

MWCOG Cooperative Forecasting Subcommittee

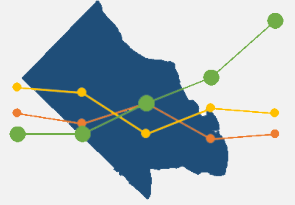
Population and Employment Forecast Methods



Community Planning, Housing and Development
Center for Urban Design and Research

Elizabeth Hardy

September 11, 2018



Presentation Outline

- Forecast Method
 - Population
 - Employment
- Forecast Model
- Coordination with Arlington Public Schools

Arlington County Government

Community Planning, Housing and
Development

Planning Division

Current
Planning

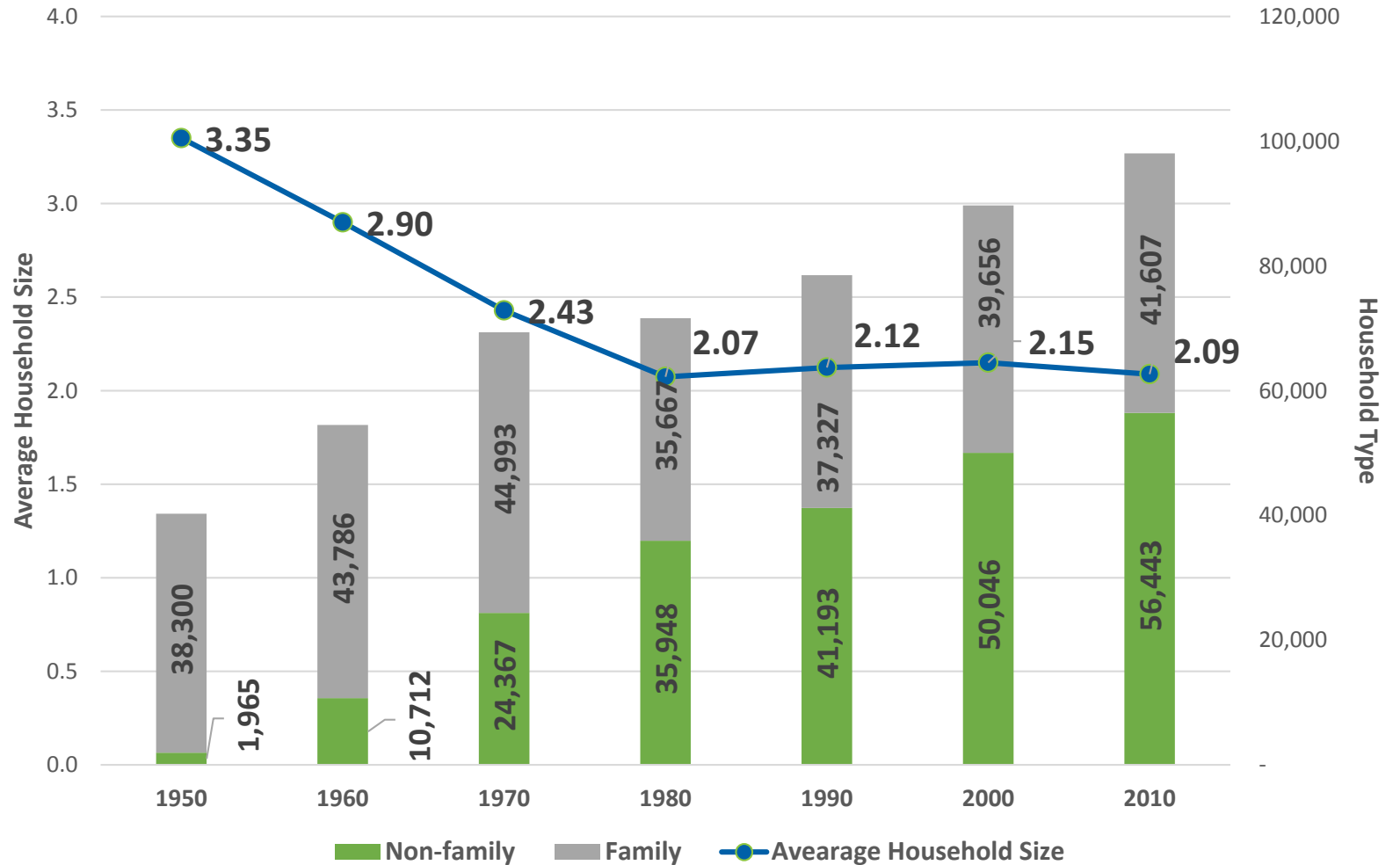
Comp
Planning

Urban
Design and
Research



Background: Population 1950-2010

