This Section sets out key assumptions and infrastructure and phasing strategies to enable delivery at Colchester Braintree Borders.

04 Colchester Braintree Borders

4.1 Concept Framework

The Colchester Braintree Borders Concept Framework defines a spatial option for the long term delivery of a Garden Community.

The framing principles are similar as for the other Garden Communities, promoting a landscape-led vision, a high level of economic self-sufficiency and a strong emphasis on public transport other sustainable modes.

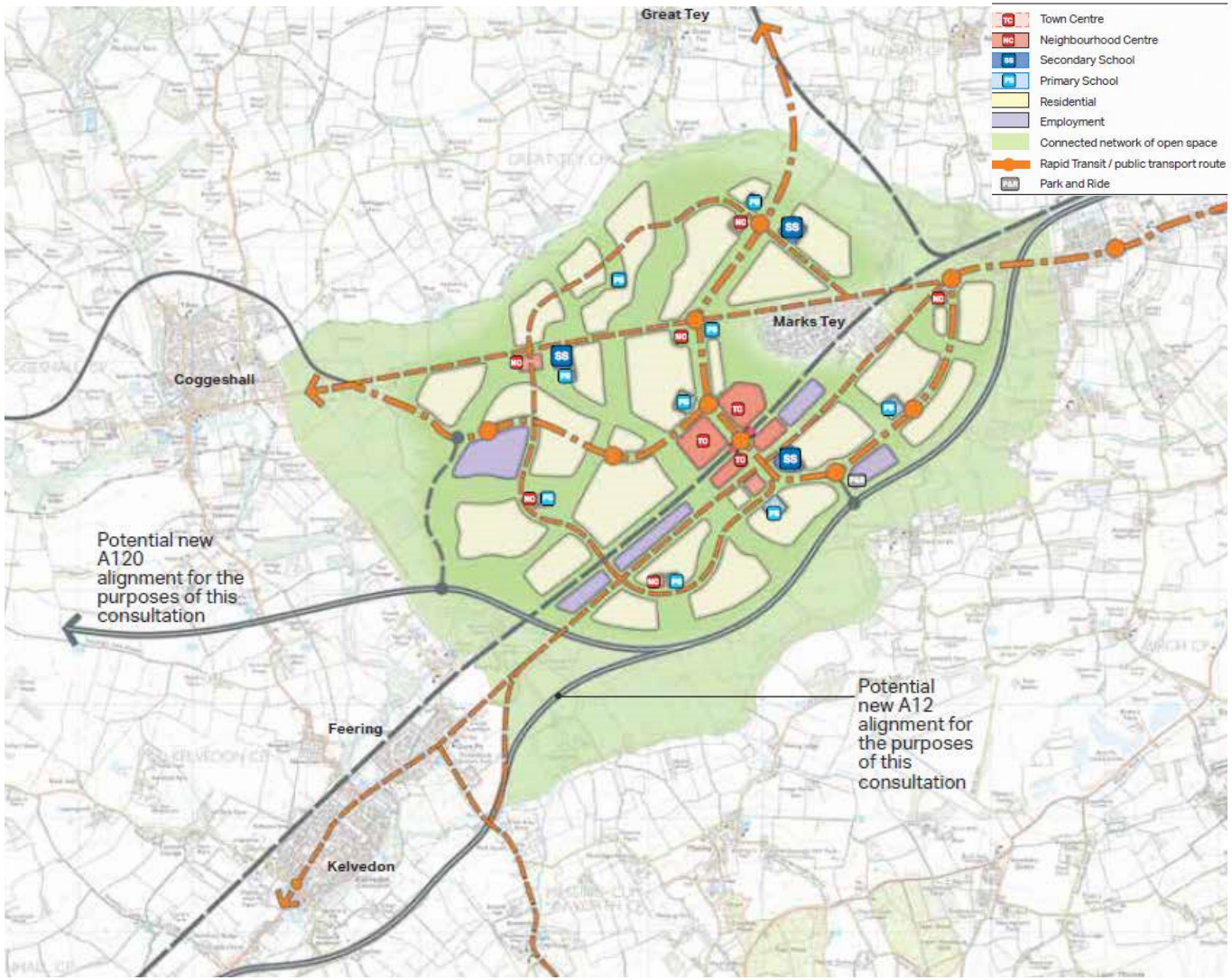

Figure 14: Colchester Braintree Borders Concept Framework (Source: DLA 2017)

4.2 Indicative masterplan and land use budget

The plan that forms the basis of this current exercise is an iteration of the Colchester Braintree Borders Concept Framework and takes account of more detailed work on the need for employment land, outlined by Cebr in their July 2019 report.

