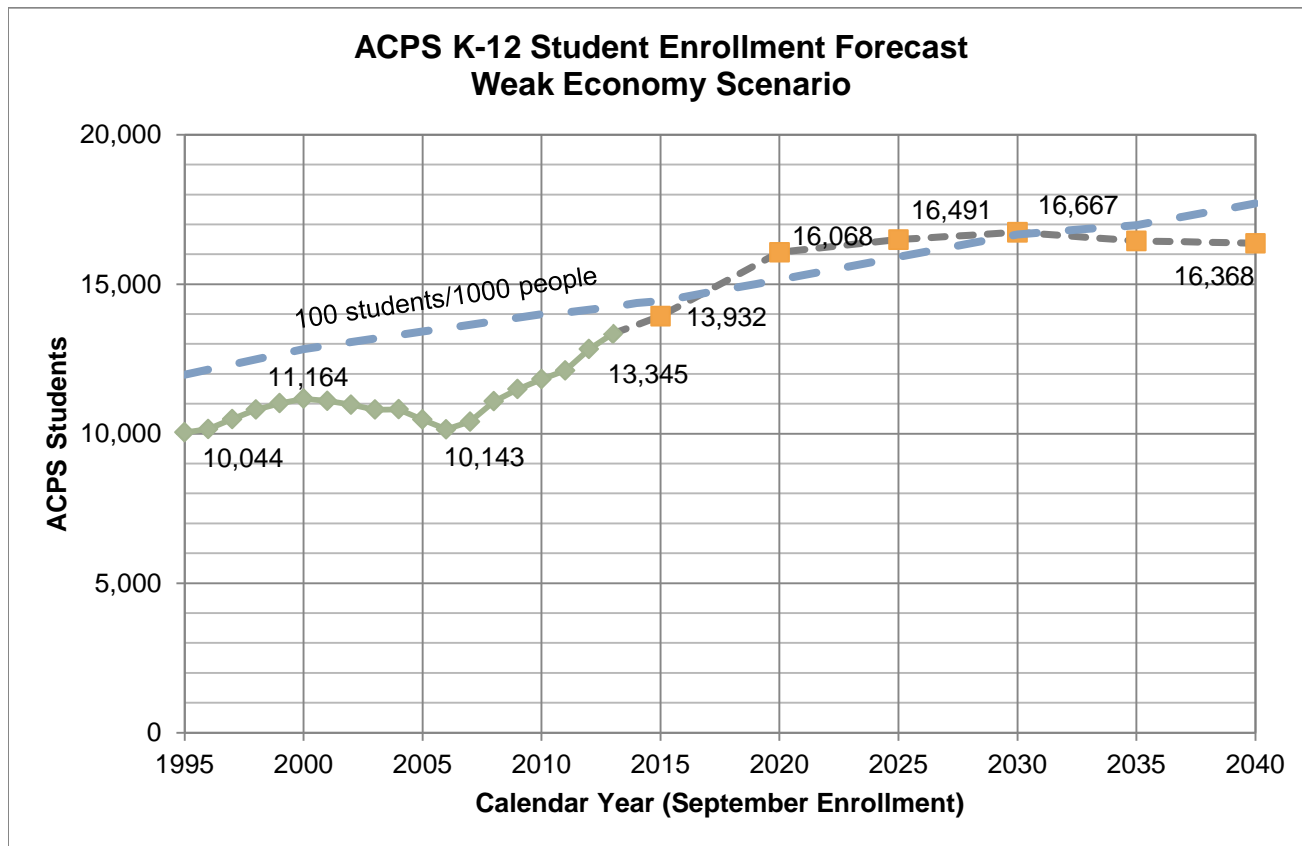


# DISCUSSION DRAFT

Concept Forecast Only - Forecast Model Not Fully Developed  
Development and Student Generation Scenarios

10/25/2013



## Weak Economy Scenario

### Assumptions

1. Slower pace of new development and population growth in Alexandria
2. Slowed employment growth
3. Incomes and home prices stagnate, but declines in suburban areas are even greater
4. Substantially slower growth in the region.
5. Less redevelopment of existing housing stock.
6. More current stock ages into affordability
7. Perception of school quality remains the same
6. Single-family detached student generation increases as units age to greater affordability, but not as much as under strong economy scenario
7. Senior share of Alexandria population maintains its current ratio to the senior share of the U.S. population
8. Additional low and moderate-income family housing developed based on 5% of new midrise apartment construction.