- From 1950-1980, the average household size steadily declined.
- Since 1980...
 - 1) The average household size has remained just above 2 persons per household.
 - 2) Non-family households have grown much faster than family households, adding over 20,000 non-family households.



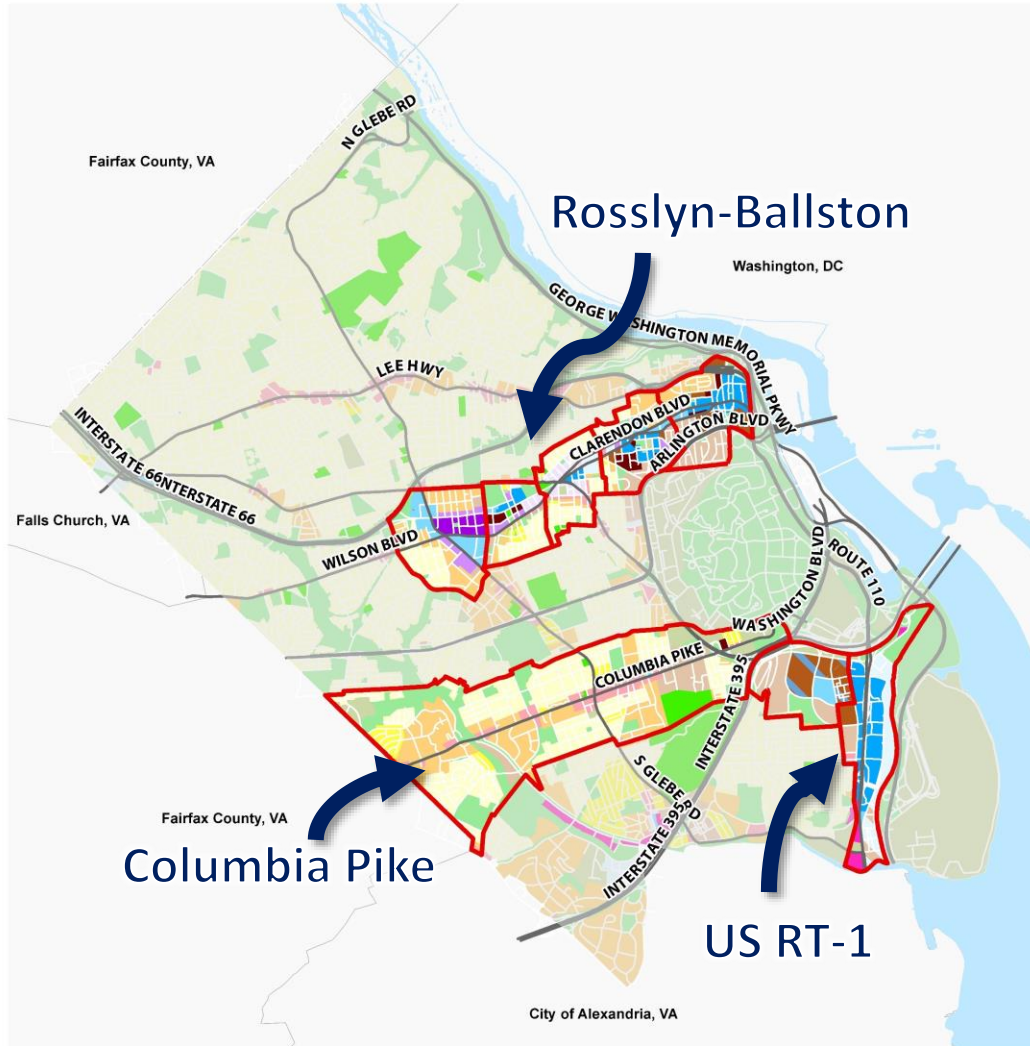


Background: Metro Corridors Development

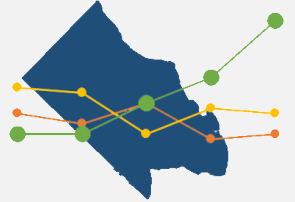




Background: Metro Corridors Development



- Concentrate density in the planning corridors:
 - Rosslyn-Ballston
 - US RT-1
 - Columbia Pike
- Preserve single family neighborhoods.
- 1/2 Population Resides in corridors = 22% of land



