUILDINGS WITH ASBESTOS CONTAINING MATERIAL (ACM)		
1	ADMINISTRATION BLDG	12,828
2	RECREATION BLDG	38,039
3	CHILD CARE FACILITY	19,170
5	BACHELOR OFFICERS QUARTERS	36,225
21	PW SHOP	3,212
22	WAREHOUSE	8,601
24	PUMP HOUSE SWITCH ROOM	1,777
29	STORAGE AVIATION	22,071
38	CHAPEL	5,000
43	INFORMATION RECRUITING	2,623
70	TRANSFORMER HOUSE	819
74	SUBSTATION	49
75	GARAGE STORAGE	625
80	HANGAR	129,014
111	QUARTERS C	2,354
118	TRANSMITTER BUILDING	3,240
126	EMERGENCY GENERATOR FACILITY	496
137	DISPENSARY	14,890
140	RESASWTRACEN APPLIED INSTR.	59,260
146	EQUIPMENT SHELTER	96
159	FILLING STATION	1,616
164	MACS ADM BLDG	1,860
172	BEQ #5	33,464
174	ENLISTED DINING CLUB	11,290
175	AIRCRAFT MAINTENANCE HANGAR	107,768
176	ARMY RESERVE TRAINING BLDG.	45,670
180	AVIONICS ENGINE SHOP	32,224
184	UTILITY BUILDING	600
601	RESERVE TRAINING BUILDING	18,024
605	NAVY EXCHANGE RETAIL STORE	19,200
606	MARINE GENERAL WAREHOUSE	16,098
608	FIRE AND RESCUE STATION	12,720
677	PERSONNEL SUPPORT ACTIVITY	10,000
681	PUMP HOUSE MARINE HANGAR	2,982
780	OPS PASSENGER TERMINAL	19,087
140A	RESASWTRACEN APPLIED INSTR. (A)	50,000
15A	BOILER HOUSE #2 (SOUTHEND)	1,729
175A	LINE SHACK A	400
175B	LINE SHACK B	400
	Total SF with ACM	**745,521**

Source: Asbestos Inspection Report by Michael Baker Jr., Inc., and RKG Associates, Inc., 2011

[1] Buildings identified or assumed to contain Asbestos Containing Material (ACM)

APPENDIX 11-4

ENVIRONMENTAL REMEDIATION AND NATURAL RESOURCES

1. Overall Assessment of Environmental Constraints

Environmental conditions currently exist at the NAS-JRB Willow Grove facility which are expected to affect, limit, and/or put conditions upon the redevelopment plan at specific locations. These conditions are discussed as follows:

- Areas designated in the development plan including parks, retail, offices, residential, recreational center, golf course, town center could be limited due to ongoing remediation and future use restrictions that are part of a remedial action due to residual groundwater and other contamination present on the base. The NAS-JRB Willow Grove facility is on the NPL list and investigation and remediation activities have been ongoing for the IRP sites under CERCLA with the Navy as the lead agency. Work being performed here is under the oversight of EPA and PADEP (see Chapter 2). Details regarding the specific environmental issues and restrictions related to the respective IRP sites are provided in Chapter 2.

- The site potable water supply wells are located in the northeast area of the facility. Future development adjacent to that area is projected to be parks/recreation center area, which would need to ensure the integrity of the supply wells. In addition, the wells are in an area where groundwater contamination exists and there is a treatment system in place. Therefore, future redevelopment would need to ensure maintenance of the wells and treatment system, and maintain testing to determine that the treatment is effective.

- Radon - The Environmental Condition of Property Report for NAS-JRB Willow Grove (Dept. of the Navy, 2006) indicates that a preliminary radon screening in approximately 8% of the buildings was performed in 2001. Of the 200 samples analyzed (8 samples were lost in transit), only 1 sample, collected from Room 122 in building #137, contained radon concentrations above the USEPA action level of 4 picoCuries per liter. It is recommended that radon screening be conducted in any buildings that would be retained for reuse.

- Lead-Based Paint - As stated in the Environmental Condition of Property Report prepared by the Navy in May of 2006, previous interviews with base personnel indicated that lead-based paint was removed from NAS-JRB Willow Grove on-base housing and other buildings frequented by children. Recent information on the facilities that contain led-based paint can be found in the Navy's Lead-Based Paint Inspections and Risk Assessment Summary Report, dated December 11, 2011. Demolition of the lead-based paint materials will require the use of personnel certified in lead-based paint abatement/remediation.

- Asbestos– As stated in the Environmental Condition of Property (ECP) Report prepared by the Navy in May of 2006, a 1996 asbestos inventory indicated 52 structures at NAS-JRB Willow Grove contain "identified" asbestos containing material or presumed asbestos-containing material. Recent information on the facilities that contain asbestos can be found in the Navy's Asbestos Inspection Summary Report, dated December 11, 2011. Demolition of the buildings that contain asbestos will require the use of a certified asbestos remediation contractor. All asbestos containing material must be disposed of in accordance with all applicable regulations.

- Wetlands – NAS-JRB Willow Grove contains approximately 14.3 acres of separated wetlands according to the ECP Report dated May 11, 2006. If the proposed redevelopment would cause any adverse impacts to these wetlands, including filling or other disturbance, a permit may be required from U.S. Army Corps of Engineers and/or PADEP.

- Cultural/Historic Resources - A Cultural Resources Survey was conducted by Louis Berger and Associates for NAS-JRB in 1996. The survey did not identify any buildings or structures that meet National Register criteria for an historic district or individual cultural resources. (Dept. of the Navy, 2006) However, since 1996 additional buildings have become more than 50 years old so the Cultural Resources Survey needs to be updated by the Navy and submitted to the Pennsylvania Museum and Historical Commission (PHMC) for review.

  The vast majority of the land surface within the boundaries of NAS-JRB Willow Grove has been subjected to severe disturbance resulting from construction activities that have occurred since 1944. As a result, the potential for intact historic or prehistoric archaeological remains at the station are limited. Out of 15 locations with historical documentation of occupation on-base, four were judged to have either moderate or high potential for intact archaeological remains. The remaining 11 locations were judged to possess low or extremely low potential for archaeological remains.
  Compliance with Section 106 and 10 of the National Historic Preservation Act requires the Navy to consult with PHMC upon their official disposal of any historic properties or if there would be any potential adverse impacts to eligible archaeological resources.

In addition, there are other environmental-related issues across the NAS-JRB Willow Grove facility that could potentially affect, limit, and/or result in conditions being placed upon reuse/redevelopment of the site. These issues have been identified due to the lack of detailed information in the ECP or lack of other documentation to verify that these issues are not of concern. Therefore, it is not possible to completely assess the potential exposure to the community, or liability to future owners, or detailed effect on development, if any. The issues of concern are explained in more detail as follows:

- Past practices at NAS-JRB Willow Grove Facility included aircraft idling and refueling in the apron, ramp, and taxiway areas in the eastern area of the facility. Although there are no detailed records regarding this activity and no known spills of fuel, based on knowledge of similar facilities, the potential exists for release of fuel, including semivolatile organic compounds to nearby soils, specifically polynuclear aromatic hydrocarbons (PAHs). Presence of PAHs could present an unacceptable risk to human health, and if found, would be of primary concern in the redevelopment areas designated for residential, park, or school, and could potentially prevent redevelopment unless remediated. Undetected fuel releases could also affect groundwater quality. This issue may warrant request of additional information from the Navy and/or soil sampling.

- According to the ECP, there are no PCB-containing materials currently located at NAS-JRB Willow Grove; however, no documentation exists regarding removal/and or management of PCBs or PCB containing material. Presence of PCBs above risk-based or regulatory levels in transformers, lighting ballasts, or soils (from potential past releases) can potentially affect redevelopment by presenting a risk to the community or requiring special handling and disposal. This issue may warrant request of additional information from the Navy and/or further investigation/survey of transformers and lighting ballasts.

- Past practices at NAS-JRB Willow Grove facility included aircraft deicing in apron, taxiway and ramp areas in the eastern area of the facility. Although there are no detailed records regarding this activity and no known spills of glycol/deicing fluids, based on knowledge of

similar facilities, the potential exists for release of glycol to nearby soils. Glycol is biodegradable; however, presence of glycol in soil could result in presence of the biodegradation product methane gas. Methane could present an unacceptable risk to human health, and if found, could potentially prevent redevelopment unless remediated, or may result in the need for vapor barriers or vapor mitigation systems. This issue may warrant request of additional information from the Navy, further investigation, and/or sampling.

