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Addis Ababa City Government Plan & Development Commission

Technical Report 1.2 | Urban Housing and Retrofitting

Finding Housing Affordability

Cost estimates and affordability paths for the Addis Ababa City Block

A Technical Report commissioned by the Addis Ababa Urban Age Task Force

URBAN AGE

Addis Ababa Urban Age Task Force

The purpose of the Addis Ababa Urban Age Task Force (AAUATF) is to support the City of Addis Ababa in advancing its strategic development agenda. The Task Force's work builds upon the Addis Ababa City Structure Plan (2017–2027), exploring opportunities for compact and well-connected urban growth that can be delivered through integrated city governance.

In addition to advisory activities and capacity building, it identifies strategic pilot projects to address complex urban challenges around housing, urban accessibility, green and blue infrastructure, and urban governance.

The AAUATF is a partnership between the Addis Ababa City Plan and Development Commission (AACPDC), LSE Cities at the London School of Economics and Political Science, the Alfred Herrhausen Gesellschaft, and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH.

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Addis Ababa Plan and Development Commission
Halle Gebresilasie Avenue
Addis Ababa
Ethiopia

LSE Cities
London School of Economics
and Political Science
Houghton Street
London
WC2A 2AE
United Kingdom

lse.cities@lse.ac.uk
lse.ac.uk/cities

@LSECities
LSE Cities
LSE Cities

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Report Authors
Jacus Pienaar, Associate, Centre for Affordable Housing Finance (CAHF), Johannesburg, South Africa

Supervision
Kecia Rust, Executive Director and Founder, Centre for Affordable Housing Finance in Africa, Johannesburg, South Africa

AAUATF Working Group
Urban Housing and Retrofitting
Ricky Burdett, Director, LSE Cities/Urban Age, London, UK
Timnit Eshetu, CEO, Construction Enterprise, Addis Ababa City Administration, Addis Ababa, Ethiopia
Brett Herron, Former Member of the Mayoral Committee: Transport and Urban Development, Cape Town, South Africa
Philipp Rode, Executive Director, LSE Cities and Urban Age, LSE, London, UK
Kecia Rust, Executive Director and Founder, Centre for Affordable Housing Finance in Africa, Johannesburg, South Africa
Elias Yitbarek Alemayehu, Architect and Associate Professor, EiABC, Addis Ababa University, Addis Ababa, Ethiopia

Production and Design
Elaine Beebe, Copy Editor
Emily Cruz, Project Manager, LSE Cities
Lizzy Garlan, Publication Coordinator, LSE Cities
Yasmin Lennon-Chong, Graphic Design
Atelier Works, Template Design

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1. Background

According to the Centre for Affordable Housing Finance in Africa, the cheapest newly built house in Ethiopia in 2019 was a 20m² structure costing Br600,000 (about US$17,226). With prevailing financing rates and terms, this was estimated to be affordable to 3.52% of the urban population. In comparative terms, the country has a strong housing delivery track record. According to the Ministry of Urban Development and Construction, 176,123 new, formal units were built in 2019 (this versus an estimated 50,000 units in Kenya). Very few of these likely were financed with a mortgage, however. Ethiopia's housing finance framework is limited, with the Commercial Bank of Ethiopia the only mortgage provider. In a country of 112 million people, just under a quarter of whom live in urban areas, there are only 214,417 mortgages outstanding. Valued at US$1,088 million, the ratio of mortgages to GDP is only 1.13%. Is it any surprise therefore, that in 2018, 64.3 percent of the urban population was living in slums and 40.4% of urban households was living in homes with three or more people per sleeping room?[1] According to a 2019 World Bank report, the housing backlog is estimated to be 1.2 million units. The World Bank further estimates that to meet new demand, the country would need to more than double its housing delivery to 400,000 units per annum.[2]

1.1 Purpose of the construction and development cost estimating exercise

In August 2019 the Executive MSc in Cities (EMC) Lab, London School of Economics and Political Sciences (LSE), conducted a study and prepared a draft report for the Addis Ababa Plan Commission and Urban Age Task Force (AAUATF) titled "Implementing Addis Ababa's Structure Plan – informing pilots for strategic interventions."[3]