Background: 2018 Estimated Population Density

225,200

Arlington County

55,500

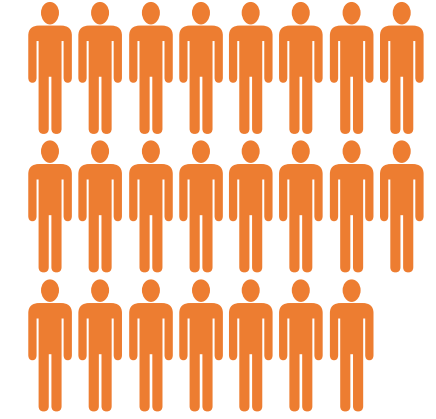
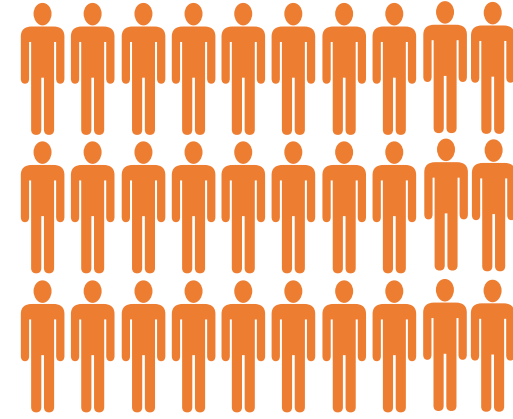
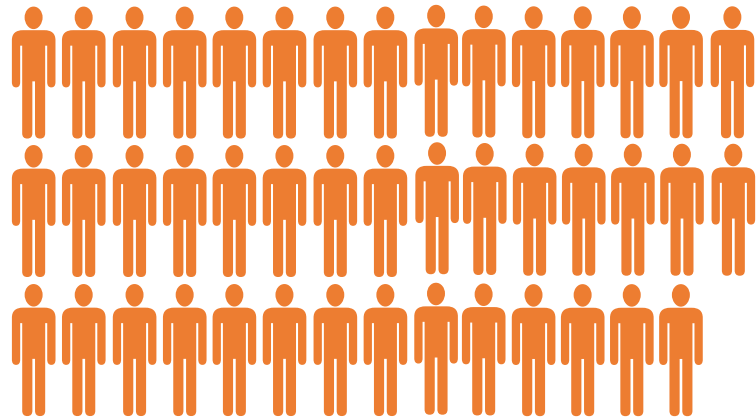
Rosslyn-Ballston

19,300

US RT-1

38,600

Columbia Pike



14

44

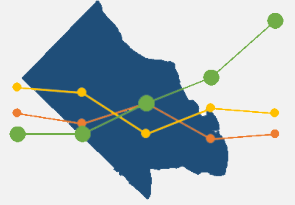
30

23



Persons Per Acre

1 Acre = Football Field Between 5-Yard Lines



Land-Use Based Forecast Method

Step 1: Develop Current Year Development Base

- 2010 Census Housing Units + Net New Housing = Current Year Base
- 2010 Employment Base (current office vacancy rate) + Net New Commercial Development

Step 2: Determine Development Potential

- The General Land Use Plan (GLUP), County Board approved site plans, phased development site plans, sector plans, small area plans, and the zoning ordinance

Step 3: Calibration and Timing

- Historic absorptions rates are calculated for multifamily housing units, office square footage and retail square footage.

