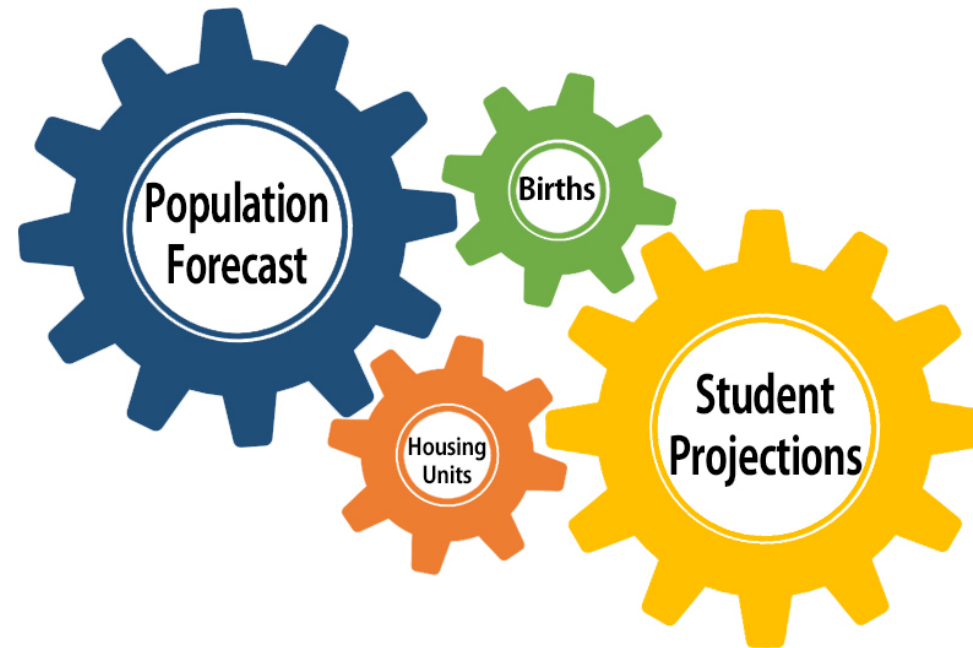


JOINT FACILITIES ADVISORY COMMISSION

November 15, 2017

Implementing Community Facility Study Recommendations

Enhancing ACG Forecasts and APS Projections



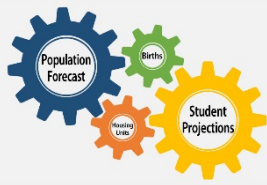
Elizabeth Hardy

Principal Planner and Demographer | Arlington County – CPHD | Planning Division

Lisa Stengle

Executive Director | Arlington Public Schools | Planning and Evaluation

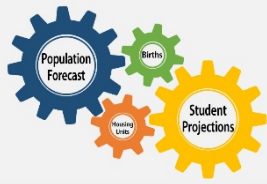




Community Facility Study

Review of ACG Forecast and APS Projections Methods

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



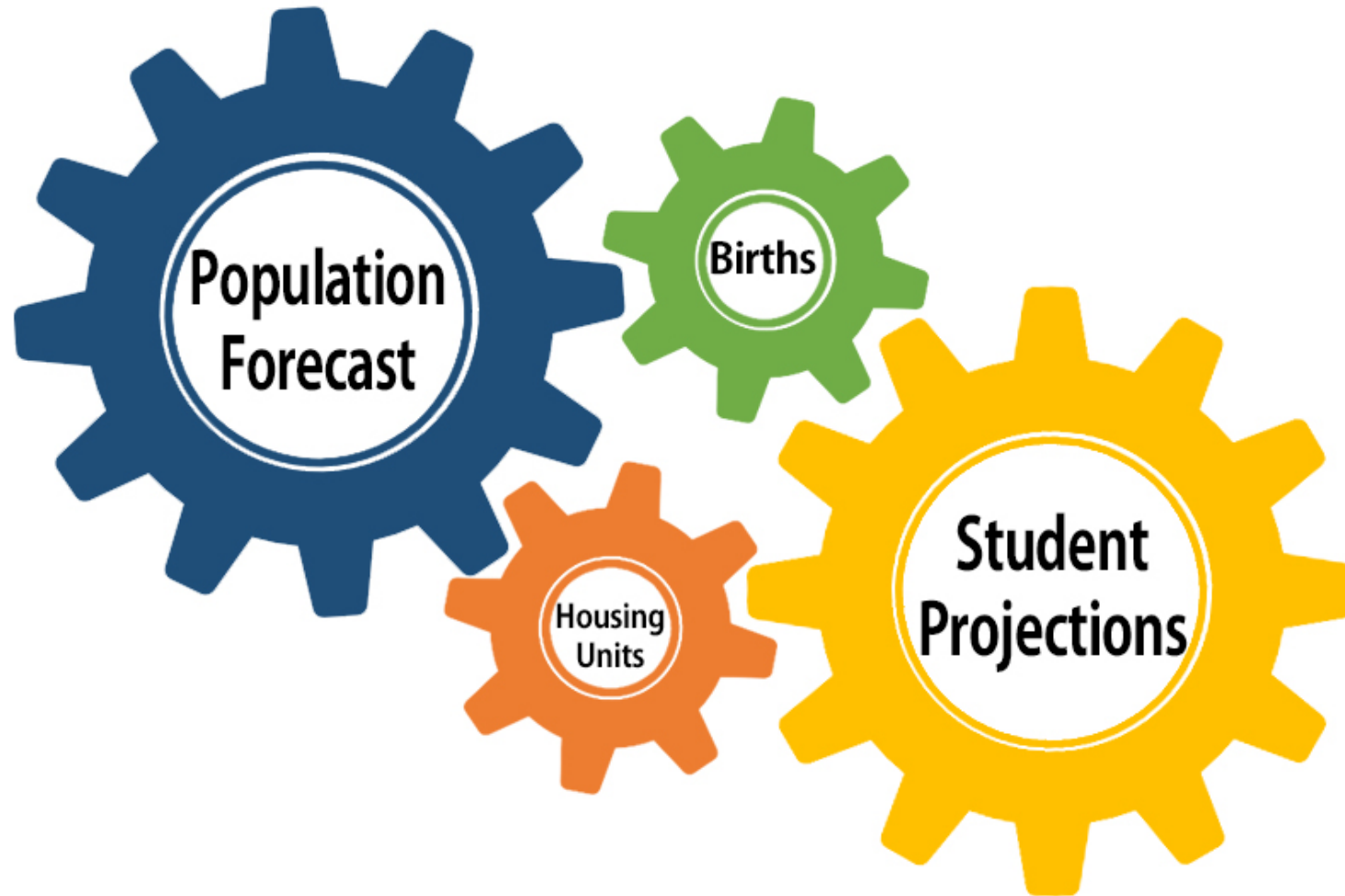
Improved Data Sharing and Collaboration

Successful transfer and of enhanced data from ACG to APS between September 29, 2017 and October 13, 2017.

- 1. Master Housing Unit Database:** All housing units in Arlington
- 2. Actual Births:** Geocoded for incorporation into GIS (2015)
- 3. Projected Births:** Estimated births for 2016-2025
- 4. Special Housing Unit Forecast:** Annual housing unit forecast 2017-2027.

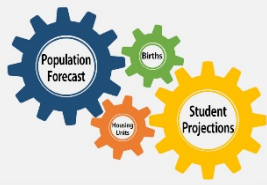


Enhanced ACG Forecast and ASP Projections



November 15, 2017

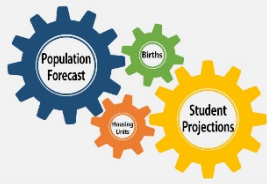




ACG Forecast

Land Use Model

- Forecast of housing units, households, population, and jobs for a 30-year period and broken down in to 5-year increments.
- Population forecast is based on the 2010 Census total population count.
- Future population is estimated by applying occupancy and households statistics to projects under construction or approved (not yet under construction) and areas which could be redeveloped to allow more density or change of land use.



