

Social Infrastructure Framework (SIF) Model: Briefing Note

North Essex Garden Communities



February 2018

The North Essex Garden Communities Concept Feasibility Study was commissioned by Colchester Borough Council, Braintree District Council and Tendring District Council to identify a strategic approach to the allocation and distribution of large scale housing led mixed use development, including employment opportunities and infrastructure provision.

In addition to the standards and assumptions detailed on p150 of document EB/008/4/4 this briefing note provides a comprehensive capture of the approach and assumptions used to derive outputs from the AECOM Social Infrastructure Framework (SIF) model.

The assumptions used to calibrate the SIF model and detailed in this note comprise:

- Social Infrastructure standards
- Housing tenure
- Housing mix
- Average household size and age profile
- Cost assumptions

The outputs of this analysis are provided in the accompanying spreadsheets as listed below:

1. East_Colchester_SIF_Cost
2. Marks_Tey_SIF_Cost
3. North_Colchester_SIF_Cost
4. West_Braintree_SIF_Cost

Social Infrastructure Standards

Table 1 sets out the all social infrastructure standards used to calibrate the SIF model. This addresses education, health, community, leisure and open space. Sources for each standard used, and as agreed with the client project team are identified.

Table 1: Social Infrastructure Standards

Education		Standard	Standard Source
Early Years	Early Year Demand per 2 Bed + Flat	0.0045	Essex County Council – Developers Guide to Infrastructure Contributions 2016
	Early Year Demand per 2 Bed + House	0.090	
	Places per Nursery	56	
	Sq.m per 56 Place Nursery	337	
Primary schools	Pupil Demand per 2 Bed + Flat	0.150	Essex County Council – Developers Guide to Infrastructure Contributions 2016
	Pupil Demand per 2 Bed + House	0.300	
	Primary School Pupils in 1 Form Entry	210	

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Secondary schools	Pupil Demand per 2 Bed + Flat	0.100	Essex County Council – Developers Guide to Infrastructure Contributions 2016
	Pupil Demand per 2 Bed + House	0.200	
	Secondary School Pupils in 1 Form Entry	150	
Sixth Form	Proportion of 16-17 Year Olds in Sixth Form	32%	AECOM Calculation of Sixth Form roll 2016 against 16-17 year old population
Health		Standard	Standard Source
Primary Health Care	People per GP	1,800	NHS
Dental Practices	People per Dentist	1,760	Ratio of Dentists to population across England 2015
Acute Hospitals	People per Bed	510	Ratio of Hospital Beds to population across England 2015
Community & Leisure		Standard	Standard Source
Library Space; based on branch	Sq.m per 1,000 person	30	Arts Council
Indoor Sports Facility (4 court hall)	Facility per 1,000 person	0.072	Colchester SPG Provision of Open Space, Sport and Recreational Facilities 2006 (0.072 facilities per 1,000 persons)
Swimming Pool (4 lanes)	Facility per 1,000 person	0.048	Colchester SPG Provision of Open Space, Sport and Recreational Facilities 2006 (0.048 facilities per 1,000 person)

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Open Space		Standard	Standard Source
Natural Green Space	ha per 1,000 person	2.000	Recommend adoption of Braintree and Tendring standard - Colchester was 5ha
Outdoor Sports	ha per 1,000 person	1.530	Average of Braintree, Colchester and Tendring LPA
Parks and Gardens	ha per 1,000 person	1.320	
Amenity Green Space	ha. per 1,000 people	0.883	
Allotments	ha. per 1,000 people	0.227	
Children's Play Space (Informal)	ha. per 1,000 people	0.208	
Children's Play Space (Formal)	ha. per 1,000 people	0.142	
Green Corridor	ha per 1,000 person	0.750	Tendring Open Space Strategy (2009)

Table 1: Social Infrastructure Standards

Household and Tenure Characteristics

In order to identify the likely population arising from development and thus the social infrastructure requirement across each site, AECOM developed assumptions regarding the following parameters:

- Housing Tenure
- Housing Mix
- Average Household Size
- Age Profile

In order to allow for a consistent assessment across all three Garden Community locations, a uniform set of tenure, household mix, household size and age profile assumptions were applied to each site. This drew from review of 2011 Census data across each local authority, as well as a review of relevant Local Plans and evidence bases.

The following tables set out the household and tenure characteristics applied within the SIF model, as well as a rationale for their application. All sources are identified.