Step 4: Calculate Population and Employment

- Apply factors: occupancy, average households size, office vacancy rate, space conversion factors



Land-Use Based Forecast Method: Step 1

Step 1: Develop Current Year Development Base

Housing Unit Base

2010 Census Housing Units + Net New Housing Units
(Household and Population Base)

Employment Base

2010 Employment Base (current office vacancy rate) + Net New Commercial Development
(GSA lease and Pentagon data)

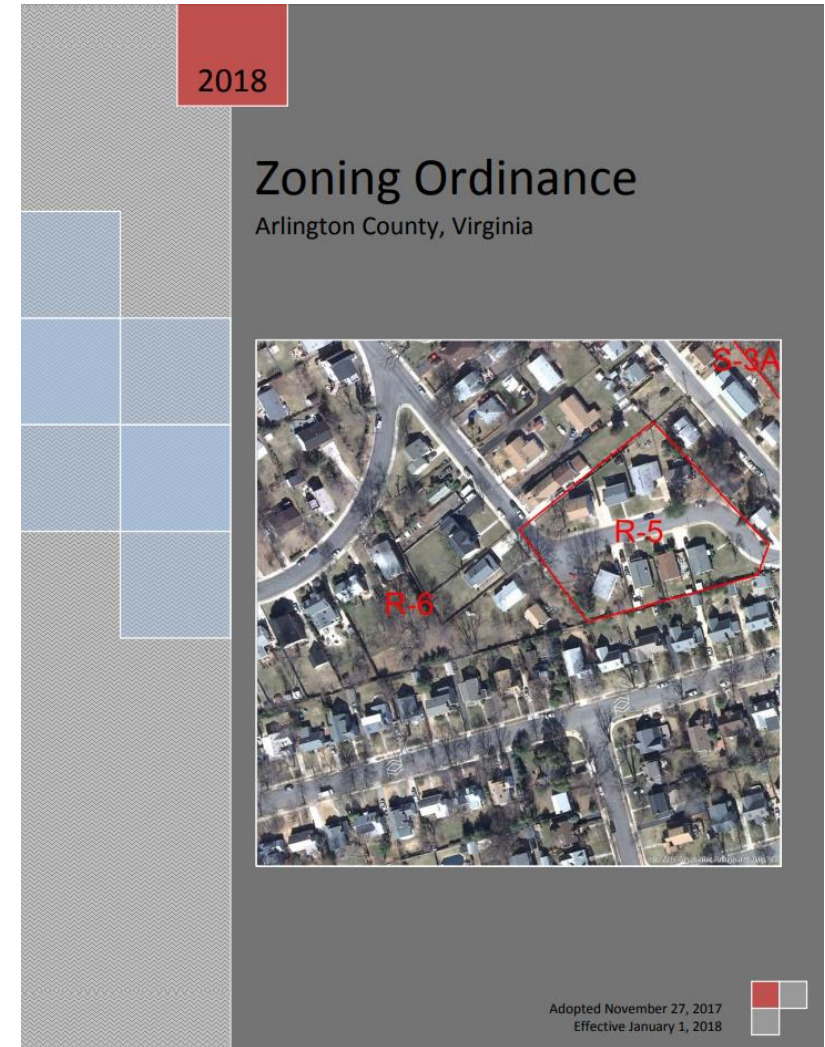
Net new housing and commercial development calculation are based on the Research Team's Development Tracking Program which records all development activity on a quarterly basis.



Land-Use Based Forecast Method

Step 2: Determine Development Potential

- General Land Use Plan
- Zoning Ordinance
- Ballston Sector Plan (1980)
- Virginia Square Sector Plan (2002)
- Clarendon Sector Plan (2006)
- Courthouse Sector Plan Addendum (2015)
- Rosslyn Area Sector Plan (2015)
- The Rosslyn to Courthouse Urban Design Study (2003)
- Columbia Pike Revitalization Plan-Update (2005)
- Columbia Pike Neighborhoods Area Plan (2012)
- Crystal City Sector Plan (2010)
- Fort Myer Heights North Area Plan (2008)
- East Falls Church Area Plan (2011)
- Lee Highway/Cherrydale Revitalization Plan (1994)
- North Quincy Street Plan (1995)
- North Quincy Street Plan Addendum (2013)
- Nauck Village Center Action Plan (2004)
- Western Rosslyn Area Plan (2015)





Land-Use Based Forecast Method

Step 3: Calibration

Historic absorptions rates are calculated for multifamily housing units, office square footage and retail square footage.

