

# **APPENDIX**

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### A. Methodology for Calculating Capital Costs (by Residential Dwelling Unit Type)

**Parks and Recreation**

Recommended level of Service for Parks:

20 acres of usable land per 1000 citizens

Cost per Acre:

\$170,396 to acquire and develop one acre of County Parkland

Used Patawomeck Park  
Phase I cost information

Source: Stafford County Parks and Recreation Department

Cost per Housing Unit Type:

	A	B	C	(AxBxC)=D
Type of Housing Unit	Housing Unit Size	County Parkland per Capita	Cost/Acre to acquire and develop new parkland	Gross Cost per Housing Unit
Single Family	3.13	0.02	\$170,396	\$10,667
Townhouse	2.91	0.02	\$170,396	\$9,917
Multi-Family	2.57	0.02	\$170,396	\$8,758
Mobile Homes	1.89	0.02	\$170,396	\$6,440

Total Monetary Impact per Housing Unit:

Single Family :	\$10,667
Townhouse:	\$9,917
Multi-Family:	\$8,758
Mobile Home:	\$6,440

**Schools**

Cost per Student

Elementary:      \$15,224,000      /      950      students      =      \$16,025

    Middle:      \$26,280,000      /      1100      students      =      \$23,891

    High:      \$55,650,000      /      1800      students      =      \$30,917

Source: Stafford County      Public      Schools

Cost per Housing Unit Type:

Facility + Land	Cost Per Student	Single Family Detached Student Generation	Cost for Single Family Detached by Education Level	Townhouse Student Generation	Cost for Townhouse by Education Level	Multi-Family Student Generation	Cost for Multi-Family by Education Level	Mobile Home Student Generation	Cost for Mobile Home by Education Level
Elementary	\$16,025	0.26	\$4,167	0.31	\$4,968	0.18	\$2,885	0.26	\$4,167
Middle	\$23,891	0.16	\$3,823	0.14	\$3,345	0.06	\$1,433	0.12	\$2,867
High	\$30,917	0.24	\$7,420	0.18	\$5,565	0.08	\$2,473	0.13	\$4,019
<b>TOTAL</b>			\$15,410		\$13,878		\$6,791		\$11,053

Monetary Impact per Housing Unit:

Single Family :      \$15,410

Townhouse:      \$13,878

Multi Family:      \$6,791

Mobile Home:      \$11,053

<b>Libraries</b>			
Recommended Level of Service is defined as land, building square footage and material (books, furnishings, and equipment) needed in order to meet county standards.			
Square feet of Library floor area per capita =			1.00
(1) Standard building size (in square feet) =			30,488
( 2) Approximate Building Cost of New Library Facility (includes FF&E) =			\$10,300,000
Ideal acreage for one facility =			3.0
Cost Breakdown:			
Square feet/capita =			1.00
Building cost/ square foot =			\$338
Building cost/ capita =			<u>\$338</u>
Number of people served by one Library Facility =			30,000
Acres/capita =			0.000100
(3) Cost/acre =			\$100,000
Acre Cost/capita =			<u>\$10</u>
<b>Subtotal to acquire land and construct a new library facility per capita</b>			<b><u>\$348</u></b>
(4) Approximate Capital Equipment (books, materials, furnishings, technology) Cost =			\$1,500,000
Approximate equipment cost per square foot per capita =			<u>\$49</u>
<b>Gross Cost per Capita</b>			<b><u>\$397</u></b>
Type of Housing Unit	Housing Unit Size	Cost of Library and Materials per Capita	Cost Per Housing Unit
Single Family	3.13	\$397	\$1,243
Townhouse	2.91	\$397	\$1,155
Multi-Family	2.57	\$397	\$1,020
Mobile Home	1.89	\$397	\$750
<u>Monetary Impact per Housing Unit:</u>			
Single-Family :		\$1,243	
Townhouse:		\$1,155	
Multi-Family:		\$1,020	
Mobile Home:		\$750	
(1) Actual size of Falls Run Library			
(2) Approximate building cost of Falls Run Library			
(3) Approximated land cost for Aquia Library (Falls Run Library site was proffered)			
(4) Approximate opening day collection cost for Falls Run Library - 75,000 books/materials			

<b>Fire and Rescue</b>			
Recommended Level of Service is defined as land, building square footage, and equipment needed in service Stafford County.			
Total Population of Stafford County as of July 1, 2009			124,166
Total Square Footage for all F&R Facilities =			131,422
Square Feet of Fire and Rescue Building Needed (per capita) =			1.058
(1) Actual building size (in square feet) =			15,833
(2) Approximate Construction Cost (per station) =			\$5,273,000
Building cost/square foot =			\$333
Building Cost/capita =			<u>\$353</u>
Total acres all F&R Facilities are located on =			31.44
Ideal acreage for one facility =			3.0
Acres/capita =			0.00025
(3) Cost/acre =			\$166,667
Acre Cost/capita =			<u>\$42</u>
(4) Approximate Capital Equipment Cost (per station) =			\$1,750,000
Approximate equipment cost/square foot =			\$111
Total Equipment Cost for all F&R Facilities =			\$14,525,895
Equipment Cost/capita =			<u>\$117</u>
Total Square Footage of the Public Safety Building =			114,960
Square Footage Designated to the F & R Department =			24,176
Utilized Square Footage by the F & R Department =			20,062
Utilized Square Footage by the F&R Department (per capita) =			0.162
Approximate Construction Cost (of utilized square footage) =			\$6,369,720
Building cost/ utilized square foot =			\$318
Building Cost/ capita =			<u>\$51</u>
<b>Gross Cost Per Capita</b>			<b><u>\$563</u></b>
Type of Housing Unit	Housing Unit Size	Cost of Fire and Rescue Facility and Equipment per Capita	Gross Cost Per Housing Unit
Single Family	3.13	\$563	\$1,762
Townhouse	2.91	\$563	\$1,638
Multi-Family	2.57	\$563	\$1,447
Mobile Home	1.89	\$563	\$1,064
<b>Monetary Impact per Housing Unit:</b>			
Single Family :	\$1,762		
Townhouse:	\$1,638		
Multi-Family:	\$1,447		
Mobile Home:	\$1,064		
(1) Fire/Rescue Station 2 (2) Approximate Construction Cost for Fire/Rescue Station 2			
(3) Approximate Land Cost for Fire/Rescue Station 14			
(4) Approximate Equipment Cost for Fire/Rescue Station 14			

**Transportation**

Road Impact Guideline Formula

# Units Proposed X (# Secondary Road Lane Miles) X Average Cost of One Lane Mile = Impact of New Project  
 # Units in County

OR

1 New Unit X (1,100-0) X \$1,800,000 = \$44,572  
 44,423 Existing Units as March 31, 2010

Source: Transportation Pre-Scoping Worksheet (Medium Cost for one Mile on Two-Lane Rural Road: \$3,600,000)

Single Family : 10.0 vehicle trips/ day  
 Townhouse : 7.0 vehicle trips/ day  
 Multi-Family : 4.0 vehicle trips/ day  
 Mobile Home : 4.8 vehicle trips/day

Monetary Impact per Housing Unit

Single Family : \$44,572  
 Townhouse : \$31,200  
 Multi-Family : \$17,829  
 Mobile Home : \$21,395

**Law Enforcement**

Public Safety Building (final contract cost) = 36,500,000

Total Population of Stafford County as of July 1, 2009 124,166

Total Square Footage of the Public Safety Building = 114,960

Square Footage Designated to the Sheriff's Office = 90,784 79.0%

Utilized Square Footage by the Sheriff's Office = 90,784 100.0%

Utilized Square Footage by the Sheriff's Office (per capita) = 0.731

Approximate Construction Cost (of utilized square footage) = \$28,824,078

Building cost/ utilized square foot = \$318

Building Cost/ capita = \$232

Service Level Provided: Stafford County currently has one deputy for every 1,100 citizens.

Number of Law Enforcement Officers = 112

Capital Equipment Associated per Officer (police cruiser, laptop, etc.) = \$45,000

Total Equipment Cost for all Officers = \$5,040,000

Equipment Cost per Capita =	<u>\$41</u>	
Total Projected Population of Stafford County as of July 1, 2030 (from VEC) =	218,772	
Gross Total of Future Population Growth from 2010 to 2030 =	82,966	37.9%
911 Communications System (building cost		
from CIP) =	30,000,000	
Building Cost Attributed to Future Population Growth =	\$11,377,050	
Cost/ new capita =	<u>\$137</u>	
Square Footage of Animal Shelter Building Provided =	6,000	
Square Footage of Animal Shelter Building Provided (per capita) =	0.048	
Estimated Building Cost Per Square Foot for an Animal Shelter Building =Building		
cost/square foot =	\$250	
Building cost/ capita =	<u>\$12</u>	
Number of Animal Control Officers =	5	
Capital Equipment Associated per Officer (animal control truck, laptop, etc.) =	\$37,000	
Total Equipment Cost for all Officers =	\$185,000	
Equipment Cost per Capita =	<u>\$1</u>	
<b>Gross Cost Per Capita</b>	<b><u>\$423</u></b>	

Type of Housing Unit	Housing Unit Size	Gross Cost of Law Enforcement per Capita	Gross Cost Per Housing Unit
Single Family	3.13	\$423	\$1,325
Townhouse	2.91	\$423	\$1,231
Multi-Family	2.57	\$423	\$1,087
Mobile Home	1.89	\$423	\$799

Monetary Impact per Housing Unit:

Single Family :	\$1,325
Townhouse:	\$1,231
Multi-Family:	\$1,087
Mobile Home:	\$799

**General Government**

Building Cost (projects from the CIP)

Courthouse Addition = \$21,700,000  
 Community Development Service Center \$500,000  
**\$22,200,000**

Source: Stafford County Budget Department

124,166 = 2009 population estimate (U.S. Census Bureau)

Cost/ capita = \$179

**Gross Cost per Capita \$179**

Type of Housing Unit	Housing Unit Size	Cost of General Government per Capita	Gross Cost per Housing Unit
Single Family	3.13	\$179	\$560
Townhouse	2.91	\$179	\$521
Multi-Family	2.57	\$179	\$460
Mobile Home	1.89	\$179	\$338

Monetary Impact per Housing Unit:

Single-Family : \$560  
 Townhouse: \$521  
 Multi-Family: \$460  
 Mobile Home: \$338

## B. Public Facilities Plan

### **Fire and Rescue**

#### Location Criteria:

- Future Fire and Rescue Stations will be located within the existing Urban Services Area (USA). Exceptions may be made when the only way to meet LOS Standards is to locate the station outside the USA.
- Fire/rescue stations should be located at points with quick and easy access to a major arterial or at an intersection of two arterials to gain both east-west and north-south access.
- Fire/rescue stations should be located near or part of mixed-use centers like Targeted Growth Areas (TGAs) and redevelopment areas where possible based on key site planning consideration such as access, safety and response time (locations of intense and dense anticipated growth)
- Response areas for each station should be established for areas in the USA and outside the USA

#### Site Selection/Design Criteria:

- Consideration should be given to co-locating fire and rescue for maximum efficiency. Consider co-locating with other public facilities like the Sheriff's Office. Coordination with other county agencies is recommended to provide more efficient services.
- Acquire sites between three to five usable acres to allow for providing co-location with other public facilities and possible future expansion. Slight variation in lot size may be necessary based upon the anticipated needs and building size construction of Fire and Rescue facilities.
- Encourage sites to be large enough to accommodate equipment storage and to allow maneuverability of the equipment to either pull-through or be backed into the garage bays without hindering traffic flows in the public right-of-way.
- Select and design sites to minimize the adverse impact of sirens and other noise on residential areas.
- Buildings should be a minimum of 15,000 square feet in size and accommodate one, two or three-bay designs depending on the needs within the service area.
- The standard capital equipment for each Fire and Rescue facility should be provided as follows: one engine and one ambulance. However, this does not exclude the need for additional equipment which is based on the location and need of each Fire and Rescue facility.
- Consider additional training facilities for the County F & R services (either on a regional or County level)

Facility Recommendations/Timing:

1.058 = Square feet provided per capita as of July 1, 2009  
 15,000 = Standard F&R Station Building Size (in square feet)

Year	Total Population	Increase in Population Annually	Accumulating Population Increase	Additional F&R Building Square Footage Needed for this Year	Accumulating F&R Building Square Footage Needed	Total # of Facilities	New Facilities Needed
2015	140,176	0	0	0	0	15	0
2016	142,380	2,204	2,204	2,332	2,332	15	0
2017	144,584	2,204	4,408	2,332	4,664	15	0
2018	147,095	2,511	6,919	2,657	7,320	15	0
2019	149,885	2,790	9,709	2,952	10,272	15	0
2020	152,954	3,069	12,778	3,247	13,519	15	0
2021	156,302	3,348	16,126	3,542	17,061	16	1
2022	159,790	3,488	19,614	3,690	20,752	16	0
2023	163,417	3,627	23,241	3,837	24,589	16	0
2024	166,904	3,487	26,728	3,689	28,278	17	0
2025	170,252	3,348	30,076	3,542	31,821	17	1
2026	173,461	3,209	33,285	3,395	35,216	17	0
2027	176,530	3,069	36,354	3,247	38,463	17	0
2028	179,320	2,790	39,144	2,952	41,415	17	0
2029	181,970	2,650	41,794	2,804	44,218	18	0
2030	184,481	2,511	44,305	2,657	46,875	18	1
2031	186,922	2,441	46,746	2,583	49,457	18	0
2032	189,364	2,442	49,188	2,584	52,041	18	0
2033	191,875	2,511	51,699	2,657	54,698	18	0
2034	194,525	2,650	54,349	2,804	57,501	19	0
2035	197,315	2,790	57,139	2,952	60,453	19	1
2036	200,524	3,209	60,348	3,395	63,848	19	0
-	-	-	<b>Totals</b>	<b>63,848</b>	-	-	<b>4</b>

## Schools

### Site Selection/Location Criteria:

- Future school sites will be located within the existing Urban Services Area (USA). Exceptions may be made when the only way to meet LOS Standards is to locate the school outside the USA.
- Provide locations for new schools that minimize travel distances for current as well as future students
- Elementary schools may be located within residential neighborhoods
- Elementary schools should be located with direct access to a collector road
- Middle and High schools site design should minimize impacts of the recreational areas on adjacent residences; sports facilities and their parking areas should be buffered from nearby homes
- Middle and High schools should be located with direct access to at least one major arterial road
- Pursue acquisition of school sites in projected growth areas of the County as identified on the Land Use Map
- Continue to coordinate school site planning and development with the Parks and Recreation Department in order to maximize community recreational facilities

### Design Criteria:

#### Elementary Schools

- Recommended Site Acreage: At least 20 acres;
- Recommended Capacity: Maximum of 950 students;
- Recommended Classroom Size:
  - a. Special Ed - 10
  - Pre-K -18
  - Kindergarten -20
  - Grades 1-2 - 22
  - Grades 3-5 - 23
- Buildings should be a minimum of 88,000 square feet;
- Buildings should be constructed at a maximum height no greater than two stories;
- Other facility elements include a multi-use/gymnasium facility that should be provided at each elementary school sized to accommodate a regulation basketball court, bleachers, restroom facilities and storage rooms; and
- Grading for outdoor facilities to include the following community use facilities:
  - a. One (1) Little League/Softball Field with a 200-foot playing area with fences for a backstop and dugouts;
  - b. One (1) Soccer/Football Field with minimum dimensions of 65 x 120 yards;
  - c. Restroom access;
  - d. Public Access Playground; and
  - e. Parking adjacent to all facilities.

### Middle Schools

- Recommended Site Acreage: At least 40 acres;
- Recommended Capacity: Maximum of 1,100 students;
- Recommended Classroom Size: 25 students;
- Buildings should be a minimum of 146,000 square feet;
- Buildings should be constructed at a minimum height no less than two stories;
- Other facility elements include a multi-purpose room/gymnasium facility that should be provided at each middle school sized to accommodate a regulation basketball court, bleachers, restroom facilities, storage room and locker rooms; and
- Grading for outdoor facilities to include the following community use facilities:
  - a. Two (2) Little/Softball Fields with a 200-foot playing area with fences for a backstop and dugouts;
  - b. Two (2) Soccer/Football Fields with minimum dimensions of 70 x 130 yards. One (1) Field with lights;
  - c. Access to restrooms;
  - d. Tennis Courts/Basketball Courts;
  - e. A Public Access Track; and
  - f. Parking adjacent to all facilities.

### High Schools

- Recommended Site Acreage: At least 70 acres
- Recommended Capacity: Maximum of 1,800 students
- Recommended Classroom Size: 25 students
- Buildings should be a minimum of 265,000 square feet
- Buildings should be constructed at a minimum height no less than two stories
- Other facility elements include in addition to the main gymnasium, a second gymnasium (auxiliary gymnasium), that should be provided at each high school sized to accommodate a regulation basketball court, bleachers, restroom facilities, storage room and locker rooms.
- Grading for outdoor facilities to include the following community use facilities:
  - a. Two (2) Regulation Baseball Fields with fully enclosed playing area. One (1) Field with lights;
  - b. Two (2) Softball Fields with fully enclosed playing area. One (1) Field with lights;
  - c. One (1) Regulation Football/Soccer Field with stadium;
  - d. Three (3) Multi-Purpose Football/Soccer Fields with minimum dimensions of 70x 130 yards;
  - e. Access to restrooms;
  - f. Tennis Courts/Basketball Courts;
  - g. A Public Access Track; and
  - h. Parking adjacent to all facilities

Facility Recommendations/Timing:

Elementary Schools:

The methodology that was applied used a minimum threshold of 90 percent of design capacity usage in order to trigger the need for a new elementary school to be built.

Average Students per Dwelling Type		
0.26	0.31	0.18

Year	S.F.	T.H.	M.F.	Total Elementary Students	Cumulative Elementary Students	Students Relationship to Capacity	Design Capacity Usage %	New Elem School Needed	Cumulative Elem Schools Needed
2016					11798	-2,601	81.94%		
2017	123	32	38	193	11,991	-2,408	83.28%		
2018	140	36	44	220	12,212	-2,187	84.81%		
2019	156	40	49	245	12,457	-1,942	86.51%		
2020	172	44	53	269	12,726	-1,673	88.38%		
2021	187	48	58	294	13,020	-2,234	90.42%	1	1
2022	195	50	61	306	13,326	-1,928	87.36%		
2023	203	52	63	318	13,645	-1,609	89.45%		
2024	195	50	61	306	13,951	-2,158	91.46%	1	2
2025	187	48	58	294	14,245	-1,864	88.43%		
2026	179	46	56	282	14,526	-2,438	90.17%	1	3
2027	172	44	53	269	14,796	-2,168	87.22%		
2028	156	40	49	245	15,040	-1,924	88.66%		
2029	148	38	46	233	15,273	-2,546	90.03%	1	4
2030	140	36	44	220	15,494	-2,325	86.95%		
2031	137	35	43	214	15,708	-2,111	88.15%		
2032	137	35	43	214	15,922	-1,897	89.35%		
2033	140	36	44	220	16,143	-2,531	90.59%	1	5
2034	148	38	46	233	16,375	-2,299	87.69%		
2035	156	40	49	245	16,620	-2,054	89.00%		
2036	179	46	56	282	16,902	-1,772	90.51%	1	6
<b>Totals</b>				<b>5,104</b>				<b>6</b>	

Middle Schools:

The methodology that was applied used a minimum threshold of 90 percent of design capacity usage in order to trigger the need for a new middle school to be built.

Average Students per Dwelling Type		
0.16	0.14	0.06

Year	S.F.	T.H.	M.F.	Total Middle School Students	Cumulative Middle School Students	Students Relationship to Capacity	Design Capacity Usage %	New Middle Schools Needed	Cumulative Middle Schools Needed
2016					6463	-1,707	79.11%		
2017	76	14	13	103	6,566	-1,604	80.37%		
2018	86	16	15	117	6,683	-1,487	81.80%		
2019	96	18	16	130	6,814	-1,356	83.40%		
2020	106	20	18	143	6,957	-1,213	85.16%		
2021	115	22	19	156	7,114	-1,056	87.07%		
2022	120	23	20	163	7,277	-893	89.07%		
2023	125	24	21	170	7,446	-1,714	91.14%	1	1
2024	120	23	20	163	7,609	-1,551	83.07%		
2025	115	22	19	156	7,766	-1,394	84.78%		
2026	110	21	19	150	7,916	-1,244	86.42%		
2027	106	20	18	143	8,059	-1,101	87.98%		
2028	96	18	16	130	8,189	-971	89.40%		
2029	91	17	15	124	8,313	-1,837	90.76%	1	2
2030	86	16	15	117	8,431	-1,719	83.06%		
2031	84	16	14	114	8,545	-1,605	84.19%		
2032	84	16	14	114	8,659	-1,491	85.31%		
2033	86	16	15	117	8,776	-1,374	86.47%		
2034	91	17	15	124	8,900	-1,250	87.69%		
2035	96	18	16	130	9,031	-1,119	88.97%		
2036	110	21	19	150	9,181	-1,959	90.45%	1	3
<b>Totals</b>				<b>2,718</b>				<b>3</b>	

High Schools:

The methodology that was applied used a minimum threshold of 90 percent of design capacity usage in order to trigger the need for a new high school to be built.