Instead of relocating Marks Tey train station, the analysis in this report assumes that it stays in situ but is linked from the outset by a high quality rapid transit network.

The other principal change is the re-alignment of the A12. This has the effect of removing land that was previously considered for development. There is potential to develop land east of a new junction, subject to A12 realignment and it being considered suitable to form part of the Garden Community and being considered by future masterplanning to inform the Development Plan Document.

Another key change from the original Concept Framework plan is the re-calibration of open space, across the site, with a target level of provision that is more in keeping with the standard assumed across all three Garden Community sites.

Table 7: Colchester Braintree Borders Land Use Budget

	Area	Dwellings
Residential (ha)	563.73	
Dwellings in Residential		19,730
Mixed Use (ha)	20.00	
Dwellings in Mixed Use		1,200
Primary School (ha)	24.00	
Secondary School (ha)	30.00	
Employment (ha)	51.70	
Open Space (ha)	421.56	
Infrastructure (5%)	58.47	
Total	**1,169.46 Ha**	**20,930**

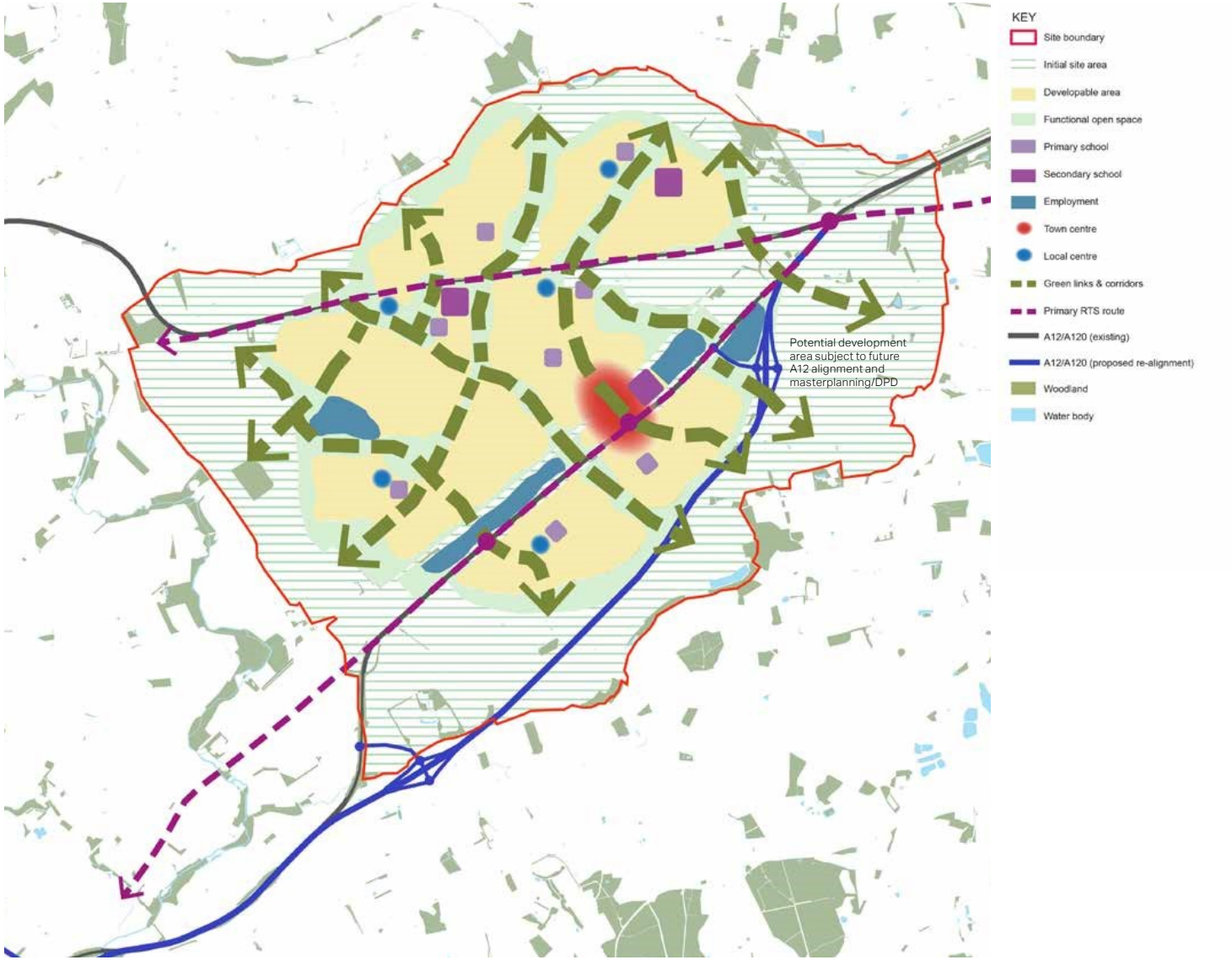

Figure 15: Colchester Braintree Borders Indicative masterplan (derived from Concept Framework)

4.3 Movement and connectivity baseline

The development site is well connected to the Strategic Road Network with the A12 and A120 passing through the site, however careful consideration should be given to their proposed realignments and the benefits this could bring to delivering access to the site.

Key Findings - Roads

Current Situation

- The site extends southwest from the A12 / A120 interchange (Junction 25). The A12 runs parallel to the southeast boundary and the A120 is an east-west link passing through the northern section of the site. Both the A12 an A120 currently experience high levels of peak period congestion.
- There are a number of small access roads into the site from the main trunk roads. These roads (predominantly rural roads) run through the site, providing wider vehicular access to the area.

Future and Wider Issues

- Highways England has proposed to upgrade the A12 between Junction 19 (Chelmsford) and Junction 25 (A120 Interchange). The upgrade in the vicinity of the site is proposed as an off-line widening scheme.