Development Tracking

Round 9.1 Absorption Rates

RESIDENTIAL

RESIDENTIAL - Completed (NEW)

	Arlington	BALLSTON	VA SQUARE	CLARENDON	COURTHOUSE	ROSSLYN	CRYSTAL CITY	PENTAGON CITY	COLUMBIA PIKE	SHIRLINGTON	OTHER AREAS
3Q2002-2Q2007	7,078	515	968	1,613	579	651	1,092	326	118	635	581
3Q2007-2Q2012	7,125	711	151	511	807	1,057	828	699	1,017	-	1,344
3Q2012-2Q2017	6,552	644	886	378	629	1,210	414	1,060	528		803

RESIDENTIAL - Completed-Demolitions (NET)

	Arlington	BALLSTON	VA SQUARE	CLARENDON	COURTHOUSE	ROSSLYN	CRYSTAL CITY	PENTAGON CITY	COLUMBIA PIKE	SHIRLINGTON	OTHER AREAS
3Q2002-2Q2007	6,257	436	951	1,613	445	215	1,092	326	75	635	469
3Q2007-2Q2012	6,577	583	115	511	807	920	828	699	1,017	0	1,097
3Q2012-2Q2017	6,319	601	886	378	610	1,147	414	1,060	472	0	751

RESIDENTIAL - 5-Year Rolling Average - Detailed Stats (NEW)

	Arlington	BALLSTON	VA SQUARE	CLARENDON	COURTHOUSE	ROSSLYN	CRYSTAL CITY	PENTAGON CITY	COLUMBIA PIKE	SHIRLINGTON	OTHER AREAS
Upper Limit	9,342	998	968	1,613	1,089	1,240	1,736	1,060	1,039	635	2,161
Lower Limit	4,958	305	43	378	86	621	-	-	118	-	285
Average	6,990	614	612	796	670	933	891	511	624	289	1,051
Median	7,078	589	721	641	615	925	828	411	528	-	933
Annual	1,384	125	134	167	134	195	156	139	111	42	182



Land-Use Based Forecast Method

Step 4: Calculate Population and Employment

Apply factors: occupancy, average households size, office vacancy rate, space conversion factors

POPULATION FORECAST

Net New Housing
x
Occupancy Rate
=
Net New Households
x
Average Household Size
=
Net New Population

2010 Census Rates vary by Major Planning Area

EMPLOYMENT FORECAST

Net New Office Development
x
Occupancy Rate (normalized over forecast)
÷
Conversion Factor (square feet per employee)
=
Net New Office Jobs

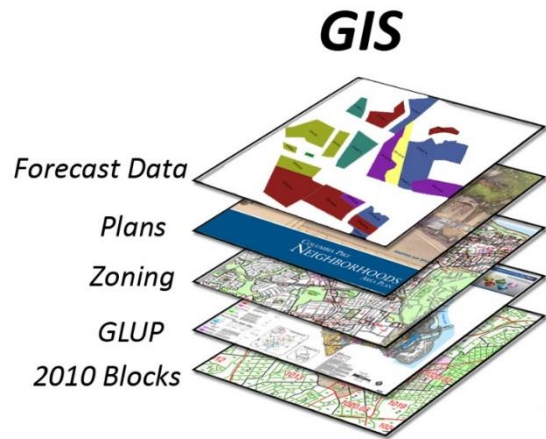
Repeat with static occupancy rate for retail development. Conversion factors vary by use: office, retail, other and industrial.



Land-Use Based Forecast Model

1

Land Use Inputs



2

Demographic Assumptions
and Calculations



FAR
Occupancy Rates
Household Size
Vacancy Rates
Jobs Factors

3

Calibrate Absorption
and Timing

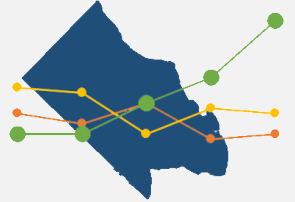




1. Land Use Inputs



Field	Value
OBJECTID_1	178
Shape	Polygon
OBJECTID	<null>
EVENT_ID	2012894
RPCMSTR	18001007
GLUP_CODE	COCTH
LOT_area	41889.66112
PER_res	0.9
PER_off	0
PER_retail	0.1
PER_hotel	0
PER_other	0
Block	510131018021001
DEM_res	0
DEM_off	19797
DEM_retail	22379
DEM_hotel	0
DEM_other	0
YEAR_	2025
Notes	CSP Redevelopment Site 2. Assume redevelopment of entire
AREA	COURTHOUSE
F_ID	CTH7
Shape_Length	816.649771
Shape_Area	41889.66112
NAME	Landmark Block
PLAN	Courthouse Sector Plan