Among other considerations and objectives, the study aimed "to formulate a building typology that would provide formal dignified housing, that is accessible and supports livelihoods, that integrates with existing and planned transportation infrastructure and services and which connects to green spaces…bearing in mind the Structure Plan's commitment to densification and land use intensification."[4]

The process resulted in a proposed typology currently referred to as the Addis Ababa City Block, modelled on Cerda's Barcelona Perimeter Block, but adapted to take into account Addis Ababa culture and the principles and objectives of the Structure Plan. The study went further to propose a pilot project for exploring new higher density housing typologies for inner city areas that offer new opportunities for social and functional mix. Local architect Elias Yitbarek Alemayehu then prepared a concept design for costing[5], and LSE, partnering with the Centre for Affordable Housing Finance in Africa (CAHF), commissioned a construction and development cost estimating exercise for the above.

The purpose of this cost estimating exercise is to compile total development cost estimates of the pilot project in a way that considers typological implications for construction costs and also shifting to local supply chains and ecologically advantageous building materials as a further big priority for the Task Force's work.

[1] All data in this paragraph is drawn from Centre for Affordable Housing Finance in Africa (2020). 2020 Yearbook: Housing Finance in Africa. Johannesburg, South Africa. Page 115. Note, the exchange rate used here is that quoted in the yearbook, where US$1.00 = Br34.83.

[2] World Bank (2019). Ethiopia Urban Land Supply and Affordable Housing: Housing Deep Dive Report. p. 12-13. As reported in CAHF (2020).

[3] Executive MSc in Cities (EMC) Lab, London School of Economics. (2019). Implementing Addis Ababa's Structure Plan – informing pilots for strategic interventions. Draft Report, 25 August 2019.

[4] Executive MSc in Cities (EMC) Lab, London School of Economics. (2019). Implementing Addis Ababa's Structure Plan – informing pilots for strategic interventions. Draft Report, 25 August 2019. Pp. 17-18.

[5] Elias Yitbarek Alemayehu. (2020). Annex 2_The Addis Ababa City Block – Concept Design and 3D Renderings – DRAFT 07-02-20.

1.2 Proposed pilot project

The 2019 study initially considered vertical cross-subsidisation in a high-value area of the City for the pilot project, but finally settled on a horizontal cross-subsidisation model along the following lines: that a private developer be given free or subsidised access to land, and increased bulk and development rights in a high-value area of the inner city with potential for maximum commercial market value extraction, Zone 1 on the map in Figure 1, in exchange for subsidising the development of affordable housing in well-located areas of the inner city Zone 2 on the map in Figure 1).

The original case study proposal in summary:

- A private developer constructs a high-rise, mixed use, mixed income, commercially profitable building on a site given to it in Zone 1, with sufficient return to subsidise up to 100% of the cost of developing affordable housing for low income households in a four- to five-storey walk-up block in Zone 2.
- Families currently occupying the sites in dilapidated Kebele and informal housing are temporarily relocated, and those unable to participate in existing government-subsidised housing schemes are re-housed in the project

Zone 1 lies in the south of the Sengatera area in the centre of the City, comprising a mix of commercial, residential, institutional and other land uses, including hotels, embassies, university departments, an international stadium and the La Gare railway station. No specific parcel of land for the high-rise city block is indicated in the report, and for the cost estimating a set of assumptions was used as set out in Section 2.

Two large sites deemed suitable for clearing and development of the subsidised affordable housing component of the pilot were identified in Zone 2, located in the Amstegna Lideta Sub-City precinct adjacent to Zone 1, and still relatively close to the central business district. Both sites are bordered by high-order roads and likewise separated from each other by such a road as can be seen on the map, and are relatively close to major public transport routes.

The Zone 2 sites are earmarked for high-density mixed-use development in the Structure Plan, but the current actual zoning of the various parcels that make up the total area is not stated. The sites are currently covered by about 2,900 Kebele and informal houses, deemed suitable for clearing.[6] A superficial perusal of satellite maps (Google Earth Pro) suggests there are also some institutional, commercial and industrial uses on the land, even a church, a police station and hospital. A river runs through the eastern side of both sites, but it is not known to what extent associated flood lines and possible protected water courses and wetlands would restrict the developable area of the sites.

