

Small Area Population Forecasting – Some Thoughts

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Outline

Current GLA Approach:

Data

Methods

Issues

An Alternative Approach

New Homes Surveys

GLA Projection Outputs

Boroughs 2001 to 2031

Development-led

Population by SYA and gender – distribution to ethnic groups

Households by type – also by age/gender/marital status of representative

Resident labour force by age groups and gender

Wards 2001 to 2031

Development-led – constrained to borough

Population by SYA and gender

Households – totals only

School Roll Projections: ages in ward projections rebased to end of August rather than mid-year

Borough Level Input Data

Population

- ONS 2001 mid-year estimate (adjusted)

- Births and deaths (ONS)

Mid-year: 2001-02 to 2007-08

Calendar year 2008 and later trends in England used to estimate 2008-09

Fertility and survival trends from ONS 2008-based England projection

- Migration (ONS)

Mid-year: 2001-02 to 2007-08 gross migration by origins and destinations

2001 Census: age/gender structures of flows – proportions and probabilities

Borough Level Input Data

Households

- Development data (LDD, SHLAA and Borough Trajectories) - net annual new homes – actual and planned
- CLG 2006-based household projections
- *At every fifth year the model produces households by gender, marital status and five-year age groups of representatives and by five household types.*
- *Average household size is the calculated as an outcome not an input*

Labour Force

- 2001 Census: economic activity rates
- ONS GB projection (Jan 2006) of economic activity rates (to 2020) by gender and (mostly) five-year age groups (up to age 74)
- *2020 rates held to 2031*

Ward Level Input Data

ONS 2001 mid-year estimate (adjusted)

2001 Census Communal Population

2001 Households

Annual Births to mid-2008

Annual Deaths to mid-2008

2001 Census migration flow structures

Annual Electorates (Qualifying dates October 2000 to October 2008)

Annual Development data – consistent with borough data

Borough population projection constraint – births, deaths, SYA population

Ward Methodology - 1

Within each borough create most sensible distribution using:

Births and deaths: 2001-08

Electorates: 2001-08

Development: 2001-31

2001 Census Migration structures

Establish initial populations each year:

2001-08 use average growth in homes/electorates

2008-31 use growth in homes

Trends in average household size

Constrain to borough (age/gender) each year

Ward Methodology - 2

Annual cycle:

Base Population - year x

Subtract Communal Population - year x

Age and Survive - from x to $(x+1)$

Apply fertility rates - at mid-point between x and $(x+1)$

Apply out-migration probabilities - to survivors from x to $(x+1)$

Calculate housing capacity - at $(x+1)$

Top up with immigrants - in year from x to $(x+1)$

Add back Communal Population – either as at year x or adjusted to $(x+1)$

Constrain to borough population by SYA - at $(x+1)$

Issues - 1

Communal Population

- we know very little about changes in local demand and provision
- non-self-contained accommodation (ie student or retirement) included in SHLAA and therefore 'private'

Fertility and Mortality

- we do not know if parts of the borough have significantly different age-specific rates
- so assume an overall adjustment from the borough rates
- assume average 2001-08 local adjustments hold for future

Electorates

- need to be aware of inconsistencies between years that have nothing to do with population change
- should we drop it?

Issues - 2

Migration

- 2001 Census data contains moves of communal population
- if future development is at a different rate to that in 2000-01 will the 2001 Census data still be relevant?
- will development stem outflow or attract more inflow - or both?

-Household Size

- basic assumption is that AHS in each ward will change at same rate
- significant (re)development can change the character of total stock

Development

- most data relate to time periods greater than a single year
- most data relate to number of units rather than the character of the unit, ie number of bedrooms, flat or house, market, affordable, special
- windfalls and other non site-specific gains (conversions, back from vacant)

An Alternative Approach

Data from New Homes Surveys

- In London: Camden, Tower Hamlets and Wandsworth
- Elsewhere: **Oxfordshire**, Surrey, Kent, S Gloucs, W Berkshire, Northants