2. Demographic Assumptions and Calculations

Land Use Assumptions Table

OBJECTID	Code	Glup_Category	Units	Office_Jobs	Retail_Jobs	Hotel_Room	Hotel_Jobs	Other_Jobs
1	LR10	Low Residential (1-10 units/acre)	4356	200	450	725	2	600
2	LR15	Low Residential (11-15 units/acre)	2904	200	450	725	2	600
3	LMR	Low-Medium Residential	1210	200	450	725	2	600
4	MR	Medium Residential	605	200	450	725	2	600
5	HMR	High-Medium Residential (3.24 FAR)	1100	200	450	725	2	600
6	HR	High Residential	1100	200	450	725	2	600

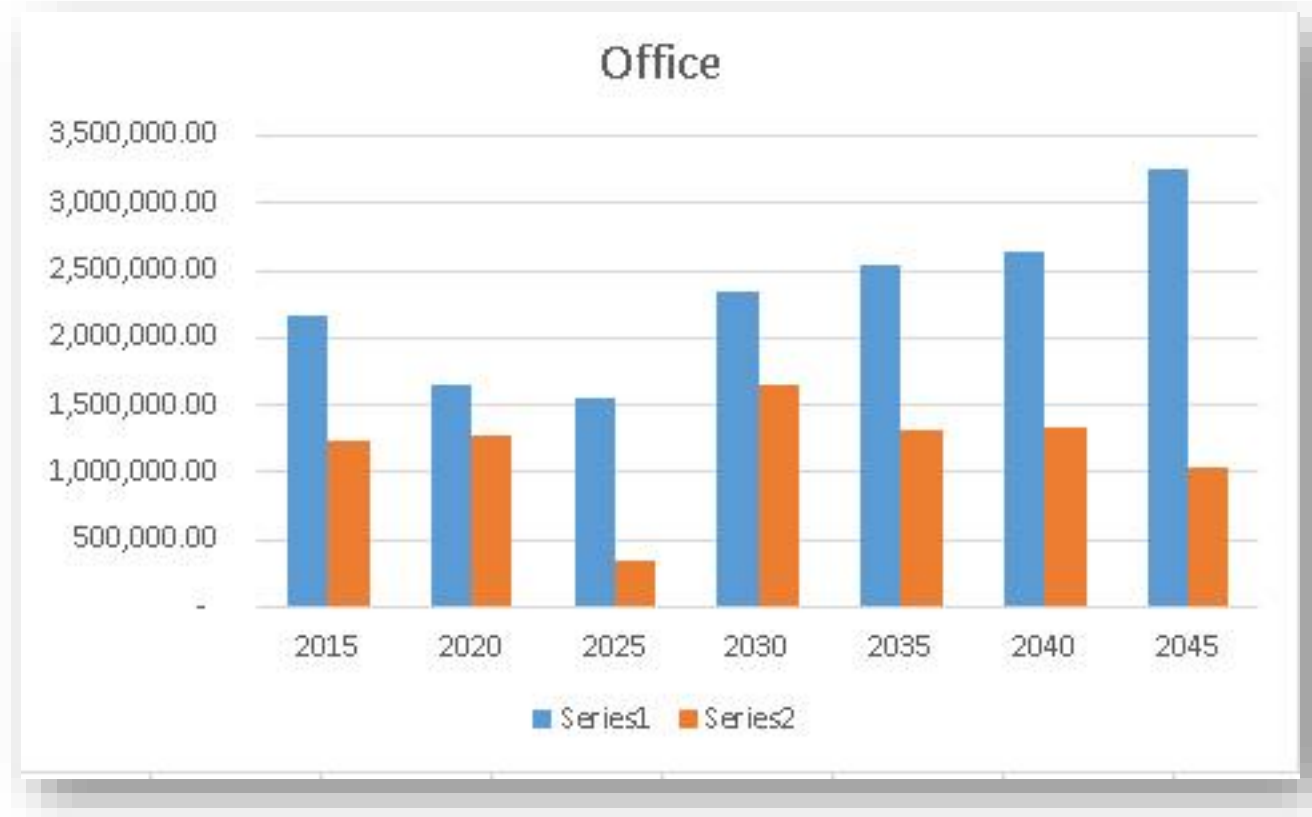
Rates Table

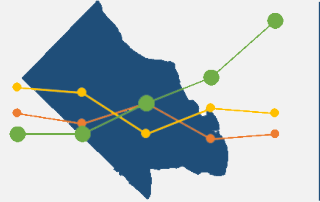
OBJECTID	AREA	Vacancy_Office_2010	Vacancy_Retail_2010	Occupancy_Office_2010	Occupancy_Retail_2010	Residential_Occupancy	Residential_HH_Size
1	Rosslyn	0.07695	0.06	0.92305	0.94	0.892163950824958	1.72833333333333
2	Courthouse	0.11415	0.06	0.88585	0.94	0.953508369118224	2.07304347826087
3	Clarendon	0.04955	0.06	0.95045	0.94	0.946186429442071	2.4219512195122
4	Virginia Square	0.03979	0.06	0.96021	0.94	0.917756179896453	2.16333333333333
5	Ballston	0.05117	0.06	0.94883	0.94	0.953536317647806	2.22380952380952
6	Crystal City	0.11951	0.06	0.88049	0.94	0.760240290925207	1.53388888888889