Average Students per Dwelling Type		
0.24	0.18	0.08

Year	S.F.	T.H.	M.F.	Total High School Students	Cumulative High School Students	Students Relationship to Capacity	Design Capacity Usage %	New High Schools Needed	Cumulative High Schools Needed
2016					9128	-272	97.11%	1	1
2017	114	18	17	149	9,277	-1,743	84.19%		
2018	130	21	19	170	9,447	-1,573	85.73%		
2019	144	23	22	189	9,636	-1,384	87.44%		
2020	158	26	24	208	9,844	-1,176	89.33%		
2021	173	28	26	227	10,071	-2,569	91.39%	1	2
2022	180	29	27	236	10,307	-2,333	81.55%		
2023	187	30	28	246	10,553	-2,087	83.49%		
2024	180	29	27	236	10,789	-1,851	85.36%		
2025	173	28	26	227	11,016	-1,624	87.15%		
2026	166	27	25	217	11,233	-1,407	88.87%		
2027	158	26	24	208	11,441	-2,819	90.52%	1	3
2028	144	23	22	189	11,630	-2,630	81.56%		
2029	137	22	21	180	11,810	-2,450	82.82%		
2030	130	21	19	170	11,980	-2,280	84.01%		
2031	126	20	19	165	12,145	-2,115	85.17%		
2032	126	20	19	165	12,311	-1,949	86.33%		
2033	130	21	19	170	12,481	-1,779	87.52%		
2034	137	22	21	180	12,660	-1,600	88.78%		
2035	144	23	22	189	12,849	-3,031	90.11%	1	4
2036	166	27	25	217	13,067	-2,813	82.28%		
<b>Totals</b>				<b>3,939</b>				<b>4</b>	

**Stafford County School Board Growth Forecast**

The School Board commissioned an assessment of the current schools to determine where and when existing schools will approach and achieve over capacity due to projected growth. A summary table of the findings is provided.

Stafford County Public Schools Out-of-Capacity Table by Level - Design Capacities																												
Stafford County Student Generation Factor																												
	Capacity								Pre-K	Month-1	Projected Month-1 ADM																	
	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22			2015-14	2014-16	2016-18	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24							
<b>Grades K-5</b>																												
ANTHONY BURNS ES	950	950	950	950	950	950	950	950	7	743	763	773	788	820	850	852	854	830	833	848								
CONWAY ES	950	950	950	950	950	950	950	950	19	881	918	933	965	1041	1108	1111	1112	1135	1146	1149								
FALMOUTH ES	794	794	794	794	794	794	794	794		538	550	561	587	644	696	711	725	725	750	789								
FERRY FARM ES	732	732	732	732	732	732	732	950		607	630	623	634	602	578	581	583	634	546	572								
GARRISONVILLE ES	768	768	768	768	768	768	768	768	19	514	517	508	519	537	556	575	591	614	626	651								
GRAFTON VILLAGE ES	754	754	754	754	754	754	754	754	29	584	577	567	563	566	571	573	574	562	574	580								
HAMPTON OAKS ES	950	950	950	950	950	950	950	950		791	802	814	822	773	736	734	731	719	729	751								
HARTWOOD ES	649	649	649	649	649	649	649	649		554	592	618	635	679	710	737	752	785	813	855								
KATE WALLER BARRETT ES	950	950	950	950	950	950	950	950		764	781	789	808	817	828	815	803	799	818	787								
MARGARET BRENT ES	950	950	950	950	950	950	950	950		852	897	885	898	918	939	947	953	977	990	1003								
MONCURE ES	754	754	754	850	950	950	950	950	11	681	694	702	723	737	752	752	748	710	779									
PARK RIDGE ES	843	843	843	843	843	843	843	843	17	624	602	594	592	495	417	422	426	449	450	453								
ROCKHILL ES	843	843	843	843	843	843	843	843	18	611	614	589	590	526	475	476	476	471	474	478								
ROCKY RUN ES	950	950	950	950	950	950	950	950		786	824	825	850	820	798	797	796	750	772	782								
STAFFORD ES	794	794	794	794	794	794	794	794		697	708	702	722	738	755	761	766	769	772	788								
WIDEWATER ES	843	843	843	843	843	843	843	843	18	847	891	921	937	921	910	930	947	989	1006	1037								
WINDING CREEK ES	925	925	925	925	925	925	925	925	32	716	764	865	927	1146	1276	1362	1453	1671	1733	1814								
ES 18 (open 2023, capacity = 950)																												
<b>Totals</b>	<b>14399</b>	<b>14399</b>	<b>14399</b>	<b>14399</b>	<b>14399</b>	<b>14399</b>	<b>14813</b>	<b>15763</b>	<b>170</b>	<b>11770</b>	<b>12124</b>	<b>12269</b>	<b>12558</b>	<b>12780</b>	<b>12965</b>	<b>13137</b>	<b>13292</b>	<b>13527</b>	<b>13805</b>	<b>14114</b>								
<b>Grades 6-8</b>																												
DIXON SMITH MS	1100	1100	1100	1100	1100	1100	1100	1100		796	793	779	781	805	816	857	885	907	932	950								
DREW MS	650	650	650	650	650	650	650	650		493	571	636	639	666	754	799	830	854	881	900								
GAYLE MS	1100	1100	1100	1100	1100	1100	1100	1100		926	931	928	927	941	973	1043	1091	1129	1173	1203								
HH POOLE MS	1100	1100	1100	1100	1100	1100	1100	1100		852	885	918	919	950	999	1101	1172	1227	1291	1334								
RODNEY E THOMPSON MS	1100	1100	1100	1100	1100	1100	1100	1100		1104	1169	1140	1139	1120	1177	1244	1291	1327	1370	1399								
SHIRLEY C HEIM MS	1100	1100	1100	1100	1100	1100	1100	1100		810	948	993	984	1049	1107	1185	1239	1261	1325	1352								
STAFFORD MS	1100	1100	1100	1100	1100	1100	1100	1100		489	484	525	526	557	547	574	593	607	624	636								
WRIGHT MS	920	920	920	920	920	920	920	920		784	747	796	796	814	822	844	859	870	884	893								
<b>Totals</b>	<b>8170</b>		<b>6354</b>	<b>6519</b>	<b>6715</b>	<b>6719</b>	<b>6901</b>	<b>7196</b>	<b>7646</b>	<b>7959</b>	<b>8202</b>	<b>8485</b>	<b>8676</b>															
<b>Grades 9-12</b>																												
BROOKE POINT HS	1800	1800	2000	2000	2000	2000	2000	2000		1759	1763	1753	1853	1986	2050	2207	2328	2491	2653	2929								
COLONIAL FORGE HS	1875	1875	2000	2000	2000	2000	2000	2000		1964	1998	2193	2193	2190	2232	2295	2439	2634	2808	3120								
MOUNTAIN VIEW HS	1800	1800	2000	2000	2000	2000	2000	2000		1814	1826	1732	1757	1749	1758	1844	1892	1971	2025	2118								
NORTH STAFFORD HS	1925	1925	1925	1925	1925	1925	1925	1925		1645	1655	1649	1634	1716	1729	1724	1763	1785	1812	1860								
STAFFORD HS	1850	2000	2000	2000	2000	2000	2000	2000		1874	1922	2013	2100	2217	2335	2389	2496	2608	2722	2904								
<b>Totals</b>	<b>9250</b>	<b>9400</b>	<b>9725</b>	<b>9925</b>	<b>9925</b>	<b>9925</b>	<b>9925</b>	<b>9925</b>		<b>9055</b>	<b>9163</b>	<b>9300</b>	<b>9515</b>	<b>9658</b>	<b>10184</b>	<b>10432</b>	<b>10918</b>	<b>11478</b>	<b>12020</b>	<b>12932</b>								
<b>System Totals</b>	<b>31819</b>	<b>31969</b>	<b>32234</b>	<b>32690</b>	<b>32690</b>	<b>32690</b>	<b>32908</b>	<b>33858</b>	<b>170</b>	<b>27179</b>	<b>27806</b>	<b>28284</b>	<b>28792</b>	<b>29539</b>	<b>30344</b>	<b>31214</b>	<b>32169</b>	<b>33207</b>	<b>34310</b>	<b>35722</b>								

Capacity Legend

< 96%    96% - 100%    100% - 105%    > 100%

Operations Research and Education Laboratory  
Institute for Transportation Research and Education  
North Carolina State University

August 18, 2014

**Parks and Recreation**

**Location/Site Selection Criteria:**

- All parks should be co-located with other public facilities where appropriate.
- Acquisition of parkland adjacent to existing parks, athletic complexes and historic sites should be acquired for creation of buffers and to allow park expansion.
- Consider public/private partnerships or any other joint opportunities in the delivery of park and recreation service delivery.
- Encourage Virginia Department of Transportation (VDOT) to construct bicycle lanes and/or paths in conjunction with road widening projects.
- Locate sites adjacent to existing or planned residential areas to promote non-vehicular access and shorten drive time.
- Sites with athletic components requiring high water and/or sewage disposal must be located within the existing USA.
- Location of historical sites and natural area parks will be determined by the presence of historical and cultural resources, environmental features, the significance of wildlife habitat, the presence of endangered, threatened or state-listed flora and fauna, and the potential for educational, interpretive and low-impact recreational activities.

Facility Recommendations/Timing:

- 1,610 = Existing Acres of County Parkland
- 0.013 = Acres of Existing County Parkland/Capita
- 20 = Acres per 1,000 people (County Standard)
- 2,483 = Needed Acres of Parkland as of the July 1, 2015 Population Estimate
- 873 = Deficit of County Parkland that exists as of July 1, 2015
- \$170,396 = Cost to acquire and develop one acre of new County Parkland in 2009
- 8.0% = Annual Inflation Rate

Year	Population	Change in Population	Accumulating Population Increase	Acres of Parkland/Capita Per Year	Total Parkland Needed at this Year
2015	140,176	0	0	0	2,483
2016	142,380	2,204	2,204	44	2,527
2017	144,584	2,204	4,408	44	2,571
2018	147,095	2,511	6,919	50	2,621
2019	149,885	2,790	9,709	56	2,677
2020	152,954	3,069	12,778	61	2,739
2021	156,302	3,348	16,126	67	2,806
2022	159,790	3,488	19,614	70	2,875
2023	163,417	3,627	23,241	73	2,948
2024	166,904	3,487	26,728	70	3,018
2025	170,252	3,348	30,076	67	3,085
2026	173,461	3,209	33,285	64	3,149
2027	176,530	3,069	36,354	61	3,210
2028	179,320	2,790	39,144	56	3,266
2029	181,970	2,650	41,794	53	3,319
2030	184,481	2,511	44,305	50	3,369
2031	186,922	2,441	46,746	49	3,418
2032	189,364	2,442	49,188	49	3,467
2033	191,875	2,511	51,699	50	3,517
2034	194,525	2,650	54,349	53	3,570
2035	197,315	2,790	57,139	56	3,626
2036	200,524	3,209	60,348	64	3,690
<b>Totals</b>	-	-	-	<b>1,207</b>	-
			<b>Total Needed in addition to deficit</b>	<b>1,207</b>	
			<b>Total needed including deficit</b>	<b>3,690</b>	

## Libraries

### Location Criteria:

- Provide new facilities to adequately and equitably serve all areas of the County. Schedule library acquisition and/or construction to respond to both current unmet demand and new growth when it occurs.
- Future library sites shall be located within the existing Urban Services Area (USA). Exceptions may be made when the only way to meet LOS Standards is to locate the library outside the USA.
- Sites should be located along main travel corridors with consideration of minimizing users' drive time. The site should be chosen to support the mission of providing library material and services to the greatest number of people.
- Generally library sites should be at least six (6) acres in size to allow for a full size branch with adequate parking.
- An alternative to construction of new facilities is to establish new libraries in leased commercial spaces such as shopping centers. In Fredericksburg and other locations, public libraries serve as anchor stores and can draw one to two thousand citizens a day. Branches could be located within the Redevelopment Areas.

### Site Selection/Design Criteria:

- Convenience and accessibility to the maximum number of users, direct access to a major arterial road.
- Preferred sites should have both north/south and east/west access.
- High visibility from major vehicular and pedestrian access routes.
- Proximity to compatible traffic-generating land uses, with evaluation similar to the needs for commercial retail business.
- Provide drive times 15 minutes or less to most parts of the service area.
- Accommodate a facility of at least 30,000 square feet.
- Provide parking at the rate of 4 spaces per 1,000 square feet of building space.
- Be incorporated into a variety of settings, including neighborhoods, adjacent to schools, or co-location with other public facilities as feasible, with relief to some criteria for co-location sites as determined by the Central Rappahannock Regional Library (CRRL).

Facility Recommendations/Timing:

- 69,907 = Existing square feet of Library building as of July 1, 2015
- 0.50 = Square feet per capita as of July 1, 2015
- 140,176 = Needed Square footage of Library building as of the July 1, 2015 Population Estimate
- 1.00 = Square feet of Library building per capita (County Standard)
- 70,269 = Deficit of Square footage of Library building that exists as of July 1, 2015
- 30,000 = Square feet for Library building (County Standard)

Year	Total Population Annually	Change in Population Annually	Accumulating Population Increase	Additional Library Square Footage Needed for this Year	Total Library Square Footage Needed at this Year	Total # of Libraries	New Facilities Needed
2015	140,176	0	0	10,269	10,269	2	2
2016	142,380	2,204	2,204	2,204	12,473	2	0
2017	144,584	2,204	4,408	2,204	14,677	2	0
2018	147,095	2,511	6,919	2,511	17,188	2	0
2019	149,885	2,790	9,709	2,790	19,978	2	0
2020	152,954	3,069	12,778	3,069	23,047	2	0
2021	156,302	3,348	16,126	3,348	26,395	2	0
2022	159,790	3,488	19,614	3,488	29,883	2	0
2023	163,417	3,627	23,241	3,627	33,510	3	1
2024	166,904	3,487	26,728	3,487	36,997	3	0
2025	170,252	3,348	30,076	3,348	40,345	3	0
2026	173,461	3,209	33,285	3,209	43,554	3	0
2027	176,530	3,069	36,354	3,069	46,623	3	0
2028	179,320	2,790	39,144	2,790	49,413	3	0
2029	181,970	2,650	41,794	2,650	52,063	3	0
2030	184,481	2,511	44,305	2,511	54,574	3	0
2031	186,922	2,441	46,746	2,441	57,015	3	0
2032	189,364	2,442	49,188	2,442	59,457	3	0
2033	191,875	2,511	51,699	2,511	61,968	4	1
2034	194,525	2,650	54,349	2,650	64,618	4	0
2035	197,315	2,790	57,139	2,790	67,408	4	0
2036	200,524	3,209	60,348	3,209	70,617	4	0
-	-	-	<b>Totals</b>	<b>70,617</b>	-	-	<b>4</b>

**Government and Judicial**

Facility Recommendations/Timing:

- 328,030 = Existing square feet of Government building as of July 1, 2015
- 2.34 = Square feet per capita as of July 1, 2015 (County Standard)
- \$179 = Cost of New Government building (per square footage)
- 8.00% = Annual Inflation Rate

Year	Population	Change in Population	Accumulating Population Increase	Additional Gov't Building Square Footage Needed for this Year	Total Gov't Square Footage Needed at this Year
2015	140,176	0	0	0	0
2016	142,380	2,204	2,204	5,157	5,157
2017	144,584	2,204	4,408	5,157	10,315
2018	147,095	2,511	6,919	5,876	16,190
2019	149,885	2,790	9,709	6,529	22,719
2020	152,954	3,069	12,778	7,181	29,901
2021	156,302	3,348	16,126	7,834	37,735
2022	159,790	3,488	19,614	8,162	45,897
2023	163,417	3,627	23,241	8,487	54,384
2024	166,904	3,487	26,728	8,160	62,544
2025	170,252	3,348	30,076	7,834	70,378
2026	173,461	3,209	33,285	7,509	77,887
2027	176,530	3,069	36,354	7,181	85,068
2028	179,320	2,790	39,144	6,529	91,597
2029	181,970	2,650	41,794	6,201	97,798
2030	184,481	2,511	44,305	5,876	103,674
2031	186,922	2,441	46,746	5,712	109,386
2032	189,364	2,442	49,188	5,714	115,100
2033	191,875	2,511	51,699	5,876	120,976
2034	194,525	2,650	54,349	6,201	127,177
2035	197,315	2,790	57,139	6,529	133,705
2036	200,524	3,209	60,348	7,509	141,214
<b>Totals</b>	-	-	-	<b><u>141,214</u></b>	-

**Targeted Growth Area Public Facility Needs**

The following section identifies the public facility needs for each individual Targeted Growth Area, as referenced in Chapter 3 of this document. These estimates are considered a portion of the total Countywide facility needs identified in the first part of this Appendix.

**Courthouse Planning Area**

Assumptions:

	2010 CENSUS	Courthouse Dwelling Units	Population	Total Population (TGA)
SF	3.00	1,500	4,500	10,267
TH	2.99	750	2,242	
MF	2.35	1,500	3,525	

1. Parks and Recreation

LOS	Total Population (TGA)	Area Demand
20 acres per 1,000 people	10,267	205 acres

2. Fire and Rescue

LOS	Total Population (TGA)	Demand	Station	Number of Fire Stations
1.058 sq.ft. per capita	10,267	10,862 sq.ft.	14,000 sq.ft.	0.78

3. Schools

	SF		TH		MF		Total Students	Number of Schools
	Gen. Rate	1,500 Units	Gen. Rate	750 Units	Gen. Rate	1,500 Units		
Elementary	.26	390	.31	232	.18	270	892	0.94
Middle	.16	240	.14	105	.06	90	435	0.40
High	.24	360	.18	135	.08	120	615	0.34
Total Students		990		472		480	1,942	

4. Libraries

LOS	Total Population (TGA)	Demand	Main Library	Number of Libraries
0.491 sq. ft. per capita	10,267	5,041 sq.ft.	37,000 sq.ft.	0.14

**Central Stafford Business Area**

Assumptions:

	2010 CENSUS	Central Stafford Dwelling Units	Population	Total Population (TGA)
SF	3.00	550	1,650	4,598
TH	2.99	200	598	
MF	2.35	1,000	2,350	

1. Parks and Recreation

LOS	Total Population (TGA)	Demand
20 acres per 1,000 people	4,598	91.96 acres

2. Fire and Rescue

LOS	Total Population (TGA)	Demand	Station	No. of Fire Stations
1.058 sq.ft. per capita	4,598	4,864 sq.ft.	14,000 sq.ft.	0.35

3. Schools

	SF		TH		MF		Total Students	Number of Schools
	Gen. Rate	550 Units	Gen. Rate	200 Units	Gen. Rate	1,000 Units		
Elementary	.26	143	.31	62	.18	180	385	0.41
Middle	.16	88	.14	28	.06	60	176	0.16
High	.24	132	.18	36	.08	80	248	0.14
Total Students		363		126		320	809	

4. Libraries

LOS	Total Population (TGA)	Demand	Main Library	No. of Libraries
.491 sq. ft. per capita	4,598	2,258 sq.ft.	37,000 sq.ft.	0.06

**Warrenton Road Planning Area**

Assumptions:

	2010 CENSUS	Warrenton Rd Dwelling Units	Population	Total Population (TGA)
SF	3.00	1,000	3,000	8,917
TH	2.99	800	2,392	
MF	2.35	1,500	3,525	

1. Parks and Recreation

LOS	Total Population (TGA)	Area Demand
20 acres per 1,000 people	8,917	178 acres

2. Fire and Rescue

LOS	Total Population (TGA)	Demand	Station	No. of Fire Stations
1.058 sq.ft. per capita	8,917	9,434 sq.ft.	14,000 sq.ft.	0.67

3. Schools

	SF		TH		MF		Total Students	Number of Schools
	Gen. Rate	1,000 Units	Gen. Rate	800 Units	Gen. Rate	1,500 Units		
Elementary	.26	260	.31	248	.18	270	778	0.82
Middle	.16	160	.14	112	.06	90	362	0.33
High	.24	240	.18	144	.08	120	504	0.28
Total Students		660		504		480	1,644	

4. Libraries

LOS	Total Population (TGA)	Demand	Main Library	No. of Libraries
.491 sq. ft. per capita	8,917	4,378 sq.ft.	37,000 sq.ft.	0.12

**Leeland Station Planning Area**

Assumptions:

	2010 CENSUS	Leeland Station TGA	Population	Total Population (TGA)
SF	3.00	240	720	2,104
TH	2.99	180	538	
MF	2.35	360	846	

1. Parks and Recreation

LOS	Total Population (TGA)	Area Demand
20 acres per 1,000 people	2,104	42.08 acres

2. Fire and Rescue

LOS	Total Population (TGA)	Demand	Station	No. of Fire Stations
1.058 sq.ft. per capita	2,104	2,226 sq.ft.	14,000 sq.ft.	0.16

3. Schools

	SF		TH		MF		Total Students	Number of Schools
	Gen. Rate	240 Units	Gen. Rate	180 Units	Gen. Rate	360 Units		
Elementary	.26	62	.31	55	.18	64	181	0.19
Middle	.16	38	.14	25	.06	21	84	0.08
High	.24	57	.18	32	.08	28	117	0.07
Total Students		157		112		113	382	

4. Libraries

LOS	Total Population (TGA)	Demand	Main Library	No. of Libraries
.491 sq. ft. per capita	2,104	1,033 sq.ft.	37,000 sq.ft.	0.03

**Brooke Station Planning Area**

Assumptions:

	2010 CENSUS	Brooke Dwelling Units	Population	Total Population (TGA)
SF	3.00	240	720	720
TH	2.99	0	0	
MF	2.35	0	0	

1. Parks and Recreation

LOS	Total Population (TGA)	Area Demand
20 acres per 1,000 people	720	14.4 acres

2. Fire and Rescue

LOS	Total Population (TGA)	Demand	Station	No. of Fire Stations
1.058 sq.ft. per capita	720	761 sq.ft.	14,000 sq.ft.	0.05

3. Schools

	SF		TH		MF		Total Students	Number of Schools
	Gen. Rate	240 Units	Gen. Rate	0 Units	Gen. Rate	0 Units		
Elementary	.26	62	.31	0	.18	0	62	0.07
Middle	.16	38	.14	0	.06	0	38	0.03
High	.24	57	.18	0	.08	0	57	0.03
Total Students		157		0		0	157	

4. Libraries

LOS	Total Population (TGA)	Demand	Main Library	No. of Libraries
.491 sq. ft. per capita	720	354 sq.ft.	37,000 sq.ft.	0.01

### D. TGA County-wide Acreage Needs

This table represents the minimum acreage that Stafford County would need to designate for Urban Development Areas based on a generalized county-wide evaluation given the alternatives that provide varying degrees of development intensity. This information is based on the methodology presented during a session on Urban Development Areas at the 2010 CPEAV Zoning Law Seminar on July 23, 2010 in Charlottesville, Virginia

Land Use	UDA Alternatives		
	Low Density Alternative	Medium/Mixed Densities	High Density
	All Single Family Dwellings (14,661)	1/3 Single Family, 1/3 Townhouse, 1/3 Multi-family (4,887 units each)	All Multi-family Dwellings (14,661)
	Acres	Acres	Acres
Residential	3,665	2,443	1,222
Commercial/Employment	574	574	574
<b>Total</b>	<b>4,239</b>	<b>3,017</b>	<b>1,796</b>

Note: The ultimate area should be adjusted to account for public land and right of way.