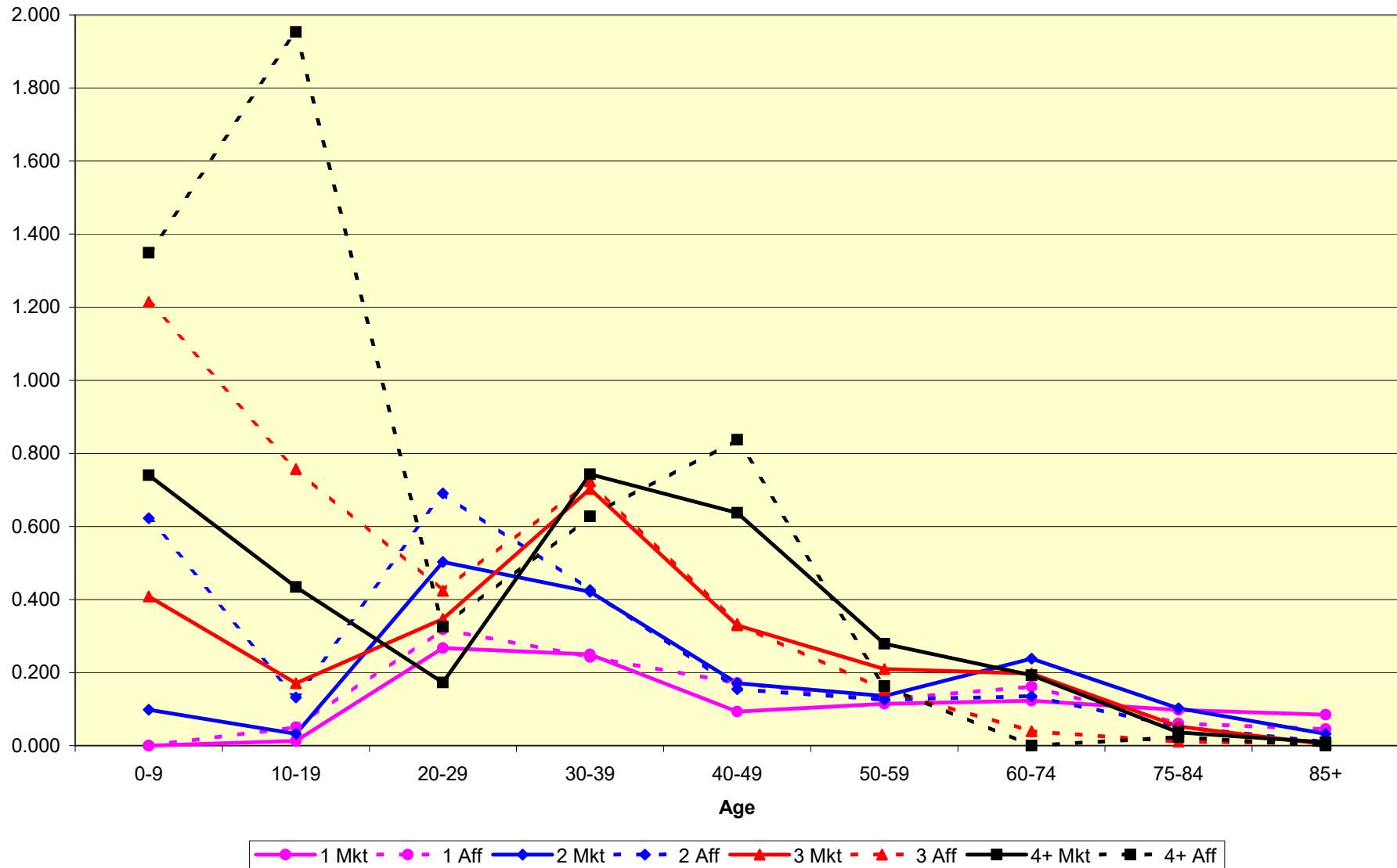
Key Variables

Population resident in new homes (up to 3 or 4 years old) by SYA/gender
Type of home: number of bedrooms – market/affordable – flat/house