- Based on existing maps and documentation available for the NAS-JRB Willow Grove facility, a hydrant aircraft fueling system was not identified at the site. However, fueling operations have been ongoing for over 50 years and the potential exists for undetected underground releases from hydrant, bulk storage, interim storage and spills. If present, it would likely be located in the eastern area of the facility near the apron/hangars/fueling area. Leaks from re-fueling systems could potentially prevent redevelopment unless remediated, or may result in the need for vapor barriers or vapor mitigation systems. This issue may warrant request of additional information from the Navy or further investigation.

- USTs/ASTs currently exist at the facility for storage of petroleum products as documented in the ECP. Presence of storage tanks at the facility present the possibility of past unreported releases to the environment. Although spills have not been reported, releases of fuel or heating oil could result in undetected soil or groundwater contamination, which could present an unacceptable risk to human health. If found, petroleum releases could potentially prevent redevelopment unless remediated, or may result in the need for vapor barriers or vapor mitigation systems. This issue may warrant request of additional information from the Navy or further investigation.

- A steam distribution/piping system exists in the northeastern area of the NAS-JRB Willow Grove facility. Although the ECP reports that there has been asbestos abatement at the facility, the possibility exists that there is undetected asbestos-coated steam piping present at the facility. Presence of asbestos-coated piping, especially when located underground, could adversely affect redevelopment if discovered, which would require remediation, and could impact disposal costs. In addition, if underground asbestos-coated piping is encountered during redevelopment earth moving operations, asbestos could be released to the environment requiring soil remediation. This issue may warrant further investigation.

- According to site personnel, there are no radiological materials located at the NAS-JRB Willow Grove facility; however, the Navy is currently updating its study and additional information is to be provided when it is available. Presence of radiological materials can potentially affect redevelopment by presenting a risk to the community or requiring specialized mitigation and/or material disposal, especially if buildings are reused. This issue warrants additional information from the Navy or further investigation.

- Landfills are present at the NAS-JRB Willow Grove facility, and where necessary, are undergoing investigations and remediation under the IRP program and CERCLA process. The potential exists for presence of methane gases from land filled areas. The landfills at the facility primarily consist of construction-type debris which is not expected to generate significant amounts of methane. Methane, if found, could present an unacceptable risk to human health, and could potentially prevent redevelopment unless remediated, or may result in the need for vapor barriers or vapor mitigation systems. This issue may warrant request of additional information from the Navy, further investigation, and/or sampling.

- Information regarding past aircraft crash sites at the facility indicates that there have not been any related releases of chemical/petroleum contamination at the site. However, as

with spills, the potential exists for unreported crashes that could have resulted in environmental contamination. This issue could potentially prevent redevelopment unless remediated, or may result in the need for vapor barriers or vapor mitigation systems. This issue may warrant request of additional information from the Navy or further investigation.

- According to site personnel, there are no identified munitions and explosives of concern (MEC) at NAS-JRB Willow Grove. However, the potential exists for the past unreported use. Presence of MEC may affect redevelopment by presenting a risk to the community or requiring specialized mitigation/land use controls and/or material disposal. This issue may warrant additional information from the Navy or further investigation.

- The ECP for the facility indicates that records relating to actual use and storage of pesticides on-site prior to 2001 were not available for review. The potential exists for presence of residual concentrations of pesticides and herbicides as a result of past pesticide use. Presence of pesticides and herbicides, in particular arsenic which has been a chemical of concern in Pennsylvania, could present an unacceptable risk to human health. If found at levels of concern, pesticides and herbicides and arsenic could affect redevelopment areas, especially in areas designated for residential, park, or school, and could potentially prevent or restrict multiple types of redevelopment unless remediated. This issue may warrant request of additional information from the Navy, further investigation, and/or soil sampling.

- Information for RCRA activities at the NAS-JRB site indicate that there are no existing or anticipated restrictions on land use or constraint due to past RCRA activities since RCRA waste was removed from the (less than 90 day) storage facility, and there are no known releases. However detailed documentation, such as disposal records, was not available. The potential exists for unreported releases or hazardous wastes remaining at the facility. Presence of hazardous wastes can potentially affect redevelopment by presenting a risk to the community or requiring remediation and/or proper waste disposal. This issue may warrant additional information from the Navy or further investigation.

- Fire training activities were known to occur at the NAS-JRB Willow Grove and the fire training area site is in the process of remediation for VOC-contaminated groundwater under CERCLA and the IRP program. However, it is not known if aqueous film forming foam (AFFF) was used in the training area or other areas at the facility. Certain past formulations of AFFF contained perfluorinated compounds (PFCs), such as perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS), which have been used in a variety of industrial and military applications, including the AFFF. PFOA and PFOS have attracted increased regulatory scrutiny because of their resistance to degradation, ability to bioaccumulate and growing evidence of toxicity in animal studies. Environmental releases of AFFF could have occurred from tank and supply line leaks, use of aircraft hangar fire suppression systems, and from firefighting training activities. PFCs, if found, could present an unacceptable risk to human health, and could potentially prevent redevelopment unless remediated. This issue may warrant request of additional information from the Navy, further investigation, and/or sampling.

- Building inspections at the facility indicated the presence of standing water in some buildings. Although presence of mold was not noted in the inspection report, the potential exists for the presence of toxic mold, especially in damp/wet areas. Mold can be of concern if buildings are to be reused and may affect reuse by requiring mitigation of the mold as well as building/drainage modifications to prevent further mold growth, This issue may warrant request of additional information from the Navy or further investigation.

- Historic aerial photos were not supplied with ECP and therefore were not reviewed at this time. Past practices on the site that can be often be determined from aerial photographs reviews include former practices not reported in the ECP or former buildings demolished and used for onsite fill. The potential exists for historic activities that could have resulted in environmental contamination, or fill that contains asbestos or lead. This issue could potentially affect redevelopment if remediation is needed or specialized disposal is necessary as a result of finding contaminated fill during earth moving activities. This issue may warrant request of additional information from the Navy or further investigation.

2. IRP Sites

There are certain areas at the NAS-JRB Willow Grove Facility where development could be affected or limited due to existence of sites with environmental contamination. The Navy has been investigating and remediating, as necessary, environmental contamination at the NAS-JRB Willow Grove facility via the Installation Restoration Program (IRP). The restrictions and considerations presented herein are based on the stats of the IRP sites as of the December 2011 Restoration Advisory Board meeting.

Twelve (12) IRP sites have been identified at the Willow Grove facility to date. Of those 12, eight have been proposed by the Navy and approved by EPA for No Further Action (NFA) status. These sites: , IRP (Sites 2, 4, 5, 6, 7, 8, 9, and 11) have no identified constraints anticipated associated with potential future reuse or development of the property associated with these nine sites, or portions thereof. These sites are located in the following land use type areas of the current Preferred Redevelopment Plan:

- Sites 9 and 10: Air Guard Station
- Site 2: Conservation Park/Office Park
- Sites 4 and 7: Parks and Open Space
- Site 5: Office Park/Golf Course
- Site 6 and 8: Office Park

