

Forecast and Projection Process

CFS Phase II: Key Findings and Recommendations

Joint County Board and School Board Work Session

January 24, 2017

Arlington
Community Facilities Study

A resource and facilities plan for our future



PRESENTATION OVERVIEW

CFS Phase II Consultant Report Highlights:

1. Detailed student generation analysis
2. Breakdown of Arlington County Government's (ACG) population forecast by age group
3. Recommendations to enhance ACG population forecasting and Arlington Public Schools (APS) student projection methods.

BACKGROUND: CFS PURPOSE AND CHARGE

Community Facilities Study Purpose:

“Build a consensus framework regarding future revenue and facility needs... in the context of Arlington’s and the region’s projected 5, 10, and 20 year economic and demographic growth”

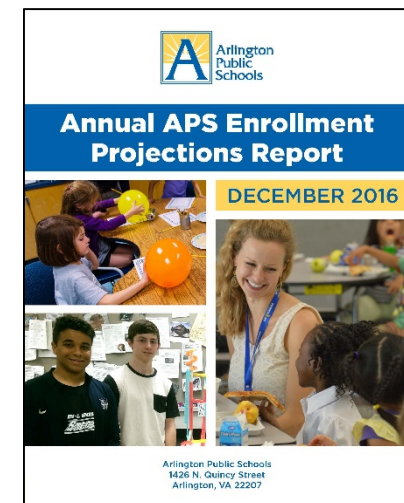
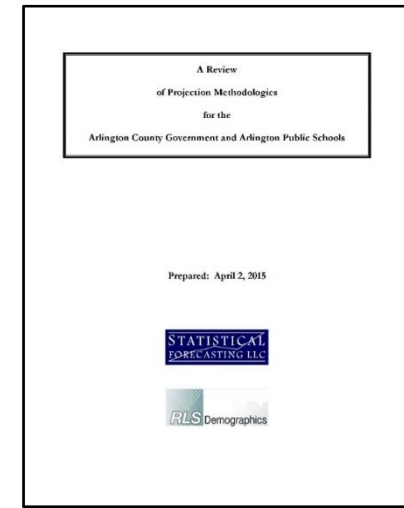
Study Committee charged with:

“Examining and, to the extent necessary, reconciling existing demographic and economic forecasts for 5, 10, and 20 years out to produce a single set of forecasts for both the County and Schools.”

BACKGROUND: CFS PHASE I CONSULTANT REPORT

Phase I Consultant Report: Projection Methodology Review (2015)

- ✓ Consultants reviewed County population and employment forecasts and APS student projections.
- ✓ Reinforced validity of methods.
- ✓ Confirmed the need for two different methodologies and projections for two different purposes.
- ✓ **Recommended short and long-term improvements for data sharing, collaboration, trend monitoring, and methodology**



BACKGROUND: CFS RECOMMENDATIONS

Recommendation #7

Improve forecast and projection methods

Recommendation #8

Improve cohort data research

Phase II Consultant Study

- More detailed Student Generation Factors (SGFs)
- Develop a model to project births and population by age group

PHASE II CONSULTANT STUDY: OVERVIEW

Questions

1. What housing types are producing the increase in student enrollment?
2. Can ACG's population forecast be augmented to project births and population by age group?



Analysis

Student Generation Factors (SGF)

- housing type
- affordability
- location
- length of ownership

Development of a component model that projects population by age group and births.

SGF DEFINED

Student Generation Factors (SGF)

SGF is the ratio of **students** to **housing units**.

SGF generated for various factors:

1) Housing Types

- Single Family Detached
- Garden Apartments
- Elevator Apartments
- Duplex
- Garden Condo
- Elevator Condo
- Townhomes

2) School Attendance Area

3) Grade level



SGF DEFINED

HYPOTHETICAL EXAMPLE



If 4,700 students
live in single family
detached houses



10,000 Units
total single family
detached housing units



0.47

Students produced from
single family detached
housing units.

APPLICATION

0.47 x

100 NEW
single family
detached houses

= **47** new students
expected

SGF IMPORTANCE

1. Estimating Future Students

- **Newly Constructed Housing**

SGFs can be applied to recently constructed housing to estimate additional students generated from the new housing.

- **Planned Housing**

APS currently applies SGF by housing type and grade level to pipeline development (those approved but not yet built) to determine the anticipated number of students from the new housing.

2. Monitoring Student Trends:

- SGFs can be used to understand population shifts among housing types.

STUDENT GENERATION ANALYSIS: KEY FINDINGS

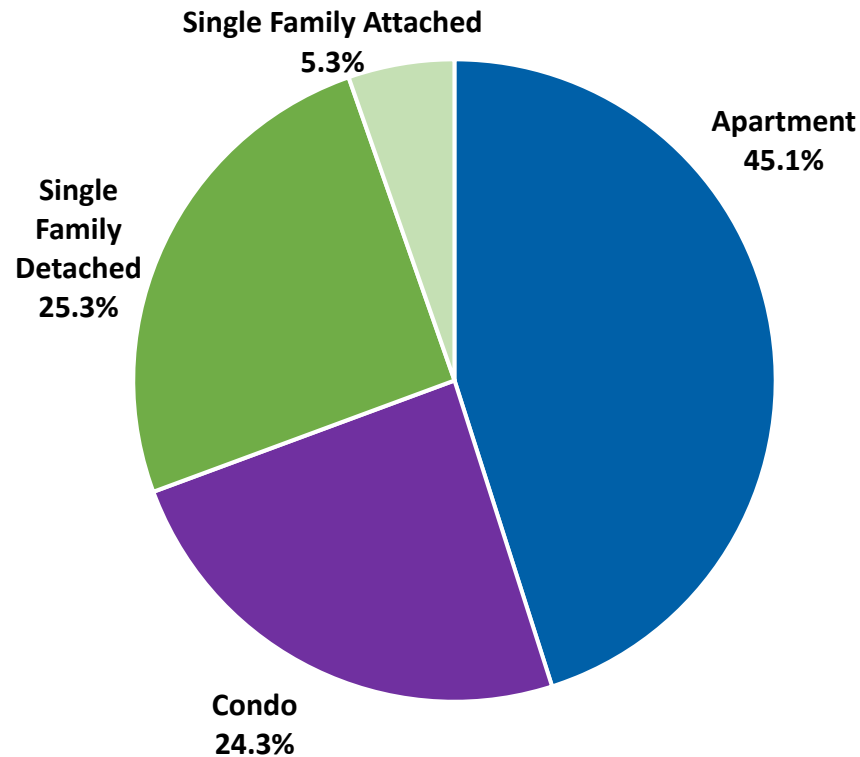
1. What housing types are producing the increase in student enrollment?

- The **majority** of APS students come from **single family housing**.
- **Single family detached** and **committed affordable housing** had the **highest SGFs**. **25%** of Arlington's housing stock is **single family detached**, while **3%** is **committed affordable (not dedicated senior housing)**.
- The **majority** of the **student increase** came from **existing** housing between 2010 and 2015.