Housing Tenure

		All Units
Market Owned		65%
Affordable		35%
Social Rented Affordable Housing		65%
Intermediate Affordable Housing:		35%

Table 2: Final Housing Tenure

Housing tenure was developed based on a review of each local authority's relevant policy documents. A significant variance between the market and affordable housing rate was identified across the three local authorities, with as much as 82% market housing identified within Tendring District Council. Following consideration for the scale and intent of development, it was determined that the above tenure mix was reflective of a realistic policy and delivery assumption across all three local authorities.

Tables 3 -5 illustrate the housing tenure policy reviewed for each local authority.

Braintree Housing Mix

Market Housing	60%
Affordable Housing	40%

Source: Core Strategy 2011

Intermediate Affordable Housing	65%
Social Rented Affordable Housing	35%

Source: SHMA 2014

Table 3: Braintree Housing Tenure Mix

Colchester Housing Mix

Market Housing	65%
Affordable Housing	35%

Source: Local Plan Issues and Options 2015

Intermediate Affordable Housing	20%
Social Rented Affordable Housing	80%

Source: Colchester Affordable Housing SPG

Table 4: Colchester Housing Tenure Mix

Tendring Housing Mix

Market Housing	82%
Affordable Housing	18%

Source: Tendring District Local Plan 2007 (Update 2012) (Affordable Housing should be 10-25%) - this represents a median

Intermediate Affordable Housing	79%
Social Rented Affordable Housing	21%

Source: SHMA 2013 recommended

Table 5: Tendring Housing Tenure Mix

Housing Mix

Market Owned
Social Rented Affordable Housing
Intermediate Affordable Housing
All units

Flats (no. of bedrooms)				Houses (no. of bedrooms)			
1	2	3	4+	1	2	3	4+
7%	6%	5%	2%	28%	24%	20%	8%
7%	6%	6%	1%	29%	23%	24%	4%
7%	8%	4%	2%	28%	32%	14%	6%
7%	6%	5%	2%	28%	24%	20%	8%

Table 6: Final Housing Size Mix

The housing mix assumption was developed following review of the Strategic Housing Market Assessment (SHMA) for Colchester Borough Council and Braintree District Council. This data was not available for Tendring District Council. In addition, a further assumption that 80% of future dwellings would be houses and 20% flats was applied, reflecting the current mix across Essex. This allowed for the target mix of Colchester and Braintree to be split between houses and flats, in which the average between both local authorities was utilised in determining the final housing mix.

	Bed Room Size %			
	1	2	3	4+
Market Housing	30.00	30.00	20.00	20.00
Intermediate Affordable Housing	33.00	33.00	35.00	0.00
Social Rented Affordable Housing	45.00	35.00	10.00	10.00

Table 7: Colchester Target Housing Mix
Source: Colchester SHMA 2013, page 175

	1	2	3	4+
Market Housing	40.00	30.00	30.00	0.00
Intermediate Affordable Housing	40.00	25.00	25.00	10.00
Social Rented Affordable Housing	25.00	45.00	25.00	5.00

Table 8: Braintree Target Housing Mix
Source: Braintree SHMA 2014, Page 171

Average Household Size and Age Profile by Unit Type

The average household size and profile assumption was developed through the application of 2011 Census data. This exercise collated relevant data across the three local authorities, and determined the average household size and age profile. This approach ensured a uniform assumption was applied across all three potential Garden Community locations.

Market Housing		Intermediate Affordable Housing		Social Rented Affordable Housing	
Flat - 1 bed	1.27	Flat - 1 bed	1.27	Flat - 1 bed	1.18
Flat - 2 bed	1.59	Flat - 2 bed	1.59	Flat - 2 bed	2.18
Flat - 3 bed	2.03	Flat - 3 bed	2.03	Flat - 3 bed	2.78
Flat - 4 bed	2.83	Flat - 4 bed	2.83	Flat - 4 bed	2.39
House - 1 Bed	1.49	House - 1 Bed	1.49	House - 1 Bed	1.32
House - 2 Bed	1.75	House - 2 Bed	1.75	House - 2 Bed	2.04
House - 3 Bed	2.39	House - 3 Bed	2.39	House - 3 Bed	3.14
House - 4 Bed	2.97	House - 4 Bed	2.97	House - 4 Bed	4.24