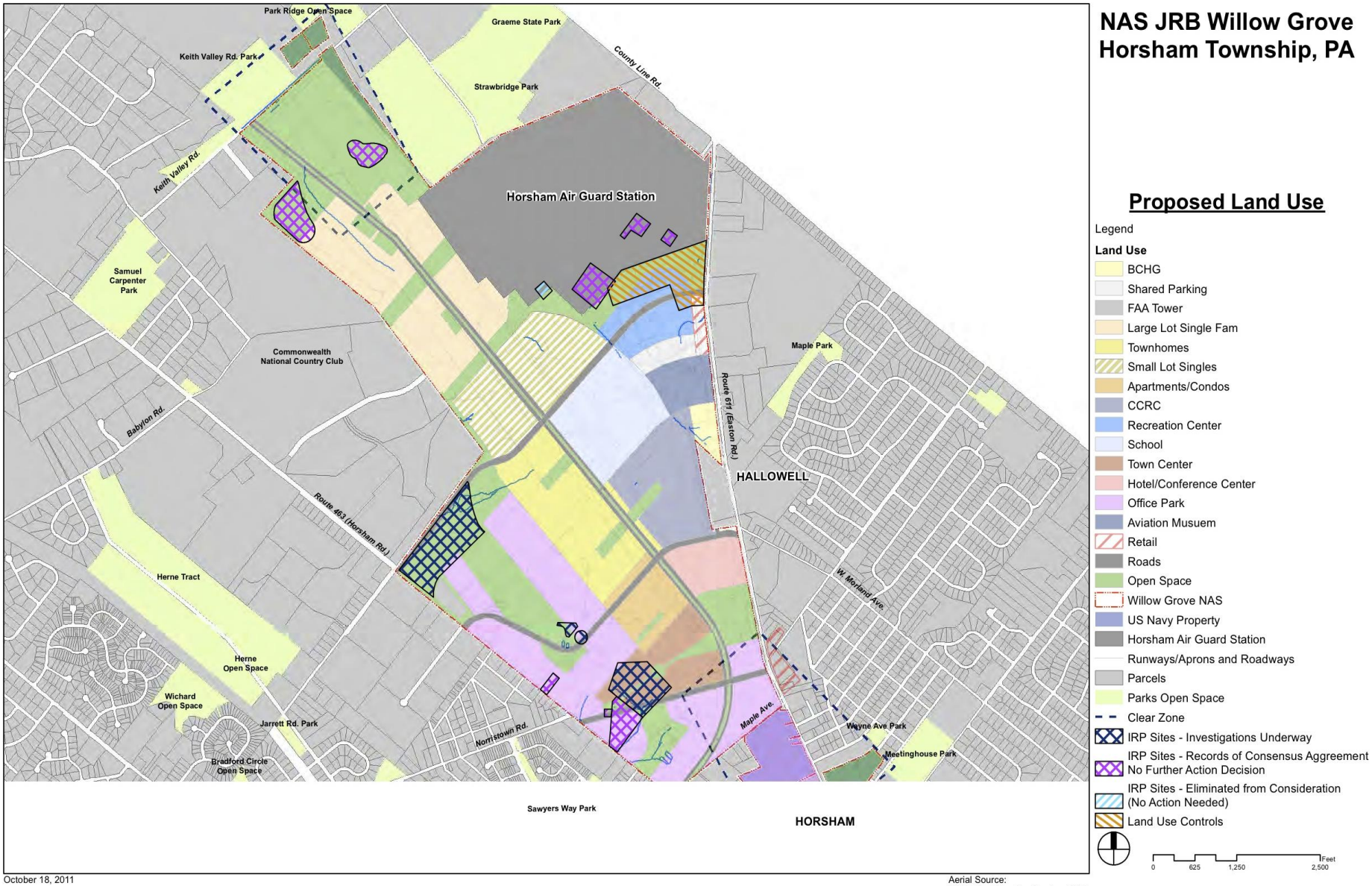
The following IRP sites have environmental contamination that could affect or limit development in their respective areas. The IRP site locations relative to the preferred redevelopment plan are shown in Map 11-5.

a.) *IRP Site 1 – Privet Road Compound Groundwater*

IRP Site 1, the Privet Road Compound, is located west of Privet Road, lies within a heavily developed section of the NAS-JRB Willow Grove facility, near the eastern boundary, across from the steam plant (Building No. 6). The entire site area is approximately 2 acres and consists of a bowling alley, parking lot, and a 1/2-acre grass covered lot (formerly) fenced area. The groundwater in the area of IRP Site 1 (also referred to as Operable unit [OU] 3 under CERCLA) is contaminated with volatile organic compounds (VOCs), specifically chlorinated solvents, and the source of the contamination has been identified at a location to the east of and outside of the NAS-JRB Willow Grove facility boundary. Based on the current Preferred Redevelopment Plan, IRP Site 1 overlaps several land use type areas, including Parks/Open Space (including pedestrian trail, Recreation Center, and Retail.

Currently there are land use controls (LUCs) in place at Site 1 area as per the interim remedy in the 2008 Record of Decision (ROD), which will remain in place until groundwater concentrations are within levels safe for unrestricted and unlimited exposure use, as defined by the ROD. EPA is currently in the process of investigating the off-site source of groundwater contamination and will ultimately issue a final ROD. The LUCs consist of restricting use of untreated groundwater in the area, which includes portions of the NAS-JRB Willow Grove facility beyond the Site 1 boundary.

Map 11-5



October 18, 2011

Aerial Source:
ESRI Bing Mapping Service, 2011

Current status of site soils is that no further action is required, based on an evaluation of unlimited use and unrestricted exposure; therefore, soil conditions do not affect development.

In general, development in the area of Site 1 may be impeded by the need to maintain integrity of and access to, or prevent removal of, groundwater monitoring wells and/or treatment equipment in place to track the progress of remediation, depending what EPA's final decision for remediation. No supply or potable wells would be allowed as part of development as per LUCs preventing groundwater use, until contaminant levels are reduced to levels safe for the intended use.

Development of parks or pedestrian trail in the area should not be affected by LUCs or site contamination, as long as there is no damage to or removal of groundwater monitoring wells. If a recreational center, retail shop, or other habitable building were to be built, and the groundwater remediation is not yet complete, then potentially a vapor mitigation system would need to be installed in the new building to prevent inhalation of vapors that can seep up through the ground and get trapped in the building. The need for this depends upon the VOC concentrations at and near the area to be developed at the time of development, and building type and use. If the recreation center were to be a large open gym-type building where there is sufficient air exchange and/or limited time spent is in the building by patrons and workers, then it may be necessary for vapor mitigation in the office areas only, depending on a risk assessment. The alternative to vapor mitigation systems are vapor barriers constructed in place prior to construction.

b.) *IRP site 3 - Ninth Street Landfill*

IRP Site 3, the Ninth Street Landfill site, is a 9- acre grassed/shrubby area located at the western boundary of the NAS-JRB Willow Grove facility, immediately north of Ninth Street. The site was used as a landfill; wastes were disposed by burning and burial in excavated trenches. The groundwater in the area of IRP Site 3 (also referred to as OU 10) is contaminated with VOCs, primarily tetrachloroethene (PCE) and the soil (OU 6) has been contaminated as a result of activities at the site. Remedial actions are required at the site. A feasibility study to evaluate remedial actions is currently being prepared and additional sampling for chromium (to determine if present as trivalent or hexavalent) is also underway. Based on the current Preferred Redevelopment Plan, IRP Site 3 overlaps multiple land use type areas, including Parks/Open Space (Golf Course) and Office Park.

The extent of the groundwater contamination is within the footprint of Site 3 and extends beyond the NAS-JRB Willow Grove facility boundary in the flow of the unconfined aquifer groundwater direction (to the north/northwest). Wastes present at Site 3 include general wastes, bulk items, paint waste, asbestos, and sewage sludge. Soil contamination at the site consists of elevated levels of semivolatile organic compounds (SVOCs), pesticides, polychlorinated biphenyls (PCBs), polychlorinated dibenzo (p) dioxins (dioxin), and metals. Groundwater and soil remediation needs to be assessed and implemented, including land use controls, before the site can be developed. The Navy has made a commitment to completing the CERCLA process for the site and implementing a remedial action that is operating properly and successfully to support property transfer. Based on information obtained from Navy representatives, it is anticipated that the site soils and waste will be removed or capped.