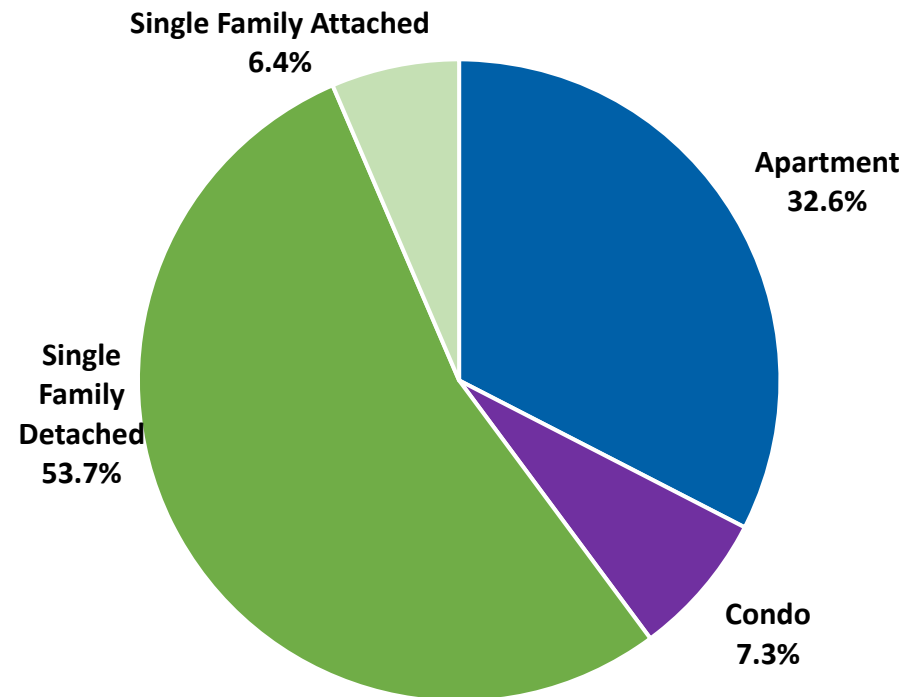
2015 HOUSING SUPPLY AND STUDENTS

In 2015, most APS students (60%) came from single family detached or attached housing, which is 31% of all housing in Arlington.

2015 Housing Units



2015 Students

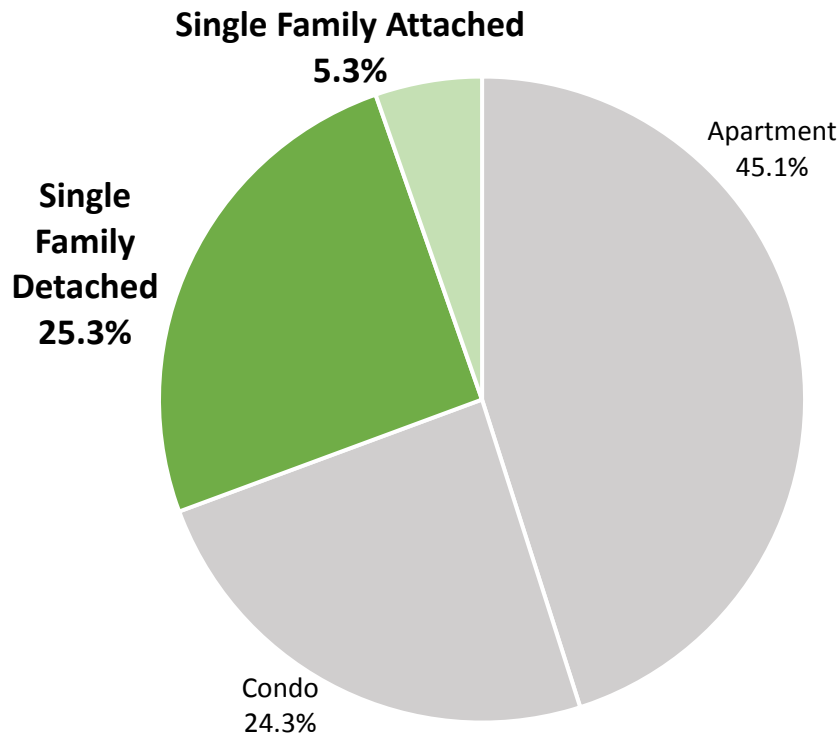


SGF: SINGLE FAMILY 2015

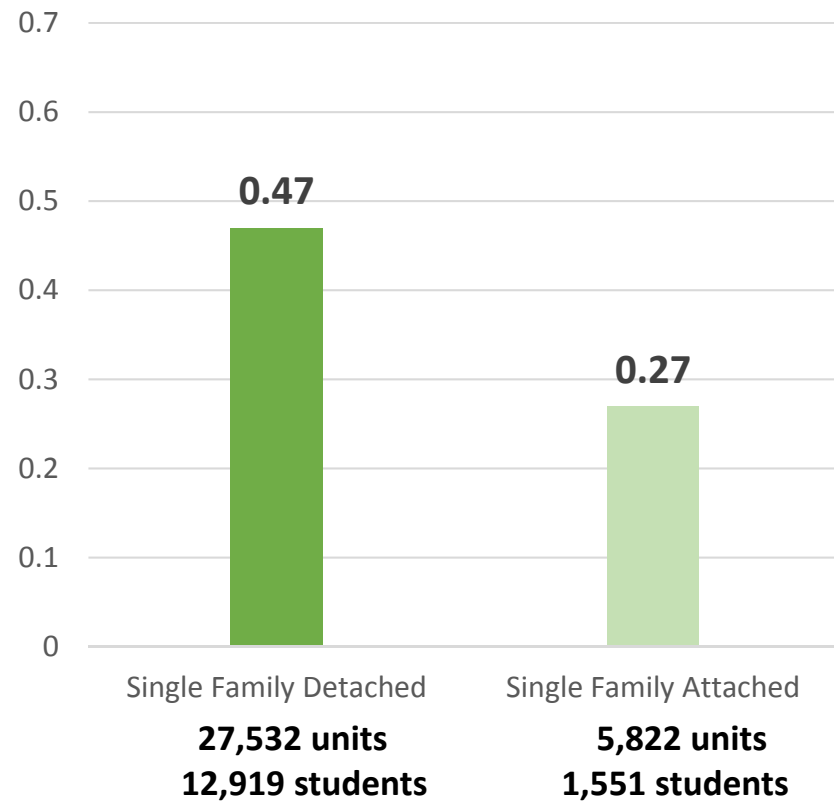
Single family detached housing generates 0.47 students per unit.

Almost 13,000 students reside in single family detached homes. Another 1,500 students reside in single family attached housing.