### Measures

1. Population up 25% from 2010 to 2040, 177,000 by 2040
2. Residential units up 25% to 90,000
3. Demolition of 2,050 garden apartments by 2040, with demolitions rising to about 100-125 units per year by 2030
4. 12,000 new midrise and 5,000 new high rise units by 2040
5. Seniors rise to 17% of Alexandria population by 2040; a smaller share of housing is available for families with children.

### Enrollment Forecast Outcomes

1. Kindergarten capture falls to historic averages of 55% to 60% of births within three years.
2. Cohort survival remains stable at about 97% for all classes except for H.S. recovery
3. Student generation rises for all unit types through 2025 as the current high K capture passes through the system.
4. Student generation continues to rise for single-family detached units after 2025.
5. After reaching a peak, student generation falls for all units with further demographic and housing changes.
6. Enrollment rises to approximately 15,550 in 2025 and then remains roughly constant.

**Note: Model does not yet incorporate aging of existing units to increased affordability over time.**

Incorporating this change would somewhat increase the enrollment forecast.

**Weak Economy Scenario - Development Forecast**

Residential Category	2010 Baseline	Demolitions						2011- 2040
		2011- 2015	2016- 2020	2021- 2025	2026- 2030	2031- 2035	2036- 2040	
Detached Residential	9,021	0	-1	-14	0	0	0	-15
Semi-detached Residential	1,500	0	0	0	0	0	0	0
Row House Residential	9,956	0	0	0	0	0	0	0
Garden Condo Residential	7,141	0	0	0	0	0	0	0
Mid-rise Condo Residential	5,813	0	0	0	0	0	0	0
High-rise Condo Residential	6,711	0	0	0	0	0	0	0
Cooperative Residential	335	0	0	0	0	0	0	0
Townhouse Condo Residential	1,536	0	0	0	0	0	0	0
Garden Apt (1-3 Story)	9,000	-163	0	-346	-400	-572	-571	-2,052
Public Housing Garden Apartment	974	0	-157	0	0	-90	-16	-263
Other Low/Moderate Income Family Housing	1,500	0	0	0	0	0	0	0
Townhouse Apartment (1-4 Story)	0	0	0	0	0	0	0	0
Mid-rise Apt (4-6 Story)	8,115	0	0	0	0	0	0	0
High-rise Apt (7+ Story)	10,100	0	-187	0	0	0	-100	-287
Assisted Living Facility	0	0	0	0	0	0	0	0
Age-Restricted Senior Apartment or Condo	725	0	0	0	0	0	0	0
Sheltered Residences	0	0	0	0	0	0	0	0
<b>Total All Residential Types</b>	<b>72,427</b>	<b>-163</b>	<b>-345</b>	<b>-360</b>	<b>-400</b>	<b>-662</b>	<b>-687</b>	<b>-2,617</b>