Development of a golf course or office park in the area of Site 3 may be impeded by the need to maintain integrity of a soil cap, or maintain integrity of and access to, or prevent removal of, treatment equipment and groundwater monitoring wells to track the progress of remediation, depending upon the final decision for remediation. If LUCs are established to prevent groundwater use, then it is likely that no supply, irrigation, or potable wells would be allowed as part of development until groundwater levels are safe for the intended use. In the event that office buildings, golf clubhouse, or other habitable buildings were to be constructed at the site, and the groundwater remediation is not yet complete, then potentially a vapor mitigation system would

need to be installed in the new building to prevent inhalation of vapors that can seep up through the ground and get trapped in the building. The need for this depends upon the VOC concentrations at and near the area to be developed at the time of development, and building type and use. The alternative to vapor mitigation systems are vapor barriers constructed in place prior to construction. If soil remediation at the site includes a cap, development would have to be performed in a way as to not damage the cap, or the cap would need to be repaired. Also, waste left-in place and covered with a cap may preclude certain development due to structural load. In addition, if any landfill wastes would be removed as part of development activities, then the wastes would likely need to be disposed in a permitted disposal facility as per PADEP regulations.

c.) *IRP site 5 – Fire Training Area*

IRP Site 5, the Fire Training Area, is approximately a 1.25-acre undeveloped grassy area, with some woody and brushy vegetation, located in the south-central portion of the NAS-JRB Willow Grove facility, between Ninth Street and Dawes Road. The area was used for drum storage, disposal, and burning of wastes, including solvents, paint chemicals, xylenes, toluene, and various petroleum compounds. The groundwater in the area of IRP Site 5 (also referred to as OU 2) is contaminated with VOCs, primarily tetrachloroethene (PCE), tricholorethene (TCE), and 1,1,1-tricholorethane (TCA) and remedial actions are required. The Navy has prepared a Record of Decision, currently under EPA review, which will formalize the bio-remediation action currently underway via pilot study, and which will also serve to add LUCs to the remedial action, prohibiting the use of untreated groundwater in the future until contaminant levels are reduced below action levels. Following a soil removal action, a no further action ROD was finalized in 2007 for soils (also known as OU 4) based on unrestricted use and unlimited access. Based on the current Preferred Redevelopment Plan, the extent of IRP Site 5 overlaps land use type areas including Office Park and Parks/Open Space (Golf Course).

The extent of the groundwater contamination within the footprint of Site 5 extends to the north of the site in the flow of the unconfined aquifer groundwater direction (to the north/northwest), and is confined within the NAS-JRB Willow Grove facility boundary. A soil removal action was performed at the site; therefore, there are no development restrictions related to soil. Groundwater remediation needs to be implemented at the site, including land use controls, before the site can be developed. The Navy has made a commitment to completing the CERCLA process for the site and implementing a remedial action that is operating properly and successfully to support property transfer. Based on information obtained from Navy representatives, it is anticipated that the current bioremediation process will continue at the site to remediate contaminants in groundwater.

Development of office park or open space/park/golf course in the area of Site 5 may be impeded by the need to maintain integrity of, or prevent removal of groundwater monitoring/injection wells to implement and track the progress of remediation. LUCs will be established to prevent groundwater use, which likely means that no supply, irrigation, or potable wells would be allowed as part of development until the groundwater has been remediated to the levels that are safe for the intended use. In the event that office buildings, golf clubhouse, or other habitable buildings were to be constructed at the site, and the groundwater remediation is not yet complete, then a vapor mitigation system would potentially need to be installed in the new building to prevent inhalation of vapors that can seep up through the ground and get trapped in the building. The need for this depends upon the VOC concentrations at and near the area to be developed at the time of development, and building type and use. The alternative to vapor mitigation systems are vapor barriers constructed in place prior to construction.

d.) *IRP site 12 - South Landfill*

IRP Site 12, the South Landfill, is approximately a 15-acre area undeveloped area that is grassy and contains some shrubs/woody vegetation located in the southwest area of the NAS-JRB Willow Grove facility. The area was used for waste disposal and contains construction

waste/debris, and municipal waste, such as bottles, scrap metal, bricks, cans, wire, china, wood, concrete, asphalt pavement. Investigations are ongoing at this site and data to date indicate that soil, sediment and surface water at the site (also referred to as OU 11) are contaminated with SVOCs, metals and, pesticides as a result of disposal activities and remedial actions are likely required. Based on the current Preferred Redevelopment Plan, the extent of IRP Site 5 is expected to overlap land use type areas potentially including Town Square/Center, Office Park and Parks/Open Space (Conservation Park, Plaza), and/or Apartments/Condos.

The extent of the contamination associated with Site 12 is not yet fully defined. It is likely that remediation needs to be implemented at the site for groundwater, soil, sediment, and/or surface water before the site can be developed. The Navy has made a commitment to completing the CERCLA process for the site and implementing a remedial action that is operating properly and successfully to support property transfer. It is anticipated that remediation actions, depending on the finding of the investigations and risk assessment, may include waste and/or sediment removal, cap, groundwater pump and treat or injected treatment.

Development of office parks, housing, retail and/or green space parks in the area of Site 12 may be impeded by the need to maintain integrity of, and allow access to treatment equipment, soil cap, groundwater monitor wells, and/or injection wells, and prevent removal of groundwater monitoring wells to track the progress of remediation, depending upon the final decision for remediation. If LUCs are established to prevent groundwater use, then no supply, irrigation, or potable wells would be allowed as part of development until contaminant levels are reduced to levels that are safe for the intended use. In addition, if the site is not remediated to levels safe for unrestricted use and unlimited exposure, then there may be restrictions on what type of development can be done. For example, if soils are remediated to, or found to be safe for, commercial use and no further remediation is performed, then there would be LUCs preventing uses less restrictive, such as residential.

In the event that office buildings, apartments, retails shops, restaurants, or other habitable buildings were to be constructed at the site, and the groundwater contaminants of concern include SVOCs that are considered sufficiently volatile and toxic for the vapor intrusion pathway[1], and remediation is not yet complete, then potentially a vapor mitigation system would need to be installed in the new building to prevent inhalation of vapors that can seep up through the ground and get trapped in the building. The need for this depends upon the SVOC (of vapor intrusion concern) concentrations at and near the area to be developed at the time of development, and building type and use. The alternative to vapor mitigation systems are vapor barriers constructed in place prior to construction. If soil remediation at the site includes a cap, development would have to be performed in a way as to not damage the cap, or the cap would need to be repaired. Also, waste left-in place and covered with a cap may preclude certain development due to structural load. In addition, if any landfill wastes would be removed as part of development activities, then the wastes would likely need to be disposed in a permitted disposal facility as per PADEP regulations.

[1] As per EPA guidance, Vapor Intrusion Pathway includes some SVOCs in addition to VOCs.

12 PROPERTY TRANSFER PROCESS

A. INTRODUCTION

This property transfer section describes the various methods of land conveyance available to the Navy under the BRAC legislation and regulations[1]. BRAC is "the process that the Department of Defense (DoD) uses to reorganize its installation infrastructure to more efficiently and effectively support its forces, increase operational readiness, and facilitate new ways of doing business."[2] Generally, these conveyance methods fall into two major categories that involve options for transferring the property, or portions of the property, at no cost or reduced cost, as well as others that involve acquisition at fair market value. Other options discussed in this chapter involve the potential for early transfer of the facility for civilian use prior to full closure and environmental cleanup by the military.

All of the options available are reflective of the military's criteria for disposal of surplus property emanating from the 2005 BRAC evaluation process. These criteria emphasize, among other factors, DoD's intent to expedite the transfer process and to maximize a return on investment for the federal government as part of that process. This stated desire to accelerate the closure process and transfer the federal surplus to the community means that the military may be more flexible in applying a variety of approaches to facilitate this conveyance. However, it is also an indication that the military will "rely on and leverage market forces" to the greatest extent possible, as noted in the Base Realignment and Closure Manual (BRRM). All of these factors have ramifications for the HLRA's preparation of the final redevelopment plan.

B. PROPERTY TRANSFER ALTERNATIVES

Once the decision has been made through the BRAC process to close a military installation, federal law provides for a number of alternative transfer methods that can be employed by the DoD to dispose of the property. The primary methods of transfer most likely to be considered by the Navy for the NAS-JRB facility are outlined in Table 12-1 and discussed in more detail in the subsequent portions of this chapter. These methods are based on information presented in the BRRM, which contains the DoD's primary guidelines for reuse of BRAC facilities. Additional transfer methods not included in the table are also discussed in the following sections.

One of the first steps in the disposal process is the federal "screening" of the property to determine if other federal agencies have use for any or all of the facility. In the case of this site, no other federal users, other than the Air Force and the Federal Aviation Administration (FAA), identified an interest in the facility within the allotted timeframe. U.S. Air Force owned most of the area (161.5 acres) now described as the current military enclave but requested. and received approximately 45.4 acres from

[1] The Federal law governing the BRAC process is contained in provisions of Title II of the Defense Authorization Amendments and Base Closure and Realignment Act (Public Law 100-526, 102 Stat. 2623, 10 U.S.C. 2687 note), and the Defense Base Closure and Realignment Acct of 1990 (Public Law 101-510, Part A of Title XXIX of 104 Stat. 1808 U.S.C. 2687 note) (reference (c)).
[2] *Base Redevelopment and Realignment Manual (BRRM)*, Office of the Deputy Under Secretary of Defense (Installations and Environment), March 1, 2006.

the Navy during the federal screening process. The military enclave now covers the approximate 207 acres. The FAA requested the transfer of a 3-acre parcel and the existing radar tower.