2015 Housing Units

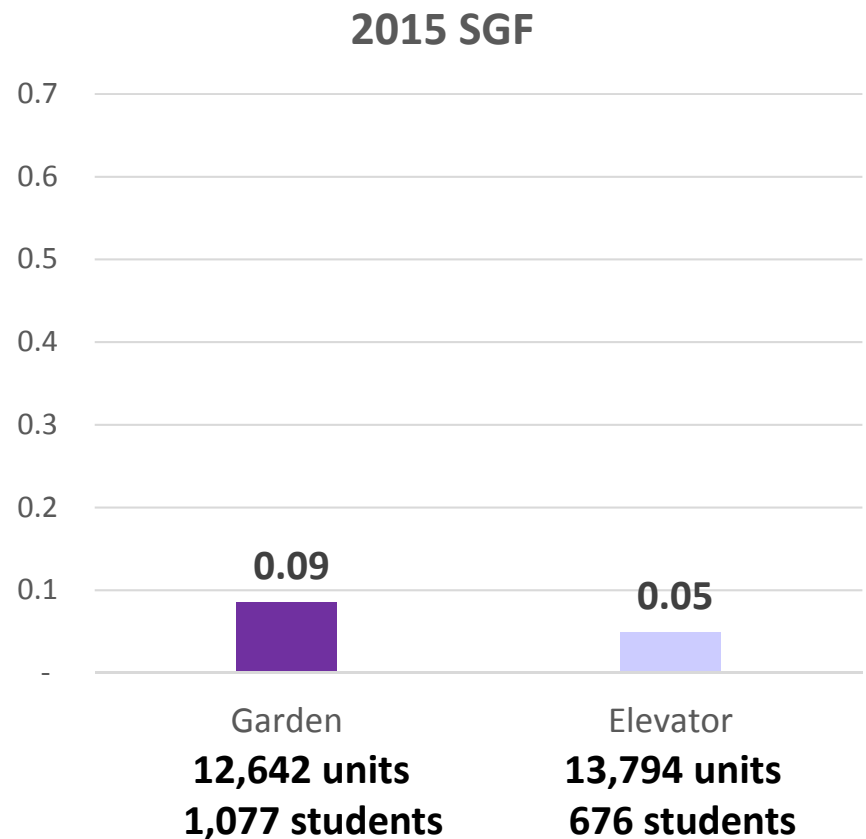
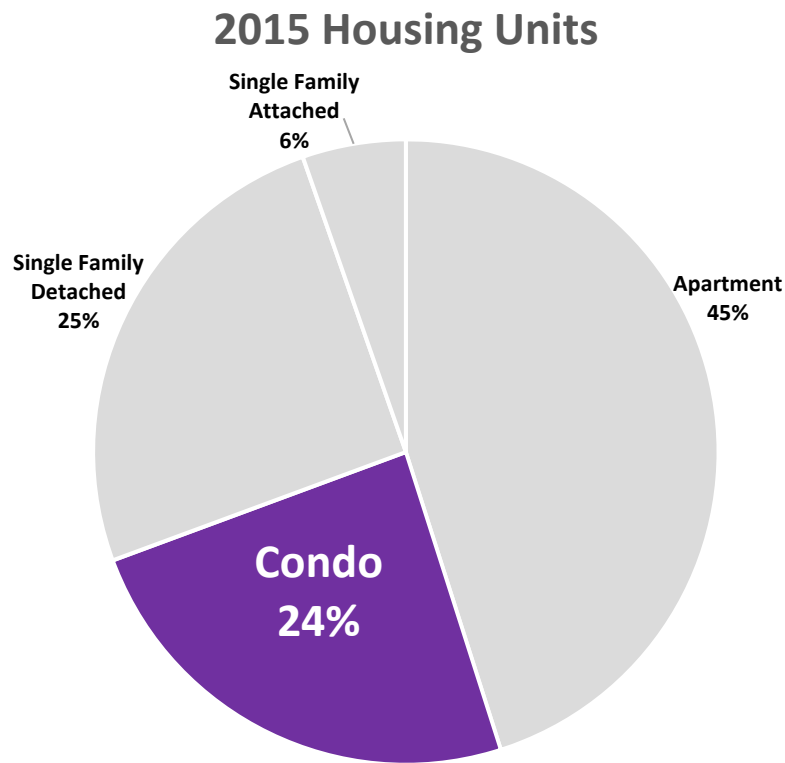


2015 SGF



SGF: CONDOS 2015

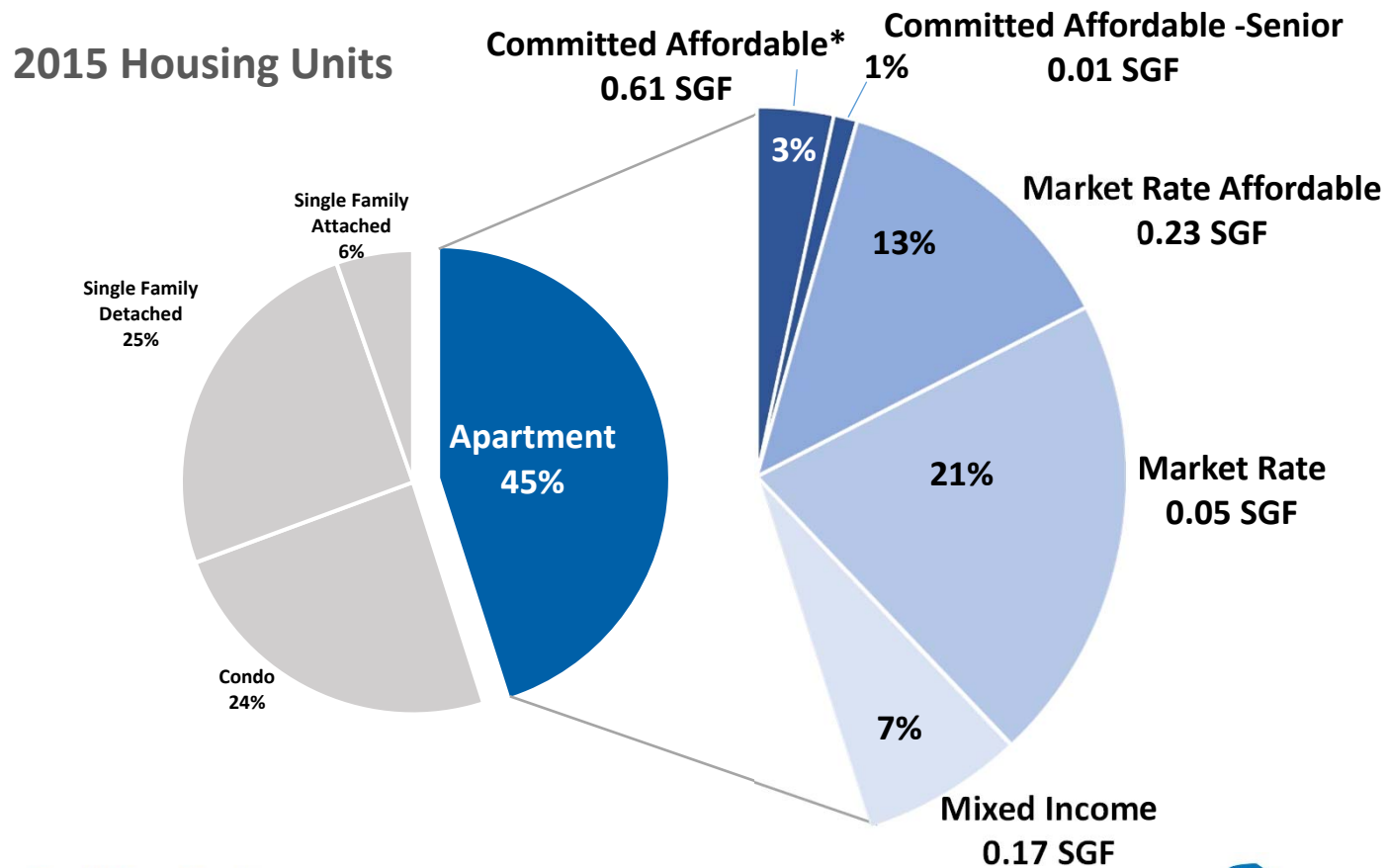
Condos generate the least amount of students.
 Condos make up 24% of Arlington housing market and generate 0.07 students per unit. Condos are almost evenly split between garden and elevator units. Overall 7% of APS students reside in condos.



SGF: APARTMENTS 2015

Committed affordable units (not dedicated senior housing) have a student generation rate of 0.61 and makes up a small share of Arlington’s housing stock.

Total committed affordable units make up 4% of Arlington’s housing stock – 3% is committed affordable without dedicated senior housing and 1% is committed affordable senior housing.