Residential Category	2010 Baseline	Remaining Existing 2010 Units						2011- 2040
		2011- 2015	2016- 2020	2021- 2025	2026- 2030	2031- 2035	2036- 2040	
Detached Residential	9,021	9,021	9,020	9,006	9,006	9,006	9,006	9,006
Semi-detached Residential	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
Row House Residential	9,956	9,956	9,956	9,956	9,956	9,956	9,956	9,956
Garden Condo Residential	7,141	7,141	7,141	7,141	7,141	7,141	7,141	7,141
Mid-rise Condo Residential	5,813	5,813	5,813	5,813	5,813	5,813	5,813	5,813
High-rise Condo Residential	6,711	6,711	6,711	6,711	6,711	6,711	6,711	6,711
Cooperative Residential	335	335	335	335	335	335	335	335
Townhouse Condo Residential	1,536	1,536	1,536	1,536	1,536	1,536	1,536	1,536
Garden Apt (1-3 Story)	9,000	8,837	8,837	8,491	8,091	7,519	6,948	6,948
Public Housing Garden Apartment	974	974	817	817	817	727	711	711
Other Low/Moderate Income Family Units	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
Townhouse Apartment (1-4 Story)	0	0	0	0	0	0	0	0
Mid-rise Apt (4-6 Story)	8,115	8,115	8,115	8,115	8,115	8,115	8,115	8,115
High-rise Apt (7+ Story)	10,100	10,100	9,913	9,913	9,913	9,913	9,813	9,813
Assisted Living Facility	0	0	0	0	0	0	0	0
Age-Restricted Senior Apartment or Condo	725	725	725	725	725	725	725	725
Sheltered Residences	0	0	0	0	0	0	0	0
<b>All Residential Types</b>	<b>72,427</b>	<b>72,264</b>	<b>71,919</b>	<b>71,559</b>	<b>71,159</b>	<b>70,497</b>	<b>69,810</b>	<b>69,810</b>

**Weak Economy Scenario - Development Forecast**

Residential Category	2010 Baseline	New Construction						2011- 2040
		2011- 2015	2016- 2020	2021- 2025	2026- 2030	2031- 2035	2036- 2040	
Detached Residential	9,021	0	13	0	0	0	0	13
Semi-detached Residential	1,500	0	0	0	0	0	0	0
Row House Residential	9,956	124	498	2	244	277	335	1,480
Garden Condo Residential	7,141	28	4	28	0	64	125	249
Mid-rise Condo Residential	5,813	0	0	0	0	0	0	0
High-rise Condo Residential	6,711	0	0	0	110	0	50	160
Cooperative Residential	335	0	0	0	0	0	0	0
Townhouse Condo Residential	1,536	0	260	0	0	0	0	260
Garden Apt (1-3 Story)	9,000	73	2	73	32	0	0	180
Public Housing Garden Apartment	974	0	60	0	0	100	16	176
Other Low/Moderate Income Family Housing	1,500	48	167	97	74	69	179	634
Townhouse Apartment (1-4 Story)	0	0	0	0	0	0	0	0
Mid-rise Apt (4-6 Story)	8,115	907	3,173	1,843	1,415	1,309	3,398	12,045
High-rise Apt (7+ Story)	10,100	774	841	1,842	1,239	220	200	5,116
Assisted Living Facility	0	0	0	0	0	0	0	0
Age-Restricted Senior Apartment or Condo	725	0	0	0	0	0	0	0
Sheltered Residences	0	0	0	0	0	0	0	0
<b>Total All Residential Types</b>	<b>72,427</b>	<b>1,954</b>	<b>5,018</b>	<b>3,885</b>	<b>3,114</b>	<b>2,039</b>	<b>4,303</b>	<b>20,313</b>