#### Assumptions

10-year projections (2010 - 2020):

40,904 new residents

14,661 dwelling units (revised estimate, as of August 12, 2010)

Commercial / Employment based on County estimate of 1 million square feet of floor area per year, or 10 million square feet over 10 years.

Conversion to acreage:  $10,000,000 / 0.4 \text{ (FAR)} / 43,560 \text{ (sq ft/ac)} = 573.92 \sim 574 \text{ Acres}$

Densities:

Single Family: 4 du/acre

Townhouse: 6 du/acre

Multi-family: 12 du/ac

## E. Affordable Housing Study

*(Presented to the Comprehensive Plan Steering Committee on September 25, 2006)(updated June 2010)*

### Introduction: Affordable Housing

**Affordable Housing (Workforce Housing)** is safe, decent housing where costs (mortgage or rent plus utilities) does not exceed 30 % of gross household income. One quarter of middle class Americans exceed this amount. (HUD)

**Workforce:** 50% to 120% of median family income (\$89,536 in Stafford County) therefore: \$44,768 to \$107,443 (2008)

Homeownership expands individual opportunities to accumulate wealth, enables a family to exert greater control over its living environment, creates incentives for households to better maintain their homes, and may benefit children of homeowners. Homeownership also benefits local neighborhoods because owner-occupiers have a financial stake in the quality of the local community. (HUD 2005)

**Communities that have had success producing more Affordable Housing have developed the attitude that Affordable Housing is part of the Economic Development Infrastructure.** It is more than just a quality of life issue. Citizens who work in the communities where they live spend more of their incomes in their communities thus dramatically increasing tax revenues for their localities.

In virtually all communities nationwide, the magnitude of the housing need is likely to dwarf available resources. (The Brookings Institution, 2003)

### Special Challenges of Low Income Housing:

Fact: Someone who makes the current minimum wage of \$5.15 per hour and allocates no more than 30% of annual income for housing should not have to pay more than \$257.50 per month in rent and utilities. The average monthly cost of a reserved parking space in downtown Washington, D.C., is \$280. (Designing An American Asset 2004)

Over two million workers in America earn minimum wage or less. (U.S. Department of Labor, 2004)

In the suburbs, local governments are politically dominated by homeowners, who comprise a majority of residents and are the most vocal. The major asset of most homeowners is their home. They have strong incentives to want the market values of homes to rise. So they oppose any policies they believe might reduce home values. They think letting more affordable units into their communities would do that and might also lower the quality of local schools and raise property taxes. So very few want to permit new low-cost housing near them, or to accept low-income neighbors. (Brookings Institution, 2003)

### Rationale for Creating Affordable Housing:

Families who pay more than 30 percent of their income for housing are considered cost burdened and may have difficulty affording necessities such as food, clothing, transportation and medical care. An estimated 12 million renter and homeowner households now pay more than 50 percent of their annual incomes for housing, and a family with one full-time worker earning the minimum wage cannot afford the local fair-market rent for a two-bedroom apartment anywhere in the United States. (HUD) (2006)

Everyone needs a place to live, regardless of age, job, race, disability, income or station in life. Although housing has often been cast as a "social" issue, it is in fact a broader concern, cutting across many disciplines, including economics, social work, and public health, in addition to urban planning. A 1999 report by the U.S. Department of Housing and Urban Development (HUD) finds that "despite six years of unprecedented economic growth, millions of families still struggle to secure decent affordable housing." The report goes on to relate how more Americans than ever before find themselves in "worst-case" housing situations, paying more than half their incomes for rent, or occupying unsafe or overcrowded dwellings. Of over 12.5 million persons with worst case needs, nearly 1.5 million are elderly and 4.5 million are children, according to the HUD report. Another 1.1 to 1.4 million worst case households includes adults who experience disabilities. (American Planning Association, 1999)

#### **Trends in Federal Funding:**

Despite recent increases in Congressional appropriations to HUD, the past two decades have seen significant erosion of federal commitment to the development of affordable housing. Evidence of this retreat can be clearly seen in decreasing funding for development subsidies, curtailment of project-based rental subsidies, and repeal of tax incentives for affordable housing, and a dwindling supply of housing affordable to many working families. Ironically, the economic growth of recent years has contributed to the housing pinch. HUD cites the strong economy as "...a key factor (in) pushing rent levels to new record highs. Rather than benefiting from the surging economy, low-income renters are left to compete for the dwindling supply of affordable housing available on the private market. Many of the most vulnerable low-income renters spend years waiting in vain to obtain needed rental housing assistance in the form of housing vouchers or public housing units." At the same time, Federal housing policy has undergone what HUD terms an "historic reversal", by placing a freeze on new housing vouchers, the principal form of assistance that allows low-income renters to access privately owned housing. (American Planning Association, 1999)

#### **State and Community Trends:**

The Federal government has shifted more of the burden for Affordable Housing without adequate funding.

Just since the year 2000, U.S. house prices have increased more than twice as fast as the growth of personal income. (Richard F. Syron Chairman and CEO, Freddie Mac, 2005)

Many communities are suffering from their own success. They have succeeded in attracting employers and jobs, but regulatory barriers, public opposition to multifamily housing, and land

use policies have prevented developers from adding enough supply to keep up with the growing demand for housing. (Joint Center for Housing of Harvard University, 2005)

### **Consequences of Affordable Housing Shortages:**

A common measure of community-wide affordability is the number of homes that a household with a certain percentage of median income can afford. For example, a community might track the percentage of its housing that is affordable to households earning 60% of median income. In addition to the distress it causes families who cannot easily find a place to live, lack of affordable housing is considered by many urban planners to have negative effects on a community's overall health.

### **Demographics:**

As of 2004, the white homeownership rate was 76 percent while African-American and Hispanic homeownership rates remained below 50 percent, and the Asian rate was 60 percent. At the same time households with very-low income had a homeownership rate that was 37 percentage points below the rate for high-income households. (HUD 2005)

### **Implications for Affordable Housing initiatives:**

Affordable housing is the hardest form of real estate to make viable in the long run, because it maintains a dual mission: (1) be financially healthy, and (2) provide affordability to low income residents. These two goals are diametrically opposite — almost every decision involves trading one off against another.

To be viable at both missions, affordable housing requires the injection of government financial resources to fill the gap between what the market requires for quality, and what poor people can afford. It is a mistake to start an affordable housing initiative with too little government resource — all the financial wizardry imaginable may disguise but will not prevent its inevitable, and expensive, failure. (Affordable Housing Institute, 2006)

### **Federal Programs for Low and Affordable Housing:**

- Low Income Housing Tax Credits (LIHTCs) and Historic Tax Credits
- HUD/FHA multifamily loans insured under all applicable sections of the National Housing Act
- HUD's Section 8 rental assistance programs
- Public housing, including privatization and revitalization of public housing under HUD's HOPE VI and mixed finance programs
- Tax-exempt bonds for housing and community development
- Representing local, regional and national non-profit developers, lenders and intermediaries in connection with acquisition, development, management and financing of housing projects
- Fannie Mae and Freddie Mac multifamily loan and investment programs

- Community and economic development programs, including Community Development Block Grants (CDBG) and related Section 108 and Economic Development Initiative programs, as well as Empowerment Zones and Enterprise Communities

Housing assistance from the federal government for lower income households can be divided into three parts.

- “Tenant based” subsidies given to an individual household, known as the Section 8 program
- “Project based” subsidies given to the owner of housing units that must be rented to lower income households at affordable rates, and
- Public Housing, which is usually owned and operated by the government. (Some public housing projects are managed by subcontracted private agencies.)

### **Sample Stafford County Employee Salaries (2010):**

**24 hr - Fire & Rescue Technician I** - average salary: \$42,086 for 7 employees - **Grade A06;** min \$38,480 mid \$48,089 max \$59,663

**Deputy Sheriff I - Field Operations** - average salary: \$39,600 for 61 employees - **Grade A05;** min \$34,985 mid \$43,721 max \$54,204

**Administrative Assistant** - average salary: \$27,319 for 5 employees - **Grade A01;** min \$24,377 mid \$29,868 max \$40,227

**Human Resources Analyst** - average salary: \$49,973 for 3 employees - **Grade A07;** min \$41,496 mid \$52,894 max \$64,313

**Parks Maintenance Worker I** - average salary: \$37,716 for 3 employees - **Grade A01;** min \$24,377 mid \$29,868 max \$40,227

**First Year Teacher:** \$36,322, Teacher with ten years experience: \$46,269

NOTE: All salaries are for full-time employees

### **Market Trends: Stafford County Home Costs (2009)**

Average Sold Price - \$244,769

- 17% decrease from 2008

Median Sold Price - \$229,000

- 16.1% decrease from 2008

Average days on the market – 89

- 28.8% decrease from 2008

**Breakdown of sample house costs in Stafford County (2006):**

Below is an example of a Closing Cost estimate to help you understand what these fees cover when you buy a home in Stafford County, Virginia. Source: Stafford County Real Estate – Homefinders.com

PRICE OF HOME	\$350,000
LOAN TYPE	Conventional
LOAN TERM	5 years
AMORTIZATION	30 years
DOWN PAYMENT (5%)	17,500
LOAN AMOUNT	332,500
INTEREST RATE	5.75%
REAL ESTATE TAXES	1,700
EARNEST MONEY DEPOSIT	3,000
<b>LOAN RELATED FEES</b>	
Appraisal Fee	\$350
Credit Report Fee	60
Misc. Lender Fees	500
Tax Service Fee	75
Flood determination	11
<b>PREPAIDS OR ESCROW ITEMS</b>	
Prepaid Interest (Per Diem)	\$970 (15 days)
Hazard Insurance (1 year)	450
Hazard Insurance Escrow	75
Prepaid RE Taxes (4 months)	566
PMI not included, available in mortgage	
<b>TITLE CHARGES</b>	
Settlement Fee (legal)	650
Title Insurance (includes lender and owner)	(\$5.30 per \$1,000 approx.)
	1855
<b>GOVERNMENT RECORDING AND TRANSFER FEES</b>	
Recording Fees	100
City/County/State Tax Stamps	approx 1855
<b>ADDITIONAL SETTLEMENT FEES</b>	
Survey	275
Pest Inspection	50
<b>TOTAL CLOSING COSTS</b>	<b>\$ 8,987</b>

DOWN PAYMENT (10%)	\$17,500
TOTAL MONEY NEED TO BUY	\$26,487
LESS EARNEST MONEY DEPOSIT OF	3,000
CASH NEEDED AT SETTLEMENT	\$23,487

Cash from the buyer at settlement is by Bank Check, Wired Funds or other certified funds. Personal checks will not be accepted by the tile company because they cannot record a deed unless they have the funds on deposit.

ESTIMATED MONTHLY PAYMENT

Principal & Interest	\$1,838 @ 5.75%
1 Month RE Taxes	141
1 Month Hazard Insurance (\$804 annum)	38

MONTHLY PAYMENTS	\$2,017
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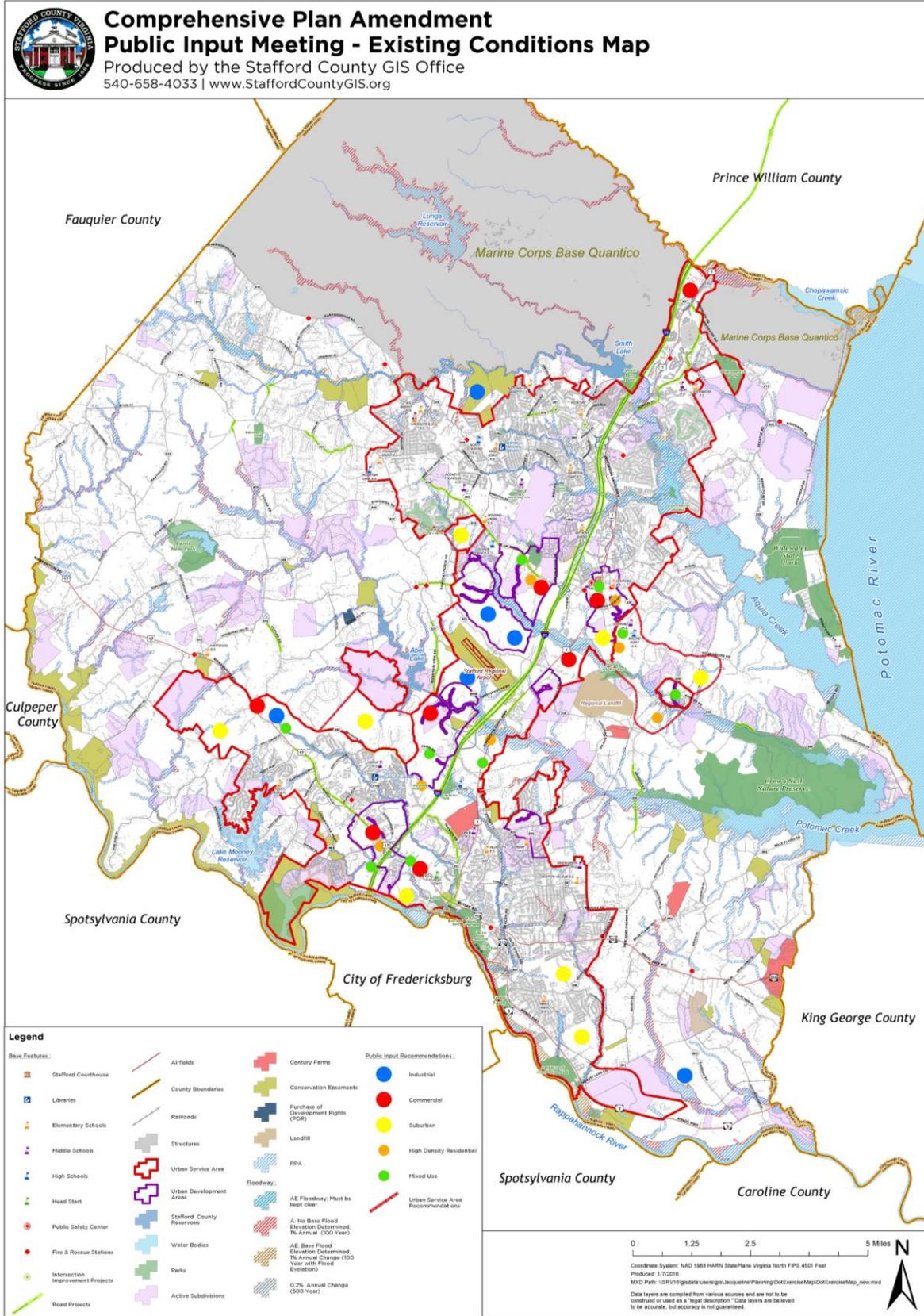
All financial information is estimated and may vary from buyer to buyer based on PMI, Interest rates, Insurance, lender fees and other actual costs

**What Other Communities Have Done To Address the Problem:**

1. Affordable Housing Ordinance - requires a percentage of new development to include affordable housing units. This ordinance must include incentives for developers or it actually increases the cost of housing instead of reducing it.
2. Forgive cash proffers on affordable housing units
3. Density bonus for developments that include a pre-determined number of Affordable Housing Units
4. Cash Proffers for Affordable Housing for Rezoning
5. Dedicating One Cent from Property Taxes to Address Funding of Affordable Housing
6. Participate in Partnerships with Business Community and Other Stakeholders to establish a non-profit entity to purchase and manage sale of affordable housing units
7. Use of County-Owned Surplus Land to Contribute to Affordable Housing Units
8. Seek Major Employer Contributions to Affordable Housing Fund
9. Determine the number of Affordable Housing Units currently in the community and take steps to conserve those units.
10. Set up Affordable Housing Taskforce with community stakeholders to determine what steps listed above will work for locality.

## **F. Public Input Summary**

On November 5<sup>th</sup> and 12<sup>th</sup>, 2015, public input meetings were held. Staff sought public input at these meetings through a growth preference survey. Attendees worked in groups to designate the preferred location of future commercial and residential growth. The map on the following page is a consolidation of the recommendations provided by the participants.



## G. Transportation Plan Background Information

### Road Improvements Sorted by Route Number

Route	Road Name	From	To	Future	R/W	Urban /Rural	Cost (in millions)
1	Cambridge Street / Jefferson Davis Highway	Fredericksburg County Line	Accokeek Creek Bridge	6	160	Urban	\$135.72
1	Jefferson Davis Highway	Accokeek Creek Bridge	Hope Road	6	120	Urban	\$31.49
1	Jefferson Davis Highway	Hope Road	Prince William County Line	6	160	Urban	\$156.43
17	Warrenton Road	Interstate 95	Berea Church Road	8	160	Urban	\$108.11
17	Warrenton Road	Berea Church Road	Truslow Road Extended	6	145	Urban	\$53.87
212	Butler Road	Cambridge Street	Chatham Heights Road	4	110	Urban	\$18.98
218	White Oak Road	Deacon / Cool Springs Road	Caisson / Newton Road	4	110	Urban / Rural	\$55.13
218	White Oak Road	Caisson / Newton Road	King George County Line	2	60	Rural	\$7.06
600	Bethel Church Road	White Oak Road	King George County Line	2	60	Rural	\$9.90
601	Forest Lane Road	Kings Highway	Caisson Road	2	60	Urban / Rural	\$9.22
601	Hollywood Farm Road	Caisson Road	Kings Highway	2	60	Rural	\$8.84
602	Chapel Green Road	White Oak Road	King George County Line	2	60	Rural	\$5.58
603	Caisson Road	Kings Highway	White Oak Road	2	60	Rural	\$11.88
603	Newton Road	White Oak Road	Belle Plains Road	2	60	Rural	\$5.38
604	Belle Plains Road	White Oak Road	End of State Maintenance	2	60	Rural	\$15.05
604	McCarty Road	Forest Lane Road	White Oak Road	2	60	Rural	\$8.98
605	New Hope Church Road	White Oak Road	End of State Maintenance	2	60	Rural	\$9.57
606	Ferry Road	Kings Highway	White Oak Road	2	60	Urban	\$12.43
607	Deacon Road	Leeland Road	Brooke Road	4	110	Urban	\$18.14
608	Brooke Road	New Hope Church Road	End of State Maintenance	2	60	Urban / Rural	\$38.19
610	Garrisonville Road	Fauquier County Line	Joshua Road	2	60	Urban / Rural	\$19.03
610	Garrisonville Road	Joshua Road	Shelton Shop Road	4	110	Urban	\$28.56
610	Garrisonville Road	Shelton Shop Road	Jefferson Davis Highway	6	135	Urban	\$72.93
611	Widewater Road	Telegraph Road	Arkendale Road	2	60	Urban / Rural	\$13.93
612	Hartwood Road	Poplar Road	Warrenton Road	2	60	Rural	\$23.40

Route	Road Name	From	To	Future	R/W	Urban /Rural	Cost (in millions)
612	Heflin Road	Poplar Road	Tacketts Mill Road	2	60	Rural	\$3.96
614	Cropp Road	Spotted Tavern Road	Fauquier County Line	2	60	Rural	\$3.47
614	Spotted Tavern Road	Cropp Road	Hartwood Road	2	60	Rural	\$8.42
615	Skyline Drive	Cropp Road	Hartwood Road	2	60	Rural	\$5.94
616	Poplar Road	Warrenton Road	Fauquier County Line	2	60	Urban / Rural	\$33.04
621	Marlborough Point Road	Brooke Road	End of State Maintenance	2	60	Rural	\$8.42
624	Layhill Road	Forbes Street	Cambridge Street	4	110	Urban	\$2.52
624	Morton Road	Leeland Road	Primmer House Road	2	60	Urban	\$4.44
626	Leeland Road	Deacon Road	Morton Road	4	110	Urban	\$25.70
626	Leeland Road	Morton Road	Potomac Run Road	2	60	Urban / Rural	\$1.90
626	Potomac Run Road	Eskimo Hill Road	Leeland Road	2	60	Rural	\$7.69
627	Forbes Street	Cambridge Street	Layhill / Morton Road	2	60	Urban	\$9.61
627	Mountain View Road	Poplar Road	Choptank Road	2	60	Urban / Rural	\$11.77
627	Mountain View Road	Choptank Road	Stefaniga Road	4	120	Urban	\$20.83
627	Mountain View Road	Stefaniga Road	Centreport Parkway	2	60	Urban / Rural	\$14.76
628	Ramoth Church Road	Woodcutter Road extended	Interstate 95	4	110	Urban	\$38.30
628	American Legion Road	Interstate 95	Jefferson Davis Highway	4	110	Urban	\$5.54
628	Eskimo Hill Road	Jefferson Davis Highway	Brooke Road	2	60	Urban / Rural	\$9.97
628	Winding Creek Road	Courthouse Road	Shelton Shop Road	2	60	Urban	\$8.87
629	Andrew Chapel Road	Courthouse Road	Brooke Road	2	60	Urban / Rural	\$3.20
630	Courthouse Road	Spartan Drive	End of State Maintenance	2	60	Rural	\$11.25
630	Courthouse Road	Shelton Shop Road	Austin Ridge Drive	4	135	Urban	\$64.51
631	Bells Hill Road	Jefferson Davis Highway South	Jefferson David Highway North	2	60	Urban	\$7.76
633	Arkendale Road	Widewater Road	Brent Point Road	2	60	Rural	\$6.93
635	Decatur Road	Widewater Road	End of State Maintenance	2	60	Rural	\$9.74
637	Telegraph Road	Interstate 95	Woodstock Lane	2	60	Urban	\$10.40
639	Woodstock Lane	Telegraph Road	Jefferson Davis Highway	2	60	Urban	\$0.83