- Essex County Council are also proposing the realignment of the A120 of which a preferred route has been identified linking Galleys Corner in Braintree with the A12 south of Kelvedon, with the existing A120 proposed to be downgraded.
- Improving access to the site from the A12 and A120 would be a requirement of delivery of this site.

Key Findings - Public Transport

Current Situation

- The existing bus routes run along the A12 and A120 with a number of bus stops serving Marks Tey with connections between Chelmsford and Colchester.
- Marks Tey train station lies in the northeast corner of the site and sits on the Great Eastern Main Line serving stations up to every 20 minutes between London and Colchester during the peak periods.

Future and Wider Issues

- The potential for greater public transport connectivity has been identified in the concept framework and further explored by Jacobs' North Essex Rapid Transit study suggesting main corridors of movements between the 3 North Essex sites and their main local employment centres such as Stanstead and Chelmsford.
- The realignment of the A12 and A120 provides opportunities for improved local access and reallocation of road space for sustainable modes.

Key Findings - Active Modes

Current Situation

- Existing provision for active modes (walking and cycling network) is constrained to main road corridors limiting connectivity. There are some PROWs that exist across the site in various locations, including Essex Way which runs across the northern section of the site.
- There are no National Cycle Network (NCN) routes of note in close proximity to the site.
-

Future and Wider Issues

- Building on the garden communities principles, Colchester Braintree Borders has the potential to plan for an important number of internalised movements to be undertaken by walk or cycle thanks to high-quality and dedicated infrastructure on-site.
- For wider hinterland/commuting movements, significant improvements would be required to increase the quality of the existing infrastructure and encourage cycling and public transport as an alternative to the car towards Colchester in particular.