Residential Category	2010 Baseline	Cumulative Units with New Construction						2011- 2040
		2011- 2015	2016- 2020	2021- 2025	2026- 2030	2031- 2035	2036- 2040	
Detached Residential	9,021	9,021	9,033	9,019	9,019	9,019	9,019	9,019
Semi-detached Residential	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
Row House Residential	9,956	10,080	10,578	10,580	10,824	11,101	11,436	11,436
Garden Condo Residential	7,141	7,169	7,173	7,201	7,201	7,265	7,390	7,390
Mid-rise Condo Residential	5,813	5,813	5,813	5,813	5,813	5,813	5,813	5,813
High-rise Condo Residential	6,711	6,711	6,711	6,711	6,821	6,821	6,871	6,871
Cooperative Residential	335	335	335	335	335	335	335	335
Townhouse Condo Residential	1,536	1,536	1,796	1,796	1,796	1,796	1,796	1,796
Garden Apt (1-3 Story)	9,000	8,910	8,912	8,639	8,271	7,699	7,128	7,128
Public Housing Garden Apartment	974	974	877	877	877	887	887	887
Income-limited Family Units	1,500	1,548	1,715	1,812	1,886	1,955	2,134	2,134
Townhouse Apartment (1-4 Story)	0	0	0	0	0	0	0	0
Mid-rise Apt (4-6 Story)	8,115	9,022	12,195	14,038	15,453	16,762	20,160	20,160
High-rise Apt (7+ Story)	10,100	10,874	11,528	13,370	14,609	14,829	14,929	14,929
Assisted Living Facility	0	0	0	0	0	0	0	0
Age-Restricted Senior Apartment or Condo	725	725	725	725	725	725	725	725
Sheltered Residences	0	0	0	0	0	0	0	0
<b>All Residential Types</b>	<b>72,427</b>	<b>74,218</b>	<b>78,891</b>	<b>82,416</b>	<b>85,130</b>	<b>86,507</b>	<b>90,123</b>	<b>90,123</b>

**Generation Factors by Age of Structure (Now used for new units since 2010 only)**

Residential Category	Prev 3-yr	Base	Percent of Base by Age of Unit					
			10	20	30	40	50	60
Detached Residential	0.275	0.280	1	1	1	1	1	1
Semi-detached Residential	0.156	0.200	0.75	0.75	0.75	1	1	1.25
Row House Residential	0.156	0.126	0.9	0.9	0.9	1	1.1	1.15
Garden Condo Residential	0.069	0.100	0.5	0.6	0.75	1	1.1	1.15
Mid-rise Condo Residential	0.091	0.080	0.75	0.75	1	1.05	1.1	1.15
High-rise Condo Residential	0.074	0.075	0.75	0.75	1	1.05	1.1	1.15
Cooperative Residential	0.616	0.600	0.3	0.3	0.5	1	1.05	1.1
Townhouse Condo Residential	0.082	0.150	0.9	0.9	0.9	1.1	1.2	1.2
Garden Apt (1-3 Story)	0.300	0.350	0.3	0.3	0.5	1	1.05	1.1
Public Housing Garden Apartment	0.978	1.000	1	1	1	1	1	1
Income-Limited Family Units		0.650	1	1	1	1	1	1
Townhouse Apartment (1-4 Story)		0.350	0.3	0.3	0.5	1	1.05	1.1
Mid-rise Apt (4-6 Story)	0.138	0.100	0.6	0.6	0.75	1	1.05	1.1
High-rise Apt (7+ Story)	0.084	0.080	0.7	0.7	0.8	1	1.05	1.1
Assisted Living Facility		0.000	0	0	0	0	0	0
Age-Restricted Senior Apartment or Condo		0.000	0	0	0	0	0	0
Sheltered Residences		0.000	0	0	0	0	0	0