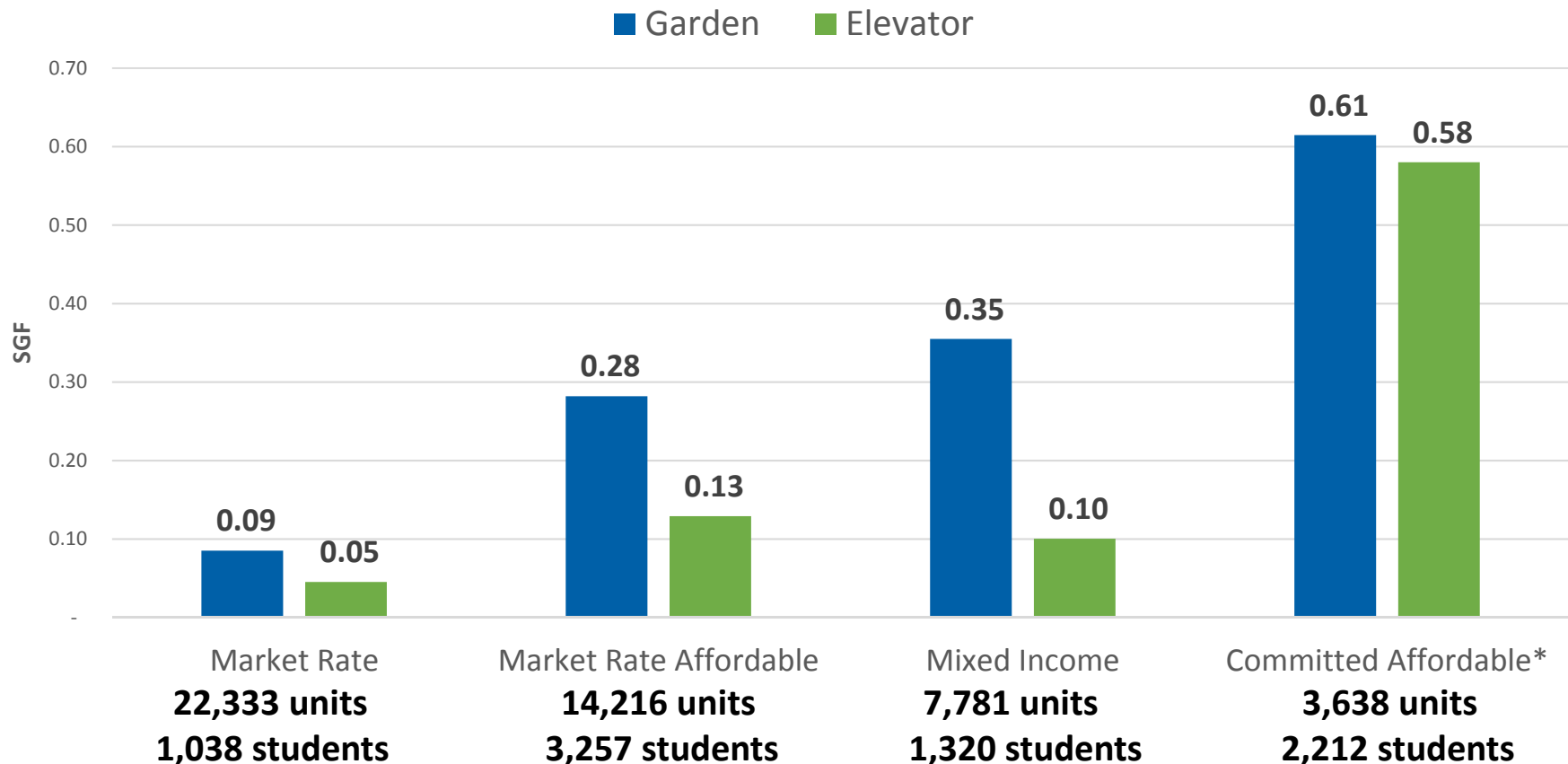


* Not Dedicated Senior Housing

SGF: APARTMENTS 2015

The largest share of apartments produces the fewest students.

Market rate apartments represent 45% of all apartments and produce the fewest students. Conversely, committed affordable garden units account for 6% of apartments and hold the highest SGF of 0.61. Across all types of apartments by affordability, elevator apartments generate fewer students than garden.

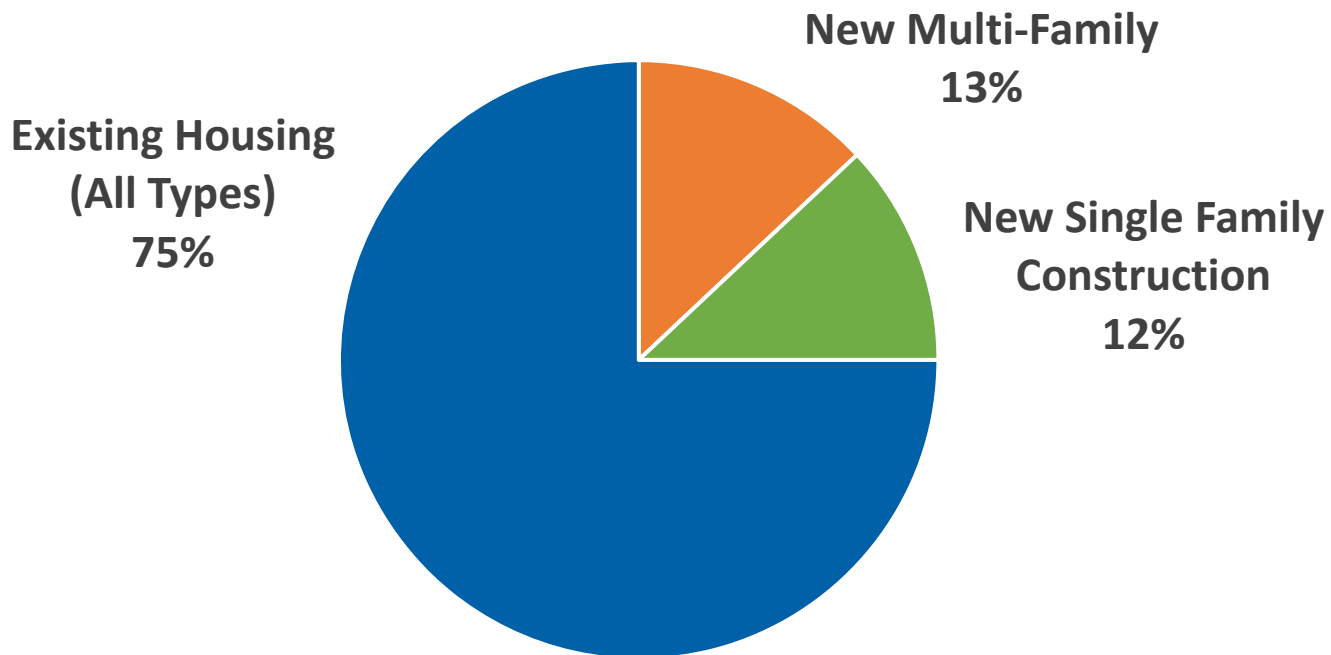


STUDENT INCREASE 2010-2015

75% of APS's enrollment increase came from existing housing.

APS's enrollment increased by over 4,000 students between 2010-2015. By examining where net student increases occurred, ACG and APS found that the majority, 75%, of students came from existing housing, while the remaining 25% came from new housing.