Table 9: Final Average Household Size
 Source: Census 2011

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Age Group	Market Owned								Social Rented Affordable Housing								Intermediate Affordable Housing							
	Flats (no. of bedrooms)				Houses (no. of bedrooms)				Flats (no. of bedrooms)				Houses (no. of bedrooms)				Flats (no. of bedrooms)				Houses (no. of bedrooms)			
	1	2	3	4+	1	2	3	4+	1	2	3	4+	1	2	3	4+	1	2	3	4+	1	2	3	4+
0-3	1.2%	3.4%	4.5%	3.4%	1.4%	2.8%	4.0%	3.5%	1.2%	3.4%	4.5%	3.4%	1.4%	2.8%	4.0%	3.5%	2.6%	15.6%	6.6%	5.3%	0.8%	7.9%	5.5%	5.2%
4-10'	0.4%	2.0%	3.9%	7.4%	1.1%	2.5%	7.1%	9.5%	0.4%	2.0%	3.9%	7.4%	1.1%	2.5%	7.1%	9.5%	1.2%	10.6%	13.9%	1.2%	1.3%	8.7%	14.0%	15.1%
11-15'	0.2%	1.3%	3.2%	6.1%	1.4%	1.6%	5.4%	8.6%	0.2%	1.3%	3.2%	6.1%	1.4%	1.6%	5.4%	8.6%	0.3%	3.9%	9.3%	2.9%	0.8%	4.9%	12.2%	16.3%
16-17	0.1%	0.6%	1.7%	3.0%	0.4%	0.7%	2.2%	3.7%	0.1%	0.6%	1.7%	3.0%	0.4%	0.7%	2.2%	3.7%	0.7%	2.1%	5.8%	1.2%	0.6%	1.8%	5.1%	7.2%
18-19	0.5%	0.6%	1.8%	1.7%	0.6%	0.6%	2.0%	2.9%	0.5%	0.6%	1.8%	1.7%	0.6%	0.6%	2.0%	2.9%	2.1%	2.8%	5.8%	19.4%	0.4%	2.1%	4.4%	6.2%
20 - 24	3.8%	5.2%	5.2%	10.1%	2.8%	2.3%	3.9%	5.1%	3.8%	5.2%	5.2%	10.1%	2.8%	2.3%	3.9%	5.1%	7.0%	12.4%	8.7%	30.6%	2.3%	6.1%	6.0%	8.1%
25 - 29	9.5%	12.0%	7.9%	5.7%	5.1%	4.9%	3.9%	2.8%	9.5%	12.0%	7.9%	5.7%	5.1%	4.9%	3.9%	2.8%	5.2%	10.4%	4.1%	7.6%	1.1%	6.1%	4.8%	3.3%
30 - 34	8.6%	9.1%	6.4%	6.7%	4.4%	5.2%	5.2%	3.2%	8.6%	9.1%	6.4%	6.7%	4.4%	5.2%	5.2%	3.2%	4.7%	6.6%	4.8%	5.9%	1.3%	4.8%	5.5%	4.6%
35 - 39	6.6%	5.5%	5.4%	6.7%	5.0%	4.9%	6.6%	6.0%	6.6%	5.5%	5.4%	6.7%	5.0%	4.9%	6.6%	6.0%	5.2%	4.9%	6.2%	5.9%	1.4%	4.8%	6.5%	6.6%
40 - 44	4.8%	4.8%	7.5%	8.8%	5.3%	5.1%	7.7%	8.9%	4.8%	4.8%	7.5%	8.8%	5.3%	5.1%	7.7%	8.9%	5.7%	5.3%	8.3%	1.2%	3.2%	5.4%	8.3%	7.7%
45 - 49	5.1%	5.1%	6.1%	7.4%	7.1%	5.4%	7.8%	9.7%	5.1%	5.1%	6.1%	7.4%	7.1%	5.4%	7.8%	9.7%	6.2%	4.9%	7.5%	5.3%	3.1%	5.4%	7.0%	6.3%
50 - 54	5.2%	5.3%	5.8%	8.4%	6.9%	5.8%	7.2%	8.3%	5.2%	5.3%	5.8%	8.4%	6.9%	5.8%	7.2%	8.3%	6.0%	4.0%	3.9%	2.9%	3.8%	4.7%	5.1%	4.2%
55 - 59	5.2%	5.2%	6.5%	5.1%	7.4%	6.9%	7.0%	7.4%	5.2%	5.2%	6.5%	5.1%	7.4%	6.9%	7.0%	7.4%	6.8%	3.5%	4.3%	1.8%	6.6%	4.5%	3.8%	2.6%
60 - 64	8.1%	7.4%	8.6%	5.4%	10.2%	10.5%	8.7%	7.5%	8.1%	7.4%	8.6%	5.4%	10.2%	10.5%	8.7%	7.5%	8.9%	3.3%	2.9%	3.5%	12.2%	6.2%	3.7%	2.4%
65 - 69	7.0%	7.6%	7.9%	6.7%	9.0%	10.2%	6.9%	5.2%	7.0%	7.6%	7.9%	6.7%	9.0%	10.2%	6.9%	5.2%	7.2%	2.4%	3.5%	1.8%	10.7%	6.1%	2.4%	1.7%
70 - 74	6.3%	6.9%	5.1%	4.0%	9.4%	9.4%	5.4%	3.2%	6.3%	6.9%	5.1%	4.0%	9.4%	9.4%	5.4%	3.2%	6.6%	2.3%	1.2%	0.6%	13.6%	6.3%	2.0%	0.9%
75+	27.4%	17.8%	12.6%	3.4%	22.5%	21.2%	8.9%	4.5%	27.4%	17.8%	12.6%	3.4%	22.5%	21.2%	8.9%	4.5%	23.8%	5.2%	3.1%	2.9%	36.9%	14.2%	3.6%	1.6%