Residential Category	Prev 3-yr	Base	Generation Factor by Age of Unit					
			10	20	30	40	50	60
Detached Residential	0.275	0.280	0.28	0.28	0.28	0.28	0.28	0.28
Semi-detached Residential	0.156	0.200	0.15	0.15	0.15	0.2	0.2	0.25
Row House Residential	0.156	0.126	0.113	0.113	0.113	0.126	0.139	0.145
Garden Condo Residential	0.069	0.100	0.05	0.06	0.075	0.1	0.11	0.115
Mid-rise Condo Residential	0.091	0.050	0.06	0.06	0.08	0.084	0.088	0.092
High-rise Condo Residential	0.074	0.080	0.056	0.056	0.075	0.079	0.083	0.086
Cooperative Residential	0.616	0.350	0.18	0.18	0.3	0.6	0.63	0.66
Townhouse Condo Residential	0.082	0.150	0.135	0.135	0.135	0.165	0.18	0.18
Garden Apt (1-3 Story)	0.300	0.350	0.105	0.105	0.175	0.35	0.368	0.385
Public Housing Garden Apartment	0.978	1.000	1	1	1	1	1	1
Income-limited Family Units		0.650	0.65	0.65	0.65	0.65	0.65	0.65
Townhouse Apartment (1-4 Story)		0.350	0.105	0.105	0.175	0.35	0.368	0.385
Mid-rise Apt (4-6 Story)	0.138	0.100	0.06	0.06	0.075	0.1	0.105	0.11
High-rise Apt (7+ Story)	0.084	0.080	0.056	0.056	0.064	0.08	0.084	0.088
Assisted Living Facility		0.000	0	0	0	0	0	0
Age-Restricted Senior Apartment or Condo		0.000	0	0	0	0	0	0
Sheltered Residences		0.000	0	0	0	0	0	0

Base = 2012 average generation for all existing units in residential category, after separation of public housing, senior units and subsidized or income-limited housing from other categories.  
Previous 3-year average prior to removal of some of above and reclassification of some units.

**Weak Economy Scenario**

Residential Category	Generation Factor Multiplier by Calendar Year						
	2010	2015	2020	2025	2030	2035	2040
Detached Residential	1	1.12	1.225	1.3	1.35	1.325	1.3
Semi-detached Residential	1	1.075	1.2	1.225	1.225	1.225	1.2
Row House Residential	1	1.075	1.2	1.225	1.225	1.225	1.2
Garden Condo Residential	1	1.075	1.2	1.2	1.2	1.175	1.15
Mid-rise Condo Residential	1	1.075	1.2	1.2	1.2	1.175	1.15
High-rise Condo Residential	1	1.075	1.2	1.2	1.2	1.175	1.15
Cooperative Residential	1	1.075	1.2	1.2	1.2	1.175	1.15
Townhouse Condo Residential	1	1.075	1.2	1.2	1.2	1.175	1.15
Garden Apt (1-3 Story)	1	1.075	1.2	1.2	1.2	1.175	1.15
Public Housing Garden Apartment	1	1.075	1.2	1.2	1.2	1.175	1.15
Income-Limited Family Units	1	1.075	1.2	1.2	1.2	1.175	1.15
Townhouse Apartment (1-4 Story)	1	1.075	1.2	1.2	1.2	1.175	1.15
Mid-rise Apt (4-6 Story)	1	1.075	1.2	1.2	1.2	1.175	1.15
High-rise Apt (7+ Story)	1	1.075	1.2	1.2	1.2	1.175	1.15
Assisted Living Facility	1	1	1	1	1	1	1
Age-Restricted Senior Apartment or Condo	1	1	1	1	1	1	1
Sheltered Residences	1	1	1	1	1	1	1