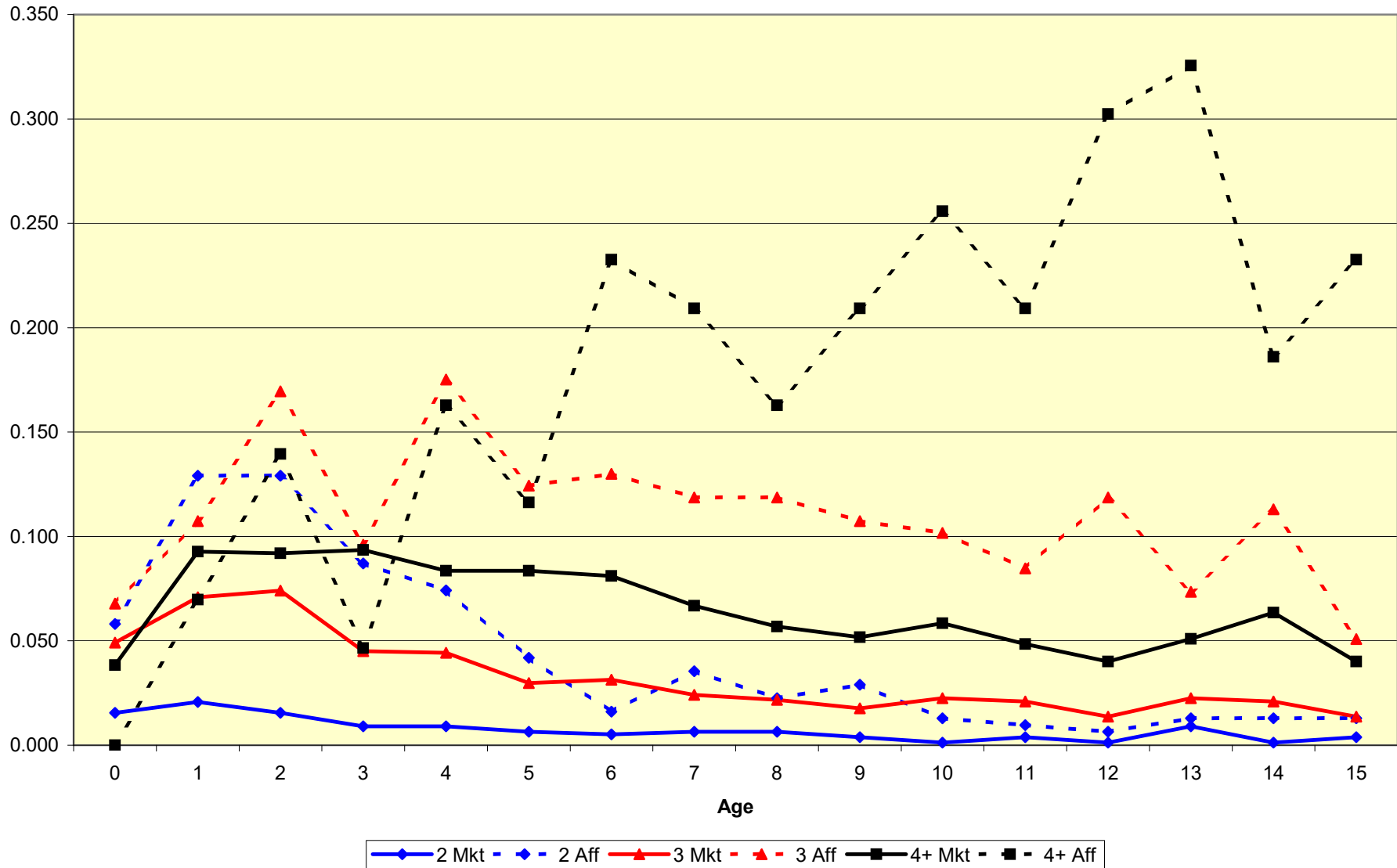
Other Variables

Former residence: elsewhere in borough – elsewhere in London – etc
GP registration: yes/no – present or former address
Did children have to change school?

Age Groups/Bedrooms/Sector



Child Yield



When to use

Large (re)developments – swamping existing stock

Greenfield areas – no pre-existing population

Large Communal Establishments – special features

Planning Gain – s106

What other data?