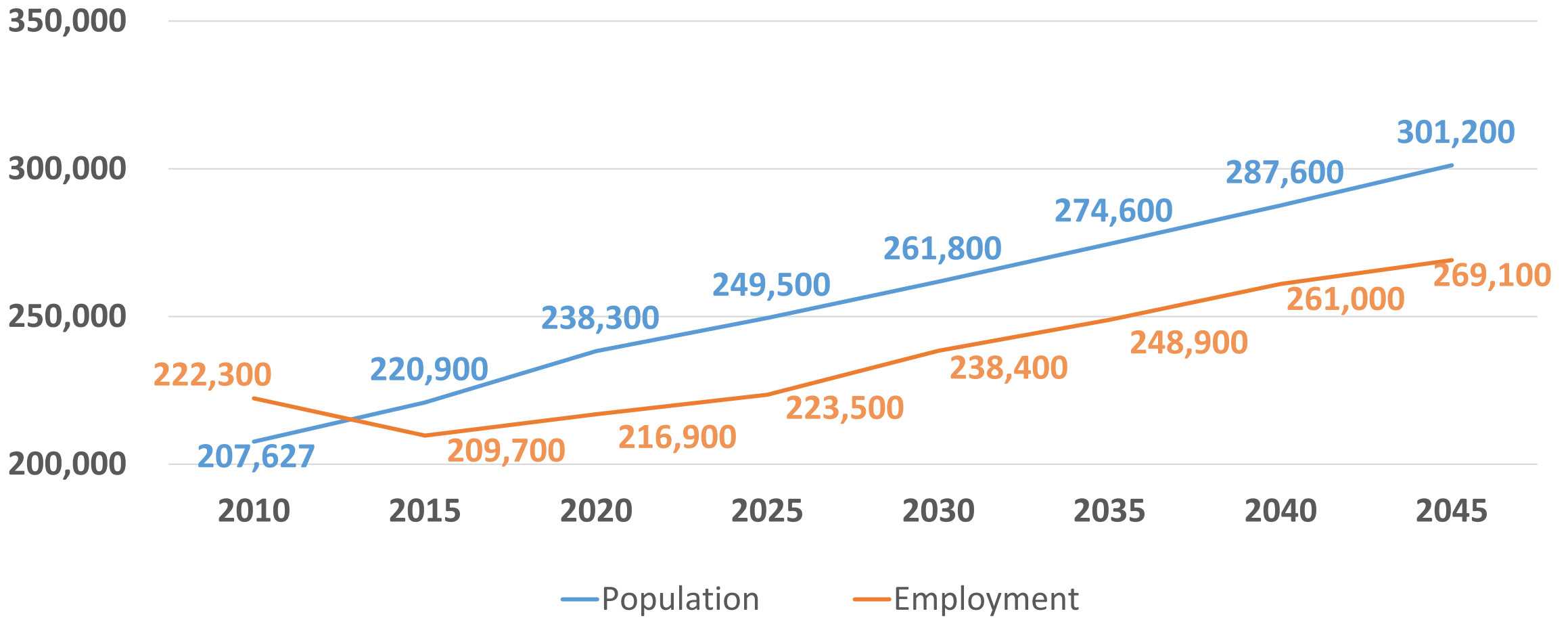
3. Calibrate Absorption and Timing

	A	B	C
1			
2	AREA	(All)	
3			
4	Row Labels	Sum of OFF_SQFT	Sum of NET_OFFICE
5	2015	2,166,266	1,233,860
6	2020	1,649,522	1,281,992
7	2025	1,560,921	350,982
8	2030	2,352,308	1,655,606
9	2035	2,550,350	1,318,237
10	2040	2,637,266	1,327,900
11	2045	3,251,524	1,038,831
12	Grand Total	16,168,157	8,207,408
13			
14			
15			
16		ARLINGTON	
17		NEW	NET
18	Upper Limit	4,113,280	3,427,461
19	Lower Limit	1,039,903	(203,684)
20	Average	2,540,338	1,759,217