In light of this fact, disposal of the property can potentially occur under one or more alternative methods of transfer that will be dependent upon the type of end user (i.e. public or private) and the intended use.

Table 12-1 Primary Property Transfer Alternatives

Conveyance Method	Conditions	Community Planning Considerations
Public Benefit Conveyance (PBC)	• The property is conveyed at market value unless a sponsoring agency determines a discount is warranted. • The property must be used for public purposes (schools, airports, healthcare, recreation, etc.) • Sponsoring agencies may impose additional land use controls	• Market value is an objective of the sponsoring agency – an appraisal will most likely be needed • Consideration should be given to how the redevelopment plan will affect market value and ultimately the price paid to the sponsoring agency
Economic Development Conveyance (EDC)	• Conveyance can only be made to an approved Implementation LRA. • The military department may seek market value but is not required to under proposed rule changes. However, the military can grant an EDC without consideration if proceeds support economic development for 7 years • Proceeds not used for economic development can be recouped by the military	• Market value may need to be determined – if so, an appraisal must be completed • If LRA develops property it must determine there are enough qualified investments (e.g. new infrastructure) to warrant a discount
Negotiated Sale to Public Entities	• Property can only be conveyed to public entity for a public benefit • Same benefit cannot be obtained from sale or PBC conveyance • Congress must approve transaction • If property is sold within 3 years all profits revert to the military	• Market value will determine final sale price for LRA or other public body – an appraisal must be completed
Advertised Public Sale	• Property is conveyed by the military through a public bidding process • Military must consult with LRA before taking this approach • The military's objective will be to seek sale to highest responsible bidder	• Because this process requires a bid process, market value is assumed to be part of this process • The establishment of minimal land use controls in the redevelopment plan may encourage more rapid, market-driven redevelopment, if so desired by the LRA

Source: *Understanding Key Issues in DoD's Base Redevelopment & Realignment Manual,* An Infobrief from the Association of Defense Communities, May 2006 (abridged)

1. Public Benefit Conveyance

One of the more useful methods of property transfer for a variety of public uses is the Public Benefit Conveyance (PBC). A PBC can be used to convey real or personal property to state and local governments, and certain non-profit organizations, for public purposes at no cost or reduced cost. These purposes include schools, parks, public health facilities, law enforcement, emergency management response, correctional facilities, historic monuments, self-help housing, and wildlife conservation.

If this method is selected by the HLRA, and approved by the DoD, a federal sponsoring agency may request assignment of the property for purposes of conveying the property to a designated eligible recipient. The sponsoring agencies are responsible for selecting qualified applicants and determining the amount of the discount (if any) from the fair market value of the property. It should be noted that some uses, such as law enforcement, emergency management response, correctional facilities, historic monuments, and wildlife conservation, do not require a sponsoring agency and can be directly transferred from the DoD to an approved recipient. The applicable PBC approaches that are potentially useful in redeveloping the property are summarized below.

- Public Safety – Water and sewer systems, as well as medical facilities, can be transferred without cost as a PBC through the endorsement of the U.S. Department of Health and Human Services. Property for use by law enforcement or fire protection may be transferred through the Department of Justice or the Department of Homeland Security.

- Education – The U.S. Department of Education can convey land and facilities to public and private non-profit educational institutions on a discounted basis over thirty years. The educational entity actually fulfills the obligation to the Federal Government for the property at the rate of three and one-third percent annually through constructive educational use. Title to the property is conveyed up front, subject to educational use restrictions, and reverter or buy-out provisions.

- Open Space/Parkland – The U.S. Department of the Interior is the sponsoring agency for PBC of open space and outdoor recreational facilities including state and national parks, historic sites and other related properties.

2. Disposal of Property for Use by Homeless Providers

As part of the initial screening process for redevelopment and disposal of a BRAC property, consideration must be given to potential use of the property to provide housing and/or services for the homeless. Property that has been identified for potential use to the homeless can then be conveyed to either an organization that is a representative homeless provider, as approved by the U.S. Department of Housing and Urban Development (HUD), or the LRA itself. If the property is conveyed to the LRA, it must then make it available to the homeless provider for no cost. The LRA would be responsible for monitoring the use of the property and ensuring that the homeless provider complies with the legally binding agreement that must accompany all such conveyances.

In accordance with base closure law, the LRA must solicit Notices of Interest (NOI) from state and local governments, representatives of the homeless, and other interested parties in the vicinity of the installation that may be eligible for a Public Benefit Conveyance related to the property. The LRA must give notice as to the timeframe in which NOIs will be accepted for submittal and hold hearings to allow interested parties to provide input into the redevelopment planning process.

The interests of homeless providers in surplus military property play an important role in the BRAC process. The Federal Department of Housing and Urban Development must approve the LRA's

redevelopment plan, which must demonstrate that these interests were taken into account throughout the planning process. LRA must demonstrate that it published the required notice and proactively contacted homeless providers in the area and made them aware of the BRAC process.

3. Economic Development Conveyance

Transfer of all or portions of the property could potentially occur by means of an Economic Development Conveyance (EDC) from the Navy. Only the LRA is eligible to acquire property under an EDC. The LRA must demonstrate that the proposed uses for the property will generate sufficient jobs to justify an EDC conveyance, and that the proposed land uses are realistically achievable given current and projected market conditions.

In earlier BRAC rounds, the regulations permitted the military department to transfer the property to the local reuse authority at no cost. The 2005 BRAC round changed those regulations by requiring the military department to seek to obtain fair market value consideration for EDC conveyance of property. The regulations have been changed once again (effective December 16, 2011). Under the revised authority, the military department may do the following:

- The most significant change is that the Department of Defense (the Department) will no longer be required to seek to obtain fair market value for an EDC
- Transfer may be made below estimated market value, or without consideration, if the LRA agrees to reinvest sale or lease proceeds for not less than seven years and to take title to the property within a reasonable timeframe
- The Department does not need to obtain an appraisal of the property as part of the EDC conveyance which should result in an expedited transfer process
- The Department will have more flexibility regarding the form of consideration it can accept including the authority to accept consideration in the form or revenue sharing, or so-called "back-end" funding, which may include proceeds from leases, sale of property, in-kind goods and services, or real property improvements that accrue to the LRA
- The determination of consideration accepted may now take into account the economic conditions of the local affected community and the estimated costs to redevelop the property

Regarding the authority to accept consideration in the form of revenue sharing or "back-end" consideration, the military department may negotiate an agreement to receive a share of future revenues that the LRA receives from future property sales or lease revenues from the conveyed property. Other forms of consideration are also included such as in-kind (including goods and services), real property and improvements or other such consideration as may be appropriate.

The LRA is responsible for preparing an application, including development of a business plan, to support their conveyance request under the EDC alternative.

4. Negotiated Sale

A negotiated sale can only be transacted with a public body if a public benefit, which would not be realized from a competitive advertised sale or authorized PBC, will result from the negotiated sale. The grantee may not pay less than fair market value based upon a highest and best use appraisal of the property. In addition, final approval of the sale must be authorized by Congress. If the property is sold within three years following a negotiated sale, the grantee will be required to remit all proceeds in excess of its initial acquisition costs and allowable holding and improvement costs.

5. Public Sale

If the LRA, after preparing a redevelopment plan, determines it is in the best interest of the community not to be directly involved in redeveloping the site, it can recommend that the Navy dispose of the property through a public sale. The actual method of sale could include sealed bids, Internet auction, or on-site auction to the highest bidder. Under such an approach, the DoD would make a determination whether to sell the entire site or as subdivided parcels. Property acquired by a private organization or individual is subject to local land use and zoning controls. The LRA's redevelopment plan would recommend any necessary changes to these ordinances to support the type of development desired.