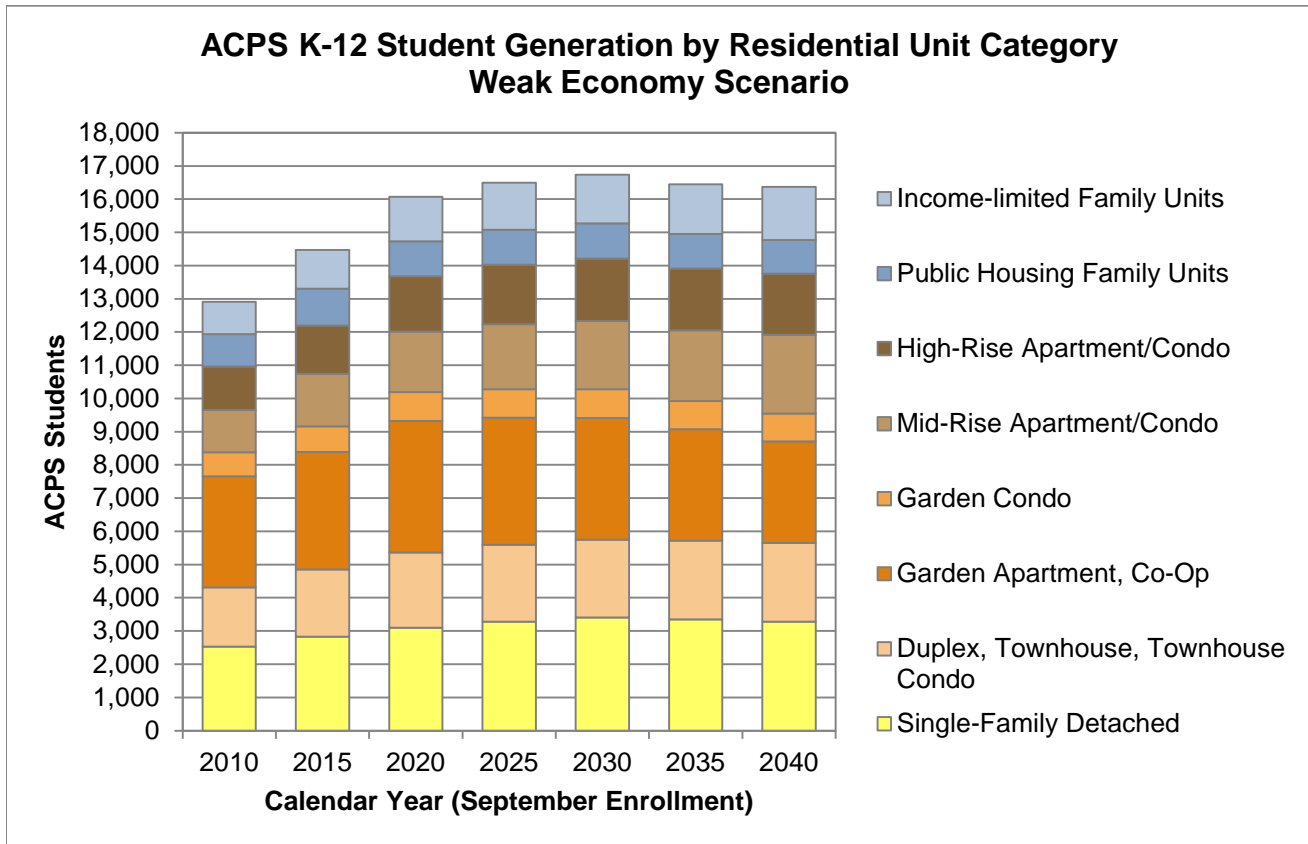
Generation factor adjustments by year are intended to account for the following factors that are not currently explicitly modeled:

1. Gradual reduction in kindergarten capture rate to 0.55 to 0.6 over 5 to 7 years
2. Sustained cohort survival rate on the order of 0.94 to 0.96 for elementary and middle school grades.
3. Aging of the existing housing stock to increase affordability for families with children.
4. Gradual growth of the senior population, retaining the current relationship to the proportion of seniors in the U.S. population. This growth will reduce the share of housing units available to other components of the population and reduce the proportion of families with children as a share of all households.