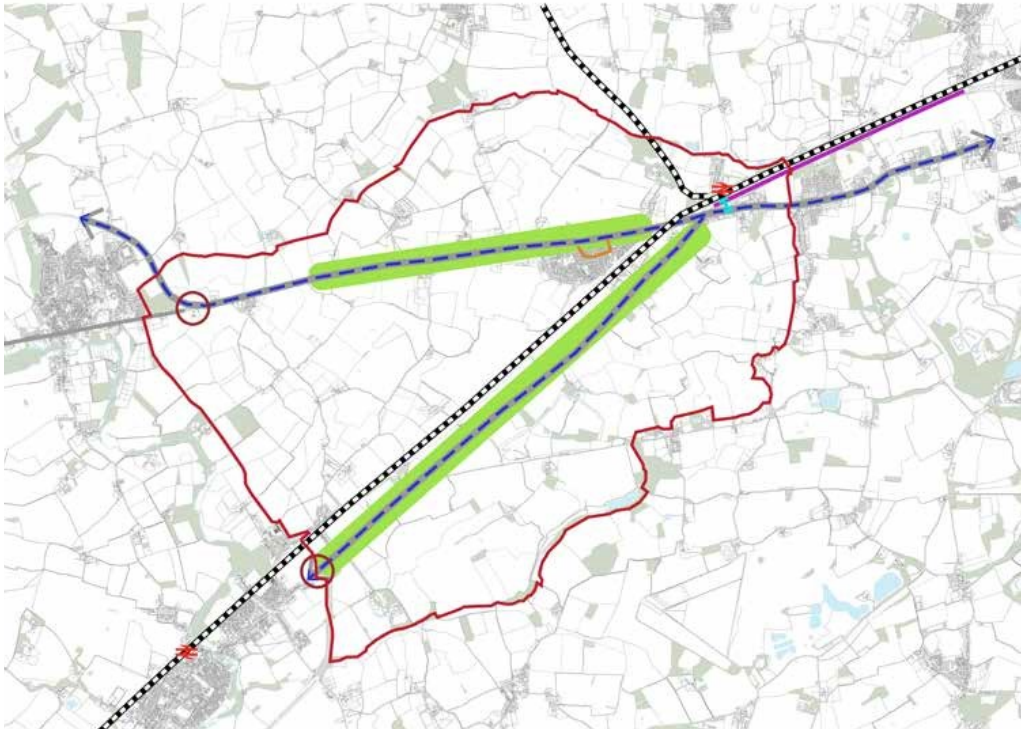

Figure 16: Colchester Braintree Borders Movement and connectivity baseline. AECOM.

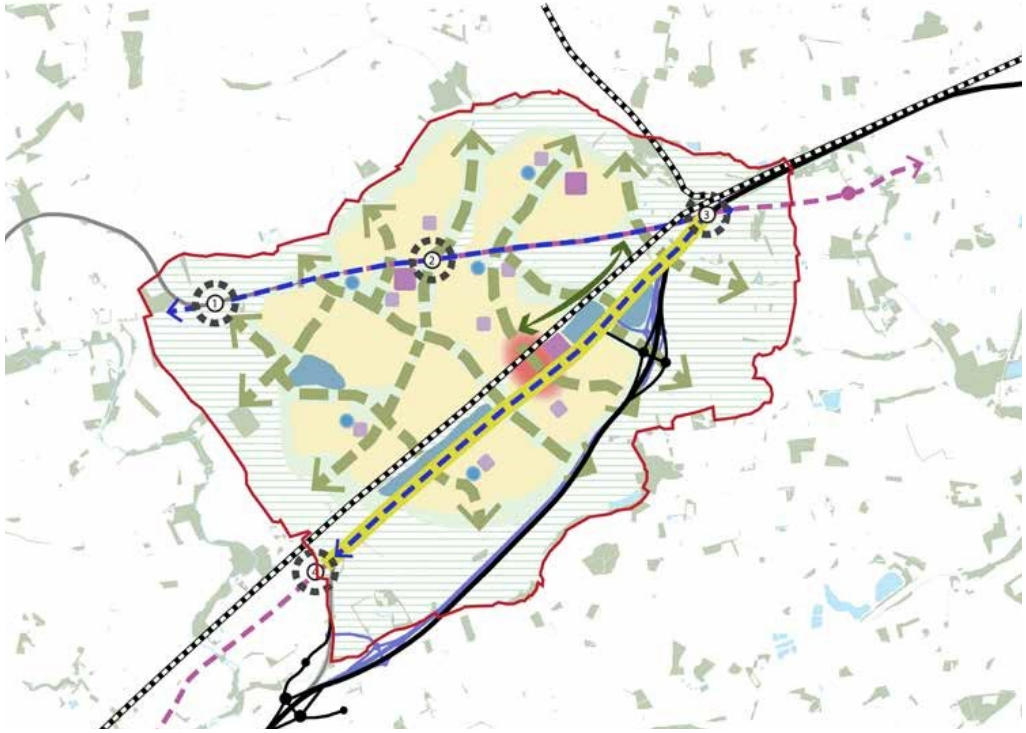

Figure 17: Colchester Braintree Borders Movement and connectivity potential interventions. AECOM.