6. MILCON Exchange

This relatively recent transfer authority allows the military department to convey a BRAC property to a third party in exchange for the construction of equally valued facilities at some other location(s). The acquiring entity can either do the construction itself (or through agreement with other firms) or arrange for the money to be available for another Navy project, without the need to go through the MILCON process. The value of the exchange is at the property's fair market value (based on an appraisal). The redevelopment of the property will be guided by market forces and by the land use regulations (zoning) that come out of the redevelopment plan or that are already in place.

7. Interim Use Leases

The ultimate goal of the military, with regard to BRAC facilities, is to dispose of any surplus property as promptly as possible. One means of facilitating an early or expedited transfer is through execution of an interim lease. Prior to deed transfer there may be opportunities for the LRA to obtain access to certain land parcels or facilities on an interim use basis that could allow economic development to proceed prior to actual installation closure and transfer. There are many examples from previous BRAC rounds where the LRA assumed responsibility for operation of the base's infrastructure in order to facilitate establishment of a master lease agreement that allowed for subleases of specific structures or sites, for civilian uses. This, in turn, created short-term revenue-generating activities and/or helped to minimize the operating and maintenance costs of the properties.

If the Navy determines that the interim use of the property would facilitate state and local economic efforts, and not interfere or delay the final property disposal, it may be inclined to grant such a lease. Further, the Navy may accept less than fair market value if it determines that such acceptance would be in the public interest and fair market rent unobtainable or not compatible with such public benefit. Before entering into a lease, the military must consult with the Environmental Protection Agency (EPA) and the Commonwealth of Pennsylvania on environmental quality to determine whether environmental conditions on the property are acceptable, for early transfer authority, for execution of such an agreement.

C. APPRAISALS AND FAIR MARKET VALUE

As noted above, proposed rule changes would no longer require that the Department of Defense obtain an appraisal of fair market value prior to granting of an EDC. However, the regulations do not preclude the Secretary of Defense, or a designee such as the Secretary of the Navy, from gathering such information to insure that the property disposal process is appropriately informed. Therefore, any transfer of property by means of an EDC, as well as a negotiated sale, public sale, certain PBCs, may necessitate preparation of an appraisal. Appraisals must be based on the highest and best use of the property, taking account of all property conditions that are relevant to fair market value. The final determination of fair market value is made by the Secretary of the Department and cannot be

negotiated by the LRA. Appraisals obtained by the seller (DoD) are typically not shared with the buyer (LRA), sometimes leading to the need for the LRA to obtain its own independent appraisal as a basis for conveyance negotiations to establish the value.

Determining market value can often appear to be a rather subjective judgment since arriving at a highest and best use for a property is dependent upon a number of assumptions that reflect *potential* future conditions that may exist at the property. Market value is heavily dependent upon assumptions related to market conditions, availability of resources, tenants, environmental contamination, capital costs, building code violations and zoning regulations. An analysis of highest and best use is required to determine the highest economic return that is typically based on the four following tests.

- What uses are *physically possible* for the site in that they could function adequately for their intended purpose?
- What uses are *legally possible* based on compliance with all applicable land use regulations and laws?
- Which uses are *financially feasible* in terms of their ability to provide an adequate return on investment?
- What is the *maximum productivity* of the physically, legally, and financially feasible uses, in terms of generating the highest return?

Based on these criteria, it is evident that the local redevelopment planning process can have a significant impact on determining highest and best use and ultimately market value. The final redevelopment plan will address issues such as zoning and other land use controls, estimated infrastructure improvements, public land uses, and redevelopment incentives.

D. EARLY TRANSFER OF PROPERTY

Under certain circumstances, the military may have environmental remediation responsibilities regarding a BRAC installation that could preclude immediate transfer of property or otherwise affect the clear-title status of the facility. In the case of NAS-JRB Willow Grove, such a situation will exist with regard to remediation of any contaminated sites at the facility where final cleanup and long-term monitoring by the Navy is expected to continue into the future.[3] Initial analysis of the environmental data indicates that various levels of contamination exist that may permit early transfer to be utilized if so desired.

Provisions of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) require federal agencies to complete all environmental remediation actions for contaminated sites before transferring property by deed to a nonfederal entity. Baseline environmental conditions at the property are described elsewhere in the redevelopment plan. An amendment to CERCLA in 1996 provided an alternative approach that allows for early transfer of contaminated sites prior to full remediation. Furthermore, through the course of the last several BRAC rounds, the DoD has made significant efforts to expedite the transfer of such sites, including approaches that involve privatization of all or portions of the environmental cleanup process. An early transfer of a military base with privatized environmental remediation typically requires the following interrelated agreements.

- An environmental services cooperative agreement (ESCA)
- A guaranteed fixed-price (GFP) contract
- Environmental insurance

[3] The Navy's clean-up schedule will be based on the results of the Environmental Impact Statement (EIS) that will be completed, once the redevelopment plan is done, such that future land uses are identified.

- Enforceable agreement(s) with the state environmental regulatory agency and/or the EPA

As part of the transfer agreement, the DoD can oversee the entire cleanup process or enact a subsidiary agreement with either a local, county or state government agency, as well as a private entity that represents the interest of a BRAC installation, to oversee cleanup and restoration activities. This agreement is referred to as a Covenant Deferral Request which would take the form of a deed provision warranting that "all remedial action necessary to protect human health and the environment with respect to any such substance remaining on the property has been taken before the date of transfer" and that "any additional remedial action found to be necessary after the date of the transfer shall be conducted by the United States." The governor of the state in which the facility is located, would be the party responsible for accepting such an agreement. For facilities listed on the Non-Priority List (NPL), the EPA, with the concurrence of the governor, may defer this CERCLA-authorized covenant for parcels of real property.

E. NOI EVALUATION PROCESS

The HLRA conducted an open and transparent process involving the solicitation notices of interest, the evaluation of NOI applications and the presentation of the HLRA Board's decisions. The process used to arrive at these decisions was in accordance with base reuse guidelines and the homeless assistance submission was submitted to the U.S. Department of Housing and Urban Development.

1. Public Engagement Process

HLRA Outreach Workshop and Base Tour
December 16, 2010
The outreach process for public benefit conveyances began in October, 2010 with a publication in the local newspapers and letters sent to known potential applicants. A *Public Benefit Conveyance and Homeless Outreach Workshop and Base Tour* was publically noticed and held on December 16, 2010 in the Horsham Township Community Center. The workshop included a Powerpoint presentation made by the HLRA staff and a van tour of the base. The presentation included an overview of the NOI process and NOI booklets were distributed to educate those attendees seeking land and buildings through a public benefit conveyance. Led by HLRA Executive Director Michael McGee, the group then departed for an hour-long bus tour of the NAS-JRB Willow Grove property. About 80 people toured the base and were able to view the facilities up close and to get a sense for the layout of the property. The attendees represented 35 different public agencies and non-profit organizations. All persons in attendance at the workshop were invited to arrange personalized base tours through the HLRA if necessary and several applicants took advantage of that opportunity. The deadline for proposal submission was announced as March 22, 2011.

Submission of NOI Applications
March 22, 2011
By the March 22, 2011 deadline, there were 17 NOI's that were received by the HLRA, with three proposals from homeless service providers, or from organizations seeking to provide services to the homeless in their programs. The homeless service proposals included: (1) Bucks County Housing Group, with partners Genesis Housing Corporation and TRF Development Partners (here-in referred to as Bucks County Housing Group et al.), (2) Philadelphia Stand Down, and (3) America Responds with Love. With the assistance of RKG Associates, Inc. and Kutak Rock, the HLRA's BRAC legal counsel, the HLRA evaluated all 17 submissions. Follow-up letters were submitted to each NOI applicant on May 25, 2011 seeking additional information and further clarification. These requests for additional information were sent to all applicants with a submission deadline of June 15, 2011. RKG Associates final evaluation of the NOI applications are summarized in Table 12-1.