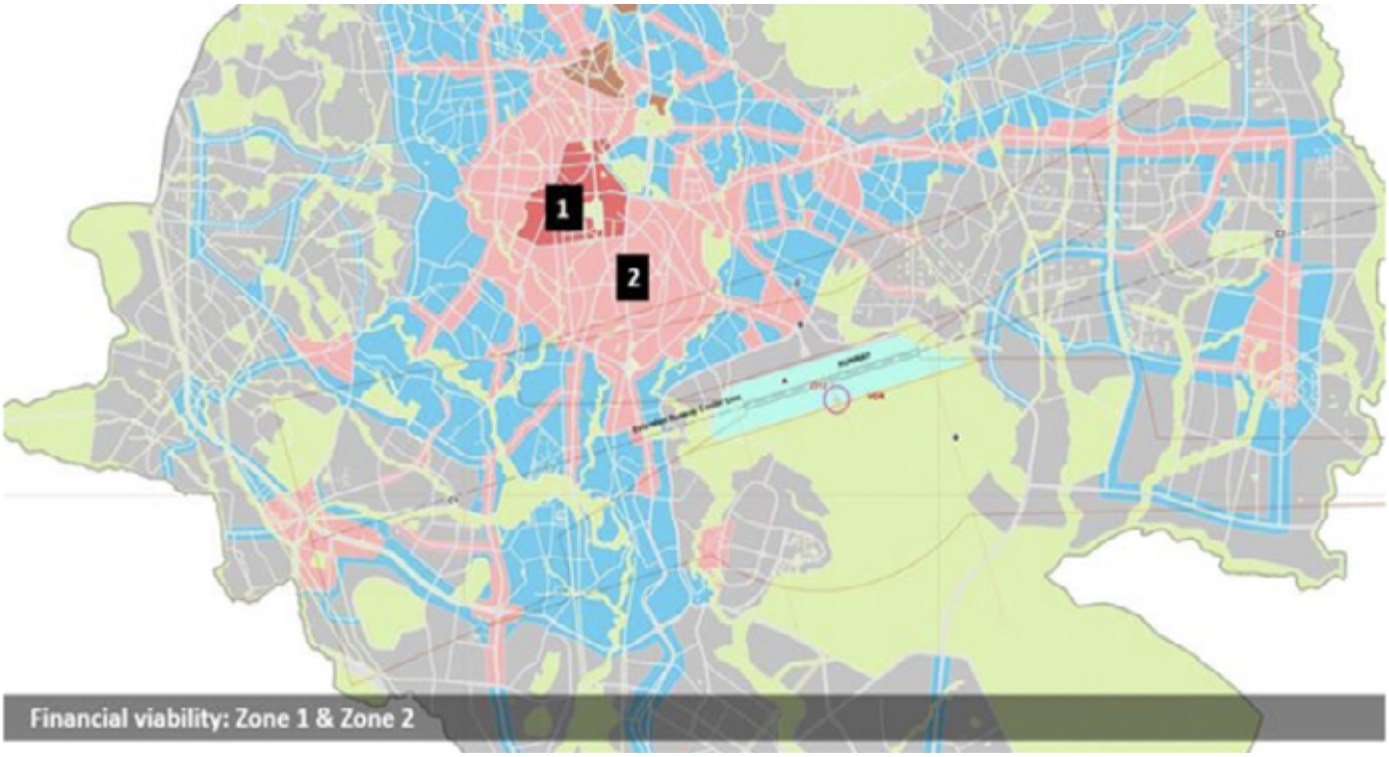

Figure 1: Location of city "zones" for a possible pilot project

Source: EMC Lab (2019). Implementing Addis Ababa's Structure Plan – informing pilots for strategic interventions (Pages 19 and 75)