## DISCUSSION DRAFT

Concept Forecast Only, Forecast Model Not Fully Developed  
Development and Student Generation Scenarios

10/25/2013



#### Forecast Student Generation by Calendar Year

Residential Category	2010	2015	2020	2025	2030	2035	2040
Single-Family Detached	2,526	2,833	3,098	3,283	3,409	3,346	3,283
Duplex, Townhouse, Townhouse Condo	1,785	2,017	2,269	2,309	2,343	2,375	2,372
Garden Apartment, Co-Op	3,351	3,541	3,962	3,826	3,662	3,357	3,055
Garden Condo	714	768	859	861	861	848	837
Mid-Rise Apartment/Condo	1,277	1,577	1,826	1,958	2,060	2,126	2,370
High-Rise Apartment/Condo	1,311	1,460	1,664	1,788	1,879	1,861	1,836
Public Housing Family Units	974	1,112	1,052	1,052	1,052	1,042	1,020
Income-limited Family Units	975	1,165	1,338	1,413	1,471	1,493	1,595
Senior Housing Units	0	0	0	0	0	0	0
<b>Total</b>	<b>12,913</b>	<b>14,473</b>	<b>16,068</b>	<b>16,491</b>	<b>16,738</b>	<b>16,448</b>	<b>16,368</b>

#### Forecast Dwelling Units by Residential Category

Residential Category	2010	2015	2020	2025	2030	2035	2040
Single-Family Detached	9,021	9,021	9,033	9,019	9,019	9,019	9,019
Duplex, Townhouse, Townhouse Condo	12,992	13,116	13,874	13,876	14,120	14,397	14,732
Garden Apartment, Co-Op	9,335	9,245	9,247	8,974	8,606	8,034	7,463
Garden Condo	7,141	7,169	7,173	7,201	7,201	7,265	7,390
Mid-Rise Apartment/Condo	13,928	14,835	18,008	19,851	21,266	22,575	25,973
High-Rise Apartment/Condo	16,811	17,585	18,239	20,081	21,430	21,650	21,800
Public Housing Family Units	974	974	877	877	877	887	887
Income-Limited Family Units	1,500	1,548	1,715	1,812	1,886	1,955	2,134
Senior Housing Units	725	725	725	725	725	725	725
<b>Total</b>	<b>72,427</b>	<b>74,218</b>	<b>78,891</b>	<b>82,416</b>	<b>85,130</b>	<b>86,507</b>	<b>90,123</b>

**Notes:**

- Existing development not yet classified by age for student generation. All existing development is assumed to generate students at the base generation rate modified by the year factor.

**Weak Economy Scenario**

Residential Category	Student Generation by Calendar Year, All Development						
	2010	2015	2020	2025	2030	2035	2040
Detached Residential	2,526	2,833	3,098	3,283	3,409	3,346	3,283
Semi-detached Residential	300	323	360	368	368	368	360
Row House Residential	1,254	1,409	1,590	1,623	1,657	1,696	1,707
Garden Condo Residential	714	768	859	861	861	848	837
Mid-rise Condo Residential	465	500	558	558	558	546	535
High-rise Condo Residential	503	541	604	604	611	599	589
Cooperative Residential	201	216	241	241	241	236	231
Townhouse Condo Residential	230	285	319	319	319	312	305
Garden Apt (1-3 Story)	3,150	3,325	3,721	3,585	3,421	3,120	2,824
Public Housing Garden Apartment	974	1,112	1,052	1,052	1,052	1,042	1,020
Income-Limited Family Units	975	1,165	1,338	1,413	1,471	1,493	1,595
Townhouse Apartment (1-4 Story)	0	0	0	0	0	0	0
Mid-rise Apt (4-6 Story)	812	1,077	1,268	1,400	1,502	1,579	1,835
High-rise Apt (7+ Story)	808	919	1,060	1,184	1,267	1,263	1,247
Assisted Living Facility	0	0	0	0	0	0	0
Age-Restricted Senior Apartment or Condo	0	0	0	0	0	0	0
Sheltered Residences	0	0	0	0	0	0	0
<b>Total</b>	<b>12,913</b>	<b>14,473</b>	<b>16,068</b>	<b>16,491</b>	<b>16,738</b>	<b>16,448</b>	<b>16,368</b>
<b>Subtotals by Major Category</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>	<b>2040</b>
Single-Family Detached	2,526	2,833	3,098	3,283	3,409	3,346	3,283
Duplex, Townhouse, Townhouse Condo	1,785	2,017	2,269	2,309	2,343	2,375	2,372
Garden Apartment, Co-Op	3,351	3,541	3,962	3,826	3,662	3,357	3,055
Garden Condo	714	768	859	861	861	848	837
Mid-Rise Apartment/Condo	1,277	1,577	1,826	1,958	2,060	2,126	2,370
High-Rise Apartment/Condo	1,311	1,460	1,664	1,788	1,879	1,861	1,836
Public Housing Family Units	974	1,112	1,052	1,052	1,052	1,042	1,020
Income-limited Family Units	975	1,165	1,338	1,413	1,471	1,493	1,595
Senior Housing Units	0	0	0	0	0	0	0
<b>Total</b>	<b>12,913</b>	<b>14,473</b>	<b>16,068</b>	<b>16,491</b>	<b>16,738</b>	<b>16,448</b>	<b>16,368</b>