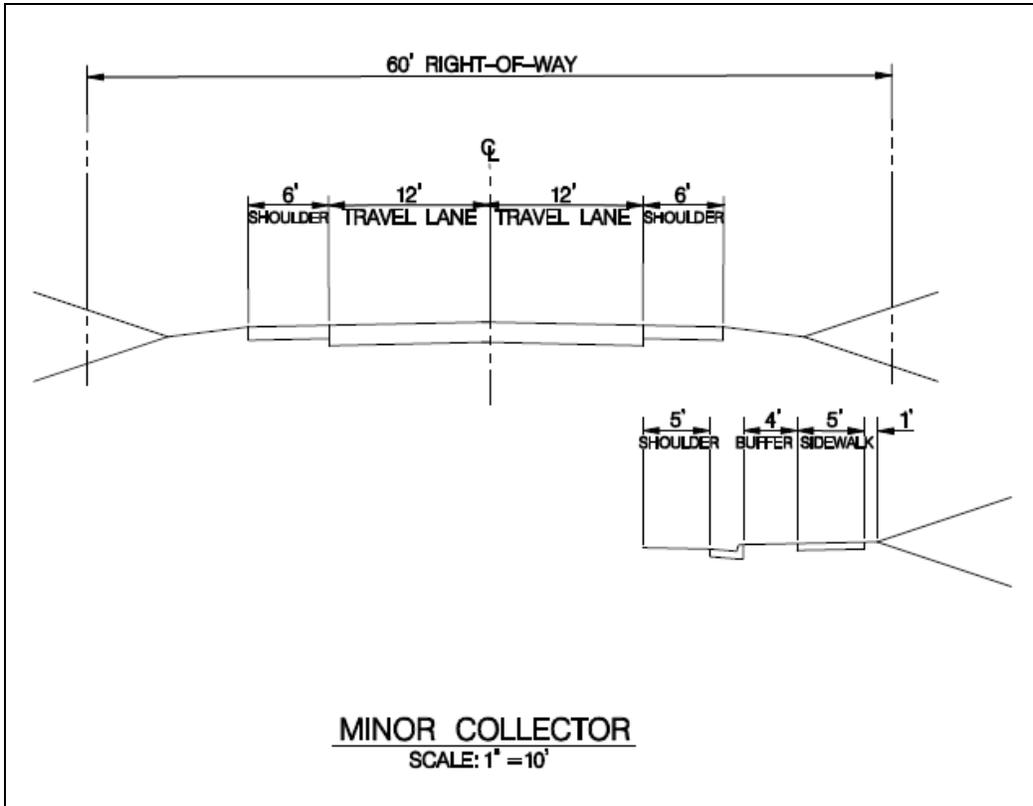
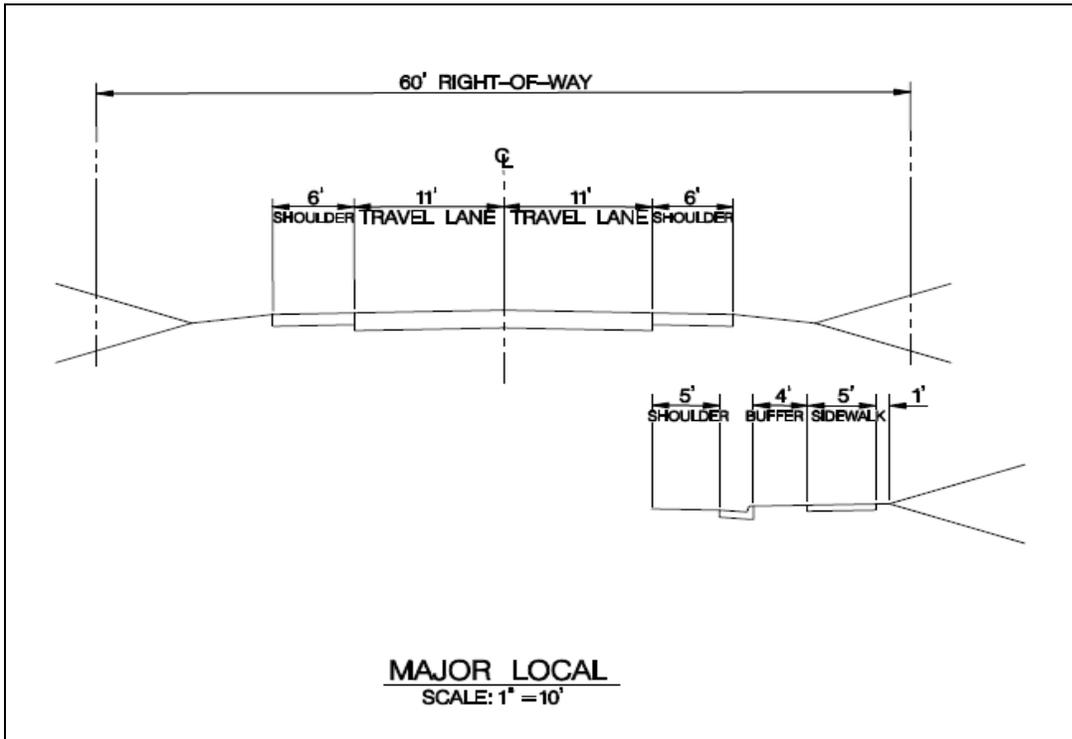
Route	Road Name	From	To	Future	R/W	Urban /Rural	Cost (in millions)
641	Onville Road	Garrisonville Road	Quantico Marine Corp Base	2	60	Urban / Rural	\$4.83
642	Barrett Heights Road	Garrisonville Road	Onville Road	2	60	Urban	\$3.23
643	Joshua Road	Garrisonville Road	Mountain View Road	2	60	Urban / Rural	\$8.47
644	Rock Hill Church Road	Mountain View Road	Garrisonville Road	2	60	Rural	\$9.04
645	Dunbar Road	Tacketts Mill Road	Rock Hill Church Road	2	60	Rural	\$4.95
646	Tacketts Mill Road	Poplar Road	Fauquier County Line	2	60	Rural	\$9.90
628	Ramoth Church Road	Woodcutter Road	Courthouse Road	2	60	Rural	\$7.43
640	Porter Lane	Enon Road	End of State Maintenance	2	60	Urban	\$1.06
648	Shelton Shop Road	Mountain View Road	Garrisonville Road	4	110	Urban	\$33.43
648	Stefaniga Road	Poplar Road	Mountain View Road	2	60	Rural	\$11.78
649	Richland Road	Warrenton Road	Hartwood Road	2	60	Rural	\$6.27
650	Mount Olive Road	Poplar Road	Kellogg Mill Road	2	60	Rural	\$9.21
651	Kellogg Mill Road	Poplar Road	Ramoth Church Road	2	60	Rural	\$14.06
652	Truslow Road	Poplar Road	Cambridge Street	2	60	Urban	\$31.23
654	Berea Church Road	Truslow Road	Warrenton Road	2	60	Urban	\$6.14
654	Rocky Run Road	Holly Corner Lane	River Acres Lane	2	60	Rural	\$4.85
654	Rocky Run Road	Greenbank Road	Burgess Lane	2	60	Rural	\$2.38
655	Holly Corner Road	River Ridge Lane	Warrenton Road	2	60	Urban / Rural	\$14.30
656	Greenbank Road	Warrenton Road	End of State Maintenance	2	60	Urban / Rural	\$8.32
658	Brent Point Road	Decatur Road	End of State Maintenance	2	60	Rural	\$16.43
670	Sanford Drive	Greenbank Road	Paul Lane	2	60	Urban / Rural	\$5.99
670	Sanford Drive	Paul Lane	Warrenton Road	4	110	Urban	\$11.26
682	Colebrook Road	Ferry Road	McCarty Road	2	60	Urban / Rural	\$6.39
684	Staffordboro Boulevard	Garrisonville Road	Sunningdale Drive	4	110	Urban	\$2.69
684	Staffordboro Boulevard	Sunningdale Drive	Pike Place	2	60	Urban	\$0.96
687	Hope Road	Jefferson Davis Highway	End of State Maintenance	2	60	Urban / Rural	\$12.86
691	Stony Hill Road	Hartwood Road	Poplar Road	2	60	Rural	\$9.57

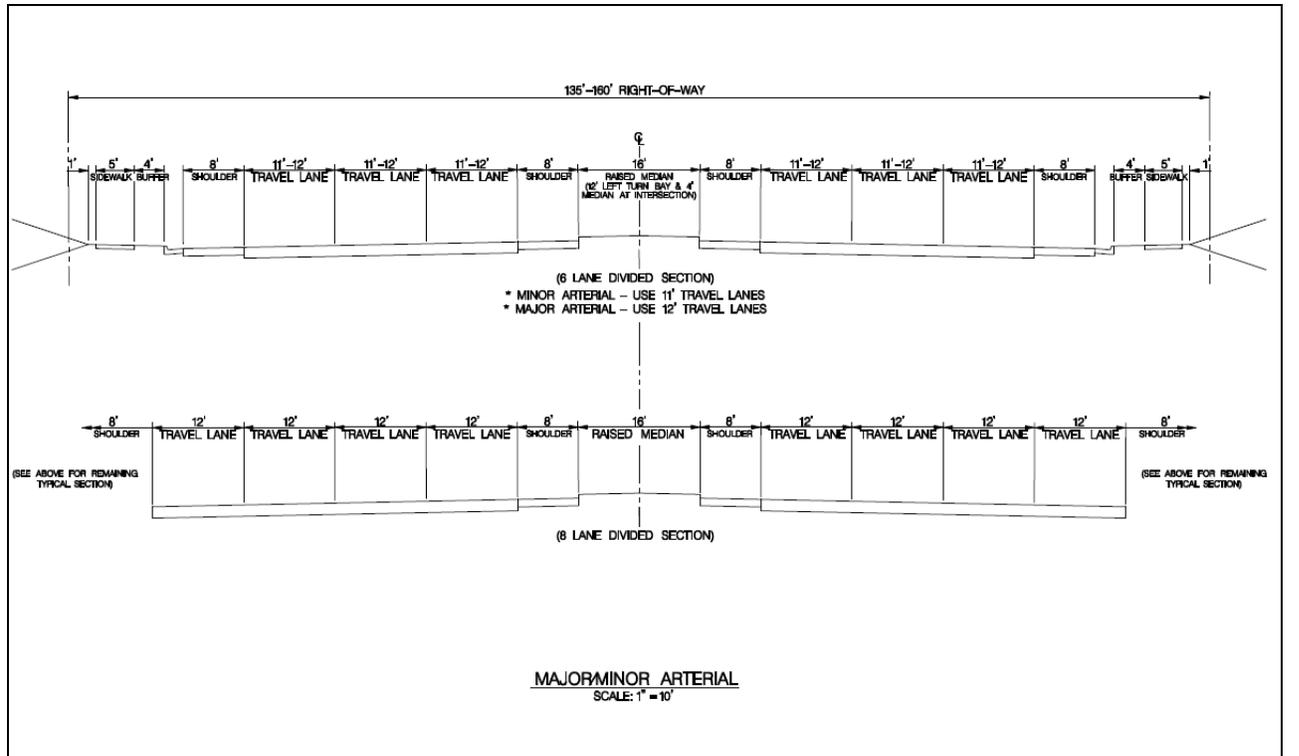
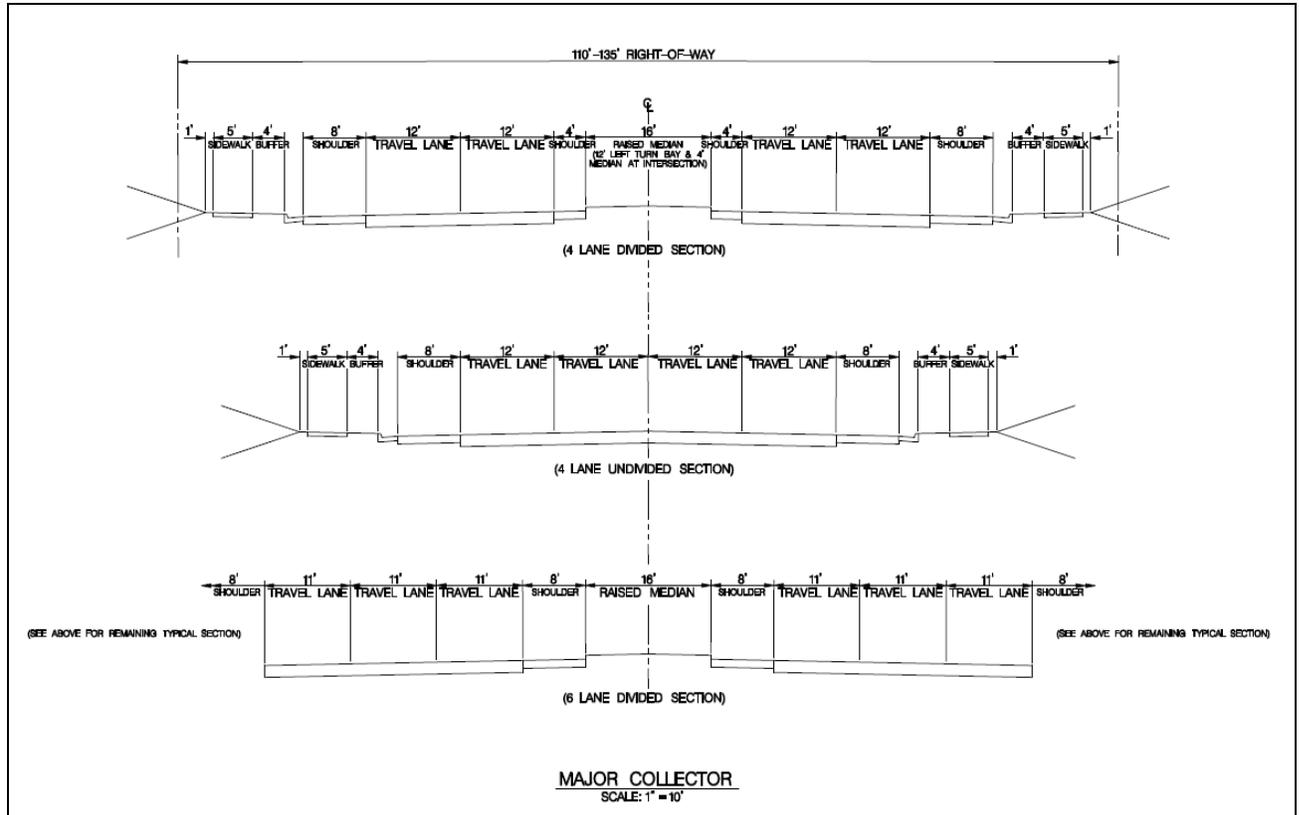
Route	Road Name	From	To	Future	R/W	Urban /Rural	Cost (in millions)
691	Storck Road	Warrenton Road	Hartwood Road	2	60	Rural	\$6.86
721	Olde Concord Road	Hope Road	End of State Maintenance	2	60	Urban	\$5.17
753	Enon Road	Porter Lane	Jefferson Davis Highway	4	110	Urban	\$3.53
753	Enon Road	Hulls Chapel Road	Truslow Road	4	110	Urban	\$6.89
753	Enon Road	Porter Lane	Hulls Chapel Road	2	60	Urban	\$1.57
754	Shackelford Well Drive	Hartwood Road	Poplar Road	2	60	Rural	\$6.01
1264	Parkway Boulevard	Garrisonville Road	Kimberly Lane	2	60	Urban	\$5.61
1706	Plantation Drive	Lichfield Boulevard	Truslow Road	4	110	Urban	\$19.15
2140	Pine View Drive	Centreport Parkway	Enon Road	2	60	Urban	\$2.91
8900	Centreport Parkway	Ramoth Church Road	Berea Parkway (new)	4	110	Urban	\$50.74

### New Roads

Road Name	From	To	Future	R/W	Urban / Rural	Cost (in millions)
New I-95 Connector East	US-1	Courthouse Road East	4	110	Urban	Unknown
Mine Road Extension	Austin Ridge Drive	Ramoth Church Road	4	110	Urban	\$96.77
Mine Road Extension	Centreport Parkway	Enon Road	4	110	Urban	\$20.43
Woodcutter Road	Courthouse Road	Kellogg Mill Road	4	110	Urban	\$35.75
Woodcutter Extended	Kellogg Mill Road	Ramoth Church Road	4	110	Urban	\$6.99
Austin Ridge Drive Extended	Eustace Road	Parkway Boulevard	2	60	Urban	\$12.10
Embrey Mill Road extended East	Embrey Mill Road	Mine Road	2	60	Urban	\$6.05
Embrey Mill Road extended West	Embrey Mill Road	Walpole Street	2	60	Urban	\$2.87
Eskimo Hill Connector	Jefferson Davis Highway	Eskimo Hill Road	2	60	Urban / Rural	\$7.75
Kellogg Mill Road extended	Woodcutter Road	Mine Road extended	2	60	Urban	\$17.39
Truslow Road Connector	Truslow Road	Jefferson Davis Highway	2	60	Urban	\$7.56
Warrenton Road Parallel Road	Sanford Drive	Stafford Lakes Parkway	2	60	Urban	\$14.52
Truslow Road extended	Poplar Road	Warrenton Road	4	110	Urban	\$10.75
New I-95 Interchange at Courthouse Road	Courthouse Road West	Jefferson Davis Highway	TBD	TBD	Urban	Unknown

### Typical Roadway Sections





**APPENDIX H: STAFFORD REGIONAL AIRPORT LAND USE COMPATIBILITY STUDY*****A. Introduction***

The Stafford Regional Airport is located in an area of the County that is anticipated to experience growth in the future. The area surrounding the Stafford Regional Airport was primarily agricultural and rural residential with very low density housing when it was initially sited in 1987. The growth pattern in the area has changed since that time with the construction of the Centerport Parkway in 2006 and amendments to the Future Land Use Plan in 2010 which allows for the potential of higher density development. The Airport Master Plan anticipates the extension of the existing runway and an increase in operations.

The Comprehensive Plan recognizes the need to plan for growth that is compatible with the airport in the following ways:

Chapter 2 (page 2-26) includes a recommendation for the development of land use compatibility standards:

*Objective 4.9. Minimize the noise impacts and potential safety hazards generated by general aviation at public and private airfields in the County.*

*Policy 4.9.1. The County should develop land use compatibility standards for new development to conform to within the aircraft approach patterns of airports and landing strips.*

Chapter 6 (page 6-10) includes the recognition of the current zoning overlay district:

*Overlay Districts*

*In addition to the base zoning districts, the Stafford County Zoning Ordinance contains eight overlay districts. The purposes of the districts vary from protecting historical and environmental resources, reducing conflicts between established facilities, and mitigating potential hazards.*

*Overlay districts add a variety of standards to the underlying districts. These standards could include use restrictions, preservation requirements, or stricter density regulations. The following is a list of the overlay districts used in Stafford County:*

*AD Airport Impact - Provides an overlay zone in areas subject to intense and/or frequent emissions of noise and vibration from airports and prevents obstructions of airport zones which may result in an air navigation hazard.*

An Airport Planning Area is established in order to further define and address the specific planning considerations related to land use compatibility including potential impacts related to exposure to aircraft noise, land use safety with respect both to people on the ground and the occupants of aircraft; the protection of airport airspace; and general concerns related to aircraft overflights. The Airport Planning Area consists of Airport Impact Zones that are defined in section C of this chapter.

***B. Background of the Stafford Regional Airport***

The Stafford Regional Airport is located in the center of Stafford County and is situated approximately 40 miles southwest of Washington D.C., 50 miles north of Richmond, Virginia and approximately 5 miles north of Fredericksburg, Virginia.

The need for a new public general aviation airport in Stafford County was determined in 1972 as part of the National Airport System Plan. In 1977 Stafford County conducted a feasibility study which detailed a need for a transport category airport in the region. A series of environmental studies were conducted between 1977 and 1992 and resulted in the final selection of an airport site in the central Stafford County area, adjacent to Interstate 95. Construction of the Airport began in 1997 and the airport opened in December 2001. The Airport was completed for just over \$41M dollars, \$5M under its allocated budget. This included an investment of \$820k from the Stafford Regional Airport Authority, almost \$39M from the Federal Aviation Administration (FAA) and approximately \$1.25M in Commonwealth of Virginia funding. The Airport Improvement Program Handbook states, with regard to any airport sponsor, "It (the airport sponsor) will take the appropriate action, to the extent reasonable, including the adoption of zoning laws, to restrict the use of land adjacent to or in the immediate vicinity of the airport to activities and purposes compatible with normal airport operations, including landing and takeoff of aircraft."