[6] Executive MSc in Cities (EMC) Lab, London School of Economics. (2019). Implementing Addis Ababa's Structure Plan – informing pilots for strategic interventions. Draft Report, 25 August 2019. p.74 - 77

The original work done on the concept by Yitbarek Alemayehu has since been updated in a Final Draft dated 18 June 2021 which further elaborates the Horizontal Above Vertical (H/V) Concept: an alternative housing form for the livelihood continuity of Low Income Groups. The departure point of the H/V housing form is "having a mix of horizontally laid conventional apartments (Horizontal) for Middle Income Groups (MIGs) above vertically laid narrow frontage housing units (Vertical) for LIGs..."[7]

Redevelopment of existing sites in both Zones 1 and 2 normally would result in unavoidable temporary relocation of people and their businesses, but the proposal is clear that this should minimise displacement and ensure that families, whether re-housed in Zone 1 or 2, remain in the city centre, well-connected to public transport and still assured of access to services and economic opportunity. This objective is reinforced by the City's policy in favour of urban redevelopment projects with on-site relocation, known as "co-development."[7]

The situation on the ground with regard to availability and developability of particular sites identified in the 2019 study may have changed since the publication of the study, and as a result different sites might in future be proposed for implementation of an actual pilot project. In the absence however, of any firm new pilot proposals at the time of writing, and as the cost estimating is intended to be illustrative in nature rather than an actual feasibility study of a real project, the original pilot project case study has been retained for this version of the cost estimating report, but adapted to take into account those aspects of the 2021 concept update that have a bearing on the costing of the building typology.

Figure 2: Location of sites identified in Zone 2 for a possible pilot project

Source: SME Lab (2019). Implementing Addis Ababa's Structure Plan – informing pilots for strategic interventions (Pages 19 and 75)

[7] Elias Yitbarek Alemayehu. (2021). Livelihood and Housing Form: The Horizontal Above Vertical (H/V) Concept for Addis Ababa. p. 4, 6

2. Project parameters and assumptions

2.1 Project parameters – horizontal cross-subsidy from Zone 1 to Zone 2 site

2.1.1 High-rise city block in Zone 1

The initial concept, developed in February 2020, proposed a city block of 120m x 120m. The June 2021 update states: "The H/V housing form at its fullest is primarily a city block of 120m x 120m..." This configuration is adopted from the Addis Ababa City Structure Plan of 2017-2023.[8] The cost estimate of the city block for Zone 1 is based on the layout for the 120m x 120m block titled 1B+G+12-15 (13 to 16 storeys), illustrated by a selection of images in Figure 3, and floor layouts in Figures 4 and 5.

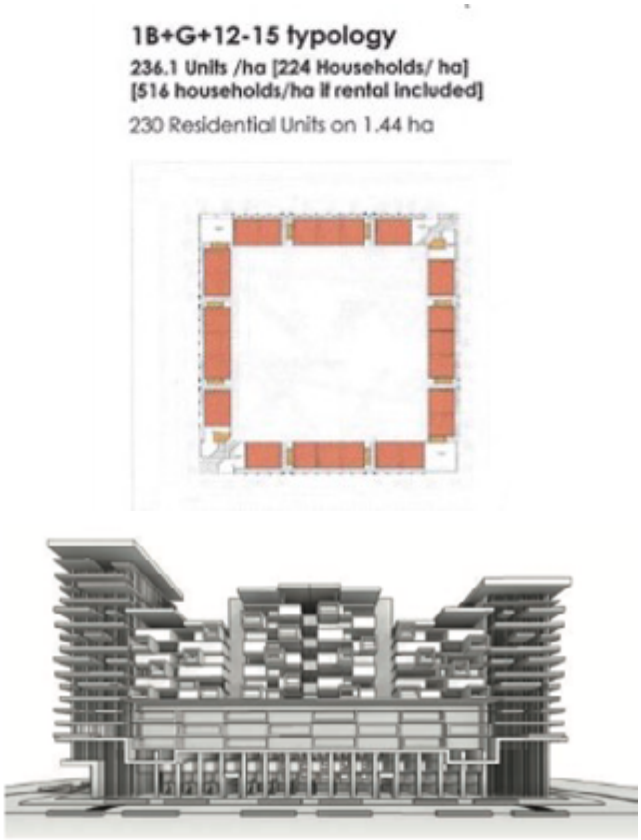

Figure 3: Selected images illustrating the City Block Concept Design used for cost estimating