Existing Infrastructure

- Site boundary
- Railway
- A Road
- B Road
- Strategic bus route
- Local bus route
- Junction identified over capacity by 20 32 (Local Plan Jacobs Modelling)
- Identified key bottle neck
- Pedestrian bridge
- Road >100% stress

Proposed Infrastructure

- Site boundary
- Railway
- Road to be downgraded
- Public transport corridor
- Primary RTS routes
- Proposed A12

Junction improvements:

1. A120/B1024
2. Site accesses
3. Marks Tey interchange junction
4. A120/Keivedon Road
5. A120/A131/Coggershall Road (Braintı shown)

- A120 proposed road connection
- Walking and cycling improvements

4.4 Utilities baseline

This section provides a high level analysis of utilities based on preliminary conversations with service providers and desk-based study. Further discussions will be required as masterplans are worked up and more detail emerges.

Key Findings - Electricity

Current Situation

- According to UKPN there is some spare capacity in the local electrical network. The new substation at Witham has sufficient capacity to support the early phases of development.

Future and Wider Issues

- Approximately 10,000 new homes would trigger the need for a new primary substation, and new distribution infrastructure would be required for any level of development

Key Findings - Waste Water

Current Situation

- The development area falls within the Copford water recycling centre (WRC).

Future and Wider Issues

- Anglian Water has advised that the high level strategy is to minimise capacity at this WRC. There is no surrounding land available to upgrade this WRC to increase its capacity to meet the additional demand resulting from significant development. Upgrades to the Colchester WRC are viable, and would provide sufficient capacity for the development.

Key Findings - Telecommunications

Current Situation

- Openreach, Virgin Media, Vodafone and Interoute have confirmed assets adjacent to A12 London Road.

Future and Wider Issues

- Protection and diversion works may be required for these assets if new highway connections are to be made to the A12 or B1408.
- Telecommunication network will be made available to the development at no cost, following a commitment by BT Openreach to serve all developments of more the 30 homes with high speed broadband.

Key Findings - Water Supply

Current Situation

- Anglian Water is the supplier of fresh water to the area, as part of their South Essex Resource Zone. The main sources of supply are groundwater abstraction and surface water from the River Colne being pumped to storage at the Ardleigh reservoir.

Future and Wider Issues

- The local area is expected to fall into a supply deficit by 2040, without accounting for the extra demand resulting from development at CBB. A number of options are being assessed, which in conjunction with demand reduction and water efficiency measures could provide sufficient additional capacity to supply the proposed development.

Key Findings - Gas

Current Situation

- There is a medium pressure (MP) main that runs along the southern carriageway of the A12, and a low pressure (LP) main that runs along the B1408 London Road.

Future and Wider Issues

- National Grid Gas advised in September 2014 that the medium pressure network is expected to be able to deliver the predicted additional demand from new development, but the low pressure network will require reinforcement in places.
- Unlike the other two Garden Communities, Colchester Braintree Borders does not require a new pressure reducing station.