Significant airport development of more than \$14M has occurred since the Airport was originally constructed with the bulk coming from the FAA. This construction includes the addition of T- Hangars, two corporate hangars, apron areas, auto parking, fuel farm, security fencing, an instrument landing system (ILS), an approach lighting system and a new terminal building that opened in January 2014. The FAA and DOAV provide nearly all of the funding for future airport improvements and it is imperative that Stafford County establish and maintain high quality development compatibility standards to insure that future expenditures are used to improve the airport instead of noise abatement measures due to poor development planning.

The Airport is governed by a seven member Airport Authority (Stafford Regional Airport Authority or SRAA). These appointed members serve four year terms and represent Stafford County (four members), Prince William County (two members), and the City of Fredericksburg, Virginia (one member). A fulltime airport manager is located at the Stafford Regional Airport and handles the daily operation of the facility.

The Stafford Regional Airport service area includes Stafford County and portions of eight surrounding counties plus the City of Alexandria and Washington D.C. as determined by the Virginia Department of Aviation (DOAV) 2003 Virginia Air Transportation System Plan (VATSP) and airport records.

The Stafford Regional Airport is served by a single 5,000' x 100' grooved runway (15-33) as shown on the Airport Layout Plan in Exhibit 1. This runway is oriented 150 and 330 degrees and has a full-length parallel taxiway. Runway 15-33 utilizes High Intensity Runway Lights (HIRL) which can be operated by pilots using the Airport's Unicom frequency (122.725). Medium

Intensity Taxiway Lighting (MITL) is also available to pilots to assist in night operations, giving the facility 24-hour operational capability.

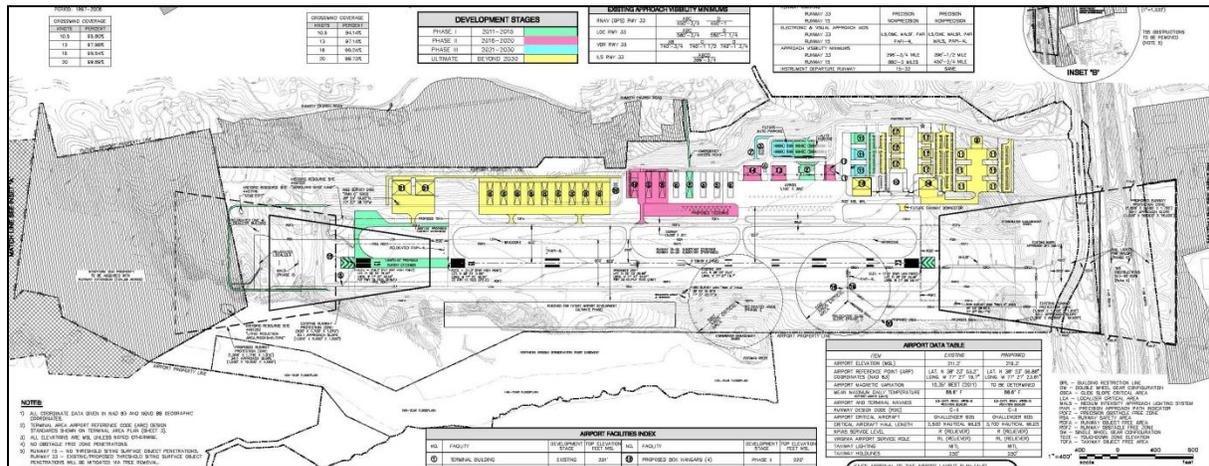


Exhibit 1: Airport Layout Plan

The Stafford Regional Airport currently has three instrument approach procedures consisting of an ILS approach, VOR approach, and a GPS approach. The ILS is an Instrument Landing System which uses radio waves broadcast from the Airport to align aircraft with the approach path to the runway. Runway 33 at the Airport has a Category 1 ILS System which enables aircraft with IFR (Instrument Flight Rules) equipment to land at RMN in inclement weather. Non-Precision instrument approaches (GPS or RNAV) for runway 15 have been developed and reviewed by the FAA but not implemented at this time.

Aircraft operating at the Stafford Regional Airport use existing traffic patterns based on the type and speed of the aircraft. The Airport currently operates with a standard left-hand traffic pattern for runway 33 and a nonstandard right-hand pattern for runway 15 as shown in Exhibit 2. This nonstandard pattern was temporarily implemented due to the proximity of a landfill which can serve as a bird attractant. Airport layout plans call for reinstating the standard left-hand traffic pattern on Runway 15 once the closest landfill cell to the Airport is closed as shown in Exhibit 3.

An operation is defined as either a takeoff or a landing at the airport. Existing airport activity exceeds 23,000 operations per year and a modest growth rate of approximately 1,000 operations per year for the next several years is projected. This figure is supported by the FAA and DOAV as indicated in the approved Airport Master Plan update that was completed in April 2013.

According to the 2011 Virginia Statewide Economic Impact Study, the Stafford Regional Airport provided 105 direct and indirect jobs and contributed \$18.2M in economic activity to the region in 2010. This impact demonstrates the value that the Stafford Regional Airport adds to the region as an economic engine.

(Source: *Stafford Regional Airport Compatible Land Use Study, May 2014, Talbert and Bright, Inc.*)

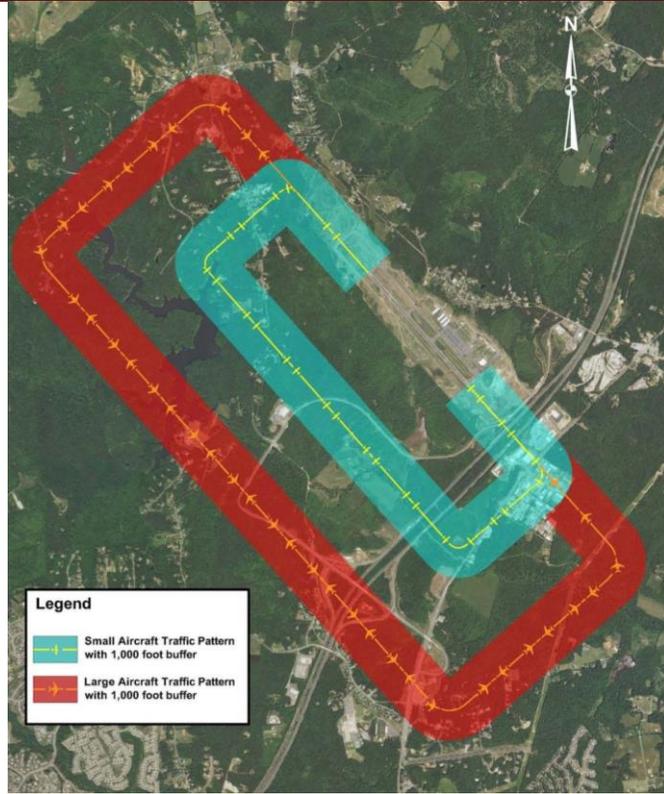


Exhibit 2: Non-standard Traffic Pattern

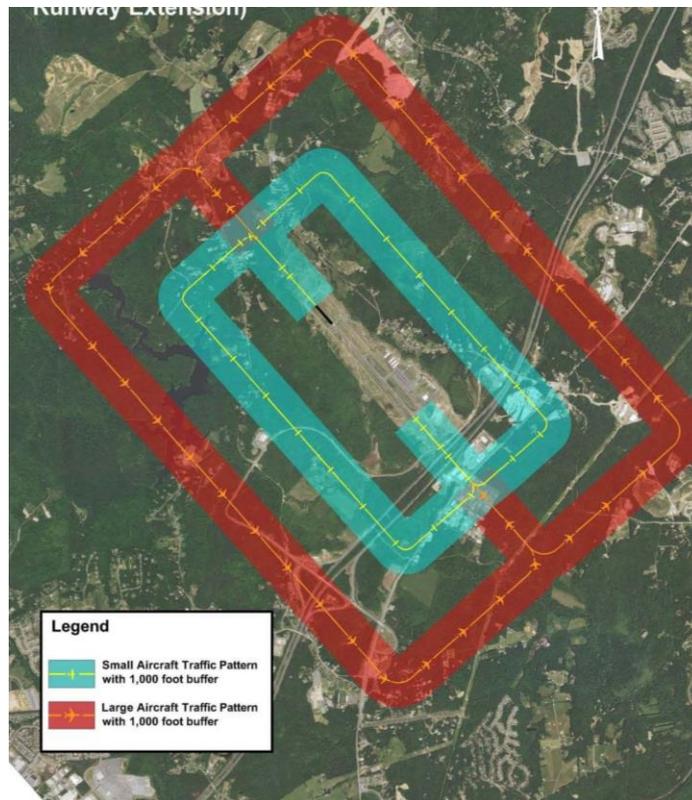


Exhibit 3: Standard Traffic Pattern

### **C. Airport Impact Zones**

The Airport Impact Zones that make up the Airport Planning Area define and address the specific planning considerations related to land use compatibility in the area identified in the Airport Impact Overlay District and the Stafford Regional Airport Master Plan. The specific planning considerations include potential impacts related to exposure to aircraft noise, land use safety with respect both to people on the ground and the occupants of aircraft; the management of airport airspace; and general concerns related to aircraft overflights. This Plan designates Airport Impact Zones that closely correspond with the existing Airport Impact Zoning Overlay District. The zones are utilized in establishing the corresponding land use compatibility standards.

**Approach zones** reflect the approach and departure areas for the runway and are divided into several sub areas.

***Approach –Final, Runway Protection Zone (AP-1).*** The closest area at the end of each runway, beginning 200-feet from the end of each runway, extending approximately two thousand five hundred (2,500) feet to the east and one thousand seven hundred (1,700) feet to the west.

***Approach – Mid (AP-2).*** The area that fans out from the Runway Protection Zone, extending fourteen thousand (14,000) feet to the east and ten thousand (10,000) feet to the west.

***Approach – Outer (AP-3).*** The area that fans out to the east of the runway that extends from fourteen thousand (14,000) feet to fifty thousand (50,000) feet from the runway.

***Approach – Transitional (AP-T).*** A 5,000 foot wide area extending along each side of the Outer Approach, beyond the Conical zone.

***Transitional (T).*** The area that fans away perpendicular to any airport runway centerline and approach surfaces

**Horizontal** zones include the area that is established by swinging arcs of ten thousand (10,000) feet radii from the center of the end of the primary surface of an airport runway and connecting adjacent arcs by drawing lines tangent to those areas. The horizontal zone excludes the approach and transitional zones. The area is divided into two sub-areas for the purpose of land use compatibility.

***Horizontal – Inside Flight Pattern (H-1).*** The inner portion of the Horizontal zone that encompasses the majority of the existing and future aircraft traffic patterns.

***Horizontal – Outside Flight Pattern (H-2).*** The outer portion of the Horizontal Zone that encompasses the outer edge of the Jet/Turboprop (large) aircraft traffic patterns.

***Horizontal – Turning Areas (H-3).*** The area of the Horizontal zone that encompasses the portion of the traffic pattern area where turning movements occur, where aircraft generate louder noise and there is increased accident probability.

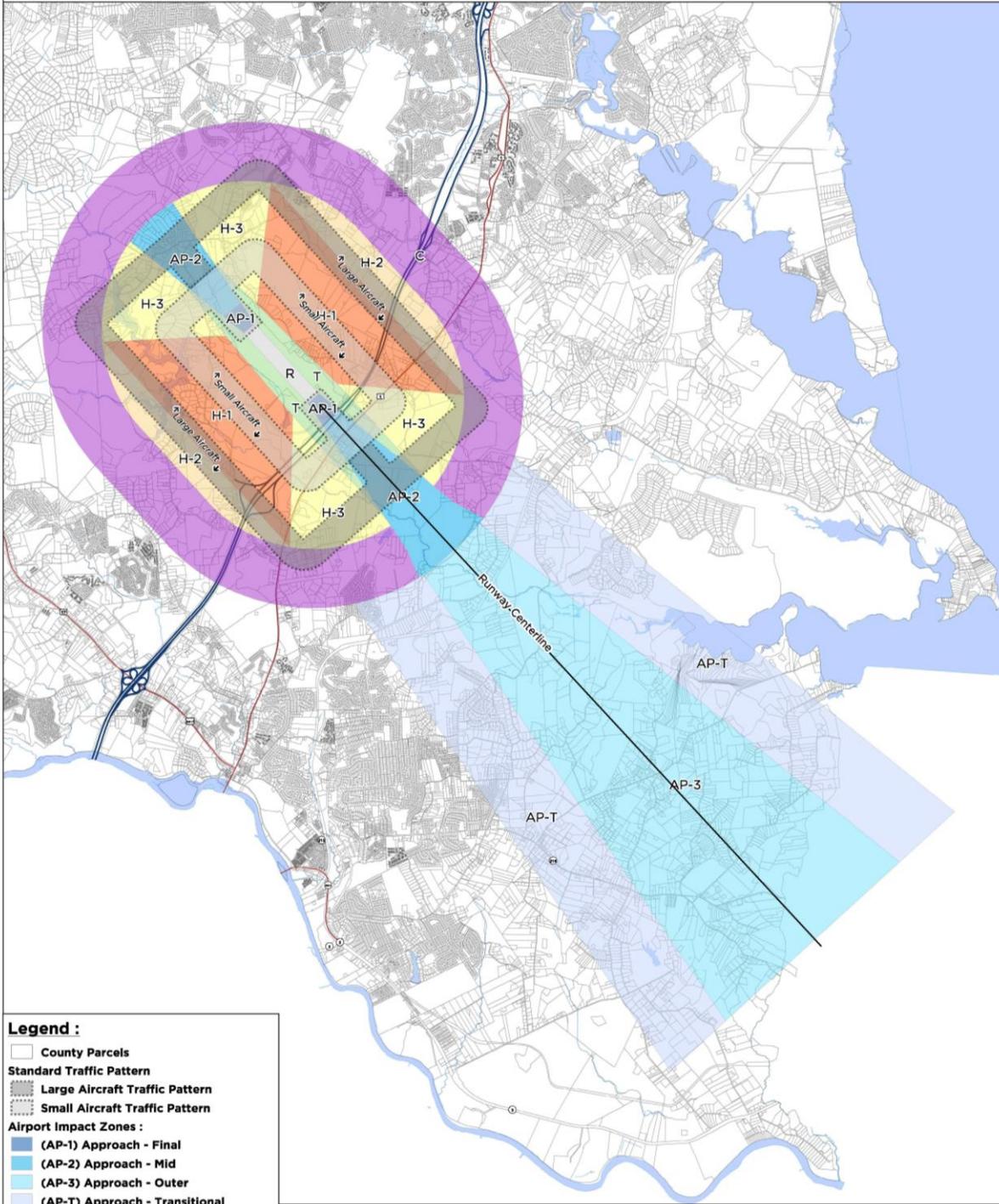
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**Conical (C).** The area that surrounds and commences at the periphery of the horizontal zone (10,000 feet from the Runway Clear Zone) and extends outward from there for a distance of four thousand (4,000) feet.



# Airport Land Use Compatibility Zones With Parcels

Produced by the Stafford County GIS Office  
540-658-4033 | www.StaffordCountyGIS.org



**Legend :**

- County Parcels
- ▨ Standard Traffic Pattern
- ▨ Large Aircraft Traffic Pattern
- ▨ Small Aircraft Traffic Pattern
- Airport Impact Zones :**
- (AP-1) Approach - Final
- (AP-2) Approach - Mid
- (AP-3) Approach - Outer
- (AP-T) Approach - Transitional
- (C) - Conical Zone
- (H-1) Horizontal Inside Flight Pattern
- (H-2) Horizontal Outside Flight Pattern
- (H-3) Horizontal Turning Zone
- (R) Runway
- (T) Transitional

0 0.75 1.5 3 Miles

Coordinate System: NAD 1983 HARN StatePlane Virginia North FIPS 4501 Feet  
 Produced: 1/7/2015  
 Mxd Path: W:\users\gis\workspace\Planning\Airport Impact Analysis\AirportImpactOverlay300x2\_Parcel.mxd

Data layers are compiled from various sources and are not to be construed or used as a "legal description." Data layers are believed to be accurate, but accuracy is not guaranteed.

***D. Land Use Compatibility Guidelines***

The following guidelines are proposed in order to better address the potential for incompatible land uses and development within the Airport Planning Area:

**GOAL:** Stafford County shall promote the appropriate use of land in the Airport Planning Area to maintain and support the viability of the Stafford Regional Airport and protect and promote the general health, safety, welfare of the citizens, and overall economy in the airport area.

**OBJECTIVE 1:** Identify the compatibility of various land uses and establish development standards in relation to airport operations to minimize potential impacts related to exposure to aircraft noise, land use, and safety with respect both to people on the ground and the occupants of aircraft and ensure the protection of airport airspace.

**Policy 1.1** General concerns related to aircraft overflights shall be identified and mitigated during the development review process for all applications for uses within the Airport Planning Area.

**Policy 1.2:** All development within the Airport Planning Area shall be consistent with the Land Use Compatibility Matrix (Table 1) that identifies whether uses are Compatible, require Additional Review or are Incompatible within each Airport Impact Zone.

**Policy 1.3:** The compatibility guidelines shall be applied in conjunction with the requirements of the Future Land Use Plan recommendations.

**Policy 1.4:** The impacts of the following factors shall be considered for any development application within the Airport Planning Area:

1. Height of all structures and vegetation per the FAR Part 77 requirements;
2. Management of earth disturbances and the creation of open dirt areas during activities such as farming and construction to minimize dust emissions;
3. Reflective surfaces which cause glare, including storm water retention ponds, solar panels and/or light-colored or mirrored building materials;
4. Light emissions shining upward into the flight path, flashing lights or lights arranged in a linear pattern;
5. Uses that generate smoke, steam or fog;
6. Potential to attract wildlife and create habitat, such as open space and agricultural uses;
7. Number of people per unit of area per proposed use;
8. Existence of above ground storage of large quantities of materials that are hazardous, such as flammable, explosive, corrosive, or toxic materials;
9. Location of proposed uses where mobility of users is limited, such as schools, hospitals and nursing homes;
10. Location of critical community infrastructure, such as power plants, electrical substations, and public communications facilities, away from areas where damage or destruction could occur and cause significant adverse effects to public health and welfare beyond the immediate vicinity of the facility;

11. Proposed percentage of open space, including usable open space, in relation to the development area. For the purposes of this document, usable open space should be open areas that are long, level and free of obstacles that could serve as an emergency landing site to promote public safety. The ideal site would be at least 300 feet by 75 feet and be clear of obstacles;
12. Compatibility of all proposed uses with the Compatibility Matrix in Table 1.

Policy 1.5: The following standards shall apply to all development within the Airport Planning Area:

1. Final subdivision plats, site specific development plans, or any other document filed as part of any approval process with Stafford County shall contain the following disclosure statement:

*All or a portion of this property lies within the Airport Overlay District.  
Persons on the premises may be exposed to noise and other effects as may  
be inherent in airport operations;*
2. Avigation easements shall be dedicated to Stafford Regional Airport for all new residential, commercial, industrial, institutional or recreational buildings or structures intended for habitation or occupancy by humans or animals to allow unobstructed passage for aircraft related to the height requirements per FAR Part 77;
3. Applicable use restrictions shall apply only to the area of development within the respective compatibility zone;
4. Height restrictions are effective at all times;
5. Underground utilities are encouraged for all development located within approach zones (AP-1 & AP-2) and traffic pattern areas (H-1, H-2, & H-3);
6. Minimize the occurrence of sunlight glare and wildlife attractants from stormwater management ponds affecting pilots by limiting the size of ponds to under ½ acre in size and encouraging dry ponds;
7. All development within the Airport Planning Area must, at a minimum, be consistent with Federal Aviation Regulation Part 77 and Advisory Circular 150/5300-13A and any subsequent revisions.

Policy 1.6: Uses identified in Table 1 as requiring “Additional Review” shall follow the specific development standards identified in Table 2. The factors to consider during “Additional Review” shall include, but may not be limited to: size, scope and scale of a development, such as the area, building height, and number and square footage of structures; proposed use(s); location of the development in relation to the airport; location of uses on an individual site; proposed mitigation measures; population concentrations; and project externalities, defined as impacts related to the development of the project that may extend beyond the limits of the project both horizontally and vertically.

Policy 1.7: The following additional standards shall apply to Non-Residential Uses that require Additional Review in Table 1:

1. Activities and structures associated with the use shall not exceed the maximum building envelope ratio and/or site population limitation;
2. Incorporate shielding, such as the use of full cut-off lighting, lower intensity or other techniques to avoid the occurrence of light emissions shining upward into the flight path; flashing lights; or lights arranged in a linear pattern;
3. Waste disposal facilities shall not be located within 10,000 feet of the runway protection zone;
4. Provision of new private airfields or runways shall not be permitted within the planning area;
5. Additional open space requirements, height limitations and square footage limitations will apply to uses with concentrations of people.

Policy 1.8: The following additional standards shall apply to Residential Uses that require Additional Review in Table 1:

1. Development proposals shall not exceed the maximum density limitations established and further described in the Table 2 Additional Review Standards;
2. Development within the airport operations area shall be constructed to include sound insulation methods to achieve maximum internal noise levels of 45 dBc Ldn (average daily noise level);
3. Disclosure notification for all future purchasers of the property will be required for all residential development within an airport compatibility zone;
4. Provide contiguous open space in conjunction with clustering of residential development areas.