Table 10: Final Age Profile
Source: Census 2011

Costing Assumptions

AECOM have prepared a cost analysis for each of the potential Garden Communities, to support the viability analysis. This is based on a combination of costs per unit and lump sum / cost per m or m² allowances for each infrastructure type.

The infrastructure outputs from the SIF Model, as set out in the Concept Feasibility Options and Evaluation report, are applied to derive a cost per unit allowance. All costs are as at May 2016 prices and exclude professional fees and contingencies which are separately accounted for. The following cost per unit allowance has been determined:

- £7,500 / Unit for education
- £2,250 / Unit for health, community and leisure
- £2,750 / Unit for open space, noting a separate allowance as appropriate of £10m for a country park

The costs are derived from a data base of information held by AECOM. This database has been developed from previous project experience and covers a full range of building and infrastructure works. For the purpose of this analysis, the contracted and final costs for the schemes with appropriate adjustments for abnormal costs, location and base date have been applied.

Table 11 presents the key rates used to derive the total costs for each facility:

Education	Rate	Additional Info
Nursery	£1,250 / m ²	Shell only for fit out by others; Exclusions: all loose fixtures, fittings and equipment and ICT
Primary School	£2,700 / m ²	Separate allowances for playing fields; Exclusions: all loose fixtures, fittings and equipment and ICT
Secondary School	£3,000 / m ²	Separate allowances for playing fields; Exclusions: all loose fixtures, fittings and equipment and ICT
Health, Community & Leisure	Rate	Additional Info
Primary Care Centre	£2,200 / m ²	Exclusions: all loose fixtures, fittings and equipment including specialist medical equipment
Dental	£1,700 / m ²	Exclusions: all loose fixtures, fittings and equipment including specialist medical equipment
Acute Care	£2,700 / m ²	Exclusions: all loose fixtures, fittings and equipment including specialist medical equipment

Swimming Pool	£2,100 / m ²	Exclusions: all loose fixtures, fittings and equipment including specialist medical equipment
Sports Centre	£1,400 / m ²	Exclusions: all loose fixtures, fittings and equipment including specialist medical equipment
Library	£1,400 / m ²	Exclusions: all loose fixtures, fittings and equipment including specialist medical equipment
Open Space	Rate	Additional Info
Outdoor Sports	£35 / m ²	
Children's Playspace	£50 / m ²	
Semi Natural Open Space	£10 / m ²	
Parks and Gardens	£25 / m ²	
Amenity Green Space	£12.50 / m ²	
Allotments	£30 / m ²	

Table 11: Key Rates per Facility

The following assumptions have been applied to the costing analysis in the Concept Feasibility Study:

1. That the construction works will be competitively tendered
2. That ground conditions are good with no abnormal costs required therefore for site preparation and foundations
3. That site access is good with no abnormal restrictions on working hours, noise etc.
4. That the quality of the buildings is commensurate with the nature and location of the sites