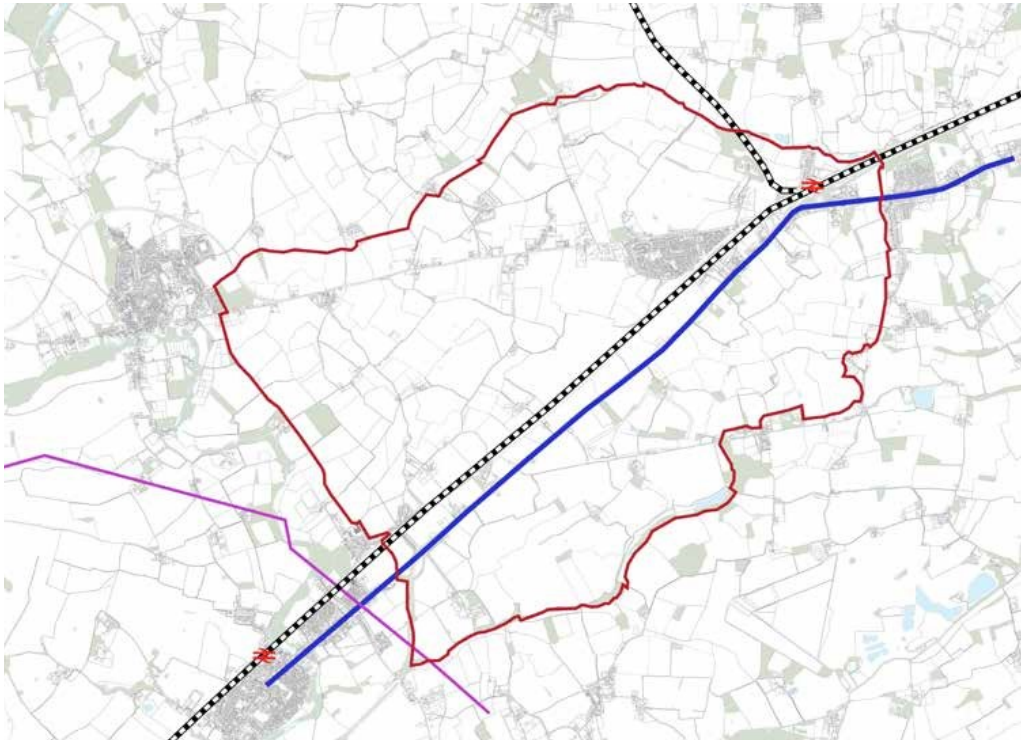

Figure 18: Colchester Braintree Borders Utilities baseline. AECOM.

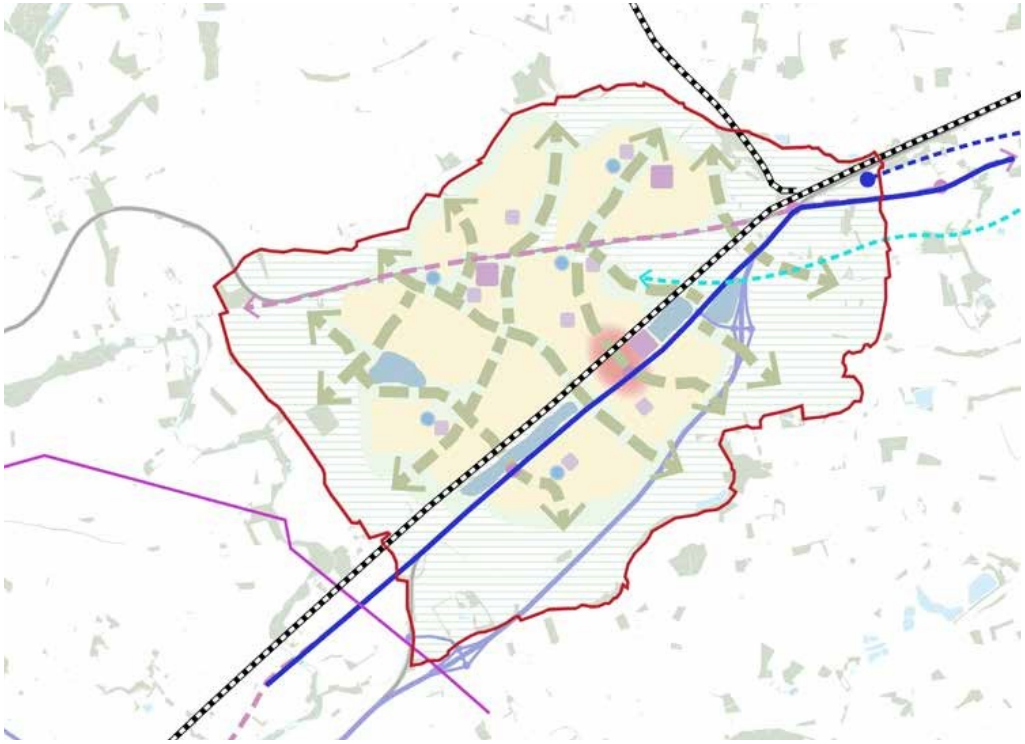

Figure 19: Colchester Braintree Borders Utility interventions. AECOM.

Existing infrastructure

- Site boundary
- Railway
- 33,000 V Tower Line
- Medium pressure gas pipe

Proposed infrastructure

- Site boundary
- 132/11 kV Primary Substation
- 12km 132kV overhead line connection to Colchester
- New pipeline to existing Water Recycling Centre

4.5 Infrastructure requirements by Phase

Project List

Infrastructure delivery forms a key element of the Garden Community principles. Table 8 contains the estimated infrastructure required to support development at Colchester Braintree Borders and the figures below show phasing assumptions spatially. Please note the infrastructure highlighted is indicative and not based on a detailed masterplanning exercise.