ACG Forecast

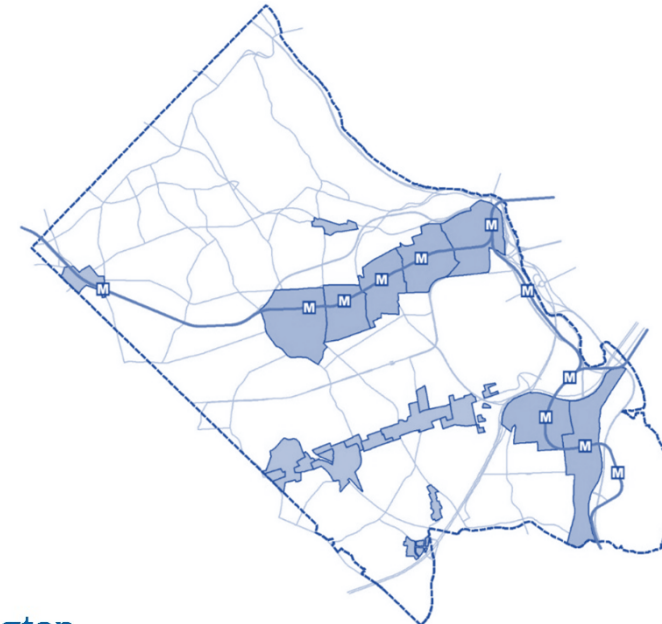
Variables

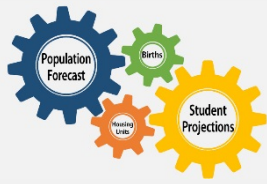
- **Housing unit occupancy** and **average household size** are derived from 2010 Census data.
- Each variable is derived for the areas listed below, plus the parcels that do not fall within these areas.

- | | |
|-----------------|-----------------------|
| 1. Rosslyn | 7. Pentagon City |
| 2. Courthouse | 8. Columbia Pike |
| 3. Clarendon | 9. Shirlington |
| 4. VA Square | 10. Cherrydale |
| 5. Ballston | 11. Nauck |
| 6. Crystal City | 12. East Falls Church |

Guidance

- **Density** and **land use** is determined by County Board approved documents:
 - General Land Use Plan (GLUP)
 - Zoning Ordinance
 - Sector and Small Area Plans



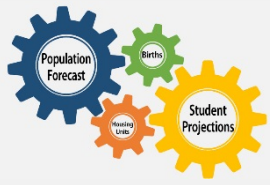


Land Use Model



*“The housing unit method is an acceptable methodology and is **especially effective** in areas with high quality data on housing development and changes.”*

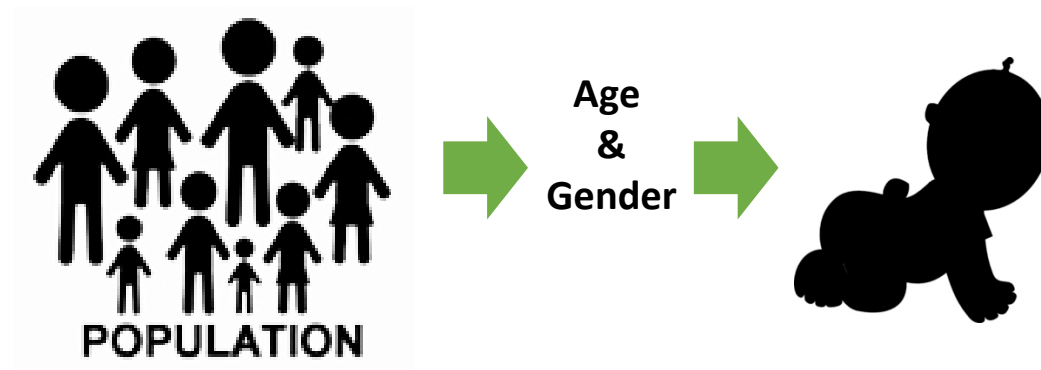
---- A Review of Projection Methodologies for the Arlington County Government and Arlington Public Schools , April 2, 2015.

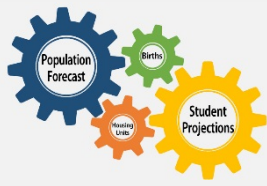


ACG Forecast - Enhancements

Cohort Component Model

- Total population broken down by age and gender.
- Project the number of births.