21	Median	2,435,722	2,249,675
22	Annual	469,548	315,161
23			
24			





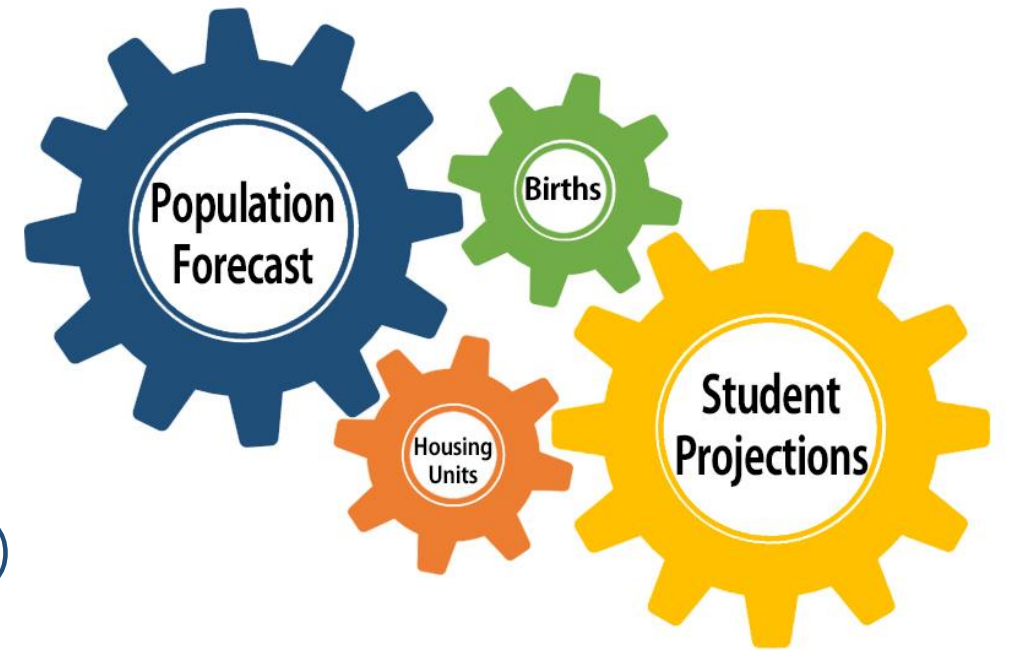
Arlington County Forecast Round 9.1





Coordination with Arlington Public Schools

- Special Housing Unit Forecast
 - Annual Housing Units and Parcel Level
 - 10-Year Forecast
 - Apply Student Generation Factors
- Cohort-Component Model
 - Forecast by Age
 - Project Birth (annually for 10-year period)





Questions?

Thank you!

Elizabeth Hardy

ehardy@arlingtonva.us

Kristina Frazier

kfrazier@arlingtonva.us