Distribution of Enrollment Increase by Housing Type

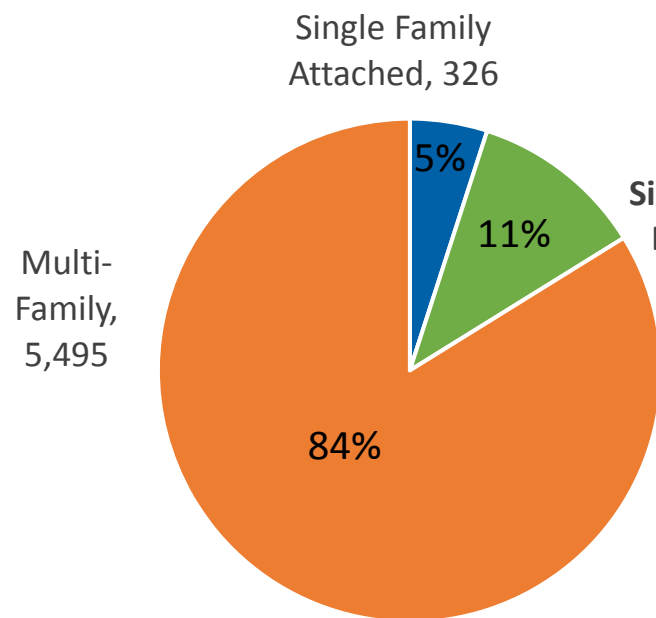


STUDENT INCREASE FROM NEW HOUSING 2010-2015

Single Family Detached: New construction SGF higher than existing units

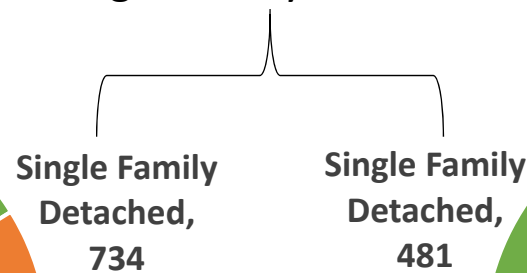
46% of the new enrollments came from the new single family detached housing, which is only 11% of the new housing between 2010-2015. This results in a SGF of 0.66 for newly constructed single family detached housing.

New Housing Units

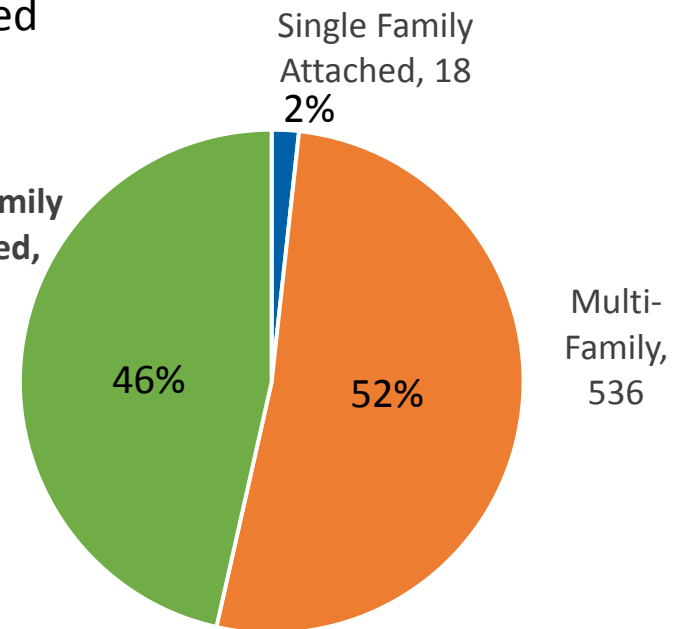


0.66 SGF

New Construction Single Family Detached



Enrollment Net Increase From New Units



2015 SGF BREAKDOWN

SGFs based on affordability and new single family construction.
 2015 SGFs can be applied to new housing to estimate additional student enrollment.

Single Family	2015 SGF
Detached	0.47
Detached - New Construction	0.66
Attached	0.27

Condo	2015 SGF
Garden	0.09
Elevator	0.05

Apartment - Garden	2015 SGF
Market Rate	0.09
Market Rate Affordable	0.28
Mixed Income	0.35
Committed Affordable*	0.61

Apartment - Elevator	2015 SGF
Market Rate	0.05
Market Rate Affordable	0.13
Mixed Income	0.10
Committed Affordable*	0.58

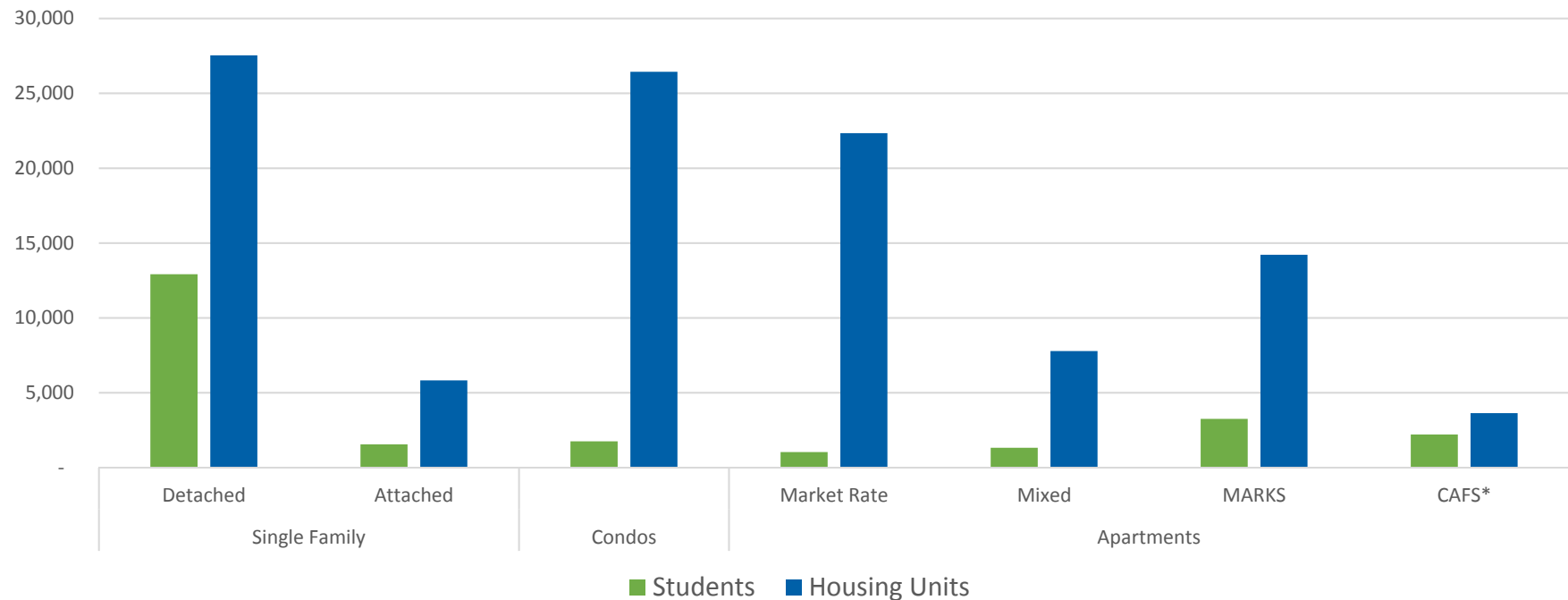
* Not Dedicated Senior Housing

SGF RECAP

Single family detached generates the majority of APS students due to its volume in Arlington’s housing stock and the high SGFs.