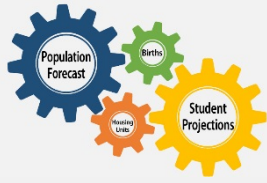




ACG Forecast - Enhancements

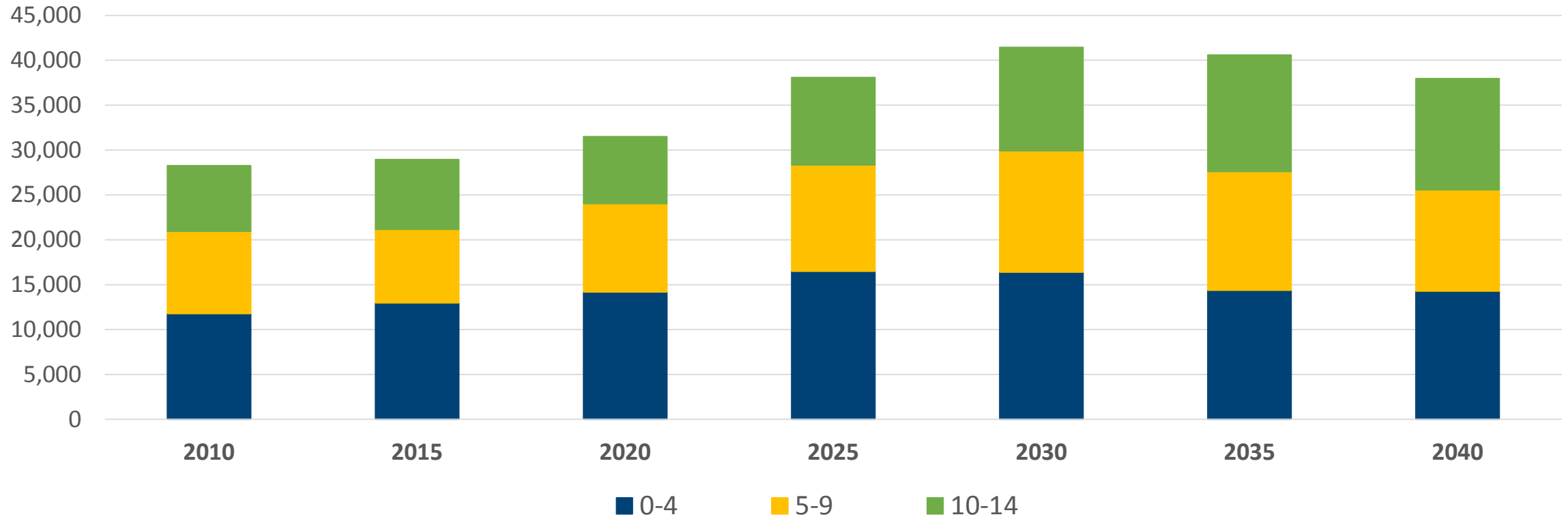
Special Housing Unit Forecast

- Breakdown housing unit forecast by year.
- Assigns a **single year** of delivery for each residential development project.
- Calibrated based on geographic area and historic **absorption rate**.
- Includes housing unit forecast by **unit type**.