Source (above): Architect Elias Yitbarek Alemayehu (2021)

[8] Elias Yitbarek Alemayehu. (2021). Livelihood and Housing Form: The Horizontal Above Vertical (H/V) Concept for Addis Ababa. p. 7, 9

Quantities were derived from the layouts below reflecting the 120m x 120m block and have been used in the cost estimates below. Figure 4 shows the ground floor layout of the high-rise block in Zone 1, comprising the first level of vertically stacked home-based enterprise (HBE) units and retail areas in the corners.

Figure 5 shows a typical floor layout of the high-rise block in Zone 1 comprising single level middle-income residential apartments and affordable rooms with shared facilities in the corners.

The concept in its current draft form, used for costing, comprises:

- One level basement for parking, storage, machine rooms, electrical switchgear, and small production units;
- Ground floor plus three floors with vertically stacked duplex affordable home-based enterprise (HBE) and rental units (104 units) and commercial retail and mixed use in the corners;
- Fourth to seventh floors: 64 high-income residential apartments;
- Eighth to 12th floors: 160 middle-income residential apartments;
- Fourth to 15th floors: So-called collective units comprising affordable rooms with shared communal ablution, cooking, dining and recreational spaces for students and others in the box-shaped spaces on the four corners of the block from fourth to 12th floors, and spread across 13th to 15th floors;
- A variety of social and green spaces as indicated in the concept, but not yet designed in detail.

The concept has not yet been developed to the level of detailed layouts or dimensions, and measurement of quantities for costing was based on such layouts and dimensions as are provided and supplementary information provided by the architect. The total number of units in the block is shown in Table 1.

The LSE report, read as a whole, makes it clear that the city block concept is intended to be in line with the Structure Plan approach and to rely extensively on public transportation and reduce car dependency in the City. The concept as is provides for 200 basement parking bays. Although the proposal of reduced private parking facilities, especially for the middle- and high-income residential market and commercial users has not been tested yet for acceptance in the marketplace, the following parking ratios that make up the total of 200 bays are assumed for purposes of the costing:

- Affordable HBE units – no parking requirement;
- Affordable rooms with communal facilities – no parking requirement;

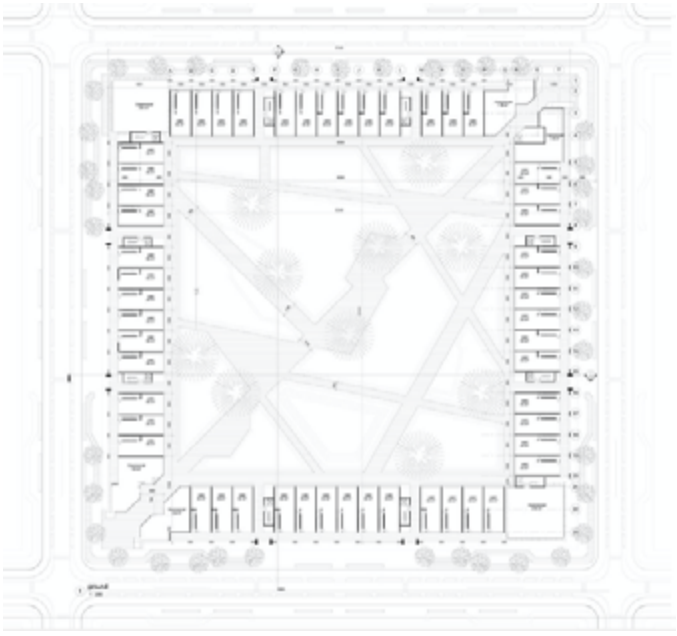

Figure 4: High-rise block: layout plan of ground floor

Source: Architect Elias Yitbarek Alemayehu (2020)

Figure 5: High-rise block: layout plan of high-income residential typical floors

Source: Architect Elias Yitbarek Alemayehu (2020)

- High-income residential units (64 units) – 1.0 bays per unit = 64 bays;
- Middle-income residential units (160 units) – 0.5 bays per unit = 80 bays;
- Retail and commercial market space (2880m² GLA) – 20 bays per 100m² of gross lettable area = 56 bays;

Average floor area required per parking bay, inclusive of circulation areas and access ramps = 30.0m².