In accordance with the Garden Community approach, the programme assumes the front-loading of several infrastructure items so that they are provided before the benchmarked trigger point.

Table 8: Colchester Braintree Borders Infrastructure requirements

				Cumulative Development Schedule							
Infrastructure	**Demand arising from development**	**Unit of demand**	**Commentary/assumptions**	**Phase 1 2,550**	**Phase 2 4,608**	**Phase 3 7,314**	**Phase 4 9,812**	**Phase 5 12,582**	**Phase 6 15,531**	**Phase 7 18,560**	**Phase 8 21,000**
Education											
Primary Schools: 2 Form Entry (including 56 place EY+C facility)	22	FE	2FE facilities and EY + C Assuming 210 places per FE and 56 places per EY. Excludes temporary accommodation.	2nr 2FE +EY	2FE + EY	2nr 2FE +EY	2FE + EY	2nr 2FE +EY	2nr 2FE +EY	2FE + EY	
Secondary Schools	20	FE	Assuming 150 places per FE. Excludes temporary accommodation.	8FE		6FE			6FE		
Standalone Early Year Facilities (56 place, above those co-located with Primary)	14	Facility	Assuming 56 places per facility. 11 EY facilities within primary schools, 25 in total required by development. Excludes temporary accommodation.	2	2	1	3	1	3	2	
Healthcare & Community											
General Practitioners	4,620	GPs	Demand arising 28 GPs. Assuming 1800 population per GP. Assuming a population of 50,400 (2.4/unit). Assuming 165 m^2 / GP.	4	4	4	4	4	4	3	1
Dentists	1,450	Dentists	Demand arising 29 Dentists. Assuming 1760 population per dentist. Assuming a population of 50,400 (2.4/unit). Assuming 50 m^2 / Dentist.	4	4	4	4	4	4	3	2
Community Space and Libraries	5,400	m^2	Demand arising 1512 m^2 of Library Space. Assuming 30 m^2 per 1000 persons. Demand arising 3024m^2 of Community Space. Assuming 60 m^2 per 1000 persons. Demand arising 3nr 1800 m^2 facilities. Assuming a population of 50,400 (2.4/unit).	12%	10%	13%	12%	13%	14%	14%	12%
4 Court Sports Centre	1,904	m^2	Demand arising 4 nr facilities. Assuming 0.072 facilities per 1000 persons. Assuming 476m^2 per facility. Assuming a population of 50,400 (2.4/unit).	1		1		1	1		
4 Lane Swimming Pool	735	m^2	Demand arising 3 nr facilities. Assuming 0.048 facilities per 1000 persons. Assuming 245m^2 per facility.. Assuming a population of 50,400 (2.4/unit).	1		1			1		
Open Space											
Open space	403	ha	Assuming a population of 50,400 (2.4/unit). Including; 8ha total open space per 1000 population.	60.48	60.48	56.45	100.80	52.42	32.26	40.32	
Environment/waste - Allowance	21,000	units	Include allowance per unit to cover the provision of acoustic bunding / fencing to mitigate the impact of external sources of noise such as highways and public transport and localised solid waste recycling area.	2,550	2,058	2,706	2,498	2,770	2,949	3,029	2,440

				Cumulative Development Schedule							
Infrastructure	**Demand arising from development**	**Unit of demand**	**Commentary/assumptions**	**Phase 1 2,550**	**Phase 2 4,608**	**Phase 3 7,314**	**Phase 4 9,812**	**Phase 5 12,582**	**Phase 6 15,531**	**Phase 7 18,560**	**Phase 8 21,000**
Utilities - Scheme-Wide Enabling Works											
Site Preparations and Earthworks			Assume Site Area of 1,169ha plus an allowance for an additional 10% of this area to allow for works outside of the core development area and within the site boundary.	12%	10%	13%	12%	13%	14%	14%	12%
General demolition and site clearance 1,286 ha = m²	12,860,000	m²									
Strategic Earthworks; cut and fill											
Highways											
Primary and secondary road network											
Drainage											
Foul and surface water network											
Landscaping											
Cost captured in open space											
Noise attenuation											
Cost captured in open space											
Waste Management											
Provision for recycling on site, excluding new amenitys	21,000	Nr									
Energy											
104 No. 11 kV to 400 V distribution substations	104	Substations									
12 No. 11 kV ring circuits from primary substation to connect to distribution substations.	12	Ring Circuits									
400 V LV circuits from distribution substations to end users	21,000	Circuits/Unit									
Residential Electricity Connections											
Budget cost per Low Voltage (LV) Service Disconnection											
Potable water											
New network of distribution pipework		Network									
Water mains, connections and infrastructure charges											
Waste Water											
New network of collection pipework	21,000	Network									
Plot connections for all properties to waste water distribution network	21,000	Connections									
Gas											
Low Pressure Residential Connections											
Utilities - Off-Site Requirements											
Electricity											
New 2 x 125 MVA Primary Substation		MVA				100%					
12km 132 kV Overhead Line connection to Colchester substation		% of overall provision		100%							
Electricity Diversion Works				100%							
Potable Water											
Connection to closest feasible supply source with capacity (e.g. trunk main or reservoir)				100%							