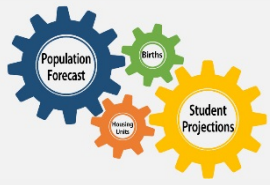


ACG Forecast - Outputs

Population Under 15 Years

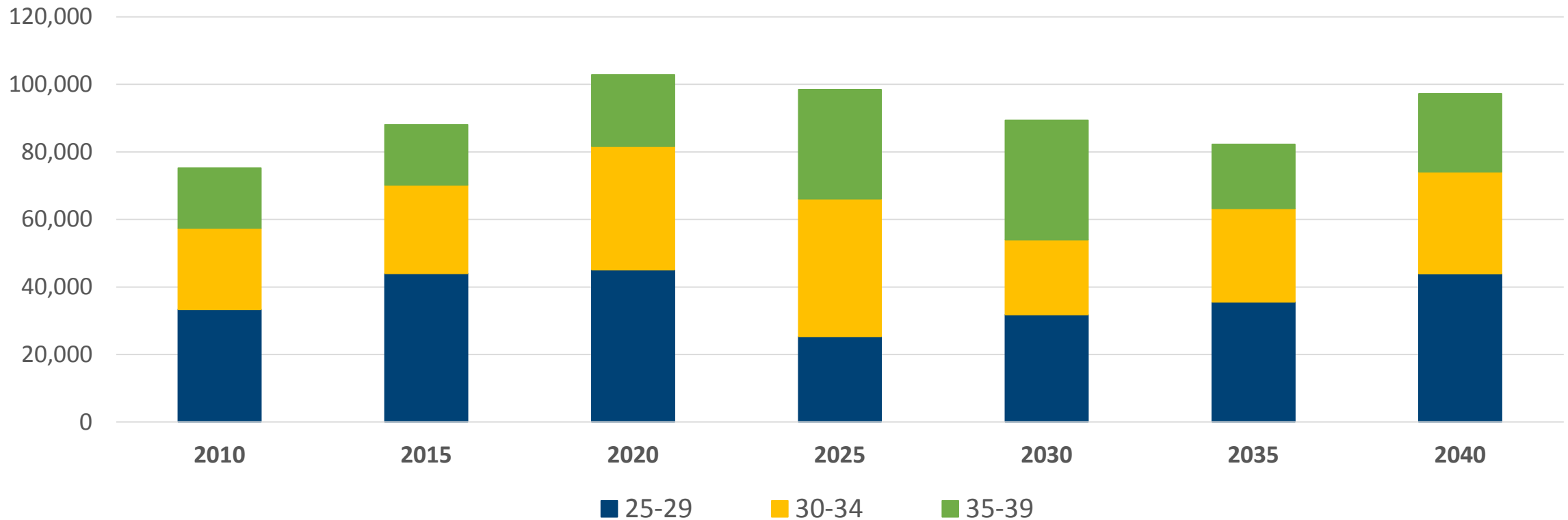


Source: CFS Phase 2 Report: Task 3

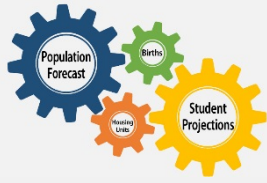


ACG Forecast - Outputs

Population Age 25-39

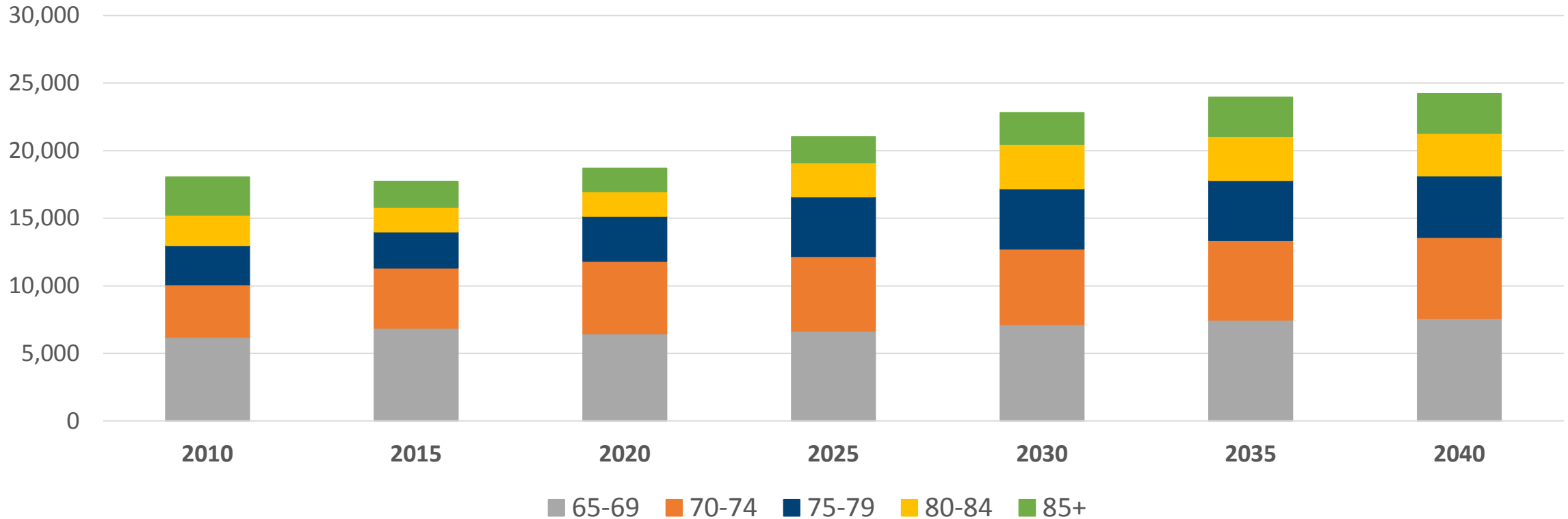


Source: CFS Phase 2 Report: Task 3

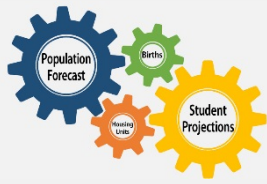


ACG Forecast - Outputs

Population Age 65+

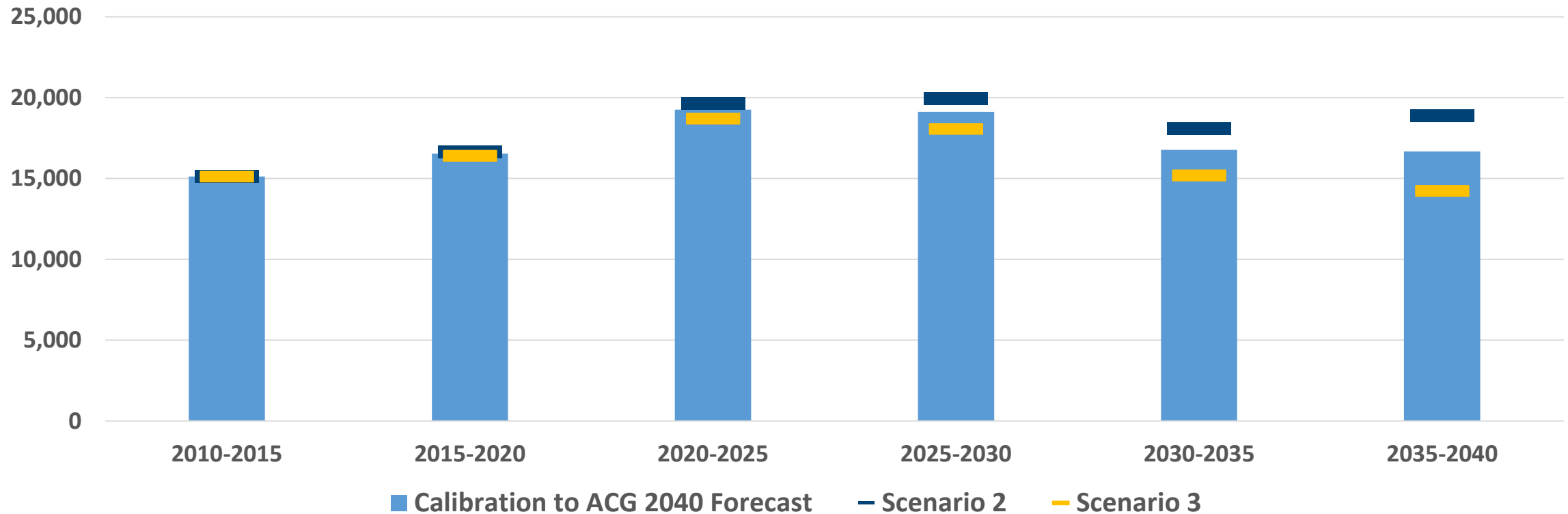


Source: CFS Phase 2 Report: Task 3

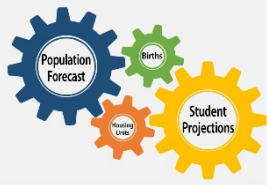


ACG Forecast - Outputs

Projected Births



Source: CFS Phase 2 Report: Task 3

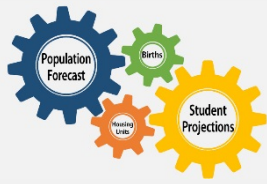


Fall 2016 Projection Components

- 1. Cohort Progression Ratio**
Percent of students advancing to the next grade.
- 2. Birth-to-Kindergarten Ratio**
Estimated number of future kindergarteners based on a comparison of births to kindergarten enrollment.
- 3. Student Generation Factor (SGF)**
Estimated students from new housing.

“Also known as the Cohort-Survival Ratio (“CSR”) method, the Grade Progression Ratio (GPR) is the preferred method to project enrollments by school demographers across the country.”