Table 12-1
Horsham Township Authority for NAS-JRB Willow Grove Redevelopment Plan
Preliminary Evaluation of Notices of Interest

No.	Submitting Organization	Property Requested	Desired Use	Conveyance Method	Sponsoring Agency	Comments	Initial Findings
1	Montgomery County	540 acres including runway and supporting aprons	Public general aviation airport	Fee title	None indicated	Simple application, no financial or organizational detail provided	Does not qualify for PBC without FAA sponsorship. Applicant lacks operational details and is incomplete
2	ATG Learning Academy (private 501c3)	Bldg 677	School for special needs students that serves the surrounding region	PBC Lease	DOE	Applicant has not inspected building No indication of contact with or approval of Dept. of Education as sponsoring federal agency. No specific financial plan for use of building. Funding to be provided from tuitions charged for services. Current budget ~$1 per year in revenues.	Applicant needs to determine (with DOE) if they qualify for a PBC. Applicant should inspect facility with qualified professionals to determine conversion costs
3	Hatboro-Horsham School District	60 acres undeveloped land - 34 acres for facilities - 6 for administration - 20 for athletic fields Illustration located at south end of runway (Maple Avenue & Easton Road)	Future educational needs to enhance services provided and replace aging and/or inadequate facilities	Fee title	None indicated	No indication of contact with or approval of Dept. of Education as sponsoring federal agency. Estimated costs for development $50 million	Applicant needs to determine (with DOE) if they qualify for a PBC.
4	Montgomery County on behalf of Delaware Valley Historical Aircraft Association	Option 1 – Army Reserve Facilities w/ 52 acres Option 2 – Existing facility, plus Bldg 806, 13 w/14 acres Option 3 – Hangar 80, 175 and Bldg 180, 780, 652, 653 w/ 34 acres Option 4 – Hangar 80, 680 and Bldg 780 w/ 25 acres Option 5 – 156 acres at south end of runaway w/ Quarters A and all outbuildings and antennae farm	Move and expand existing aviation museum and park	PBC Lease (nominal) Fee title	Montgomery County, Parks & Heritage Services	May qualify under Historic Monuments (DOI/NP) or Parks & Recreation No Federal agency sponsorship(s) indicated Detailed operational budgets provided for alternative locations Visitor attendance and revenue forecasts provided	Applicant needs federal sponsorship. DVHAA does not appear to have the ability to implement the plan
5	Horsham Water & Sewer Authority	Parcel 1 – easement Parcel 2 – easement Parcel 3 – 5 acres fee Parcel 4 - easement Parcel 5 –easement Parcel 6 -1.25 acre easement Parcel 7 - easement Parcel 8 - easement	1 – sewer interceptor 2 – sewer line 3 – elevated water storage tank 4 – water and electric line 5 – sewer line 6 – well head protection area 7 – 20' easement over all existing water lines 8 – 20' easement over all existing sanitary lines	PBC	HUD	HUD acknowledgement received and application submitted (?)	Final location and determination of property request should reflect final Reuse Plan
6	Horsham Township	Bldg 1.83 (Fire Station) w/ 1.83 acres	Fire station and Emergency preparedness office	PBC	DHA/FEMA	Wants to use a back up fire station	Consistent with township's municipal service mission
7	Horsham Township	Six parcels totaling 128 acres A – 8.1 acres between Girard and Columbia Aves B – 6.284 acres at south end of runway C – 6.171 acres at south end of runway D – 9.2 acres behind Admin Bldg (active recreation) E – 93.6 acres at north end of runway F – 4.66 acres across Keith Valley Rd. in RPZ	Parks and recreation	PBC	DOI – Federal Lands to Parks program	5 parcels located in airport safety zones (3 at south end and 2 at north end of runway. 6th parcel is near main gate	Consistent with township's mission to provide parks & recreation facilities for residents
8	Horsham Township	Unknown but to be determined through reuse	Future public roadways	PBC	DOT	Proposed roadway easements and ROW's thru and around base	Final determination will be based

		planning process				property	on Reuse Plan
9	YMCA of Philadelphia & Vicinity 501(c)(3)	1 – Bldg 638 (Marine Reserves) and at least 40 acres of undeveloped land 2 – Bldg 660 (Navy Lodge) plus 40 acres	Child care center and summer day camp	Fee title or lease	None indicated	Estimated $2.2 million in capital costs to be funded from donations, operating costs covered by fees and donations.	Uses may not qualify for PBC unless the meet DOE (education) or DOI (parks) criteria
10	Bucks County Aviation Authority	681.57 acres including runways and supporting areas and hangars	Public airport and business aviation center Two phase development – 536.39 acres for airport and initial business park, and 145.18 acres for future business center	PBC	FAA	Plan to apply for FAA-funded (AIP) airport feasibility study Possible uses include FBO, Medivac, MRO, corporate hangars 5 year proforma shows surplus in all years (with hangar rents at $10.50/SF) Application includes letters of support from other airports and aviation users	Will require FAA concurrence No specific forecast of employment impacts or market demand for aviation and non-aviation uses, although assumes a 5 year build-out.
11	America Responds with Love, Inc. (501c3)	1 - 20,000± SF of inside storage space 2 – 5-15 acres of land 3 – 10 acres of land	1 – storage of donated items prior to distribution to other agencies 2 – agriculture (flower growing) 3 - to build 40± residential units for handicapped veterans and others	1 – donation or 5 yr nominal lease 2 – 5 yr nominal lease 3 – fee ownership	None indicated	Location of facilities/land unspecified Little information on organization's capacity to achieve the intended uses.	Uses do not appear to qualify for PBC unless housing is HUD Self-Help or agricultural use qualifies under DOI Parks program
12	Bucks County Housing Group w/ Genesis Housing Corporation and TRF Development Partners	105 acres in three parcels 1 – Columbia Ave 2 – Navy Lodge facilities & Quarters B-F 3 – NW corner Maple & Easton Aves.	To develop 105 units of permanent supportive housing (under McKinney/HEARTH programs) 1 – 30 units of detached housing 2 – includes Navy Lodge and Exchange 3 – 40 units (20 duplexes)	PBC Fee title	HUD (Homeless)	Letter of support from Montgomery County Department of Housing and Community Development	Must balance community needs with homeless assistance needs
13	Philadelphia Stand Down, Inc. - 501(c)(3)	1-Bldg. 43, 22 2-Bldg. 172 (BEQ) 3-Bldg. 605 (Navy Lodge) 4-Bldg. 601 5-Bldg. 140 6-Bldg. 635 7-Bldg. 118 plus acreage	1 – recruiting and warehouse storage 2 – transient housing for homeless veterans 3 – corporate offices, VA medical center 4 – drug and alcohol treatment center (VA) 5 – education & training center, library 6 – motor pool dispatch 7 – facilities maintenance center, recreational facilities	Deed transfer	None indicated Refers to VA involvement with services, plus local homeless agencies	Applicant operates an annual 3-day homeless services session, serving ~ 250+ individuals. In 2010, org. had $56K in income and $55K in expenses for 3-day event. Total assets = $56K Applicant had less than 2 weeks to prepare materials – application is incomplete	Appears to desire to expand from single annual 3-day event to comprehensive full-time program for serving needs of veterans, including homeless Applicant needs to coordinate with local homeless service providers and VA to determine need and feasibility of desired programs. Applicant should inspect facilities with qualified professionals to determine requirements and costs.
14	ESI Equipment, Inc.	Bldg. 608 (Fire Station) Bldg. 650 (Haz-Mat) w/ 6-10 acres	1) national training and research center 2) private business	Not specified		Possible sharing of #608 with a local Fire Department Funding would come from corporate revenues, which are ~$5 million annually	Does not qualify for PBC
15	ACTS Retirement-Life Communities Inc. 501(c)(3)	60-80 acres	300-350 independent living units (2-3 story garden style apts), 40-60 assisted living units, 60 skilled care beds Frontage on Horsham or Easton Roads	Deed transfer Long-term lease at no cost	None indicated	Operates 8 retirement facilities nearby, with waiting list of 1,200+ Finance with tax-exempt bonds	Does not qualify for PBC
16	Greater Philadelphia Search and Rescue 501(c)(3)	Bldg. 608 (Fire Station) Other buildings if necessary: 2,000 SF plus parking areas	Base of operations for volunteer organization that serves a multi-state region	PBC	FEMA	No indication of contact with or approval of DOH/FEMA as sponsoring federal agency. Current space becomes unavailable in mid-2011 Does not seek title to property – township or county to own Possible sharing of facility with local fire/police Operations funded from donations	Applicant needs to determine if use qualifies for PBC under DHA Emergency Management criteria
17	Play and Learn, Inc. 501(c)(3)	1 – Bldg 638 (Marine Reserves) + 3-5 acres 2 – Bldgs 114, 113,63 – Quarters A 3 – 3-5 acres on Horsham Rd. for new construction	Early childhood education and daycare center for ~150 children	Fee title		Applicant estimates rehab costs for Bldg 638 at $500,000 to $800,000, funded from program revenues	Applicant needs to determine if use qualifies for PBC under Dept. of Education criteria, otherwise does not qualify for PBC

HLRA Board NOI Decisions
July 27, 2011

At this public meeting, the 17 Notice of Interest (NOI) applications for no or low cost Public Benefit Conveyances were publicly presented and evaluated by the HLRA Board. The outreach process for public benefit conveyances began in October, 2010 with a publication in the local newspapers and letters sent to known potential applicants. The deadline for submitting a Notice of Interest (NOI) was March 22, 2011. After several months of review and an opportunity for the applicants to submit additional information, the HLRA Board rendered decisions on which NOIs to carry forward into the three redevelopment alternatives. A decision not to approve the two airport-related NOIs was made by the HLRA Board, ending further consideration of an airport redevelopment alternative. The key factors leading the Board to that decision can be found in Chapter 8 – Aviation Market Assessment.