Policy 1.9: Specific projects which are Not Compatible, as identified in Table 1 may be appropriate if it can be demonstrated that the specific project would not negatively impact airport operations or safety of the general public upon additional review, consistent with the guidelines.

Policy 1.10: If a proposed use is not listed in Table 1, the use determined to be most similar would apply and would be evaluated against the related Additional Review criteria and any other standards deemed appropriate.

Policy 1.11: The County shall support efforts of the Airport Authority or other entity to acquire land and/or purchase development rights by coordinating receiving areas outside of the planning area in order to encourage compatible land uses within the planning area.

#### IMPLEMENTATION POLICIES

Policy 1.12: For projects in the Airport Planning Area, the County shall coordinate review of all proposed development applications, including, but not limited to, zoning reclassifications, conditional use permits, site plans, and preliminary plans, with the Airport Authority for compatibility with airport operations and plans for the purpose of receiving advisory comments and encouraging participation at County development review meetings.

Policy 1.13: The Zoning Ordinance shall be revised to implement the Compatibility Guidelines recommendations, including use restrictions, and development and building standards, and make commensurate adjustments to the Airport Overlay District.

Policy 1.14: Comprehensive Plan amendments and Ordinance amendments applicable to land within the Airport Planning Area shall be reviewed for compatibility with the Regional Airport Master Plan, Compatibility Matrix (Table 1) and related criteria and standards.

**TABLE 1: CONSOLIDATED LAND USE COMPATIBILITY MATRIX**

ZONE CODE	AP-1	AP-2	AP-3	AP-T	T	H-1	H-2	H-3	C
ZONE DESCRIPTION	APPROACH - FINAL RUNWAY PROTECTION ZONE	APPROACH - MID -14,000' EAST -10,000' WEST	APPROACH - OUTER (EAST)	APPROACH - TRANSITIONAL	TRANSITIONAL ZONE	HORIZONTAL ZONE - INSIDE FLIGHT PATTERN	HORIZONTAL ZONE - OUTSIDE FLIGHT PATTERN	HORIZONTAL - TURNING ZONE	CONICAL ZONE
USES									
<b>INSTITUTIONAL</b>									
<i>Assembly</i> (schools, place of worship, daycare)	NC	NC	AR	C	NC	AR	AR	NC	C
<i>Hospitals</i>	NC	NC	AR	C	NC	AR	AR	NC	C
<i>Community</i> (Police, fire and rescue, neighborhood centers)	NC	AR	AR	C	AR	AR	C	AR	C
<i>Vertical Infrastructure</i> (Electric Transmission, Water Towers, Telecommunication Towers)	NC	NC	AR	AR	NC	AR	AR	AR	AR
<b>RESIDENTIAL</b>									
<i>Single-Family - Rural</i> (Maintain 3 acre density with min. lot size of 1 acre outside the USA, while inside the USA, lot sizes can be smaller than 1 acre if significant areas are retained for open space and the lowest density recommendations of the land use plan are not exceeded)	NC	AR	AR	C	NC	AR	AR	AR	C
<i>Single-family - Small Lot (&lt;1 acre) &amp; Townhomes</i>	NC	NC	AR	C	NC	AR <sup>1</sup>	AR <sup>1</sup>	NC	C
<i>Multi-Family</i> (Three or more units per building)	NC	NC	AR	C	NC	AR <sup>1</sup>	AR <sup>1</sup>	NC	C
<i>Group Living</i> (Nursing homes, group homes)	NC	NC	AR	C	NC	AR	AR	NC	C
<i>Transient Lodging</i>	NC	AR	C	C	NC	AR	AR	AR	C
<b>COMMERCIAL (RETAIL/OFFICE)</b>									
<i>General Retail &amp; Service</i> (shopping centers & stores, restaurants, convenience, vehicle fueling)	NC	AR	C	C	AR	AR	C	AR	C
<i>Automobile related</i> (sales lot, repair, storage)	NC	C	C	C	AR	C	C	C	C
<i>Low-rise Office</i> (1-3 stories)	NC	AR	C	C	AR	AR	C	AR	C
<i>Mid/High-rise Office</i> (4+ stories)	NC	NC	AR	C	NC	AR	AR	NC	C
<b>INDUSTRIAL</b>									
<i>Light</i> (Light Manufacturing, Storage, Warehouse)	NC	AR	C	C	AR	AR	C	C	C
<i>Heavy</i> (Landfill, Heavy Manufacturing, bulk fuel storage, mining, uses that emit smoke or create sun glare)	NC	NC	NC	AR	NC	AR	AR	AR	AR

<sup>1</sup> Residential uses within zones H-1 and H-2 are discouraged. Individual projects may be considered appropriate if it is determined that it satisfactorily addresses the Additional Review factors highlighted in Table 2.

ZONE CODE	AP-1	AP-2	AP-3	AP-T	T	H-1	H-2	H-3	C
ZONE DESCRIPTION	APPROACH - FINAL RUNWAY PROTECTION ZONE	APPROACH - MID -14,000' EAST -10,000' WEST	APPROACH - OUTER (EAST)	APPROACH - TRANSITIONAL	TRANSITIONAL ZONE	HORIZONTAL ZONE - INSIDE FLIGHT PATTERN	HORIZONTAL ZONE - OUTSIDE FLIGHT PATTERN	HORIZONTAL - TURNING ZONE	CONICAL ZONE
USES									
RECREATION AND OPEN SPACE									
<i>Passive</i> (trails & natural areas)	NC	AR	C	C	NC	AR	C	AR	C
<i>Active</i> (community sports fields, golf, indoor facilities)	NC	AR	AR	C	NC	AR	C	AR	C
<i>Amusement</i> (Stadiums, amusement parks, fairgrounds)	NC	NC	AR	C	NC	AR	AR	NC	C
AGRICULTURAL									
<i>Grazing, Crops</i>	AR	AR	C	C	AR	AR	C	AR	C
<i>Processing</i> (Lumber mill, grain elevators and silos)	NC	NC	C	C	NC	AR	AR	AR	AR
OTHER									
<i>Aboveground storage tanks of fuel and flammable materials (except residential uses)</i>	NC	NC	NC	C	NC	NC	C	NC	C

Key: **C** = Compatible  
**AR** = Additional Review – uses or activities that may be compatible with airport operations depending on their location and specifics of each project. Refer to design standards.  
**NC** = Not Compatible – uses or activities that should not be permitted

**ADDITIONAL REVIEW STANDARDS**

Overview

Uses identified in Table 1 requiring “Additional Review” shall follow the specific development standards identified in Tables 2 and 3. The factors to consider during “Additional Review” shall include, but may not be limited to: size, scope and scale of a development, such as the area, building height, and number and square footage of structures; proposed use(s); location of the development in relation to the airport; location of uses on an individual site; proposed mitigation measures; population concentrations; and project externalities, defined as impacts related to the development of the project that may extend beyond the limits of the project both horizontally and vertically.

Residential proposals (Single-family - small lot & Multi-family) within the H-1 and H-2 zones

In consideration of a new residential rezoning request from the A-1 or A-2 zoning district, where all of the Additional Review criteria is satisfied, projects not exceeding a density increase of 50% over the current density may be considered Compatible. Rezoning from any commercial or other residential zoning district that adds or increases the permitted residential density is considered Not Compatible.

Uses in the AP-3, Approach Outer zone requiring Additional Review

Given the size and extent of the AP-3 zone, which extends east to King George County, uses may be deemed more compatible the farther away they are from the airport. Application of the additional review standards will be based on the location on a case by case basis and dependent on the site conditions and specific development proposal.

**TABLE 2: ADDITIONAL REVIEW STANDARDS**

<u>USE</u>	<u>ZONE(S) REQUIRING ADDITIONAL REVIEW</u>	<u>STANDARD</u>
<b>INSTITUTIONAL</b>		
<i>Assembly (schools, place of worship, daycare)</i>	H-1; H-2	<ul style="list-style-type: none"> <li>• Limit population concentration thresholds within the low to mid- level range (see Table 3);</li> <li>• Limited to independently mobile populations;</li> <li>• Public and private grade schools and stand-alone daycare are not permitted;</li> <li>• Provide usable open space.</li> </ul>
<i>Assembly (schools, place of worship, daycare)</i>	AP-3	<ul style="list-style-type: none"> <li>• Uses considered generally compatible; siting located laterally offset of the extended centerline of the runway is preferred.</li> </ul>

<u>USE</u>	<u>ZONE(S) REQUIRING ADDITIONAL REVIEW</u>	<u>STANDARD</u>
<i>Hospitals</i>	AP-3; H-1; H-2	<ul style="list-style-type: none"> <li>• Permitted if deemed a critical service need by the Fire/Safety division;</li> <li>• Limited to independently mobile patients and/or short term care of critical patients or use as a triage center;</li> <li>• Provide usable open space;</li> <li>• Limit building height to 1 story.</li> </ul>
<i>Community (Police, fire and rescue, neighborhood centers)</i>	AP-2; AP-3; T; H-1; H-3	<ul style="list-style-type: none"> <li>• Emergency services are permitted if deemed a critical service need by the Fire/Safety division;</li> <li>• Provide usable open space.</li> </ul>
<i>Vertical Infrastructure (Electric Transmission, Water Towers, Telecommunication Towers)</i>	AP-T; H-1; H-2; H-3; C	<ul style="list-style-type: none"> <li>• Permitted if it does not interfere with airport communications and does not exceed height limitations, or otherwise causes safety concerns;</li> <li>• Monopole type of structure is preferred over lattice or guy-wire type;</li> <li>• Consider the height of the tower in relation to the site elevation.</li> </ul>
<b>RESIDENTIAL</b>		
<i>Single-Family - Rural (Maintain 3 acre density with min. lot size of 1 acre outside the USA, while inside the USA, lot sizes can be smaller than 1 acre if significant areas are retained for open space and the lowest density recommendations of the land use plan are not exceeded)</i>	AP-2; AP-3; H-1; H-2; H-3	<ul style="list-style-type: none"> <li>• Encourage clustering with usable open space requirement;</li> <li>• Encourage TDR program participation as a sending area;</li> <li>• Require real estate disclosure notice on initial deed of transfer within the AP-2, H-1, H-2, and H-3 zones;</li> <li>• Require notification statement on all plans of development and marketing literature;</li> <li>• Encourage noise mitigation measures as part of construction if under the flight pattern to reduce internal noise levels at or below 45dB.</li> </ul>
<i>Single-family - Small Lot (less than 1 acre) &amp; Townhomes</i>	AP-3	<ul style="list-style-type: none"> <li>• Encourage clustering with usable open space requirement;</li> <li>• Minimum of 50 percent overall open space, including usable open space;</li> <li>• Require notification statement on all plans of development and marketing literature.</li> </ul>

<b><u>USE</u></b>	<b><u>ZONE(S) REQUIRING ADDITIONAL REVIEW</u></b>	<b><u>STANDARD</u></b>
<i>Single-family - Small Lot (less than 1 acre) &amp; Townhomes</i>	H-1, H-2	<ul style="list-style-type: none"> <li>• Use prohibited within 3000 feet of the centerline of the runway;</li> <li>• Areas of a proposal located within routine overflight zone should meet the usable and site open space requirements;</li> <li>• Development should be clustered outside of the overflight zone area;</li> <li>• Require real estate disclosure notice on initial deed of transfer;</li> <li>• Require notification statement on all plans of development and marketing literature;</li> <li>• Encourage noise mitigation measures as part of construction if under the flight pattern.</li> </ul>
<i>Multi-Family (Three or more units per building)</i>	AP-3; H-1; H-2	<ul style="list-style-type: none"> <li>• Use prohibited within 3000 feet of the centerline of the runway;</li> <li>• Areas of a proposal located within routine overflight zone traffic pattern should be utilized to meet the usable and site open space requirements within a residential development; Cluster residential density outside of the overflight area if feasible;</li> <li>• Limit number of units per building;</li> <li>• Limit height to three stories;</li> <li>• Require real estate disclosure notice on initial deed of transfer within the H-1 and H-2 zones;</li> <li>• Require notification statement on all plans of development and marketing literature;</li> <li>• Encourage noise mitigation measures as part of construction if under the flight pattern.</li> </ul>
<i>Group Living (Nursing homes, group homes)</i>	AP-3; H-1; H-2	<ul style="list-style-type: none"> <li>• Population concentration thresholds within low to mid-level range shall not be exceeded (see Table 3);</li> <li>• Limited to independently mobile patients;</li> <li>• Require notification statement on all plans of development and marketing literature.</li> </ul>
<i>Transient Lodging</i>	AP-2; H-3	<ul style="list-style-type: none"> <li>• Use should not exceed a height of 3 stories;</li> <li>• Population concentration thresholds within low to mid-level range shall not be exceeded (see Table 3);</li> <li>• Encourage noise mitigation measures as part of construction if under the flight pattern;</li> <li>• Parking lot lighting shall not be linear in design to avoid confusion with runway lighting.</li> </ul>

<u>USE</u>	<u>ZONE(S) REQUIRING ADDITIONAL REVIEW</u>	<u>STANDARD</u>
<i>Transient Lodging</i>	H-1; H-2	<ul style="list-style-type: none"> <li>• Use should not exceed a height of 3 stories;</li> <li>• Population concentration limits for site and single-acre shall not be exceeded (see Table 3);</li> <li>• Encourage noise mitigation measures as part of construction if under the flight pattern;</li> <li>• Parking lot lighting shall not be linear in design to avoid confusion with runway lighting.</li> </ul>
<b>COMMERCIAL (RETAIL/OFFICE)</b>		
<i>General Retail &amp; Service (shopping centers &amp; stores, restaurants, convenience, vehicle fueling)</i>	AP-2; T; H-1; H-3	<ul style="list-style-type: none"> <li>• Population concentration limits for site and single-acre shall not be exceeded (see Table 3);</li> <li>• Larger shopping centers should provide usable open space;</li> <li>• Parking lot lighting shall not be linear in design to avoid confusion with runway lighting.</li> </ul>
<i>Automobile related (sales lot, repair, storage)</i>	T	<ul style="list-style-type: none"> <li>• Limited to vehicle storage or open space;</li> <li>• Parking lot lighting shall not be linear in design to avoid confusion with runway lighting.</li> </ul>
<i>Low-rise Office (1-3 stories)</i>	AP-2; AP-3; T; H-1; H-3	<ul style="list-style-type: none"> <li>• Provide usable open space requirements;</li> <li>• Maximum population thresholds shall not be exceeded (see Table 3);</li> <li>• Parking lot lighting shall not be linear in design to avoid confusion with runway lighting.</li> </ul>
<i>Mid/High-rise Office (4+ stories)</i>	AP-3; H-1; H-2	<ul style="list-style-type: none"> <li>• Population concentration limits for site and single-acre shall not be exceeded (see Table 3);</li> <li>• Consider limitations to building height based on the elevation of the site and proximity to the airport and flight patterns;</li> <li>• Parking lot lighting shall not be linear in design to avoid confusion with runway lighting.</li> </ul>
<b>INDUSTRIAL</b>		
<i>Light (light manufacturing, storage, warehouse)</i>	AP-2; T; H-1	<ul style="list-style-type: none"> <li>• Low level of population concentration limits shall not be exceeded (see Table 3);</li> <li>• Compatible without externalities;</li> <li>• Provide usable open space;</li> <li>• Parking lot lighting shall not be linear in design to avoid confusion with runway lighting.</li> </ul>

<u>USE</u>	<u>ZONE(S) REQUIRING ADDITIONAL REVIEW</u>	<u>STANDARD</u>
<i>Heavy (landfill, heavy manufacturing, mining, uses that emit smoke or create sun glare)</i>	AP-T; H-1; H-2; C; H-3	<ul style="list-style-type: none"> <li>• Compatible without externalities;</li> <li>• Provide usable open space;</li> <li>• Utilities that affect public health, safety and welfare not permitted within 4,000 feet of the runway;</li> <li>• Consider limitations to structure height based on the elevation of the site and proximity to the airport and flight patterns;</li> <li>• Parking lot lighting shall not be linear in design to avoid confusion with runway lighting.</li> </ul>
<b>RECREATION AND OPEN SPACE</b>		
<i>Passive (trails &amp; natural areas)</i>	AP-2; H-3	<ul style="list-style-type: none"> <li>• Avoid the incorporation of elements, vegetation and/or materials that attract birds,</li> <li>• Limit water retention areas to no greater than .5-acres;</li> <li>• Limit height and types of new and existing vegetation in accordance with the FAR Part 77 requirements.</li> </ul>
<i>Active (community sports fields, golf, indoor facilities)</i>	AP-2; AP-3; H-1; H-3	<ul style="list-style-type: none"> <li>• Population concentration limits for site and single-acre shall not be exceeded (see Table 3);</li> <li>• Limit water retention areas to no greater than .5-acres;</li> <li>• Avoid new features, vegetation and/or materials that attract birds.</li> </ul>
<i>Amusement (Stadiums, amusement parks, fairgrounds)</i>	AP-3; H-1; H-2	<ul style="list-style-type: none"> <li>• Compatible with increased open space;</li> <li>• Within population concentration limits for site and per acre (see Table 3);</li> <li>• High intensity uses, such as stadiums, are not permitted;</li> <li>• Parking lot lighting shall not be linear in design to avoid confusion with runway lighting.</li> </ul>

### POPULATION CONCENTRATION THRESHOLDS

#### Overview

This table is to be utilized when an Additional Review Standard in Table 2 refers to population concentration. These population concentration thresholds serve as a measurement tool to determine whether the population density for a given use may be too intense for a particular zone. The thresholds are measured across an entire site (site-wide) and within a portion of a site (single-acre).

- Site-wide Average Intensity: calculated by determining the total number of people expected to be on the site at any given time under normal conditions and dividing by the total number of acres of the project site.
- Single-Acre Intensity: calculated by determining the total number of people expected to be within any one-acre portion of the site at one time.

**TABLE 3: POPULATION CONCENTRATION THRESHOLDS**

ZONE(S)	SITE-WIDE AVERAGE INTENSITY	SINGLE-ACRE INTENSITY
AP-1	Site-wide Intensity: Exceptions can be permitted for agricultural activities, roads, and automobile parking provided that FAA criteria are satisfied	
AP-2	Site-wide Intensity: Low to Mid: 40 - 50 people per acre Mid to High: 51 - 60 people per acre	Single-Acre Intensity: Low to Mid: 80 -100 people per acre Mid to High: 101 -120 people per acre
T	Site-wide Intensity: Low to Mid: 70 - 85 people per acre Mid to High: 86 -100 people per acre	Single-Acre Intensity: Low to Mid: 210 - 255 people per acre Mid to High: 256 - 300 people per acre
H-1; H-2	Site-wide Intensity: Low to Mid: 200 - 250 people per acre Mid to High: 251 - 300 people per acre	Single-Acre Intensity: Low to Mid: 800 - 1000 people per acre Mid to High: 1001 - 1200 people per acre
H-3	Site-wide Intensity: Low to Mid: 70 - 85 people per acre Mid to High: 86 - 100 people per acre	Single-Acre Intensity: Low to Mid: 210 - 255 people per acre Mid to High: 256 - 300 people per acre

Source: California Airport Land Use Planning Handbook (Handbook) released October 2011 by the California Department of Transportation, Division of Aeronautics.

**STAFFORD REGIONAL AIRPORT SAMPLE REAL ESTATE DISCLOSURE STATEMENT**

The following is a sample disclosure statement that is recommended to be incorporated into the initial sale of new homes located within the Airport Impact Areas:

**STAFFORD REGIONAL AIRPORT DISCLOSURE**

The purchaser(s) of property at the following address: \_\_\_\_\_, on Assessor’s Parcel \_\_\_\_\_, located in Stafford County Virginia, hereafter referred to as “property”, acknowledges that the property lies in proximity to Stafford Regional Airport, and that the property is subject to aircraft operations and aircraft overflight, with related noise and safety concerns.

While air traffic may be generalized into tracks, it is, by nature, dispersed. Aircraft may approach and depart the airport from any number of directions. Flight paths vary depending on a variety of factors including origin/destination, wind conditions and other aircraft in the traffic pattern. As a result, any property in the vicinity of an airport is likely to be subject to aircraft overflight and its impacts to some degree. Stafford County’s Comprehensive Plan has an exhibit that depicts the aircraft traffic patterns associated with the airport.

Flight patterns may shift or change over time. Changes in operations may occur due to weather, changes in users, changes in aircraft type, military missions, weather conditions, etc. The airport is relatively new and still growing. Runway expansion and expansion of ground facilities are planned that will likely increase the number of flights in and out of the airport. The Stafford Regional Airport has a Master Plan that identifies plans for future expansion and development needs.

The undersigned purchaser(s) of said tract of land certify(ies) that he/she (they) has (have) read the above disclosure statement and acknowledge(s) the pre-existence of the Stafford Regional Airport and the noise exposure due to the airport.

Dated this \_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

\_\_\_\_\_  
Purchaser’s Signature

\_\_\_\_\_  
Purchaser’s Signature

\_\_\_\_\_  
Purchaser’s Signature

**STAFFORD REGIONAL AIRPORT SAMPLE NOTICE**

For full disclosure of the proximity to Stafford Regional Airport to prospective purchasers, the following sample notice should be included on all subdivision and site plans and record plats filed with Stafford County and used in sales contracts, brochures and promotional documents, including any illustrative site plans, and homeowner's association documents:

“STAFFORD REGIONAL AIRPORT: This property is located within the proximity to Stafford Regional Airport, specifically the Airport Impact Areas and Aircraft Traffic Pattern areas around the airport, as identified in the Stafford County Comprehensive Plan and Stafford Regional Airport Master Plan. The property is likely to be subject to aircraft overflight and noise impacts of varying degrees.”