---- A Review of Projection Methodologies for the Arlington County Government and Arlington Public Schools , April 2, 2015



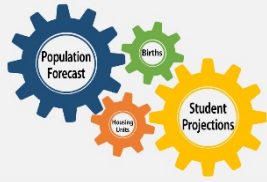
APS Projections: Cohort Progression Ratio

Cohort Progression Ratio

The likelihood of a student advancing from one grade to the next

- **Sept. 30th** student enrollment for current and previous school years
- **Ratio** of the number of students in a grade to the number of students from the previous grade in the previous school year
- Average across **three years** produces the cohort progression ratio

	September 30th Membership		Cohort Progression Rate Grade 2-3	
	Grade 2	Grade 3	One-Year Average	Three-Year Average
2011	99	105	--	--
2012	101	98	0.989	--
2013	102	104	1.029	--
2014	93	99	0.970	0.996

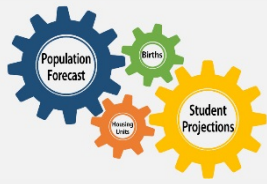


APS Projections: Birth-to-Kindergarten Ratio

Estimation of Kindergarten Population

- Arlington County **resident “live” birth** data from Virginia Center for Health Statistics.
- Ratio developed to relate the **number of births** to the **number of kindergarteners**.
- Ratio applied to resident “live” births to estimate **future kindergarten population**.

Birth Year	Kindergarten School Year	Resident Live Births	Kindergarten Cohort	Birth to KG Ratio
2000	2005	2,715	1,501	55%
2001	2006	2,814	1,627	58%
2002	2007	2,686	1,610	60%
2003	2008	2,659	1,697	64%
2004	2009	2,810	1,924	68%
2005	2010	2,809	2,003	71%
2006	2011	2,561	1,968	77%
2007	2012	2,778	2,179	78%
2008	2013	2,924	2,139	73%
2009	2014	2,935	2,196	75%
2010	2015	3,097	2,152	69%
2011	2016	3,049	2,127	70%

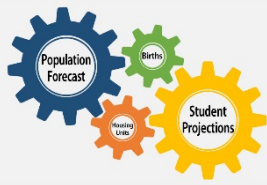


APS Projections: Student Generation Factor

Estimation of students from new housing.

- Student Generation Factor (SGF) is the ratio of the number of student to the number of housing units.
- SGF is applied to new housing unit to estimate the student yield.

All Grade Levels (PreK-12)					
Housing Type	APS PreK-12 Students	% of Students by Housing Type	Housing Units County-wide	% of County Housing Type	Student Generation Factor
Single Family Detached	13,198	52.79%	27,564	25.05%	0.479
Apartment - Garden	5,441	21.76%	15,190	13.81%	0.358
Apartment - Elevator	2,917	11.67%	34,837	31.66%	0.084
Duplex	945	3.78%	2,240	2.04%	0.422
Condo - Garden	1,132	4.53%	12,828	11.66%	0.088
Condo - Elevator	683	2.73%	13,783	12.53%	0.050
Townhouse	684	2.74%	3,582	3.26%	0.191
Total	25,000	100.00%	110,024	100.00%	0.227



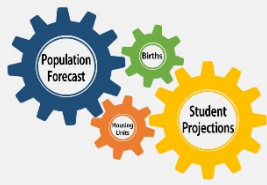
APS Projections - Enhancements

Projected Births

- Incorporate projected births from ACG population forecast cohort component model.
- Apply birth-to-kindergarten ratio to project future students.

Housing Unit Forecast

- Incorporate annual housing unit forecast.
- Apply student generation rates to project the student yield from new housing.



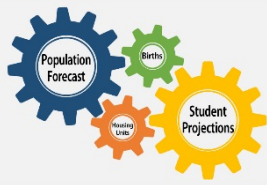
APS Projections – Enhancements

Scenario Projections

- APS and ACG staff working jointly to develop high, medium, and low student projection scenarios

Review Committee

- APS is developing a process to jointly work with ACG staff and Arlington community members to review and advise projections and scenarios.



Next Steps

- ACG and APS continue to work jointly on population forecasts and student projections.
- Continue to monitor and adjust forecast and projections models.
- Continue to monitor key data points:
 - Population estimates
 - Migration data
 - Home sales
 - Student generation factors.
- Annually review ACG and APS data sharing scope.