Committed affordable units also generate a higher number of students per unit. However, these units account for a very small portion of the housing stock – 3%.

Student Enrollment and Housing Stock



* Not Dedicated Senior Housing

COMPONENT MODEL: KEY FINDINGS

2. Can ACG's population forecast be augmented to project births and population by age group?

- By 2030, Arlington will have experienced the peak in births and those under the age of 15.
- Supplementing ACG's forecasting method with the component model to project births will enhance the long-term student enrollment projections (years 6-10).
- Several data points should be monitored including single family sales, changing SGFs, migration, and births to add a qualitative element to the forecasting and projections process.

COMPONENT MODEL VARIABLES

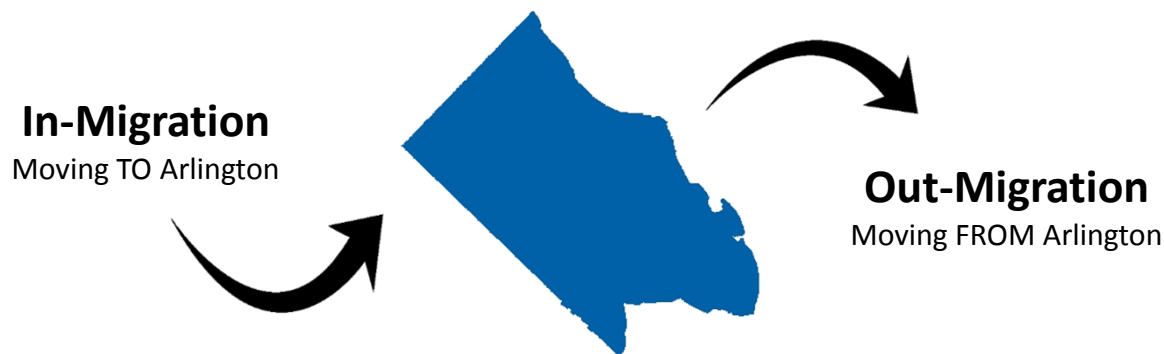


Natural Increase Components are most **reliable**.

Birth and **death** components derived from actual vital records data.

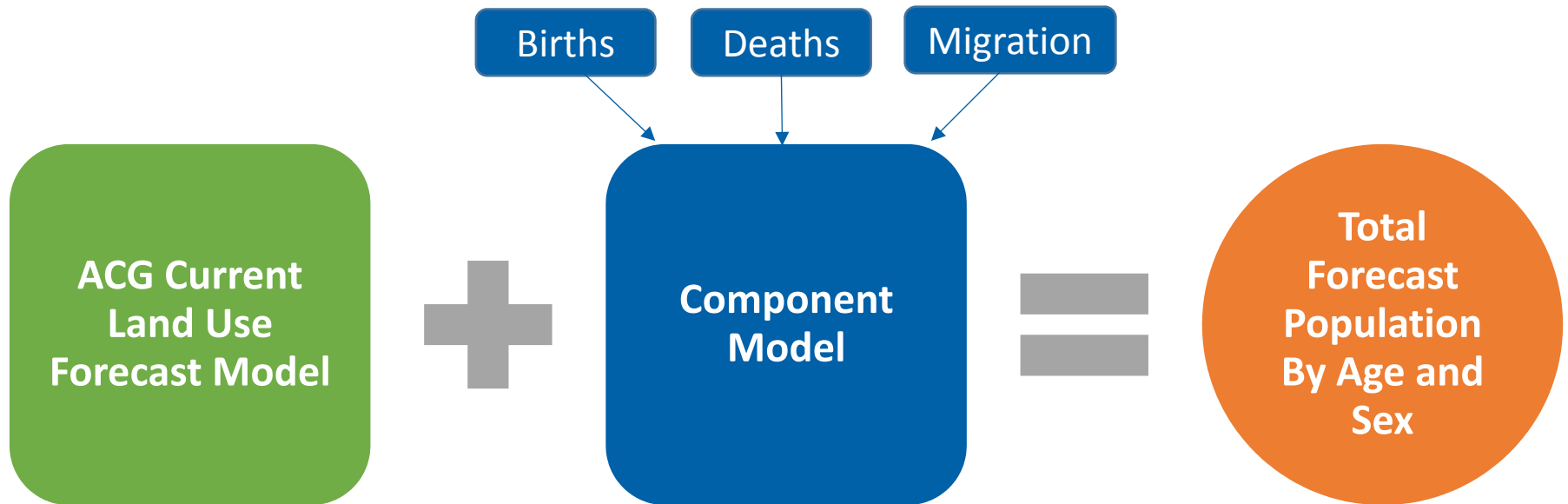
Net Migration Components are more **volatile**.

The difference between those moving in and out during a given period.



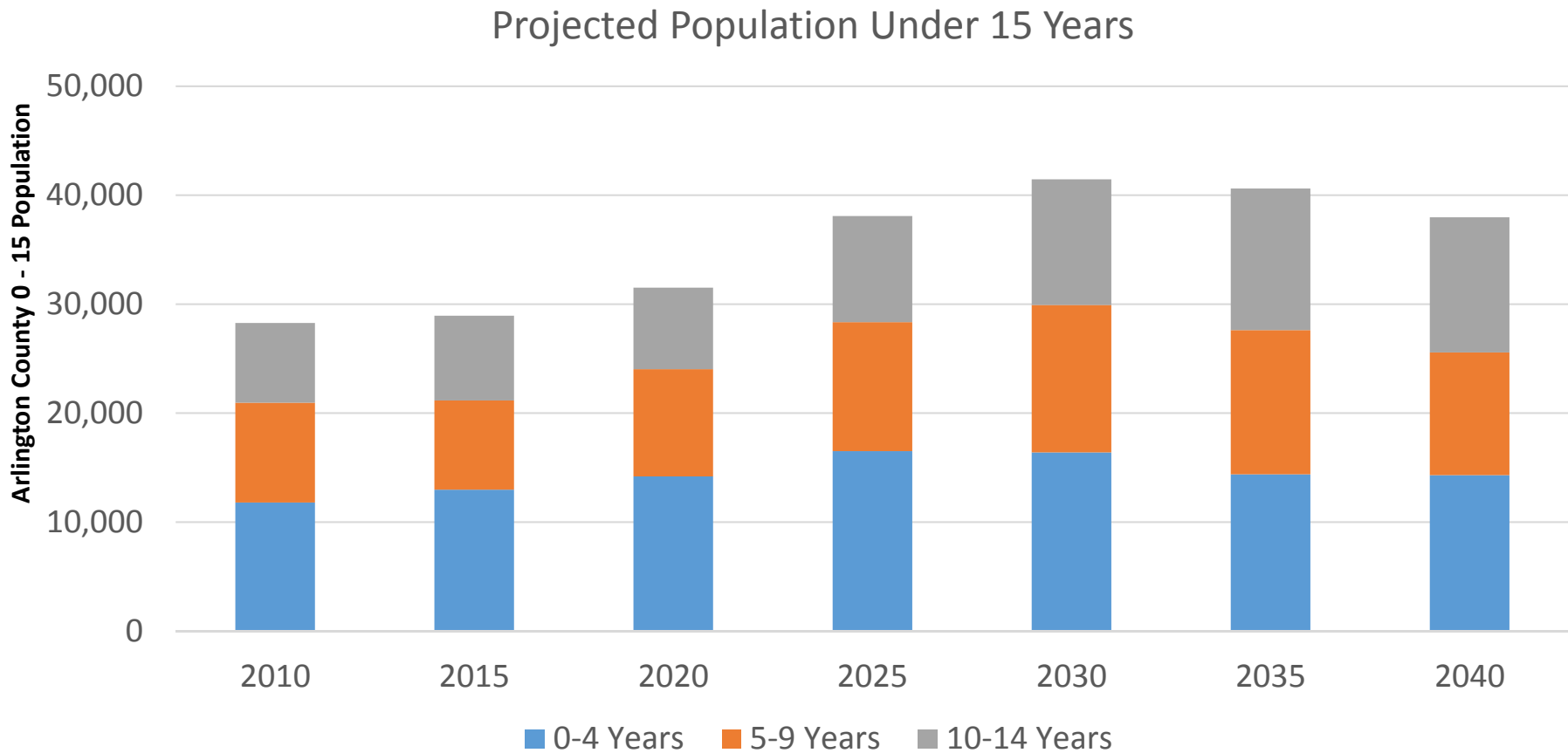
COMPONENT MODEL

ACG population forecast can be supplemented by component model to project the total population by age and sex.