***E. Analysis of the Planning Area***

The following analysis shows the area of existing zoning classifications within each zone and the future land use designations, which identify the types of potential development that may occur. When comparing current zoning to future land use, the greatest potential for incompatible development to occur is within the Horizontal Zone. The majority of the area is zoned A-1, Agricultural, with the potential of being rezoned as the land is planned for Business and Industry, Suburban and Urban Development Area (UDA) future land use designations. The land use designations within the Horizontal Zone are described below:

*Business and Industry* – 1,533 acres - Uses include retail, wholesale, corporate and professional offices, research and development, entertainment, manufacturing, distribution and transportation; possible heavy industrial uses; new and used vehicle sales, including automobiles and boats.

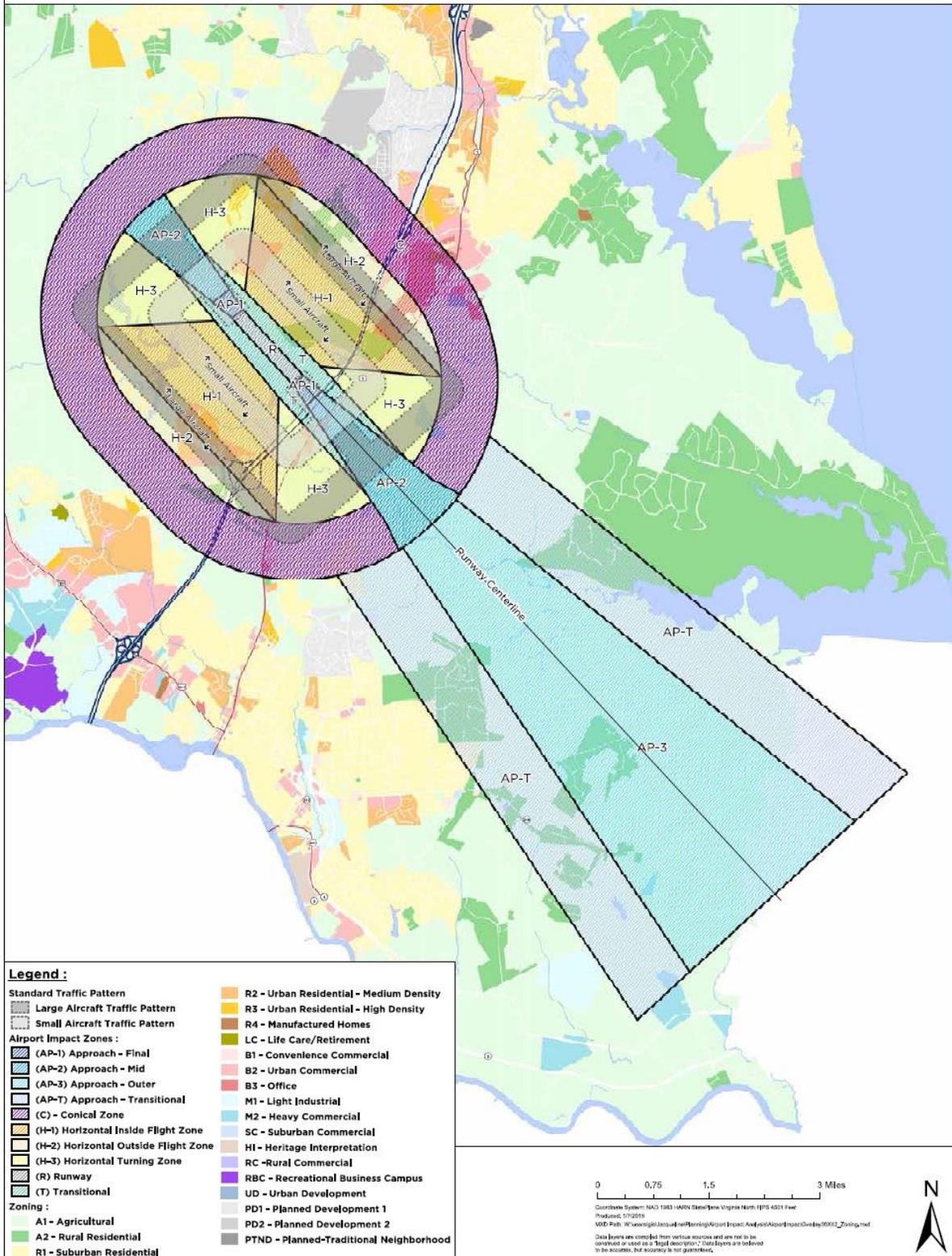
*Suburban* – 725 acres - Uses include single family detached dwelling units, typically on ¼ to ½ acre lots, maximum density of 3 du/ac; neighborhood and community oriented activity centers, places of worship, parks and play areas, and retail and business activities with a maximum floor area ratio (FAR) of 0.4.; industrial uses include warehousing, wholesaling, manufacturing, processing operations, mixed-use commercial/industrial development, and flex office space.

*Urban Development Areas* – mix of uses including approximately 8,829 dwelling units and 13,900,800 square feet of commercial retail and office space in an area totaling approximately 3,196 acres, 2,300 acres of which are within the Horizontal Zone.



# Airport Land Use Compatibility Zones With Zoning

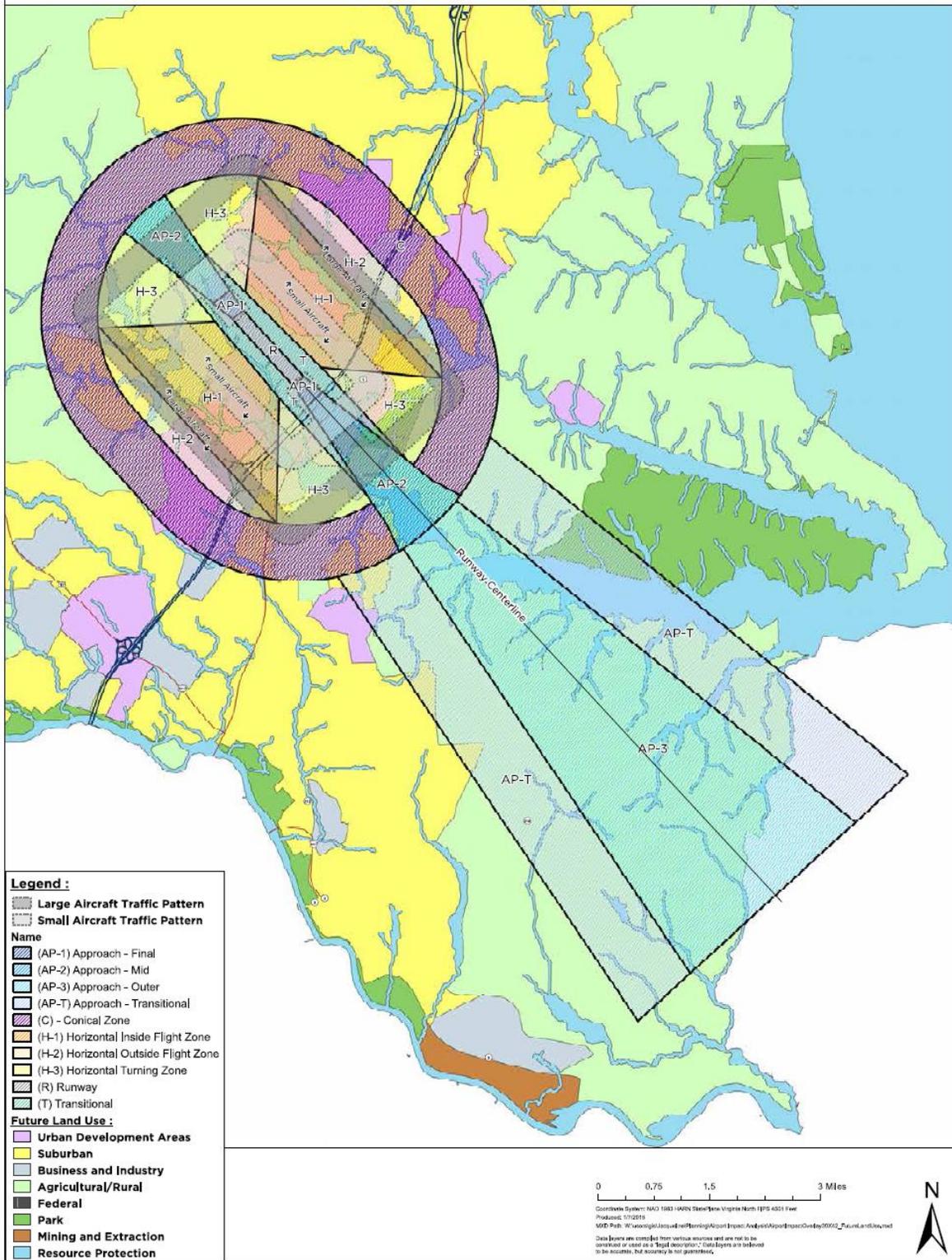
Produced by the Stafford County GIS Office  
540-658-4033 | www.StaffordCountyGIS.org





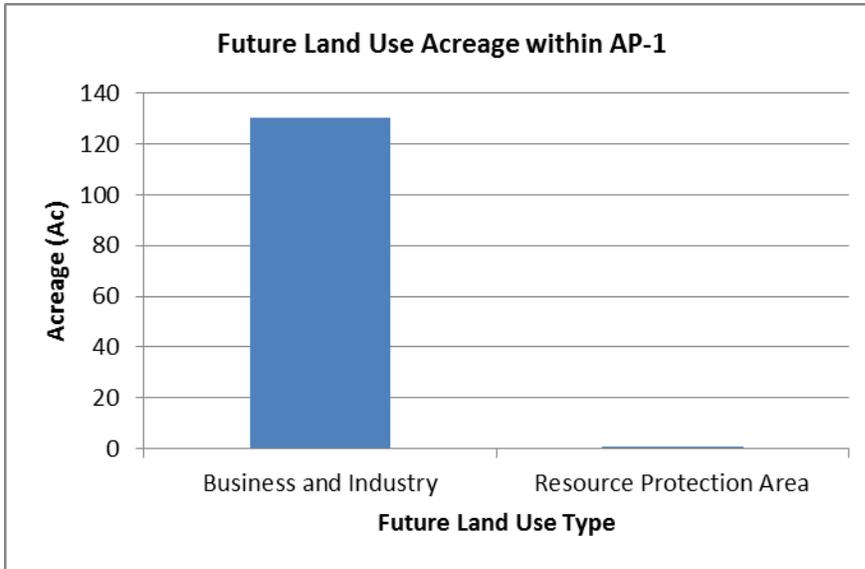
# Airport Land Use Compatibility Zones With Future Land Use

Produced by the Stafford County GIS Office  
540-658-4033 | www.StaffordCountyGIS.org

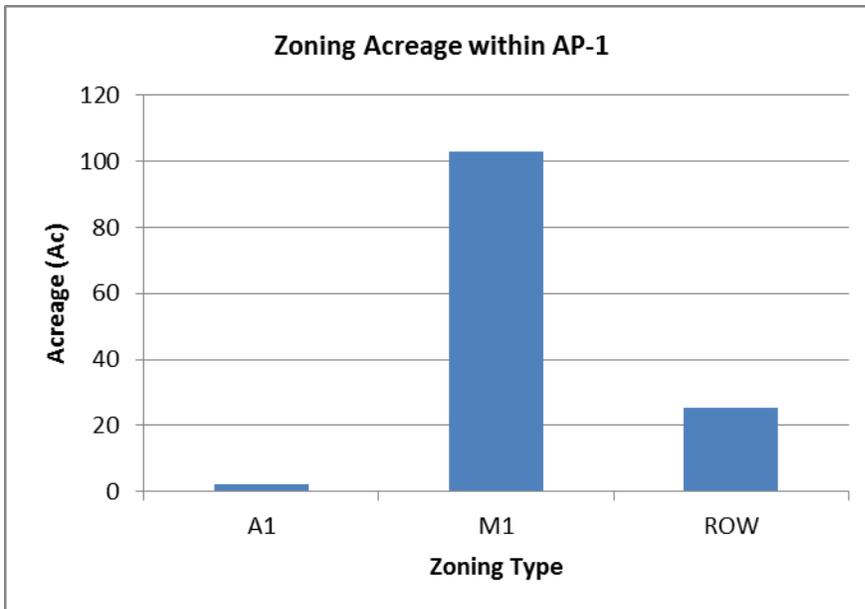


**Existing Future Land Uses and Zoning District Classifications by Airport Impact Zone**

1. Final Approach Compatibility Zone (AP-1)

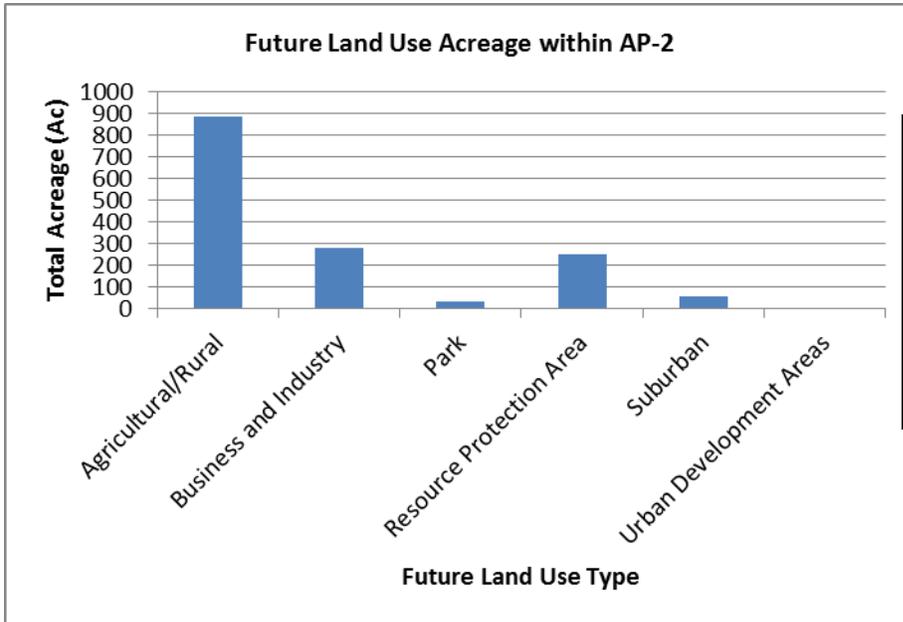


<u>Future Land Use</u>	<u>Acres</u>
Business and Industry	130.42
Resource Protection Area	0.21

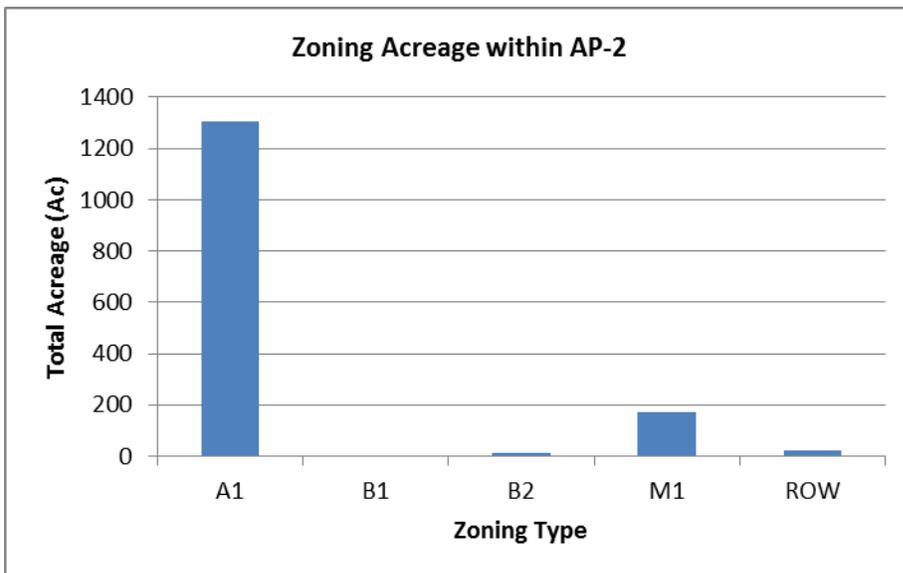


<u>Zoning</u>	<u>Acres</u>
A1	2.12
M1	103.05
ROW	25.46

2. Middle Approach Compatibility Zone (AP-2)

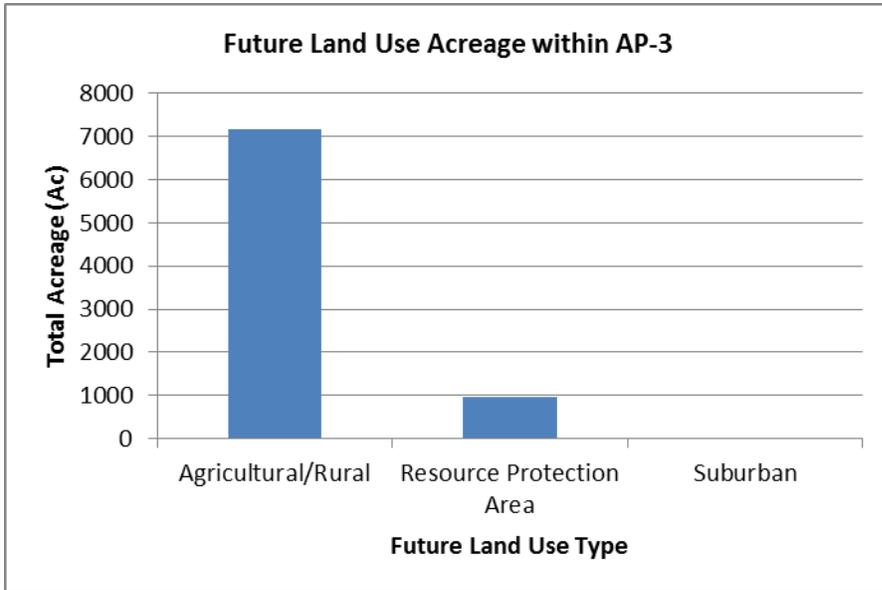


<u>Future Land Use</u>	<u>Acres</u>
Agricultural/Rural	885.18
Business and Industry	278.98
Park	36.74
Resource Protection Area	251.23
Suburban	57.30
Urban Development Areas	0.33

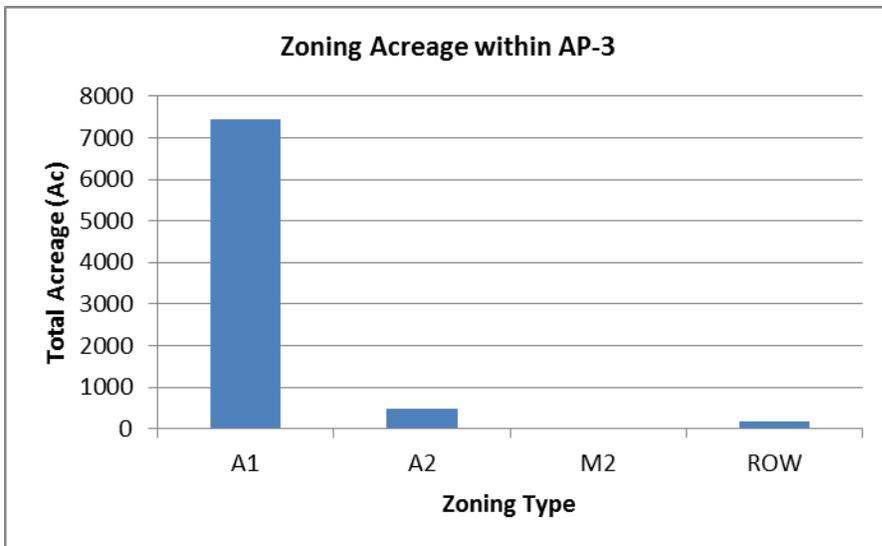


<u>Zoning</u>	<u>Acres</u>
A1	1303.13
B1	1.74
B2	12.48
M1	169.78
ROW	22.62

3. Outer Approach Compatibility Zone (AP-3)

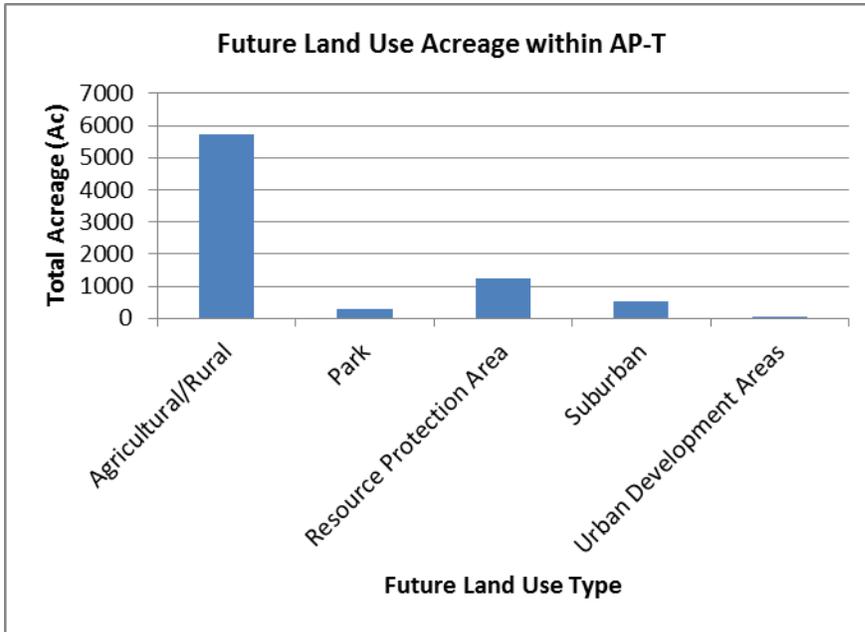


<u>Future Land Use</u>	<u>Acres</u>
Agricultural/Rural	7183.19
Resource Protection Area	962.46
Suburban	0.95