Table 12-2
HLRA Board Action - NOI Applications
NAS-JRB Willow Grove Redevelopment Plan

	HLRA Board Action on 7-27-11		
NOI Applicant	**Direct the consultants not to include the application in preparation of the various redevelopment scenarios**	**[1] Direct the consultants to further study and attempt to include the application as they prepare the various redevelopment scenarios**	**Direct the consultants to further study and attempt to include the application as they prepare the various redevelopment scenarios, however without a no or low cost PBC and not incorporate the application in the redevelopment scenarios**
Montgomery County (Airport)	X		
ATG Learning Academy			X
Hatboro-Horsham School District		X	
Montgomery County for DVHAA		X	
Horsham Water & Sewer Authority		X	
Horsham Township Firehouse		X	
Horsham Township Parks & Recreation		X [2]	
Horsham Township Easements & Roads		X	
YMCA of Philadelphia	X		
Bucks County Airport Authority	X		
America Responds with Love	X		
Bucks County Housing Group/Genesis/TRF		X	
Philadelphia Stand Down	X		
ESI Equipment, Inc.	X		
Acts Retirement-Life Communities, Inc.			X
Greater Philadelphia Search and Rescue			X
Play & Learn, Inc.			X

Notes:
[1] -Location, size and method of conveyance will be determined at a later time.
[2] The Board specifically directed that the parcel where the old Horsham Elementary School was located (east of Rt 611) be included in the Parks/Open Space plan.

The HLRA Board decided to deny six NOI applicants because their submissions were either: (1) incomplete and did not provide enough information to evaluate, (2) the proposed use was not eligible for a PBC, (3) the applicant did not demonstrate a capacity to implement, (4) the applicant had not contacted or did not have a federal sponsoring agency, or (5) the proposed use was inconsistent with the community planning principals and issues established by the community and adopted by the HLRA Board.

In addition to the NOI decisions, the HLRA Board also adopted a set of redevelopment planning principles to guide the preparation of the three base reuse alternatives. They include basic sound planning principles that were identified by the public during community meeting #1. The top principles were ranked by the HLRA Board members.

- Encourage a mixed-use plan that allows people to live, work and recreate, in the same location, in order to reduce traffic moving on and off the site.
- Maximize its employment/tax base benefits to the township or achieve a more balanced plan that meets a variety of community needs.
- Create a sense of place and community with a Town Center
- Consider impacts of traffic congestion and circulation in and around NAS-JRB.
- Secure viable sources for water and wastewater utilities to support development.
- Incorporate the latest green and sustainable design principles where appropriate (e.g., LEED buildings, LID, complete streets, energy efficiency/renewable energy, etc.).

2. Final NOI Land and Building Allocation

The final allocation of land and buildings for those NOI applicants or land uses that were carried through the reuse planning process is as follows:

Table 12-3
Final NOI Uses Incorporated into Preferred Reuse Plan
NAS-JRB Willow Grove Redevelopment Plan

Specific Applicant Included in Reuse Plan	**Acreage Allocation**
Hatboro-Horsham School District	40.0
Montgomery County for DVHAA	13.1
Horsham Water & Sewer Authority	[1]
Horsham Township Firehouse	[2]
Horsham Township Parks & Recreation	[3]
Horsham Township Easements & Roads	[4]
Bucks County Housing Group/Genesis/TRF	7.4
Use was Incorporated into Reuse Plan (but not specific NOI applicant)	
ATG Learning Academy	Included
Acts Retirement-Life Communities, Inc.	30.3
Greater Philadelphia Search and Rescue	Included
Play & Learn, Inc.	Included

Notes:
[1] - Water & sewer lines and water tower are assumed to be within road R.O.Ws and in public open space
[2] - Assumes that township would receive existing fire station building
[3] - Assumes that the township will receive the majority of 204.8 acres set aside for public recreation and open space
[4] - Assumes that the township will receive public R.O.Ws for major trunk roads out of a total of 215.5 acres

Given the number of NOI requests and the overlapping interest in the property, the HLRA Board had to seek a balance between the community's economic development interests and the needs of the applicants. This required the HLRA and all applicants to compromise on their land and building request. For those applicants seeking land acreage, the amount of land was reduced in order to achieve this balance of uses. For those uses (e.g., learning academy, retirement community, daycare center) that were carried through the planning process without their applicant (Table 12-3), it was assumed that the various uses could be accommodated into the final redevelopment plan, although no specific location was identified on the preferred reuse plan. These decisions can be made in the future, as the redevelopment planning advances and becomes more detailed.

F. PREFERRED CONVEYENCE METHOD

After considerable review, the HLRA Board decided to pursue an Economic Development Conveyance of the entire 862-acre NAS-JRB property. While PBC opportunities exist for applicants such as the Hatboro-Horsham School District, the DVHAA, and Buck County Housing Group and Horsham Township and Water & Sewer Authority, the EDC process offers the maximum flexibility for the HLRA as it moves forward with implementation. The EDC method also offers the greatest protection for the redevelopment effort, should changes in the plan occur in the future. In the event that one or more of the NOI applicants cannot carry-out their plans as proposed, the HLRA's ability to intervene to find other suitable and complementary uses for the property would be limited. In addition, the EDC method offers the NOI applicants more flexibility to implement their plans in accordance with the HLRA's redevelopment progress rather than a prescribed performance period, which may not be in line with the redevelopment timeline.

G. IMPLEMENTATION LRA

Once the redevelopment plan is adopted, the types of issues confronting the LRA will typically change from consensus building and preparation of a land use plan to implementation and management of a redevelopment effort. If the LRA decides to pursue a more active role in the redevelopment of the surplus properties by utilizing an EDC then it will need to become what is known as an "Implementation LRA." This new entity would need additional powers and authority in order to take actions relative to owning property, borrowing funds, and entering into legally binding agreements to facilitate a direct role in redeveloping the property, to name a few.

The organizational structure of this new entity will be influenced by the nature of the property to be managed. In essence, an implementation LRA should be established so that it has the capability, in terms of staff, skills and authority, to best manage redevelopment efforts directed by the preferred redevelopment alternatives established for the surplus NAS-JRB Willow Grove properties. In light of these long-term needs, it is very likely that the composition of the implementation LRA board members will be different than the planning LRA since the new focus will be on selling and leasing property, maintaining the utilities, roadways and common property; and providing for the business-like operations and financing of a major real estate holding. Furthermore, broader representation on the implementation LRA may be sought from outside the community if expertise is not available within the community.

If the LRA plays a larger role, or if there is property that will take a long time to redevelop and there is a need for interim management and caretaker responsibilities, then the staffing requirements will be proportionally greater. This would include property management specialists and crews (unless contracted out), legal expertise, marketing and sales people, etc. Typical LRA's that take on the implementation "in house" have annual budgets ranging from a few hundred thousand dollars to a few million dollars. Conversely, an implementation LRA may decide to maintain a small staff and contract

out various marketing, financing and development tasks to a private sector master developer. In such instances an outside firm is retained, through a competitive bid process, to provide a range of maintenance, engineering, marketing and management functions for a fee ("development advisor"), but does not take actual title to the undeveloped property (although it may be able to also be the developer of specific parcels within the overall plan).