Development Schedule

Fertility Rates

Survival Rates

Impact of Turnover

- Likelihood of emigration
- Structure of replacement flows

Development Schedule 1

Total	1000
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Market	700
Affordable	300

Development Schedule 2

Market	Number of Bedrooms:			
	1	2	3	4+
Year 1	7	9	9	11
Year 2	16	26	26	37
Year 3	21	63	63	63
Year 4	11	63	74	63
Year 5	7	42	42	49

Development Schedule 3

Affordable	Number of Bedrooms:			
	1	2	3	4+
Year 1	3	18	18	21
Year 2	5	27	27	32
Year 3	5	27	27	32
Year 4	2	14	14	16
Year 5	1	5	5	5

Who Moves In

Population Ages:	Year										Total	
	1	2	3	4	5	6	7	8	9	10		
0-3	27	50	70	57	33	0	0	0	0	0	0	237
4-10	55	96	117	83	45	0	0	0	0	0	0	397
11-15	39	65	75	50	25	0	0	0	0	0	0	254
16-17	12	21	24	16	8	0	0	0	0	0	0	82
18-19	4	8	10	8	5	0	0	0	0	0	0	35
20-39	93	187	287	245	147	0	0	0	0	0	0	959
40-59	54	113	169	146	91	0	0	0	0	0	0	572
60+	16	39	70	65	42	0	0	0	0	0	0	231
Total	300	579	822	670	396	0	0	0	0	0	0	2767
11-13	25	42	48	31	16	0	0	0	0	0	0	162
14-15	14	23	27	19	10	0	0	0	0	0	0	92
65+	16	38	69	64	41	0	0	0	0	0	0	228
Homes	95	195	300	255	155	0	0	0	0	0	0	1000
Build Rate:												
Market	35	105	210	210	140	0	0	0	0	0	0	700
Affordable	60	90	90	45	15	0	0	0	0	0	0	300
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Average Household Size	3.161	2.967	2.740	2.626	2.558	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	2.767

Who Lives There

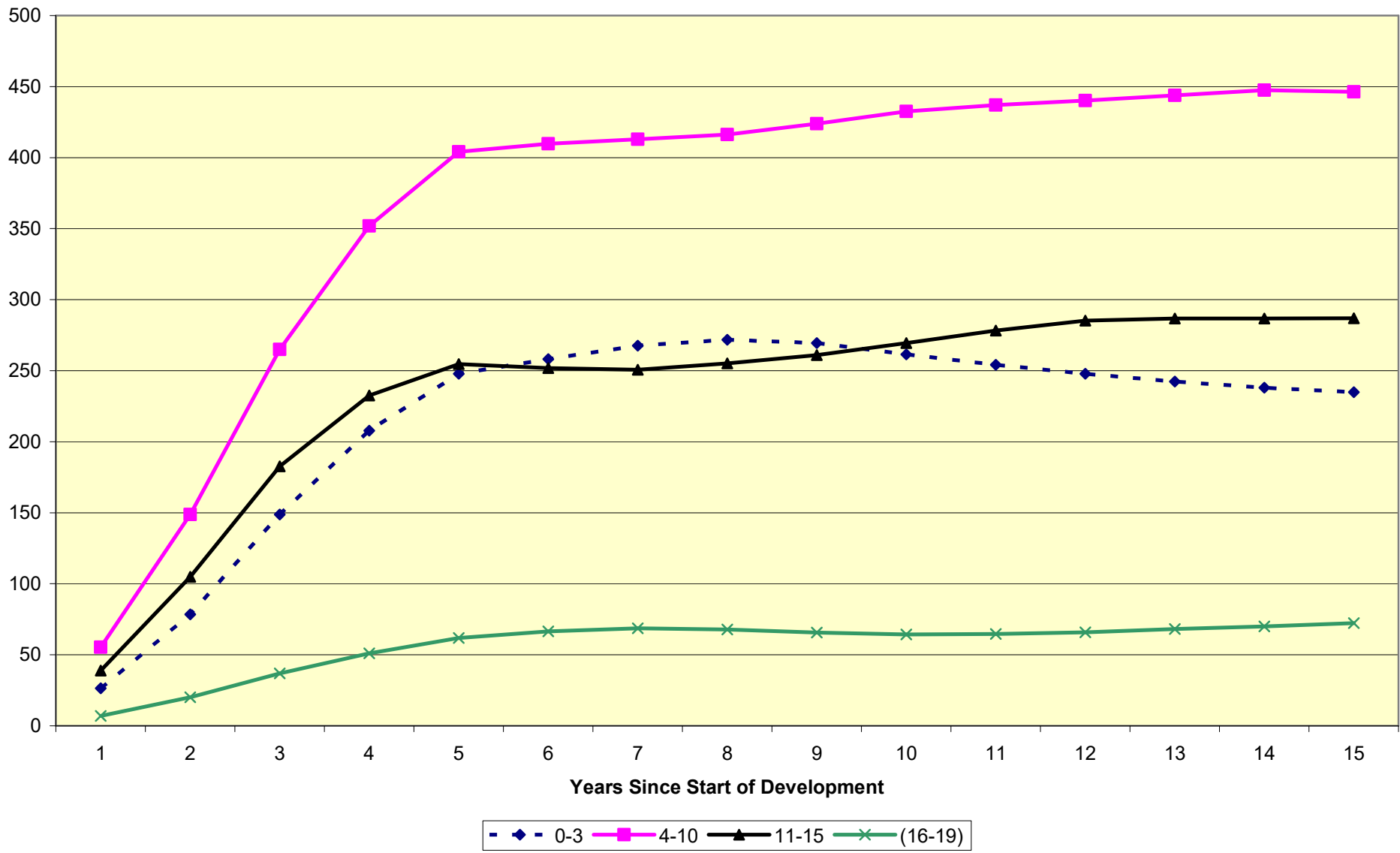
PROJECTION FOR END OF YEAR:

		1	2	3	4	5	6	7	8	9	10
Ages:	0	3	14	32	53	67	71	69	67	65	63
	1	7	18	34	48	62	66	70	68	66	64
	2	10	26	42	53	59	62	67	71	69	66
	3	6	21	41	54	60	58	62	66	70	68
	4	9	22	42	56	62	59	58	61	65	70
	5	7	21	38	53	63	62	59	58	61	65
	6	9	22	40	51	60	62	61	59	57	61
	7	8	23	39	52	57	60	62	61	59	57
	8	7	20	37	48	57	57	60	62	61	58
	9	8	20	35	47	53	56	56	60	61	61
	10	8	21	36	45	52	53	56	56	59	61
	11	7	20	35	45	50	52	52	56	55	59
	12	9	22	36	45	50	50	52	53	56	56
	13	9	24	39	47	50	49	49	51	52	55
	14	7	21	39	49	52	50	48	48	50	51
	15	7	18	34	47	52	52	49	48	48	50
	16	6	17	30	42	50	52	51	49	47	48
	17	6	16	28	37	44	49	50	49	47	45
	18	2	10	21	32	39	43	48	49	48	46
	19	2	6	14	22	30	33	37	41	42	42
	20-29	39	111	217	299	341	333	329	328	330	335
	30-39	54	164	331	468	536	506	478	452	427	404
	40-49	39	119	240	350	431	453	473	489	503	515
	50-59	16	52	111	168	210	222	234	247	261	277
	60-74	10	37	86	135	170	175	181	187	191	194
	75-84	4	14	31	46	56	57	58	59	60	61
	85+	1	5	10	15	19	20	21	22	22	22
	Total Population	300	883	1716	2407	2832	2863	2890	2913	2934	2952
	Births	-	7	22	44	62	71	69	67	65	63
Year =>		1	2	3	4	5	6	7	8	9	10
Pre-school	0-3	27	78	149	208	248	258	268	272	270	261
Primary	4-10	55	149	265	352	404	410	413	416	424	433
Secondary	11-15	39	105	183	233	255	252	251	255	261	269
Sixth Form	(16-19)	7	20	37	51	62	67	69	68	66	64
	Households	95	290	590	845	1000	1000	1000	1000	1000	1000
	Average Household Size	3.161	3.044	2.908	2.848	2.832	2.863	2.890	2.913	2.934	2.952

Sixth Form
Staying-on
Rates by age
(assumed)

0.500
0.500
0.300
0.100

Child Population



Issues

Allowing for old persons accommodation or other special groups

Linking populations in new development with those in existing housing

Levels of vacancy

Method of calculating moves to second-hand property in new development

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