				Cumulative Development Schedule							
Infrastructure	**Demand arising from development**	**Unit of demand**	**Commentary/assumptions**	**Phase 1 2,550**	**Phase 2 4,608**	**Phase 3 7,314**	**Phase 4 9,812**	**Phase 5 12,582**	**Phase 6 15,531**	**Phase 7 18,560**	**Phase 8 21,000**
Waste Water / Foul Water											
Upgrades to water course discharges / Surface Water		Upgrades		100%							
13km connection to existing waste water treatment works				100%							
Gas											
Extension to Medium Pressure network				100%							
1 No. Medium to Low Pressure reducing station	1	Station		100%							
Budget cost per lowering of a 180mm Low Pressure Gas Main to accommodate a site entrance.	2	Site Entrance	Assuming 2nr site entrances	100%							
Budget cost per lowering of a 225mm Medium Pressure Gas Main to accommodate a site entrance.	2	Site Entrance	Assuming 2nr site entrances	100%							
Telecommunications											
Development of access chambers for BT Telecoms network, BT Openreach fibre optic network and private telecoms network throughout development				12%	10%	13%	12%	13%	14%	14%	12%
Budget cost per fibre provider for the diversion of underground apparatus at a single location	3	Nr	Assuming 3nr providers	100%							
Transport											
A3 - Active Modes link (Church Lane - Marks Tey station)		% of total provision		100%							
Park & Ride facilities & interchange with RTS		% of total provision	To provide for interchange between modes, including provision of park & ride (as appropriate)	10%	90%						
Internal Road Network			Include in enabling costs								
Walking and Cycling connections				100%							
Additional bridges over railway line (2 vehicular & 3 pedestrian/cycle)				40%	14%		40%	6%			
A2 & A4 - Active Modes Connections to Rural Hinterland, Cycle Links		% of total provision	A4 upfront (cycle links) with remainder hinterland	30%	10%	15%	10%	10%	15%	10%	
Marks Tey Station and junction package & Stane St reduction			Various work to station and environs	58%	42%						
R2 - A12 Southern junction with Garden Community. R2 in MAS			Delivered in line with A12 improvements.	100%							
Widest realignment of A12 as part of improvements			Delivered in line with A12 improvements.	100%							
A12 capacity improvements around Kelvedon			Delivered in line with A12 improvements.	100%							
On site RTS route and related improvements/facilities				60%	20%	20%					
Contribution to provisions of off site RTS network				60%	20%	20%					

				Cumulative Development Schedule							
Infrastructure	**Demand arising from development**	**Unit of demand**	**Commentary/assumptions**	**Phase 1 2,550**	**Phase 2 4,608**	**Phase 3 7,314**	**Phase 4 9,812**	**Phase 5 12,582**	**Phase 6 15,531**	**Phase 7 18,560**	**Phase 8 21,000**
Per Unit Contributions											
Investment in early phase bus/transit services		% of total provision		75%	25%						
Contribution to A120		% of total provision	Delivered from day one with funding annually	12%	10%	13%	12%	13%	14%	14%	12%
Travel plan measures (smarter choices, car clubs, charging points, etc) - Straight Line Cost Over Time		% of total provision	Aligned to Modal Shift analysis (ITP) Delivered from day one with funding annually	12%	10%	13%	12%	13%	14%	14%	12%
Open Space Endowment		% of total provision	Delivered from day one with funding annually	12%	10%	13%	12%	13%	14%	14%	12%
Employment Space		% of total provision		12%	10%	13%	12%	13%	14%	14%	12%