COMPONENT MODEL: POPULATION UNDER 15 YEARS

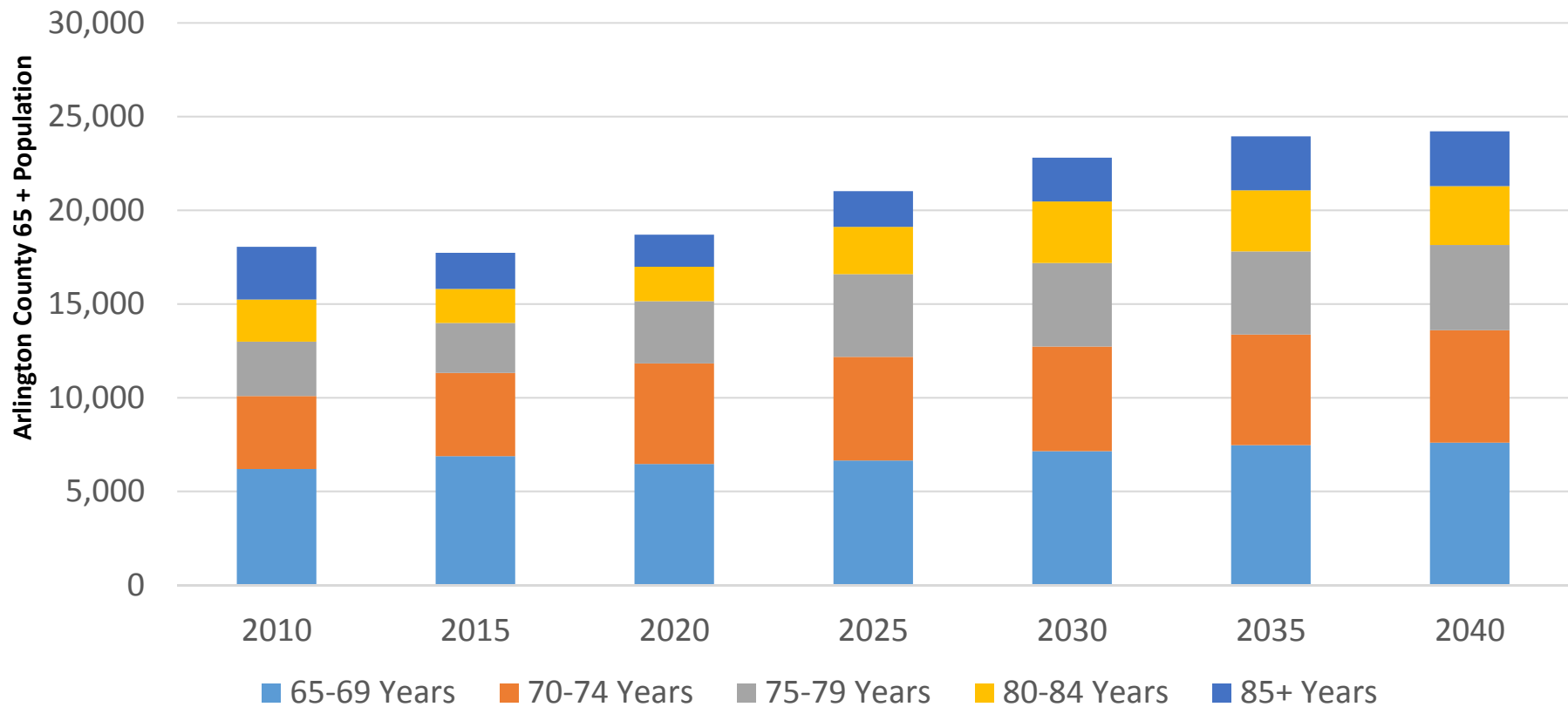
The population under the age of 15 is predicted to peak in 2030.



COMPONENT MODEL: POPULATION OVER 65 YEARS

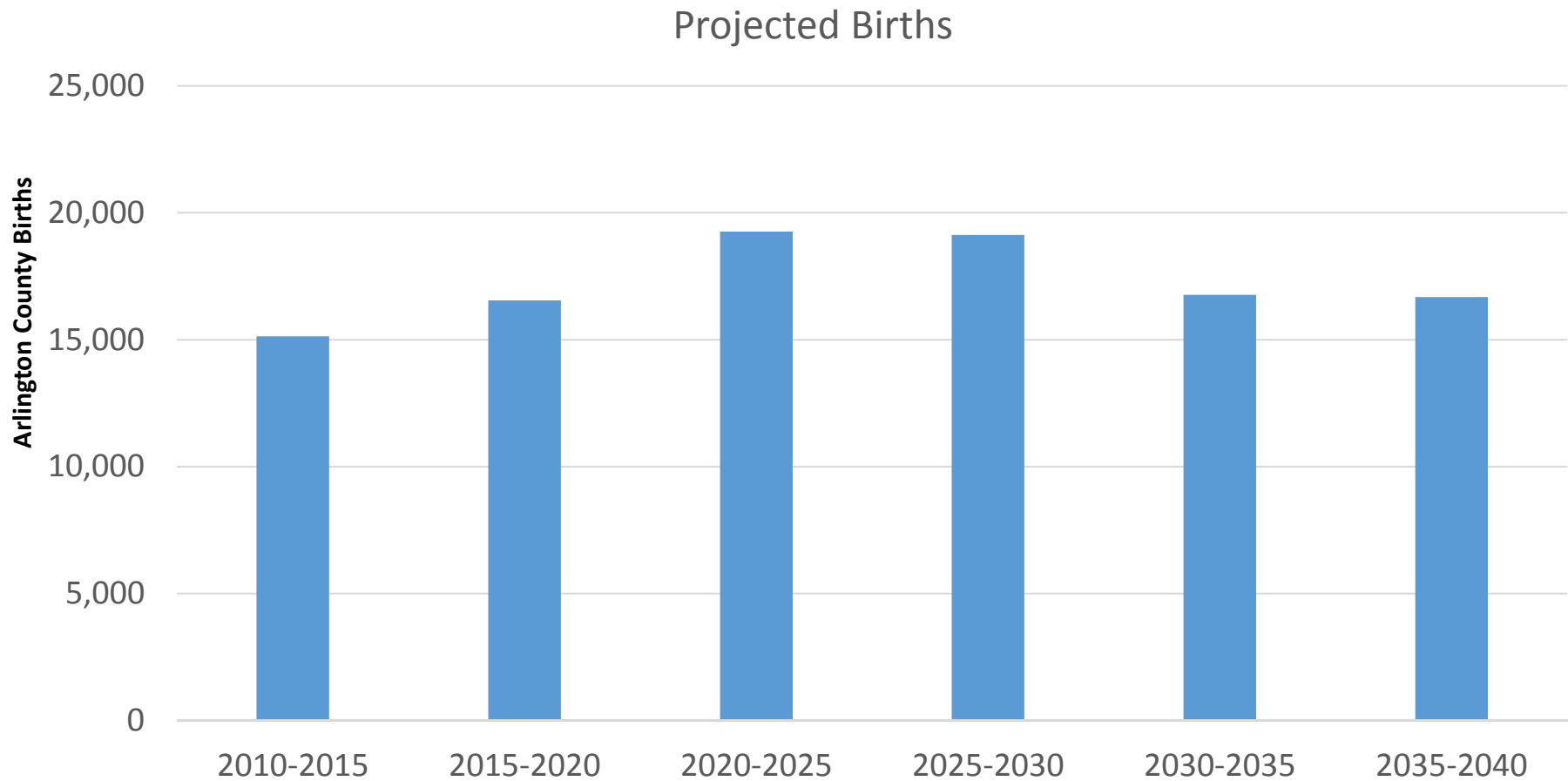
The population over 65 years is predicted to increase by 34% by 2040.