Residential Category	Student Generation by Calendar Year, 2010 Existing Development						
	2010	2015	2020	2025	2030	2035	2040
Detached Residential	2,526	2,829	3,094	3,278	3,404	3,341	3,278
Semi-detached Residential	300	323	360	368	368	368	360
Row House Residential	1,254	1,349	1,505	1,537	1,537	1,537	1,505
Garden Condo Residential	714	768	857	857	857	839	821
Mid-rise Condo Residential	465	500	558	558	558	546	535
High-rise Condo Residential	503	541	604	604	604	591	579
Cooperative Residential	201	216	241	241	241	236	231
Townhouse Condo Residential	230	248	276	276	276	271	265
Garden Apt (1-3 Story)	3,150	3,325	3,712	3,566	3,398	3,092	2,797
Public Housing Garden Apartment	974	1,047	980	980	980	854	818
Income-Limited Family Units	975	1,048	1,170	1,170	1,170	1,146	1,121
Townhouse Apartment (1-4 Story)	0	0	0	0	0	0	0
Mid-rise Apt (4-6 Story)	812	872	974	974	974	954	933
High-rise Apt (7+ Story)	808	869	952	952	952	932	903
Assisted Living Facility	0	0	0	0	0	0	0
Age-Restricted Senior Apartment or Condo	0	0	0	0	0	0	0
Sheltered Residences	0	0	0	0	0	0	0
<b>Total</b>	<b>12,913</b>	<b>13,933</b>	<b>15,283</b>	<b>15,361</b>	<b>15,319</b>	<b>14,707</b>	<b>14,146</b>

Residential Category	Student Generation by Calendar Year, All Post-2010 Development						
	2010	2015	2020	2025	2030	2035	2040
Detached Residential	0	4	4	5	5	5	5
Semi-detached Residential	0	0	0	0	0	0	0
Row House Residential	0	61	85	87	121	159	201
Garden Condo Residential	0	0	2	4	4	8	16
Mid-rise Condo Residential	0	0	0	0	0	0	0
High-rise Condo Residential	0	0	0	0	7	7	10
Cooperative Residential	0	0	0	0	0	0	0
Townhouse Condo Residential	0	38	42	42	42	41	40
Garden Apt (1-3 Story)	0	0	9	19	23	28	28
Public Housing Garden Apartment	0	65	72	72	72	188	202
Income-limited Family Units	0	117	168	243	301	348	474
Townhouse Apartment (1-4 Story)	0	0	0	0	0	0	0
Mid-rise Apt (4-6 Story)	0	205	294	426	528	626	901
High-rise Apt (7+ Story)	0	51	109	232	316	331	344
Assisted Living Facility	0	0	0	0	0	0	0
Age-Restricted Senior Apartment or Condo	0	0	0	0	0	0	0
Sheltered Residences	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>539</b>	<b>784</b>	<b>1,130</b>	<b>1,419</b>	<b>1,741</b>	<b>2,222</b>