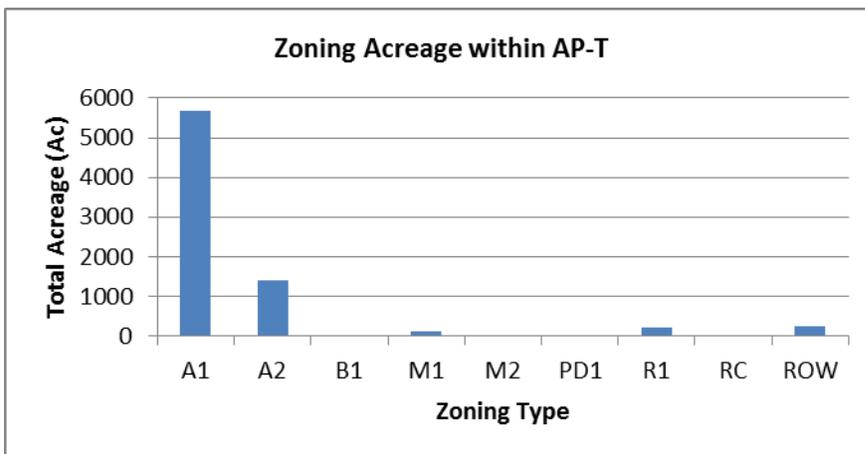


<u>Zoning</u>	<u>Acres</u>
A1	7430.01
A2	490.70
M2	31.96
ROW	184.95

4. Transitional Approach Compatibility Zone (AP-T)

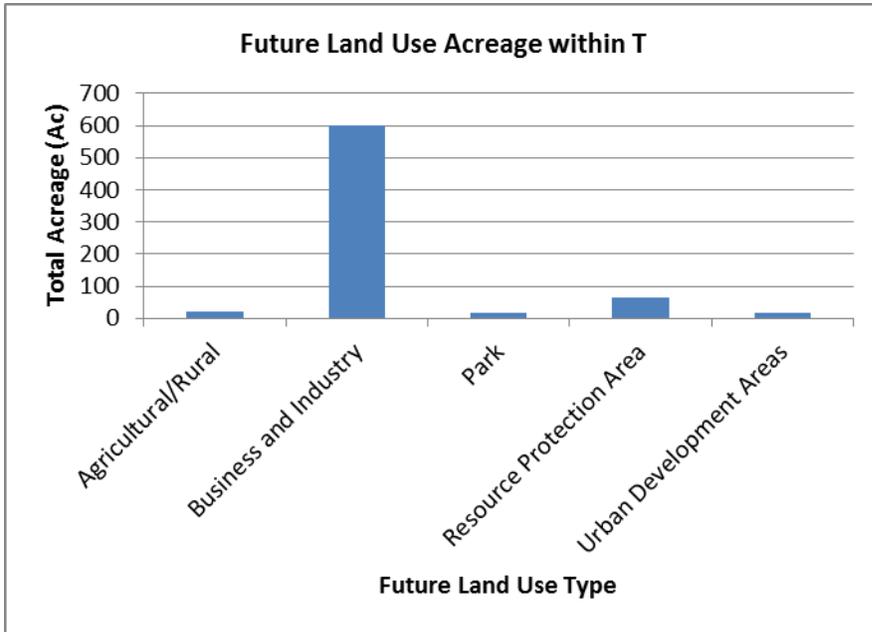


<u>Future Land Use</u>	<u>Acres</u>
Agricultural/Rural	5733.86
Park	273.53
Resource Protection Area	1232.03
Suburban	513.13
Urban Development Areas	63.26

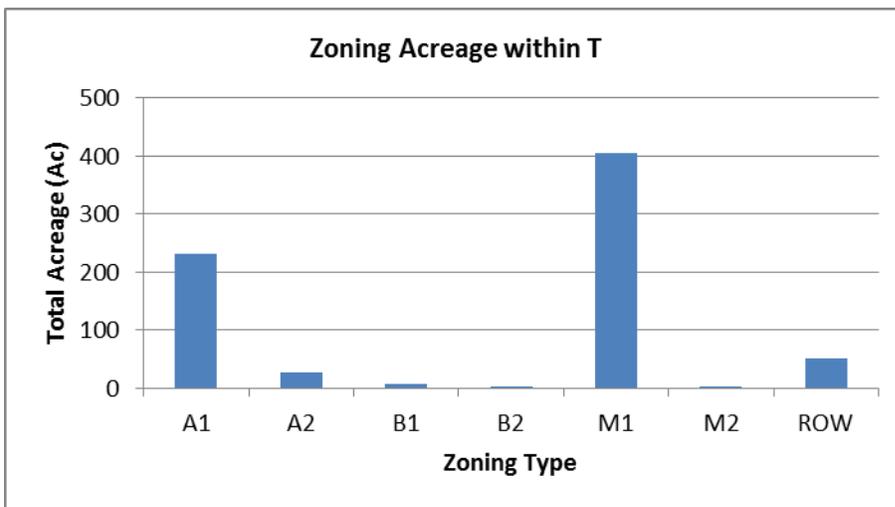


<u>Zoning</u>	<u>Acres</u>
A1	5689.74
A2	1404.22
B1	3.62
M1	109.61
M2	20.69
PD1	24.81
R1	232.76
RC	3.80
ROW	260.43

5. Transitional Compatibility Zone (T)

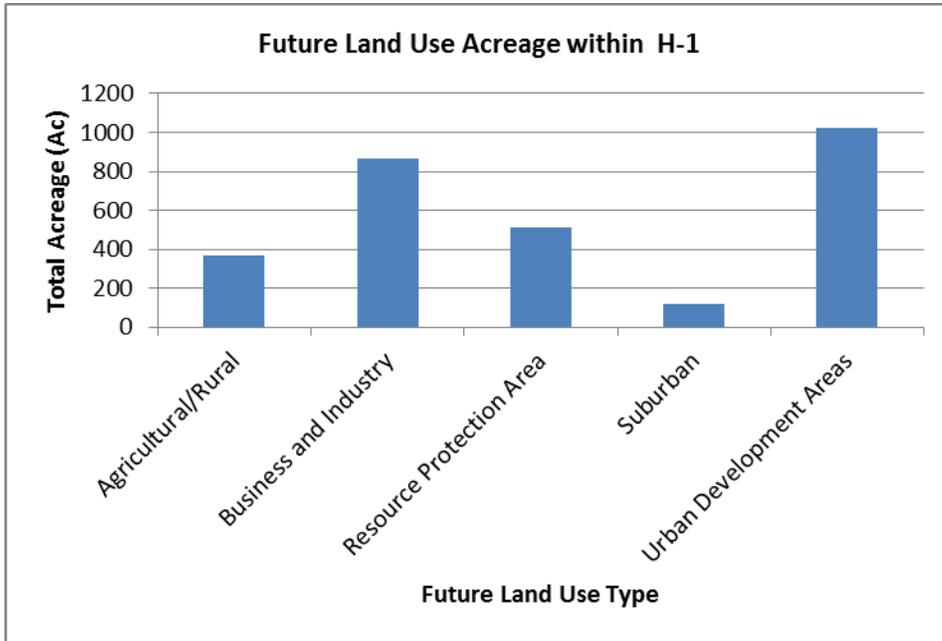


Future Land Use	Acres
Agricultural/Rural	19.69
Business and Industry	601.24
Park	17.16
Resource Protection Area	66.32
Urban Development Areas	16.74

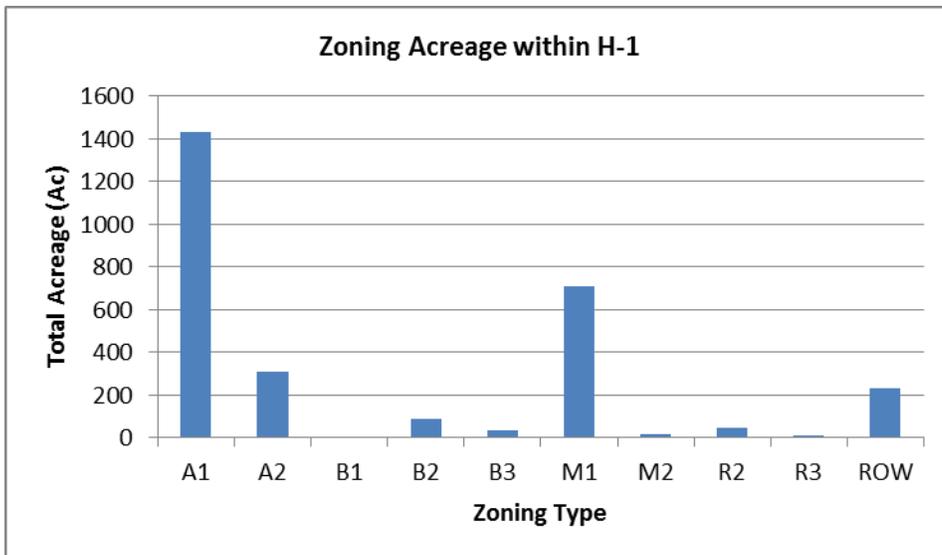


Zoning	Acres
A1	231.17
A2	27.46
B1	7.21
B2	2.11
M1	406.01
M2	1.33
ROW	51.36

6. Inner Horizontal Compatibility Zone (H-1)

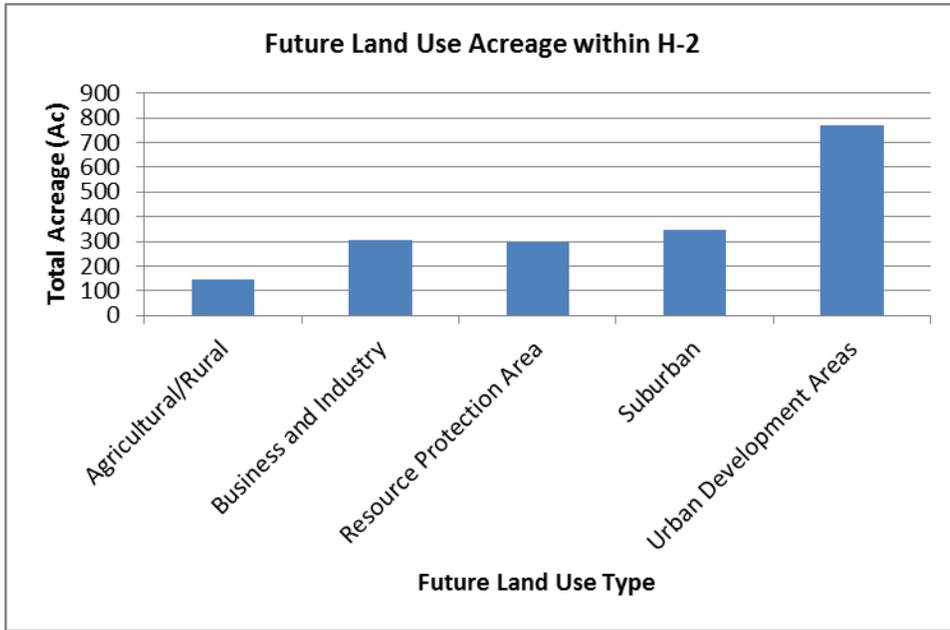


<b>Future Land Use</b>	<b>Acres</b>
Agricultural/Rural	367.09
Business and Industry	862.89
Resource Protection Area	513.69
Suburban	121.38
Urban Development Areas	1024.09

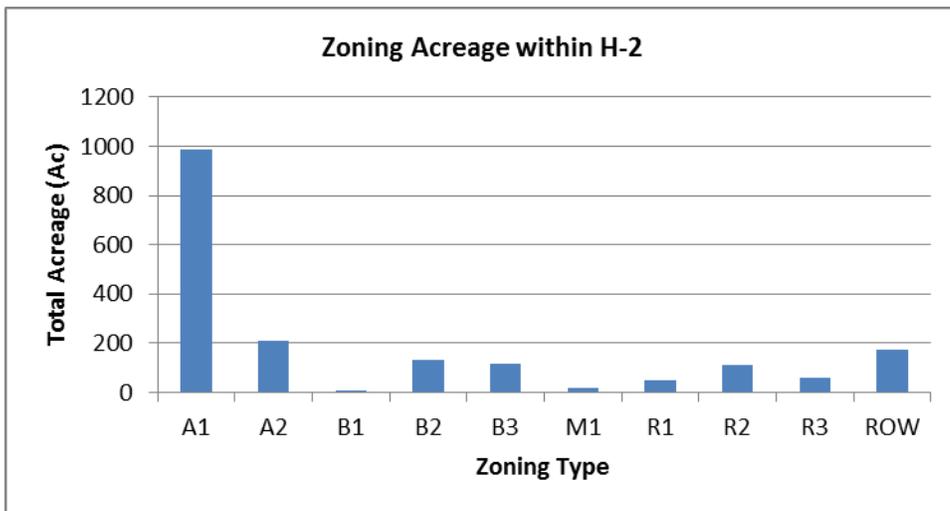


<b>Zoning</b>	<b>Acres</b>
A1	1431.06
A2	311.37
B1	0.40
B2	89.20
B3	36.59
M1	711.89
M2	15.96
R2	46.85
R3	12.34
ROW	233.49

7. Outer Horizontal Compatibility Zone (H-2)

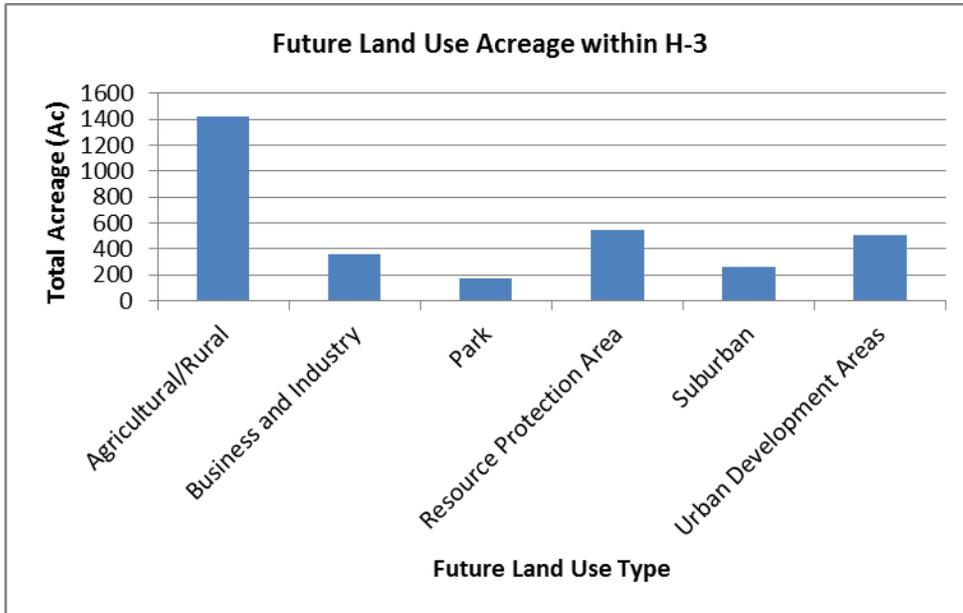


<u>Future Land Use</u>	<u>Acres</u>
Agricultural/Rural	144.72
Business and Industry	307.29
Resource Protection Area	296.36
Suburban	345.19
Urban Development Areas	770.89

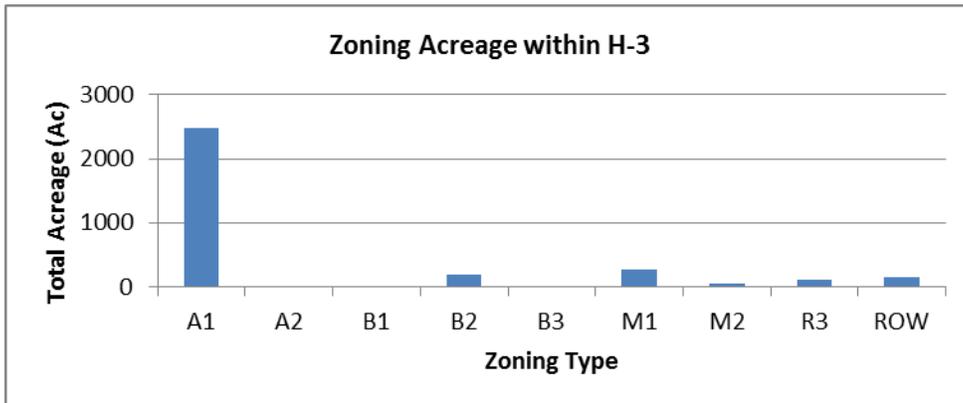


<u>Zoning</u>	<u>Acres</u>
A1	989.03
A2	210.99
B1	7.31
B2	129.36
B3	114.76
M1	16.78
R1	51.32
R2	110.35
R3	58.94
ROW	175.86

8. Horizontal Turning Zone (H-3)

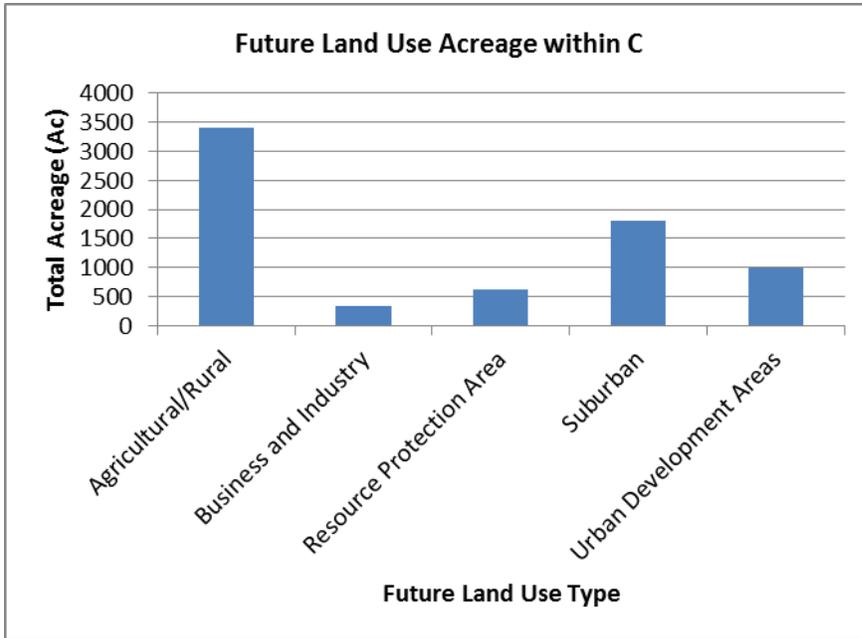


Future Land Use	Acres
Agricultural/Rural	1421.77
Business and Industry	363.01
Park	172.44
Resource Protection Area	546.92
Suburban	258.66
Urban Development Areas	505.66

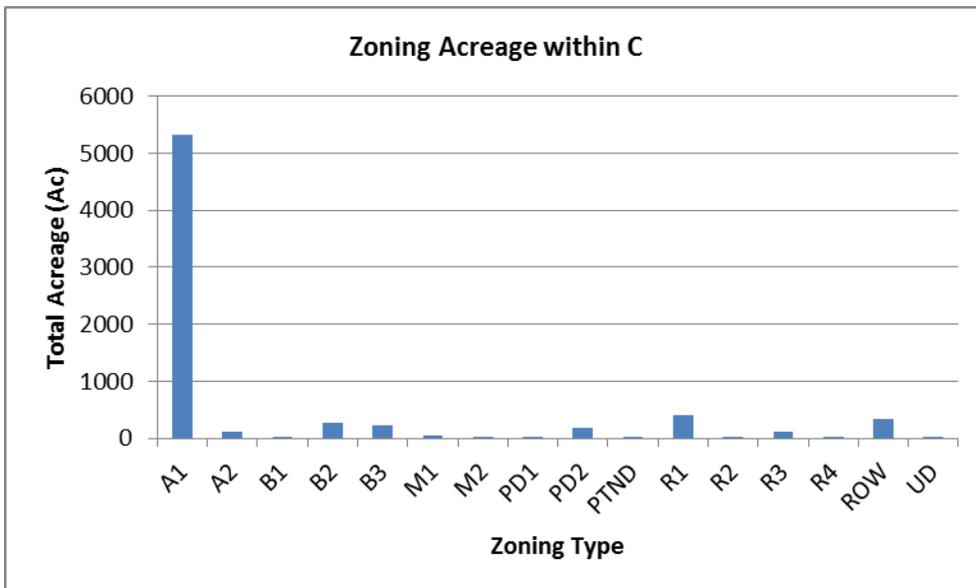


Zoning	Acres
A1	2488.64
A2	1.78
B1	19.31
B2	182.38
B3	5.23
M1	265.50
M2	41.38
R3	111.65
ROW	152.64

9. Conical Compatibility Zone (C)



<u>Future Land Use</u>	<u>Acres</u>
Agricultural/Rural	3413.87
Business and Industry	334.81
Resource Protection Area	617.88
Suburban	1802.59
Urban Development Areas	1000.08



<u>Zoning</u>	<u>Acres</u>
A1	5325.93
A2	125.04
B1	10.37
B2	262.13
B3	232.20
M1	39.43
M2	22.36
PD1	13.65
PD2	185.72
PTND	11.00
R1	412.15
R2	27.65
R3	119.17
R4	30.45
ROW	344.38
UD	11.68