Projected Population Age 65+



COMPONENT MODEL: PROJECTED BIRTHS

Births are predicted to peak between 2020 and 2030.




COMPONENT MODEL: PROJECTED BIRTHS

Projected births can be incorporated in to APS long-term projections.

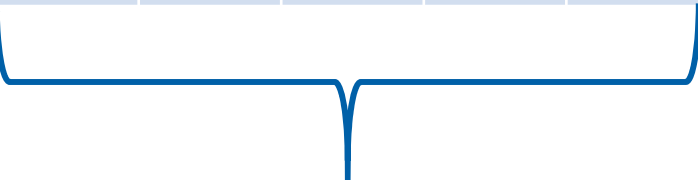
Actual births are incorporated into APS’s projection for kindergarten enrollment for projection years 1-5. Currently, APS uses a 3-year rolling average of past births to project enrollment for years 6 – 10. In the future, APS can utilize component projected births for the long-term (6-10 year) projections.

APS Kindergarten Enrollment Projections

APS Projection Year	1	2	3	4	5	6	7	8	9	10
Kindergarten Year	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Birth Year	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021



Actual Births

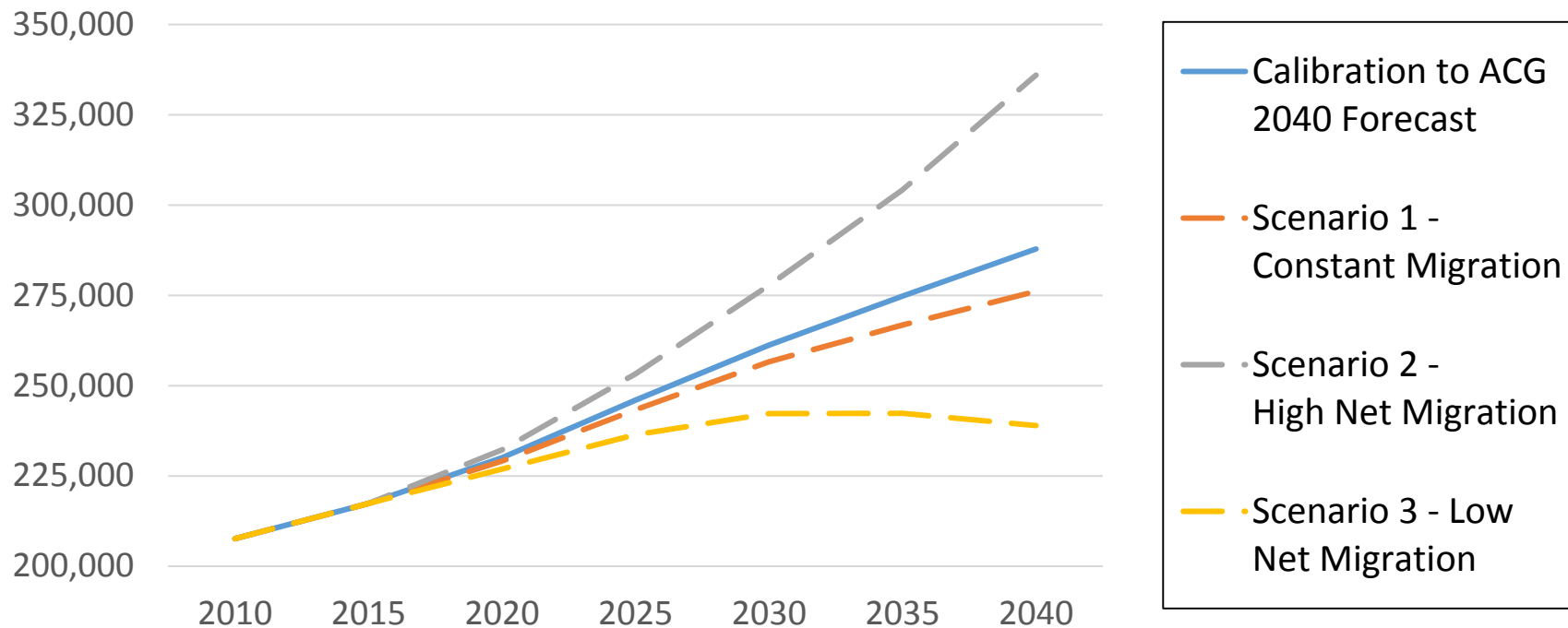


Projected Births

COMPONENT MODEL: SCENARIO PROJECTIONS

Population scenarios can be produced by varying net migration rates, resulting in a range projected population.

Projected Population by Scenario



DATA MONITORING

ACG and APS will monitor key data points to add a qualitative element to the forecasting and projections process.

- Housing Sale Data
- Length of Home Ownership
- Births
- Migration Patterns
- Long-term trends in SGFs by housing type
- Student distribution by geographic location

KEY FINDINGS - RECAP

1. The **majority of APS student** come from **single family housing**.
2. **Single family detached** and **committed affordable** housing had the **highest SGFs**. 25% of Arlington's housing stock is single family detached, while 3% is committed affordable.
3. The majority of the **student increase** came from **existing housing** between 2010 and 2015.
4. By **2030**, Arlington will have experienced the **peak in births** and those **under the age of 15**.
5. Supplementing ACG's forecasting method with the **component model** to project births will **enhance** the **long-term student enrollment projections** (years 6-10).
6. Several **data** points should be **monitored** including single family sales, changing SGFs, migration, and births to add a qualitative element to the forecasting and projections process.

RECOMMENDATIONS

Initial Next Step: Document ACG and APS data sharing agreement including timing and methods.

ACG

1. Supplement ACG's population forecast with the component model.
2. Produce and provide APS with a range of projected births based on migration scenarios.
3. Monitor and track key data points: births, deaths, and migration.
4. Continue data sharing and collaboration with APS.

APS

1. Apply new SGF for multifamily based on affordability and new single family detached construction
2. Test and evaluate incorporating ACG's projected births.
3. Incorporate ACG **forecast** housing units in projections.
4. Monitor and track key data points: home sales and length of home ownership.
5. Continue data sharing and collaboration with ACG.

CFS: PHASE II CONSULTANT STUDY

Discussion