The floor area parameters for the Zone 1 city block established in accordance with the above are summarised in Table 2. Gross construction area (GCA) is defined as the total enclosed building floor area under roof on all levels of the building or buildings, inclusive of service areas such as storage and plant rooms, and horizontal and vertical circulation areas. Gross lettable area (GLA) is defined as the enclosed internal unit areas under roof on all levels of the building or buildings excluding service areas such as storage and plant rooms, and horizontal and vertical circulation areas. The total footprint of the block is given by the architect as 1.46 hectares (121m x 121m). For costing purposes however, the total footprint of the concept, inclusive of the city "open street" is taken as 150m x 150m or 22,500m^2 (2.25 hectares). Depending on additional functions such as access roads, the final position, shape and size of the blocks fitted on an irregular shape polygon as is for instance the case with the sites in Zone 2, the total land requirement per block would vary, but is estimated at between 2.25 and 2.5 hectares for the current design. For costing purposes the greater number of 2.5 hectares has been used.

2.1.2 Five-storey residential block in Zone 2 (G+4, no basement)

Although not explicitly stated in the pilot proposal, it is assumed that the five-storey subsidised affordable housing block (Ground plus four) intended for sites in Zone 2 (not yet designed) will follow the Zone 1 city block concept, but with significant adaptations. The parameters of this assumption may change substantially once designed, and the cost estimating results therefore are presented as only illustrative at this stage.

Dimensions of the Zone 2 sites are shown in Figure 6, and as previously stated the sites could accommodate at least one, but probably a number of city blocks each.

The site north of Burundi Street is 10.3763 hectares and the one south of the street 12.4897 hectares in size, for a total of 25.43 hectares.[9] (The small discrepancy between the sizes given in the text of the report and shown on the map above is not explained in the report, but is not critical to the outcome of the current cost estimating study).

Table 1: Addis Ababa City Block 1B+G+12-15: Unit numbers for high-rise city block in Zone 1

Floors	No. of floors	Residential living units per floor	Collective units per floor	Commercial units and offices per floor	Production units per floor	Parking bays per floor	Total residential living units	Total collective units
Basement	1				24	200		
Ground plus three (four levels): Affordable home-based enterprise (HBE) and rental units:	4							
Lower duplex: Ground plus first floor	2	52 across both floors		12			52	
Upper duplex: Second plus third floor	2	52 across both floors		12			52	
Fourth to seventh floor	4	16	4	16			64	16
Eighth to 12th floor	5	32	4				160	20
13th to 15th floor	3		9					27
Totals – all floors							**328***	**63****
Total living units	**391**							

* The concept envisages the occupation of each of the 104 HBE unit by at least two households (one owner and one rental tenant), resulting in a total of 432 households being accommodated in the 328 living units.

Source: Architect Elias Yitbarek Alemayehu (2020)

[9] Executive MSc in Cities (EMC) Lab, London School of Economics. (2019). Implementing Addis Ababa's Structure Plan – informing pilots for strategic interventions. Draft Report, 25 August 2019. P. 77

Table 2: Estimated floor areas used in estimating the cost of high-rise city block in Zone 1

Residential space						
Floors	**Description**	**Gross construction area (GCA) m²**	**Gross Lettable area (GLA) m²**	**Number of units**	**GCA per unit m²**	**GLA per unit m²**
Ground plus three (Four levels)	Affordable home-based enterprise (HBE) and rental units	14,520	11,440	104	139.6	110
Four to seven (four levels)	High-income apartments	19,108	13,456	64	298.6	210.2
Eight to 12 (five levels)	Middle-income apartments	23,885	16,820	160	149.28	105.1
Four to 12 and 15 in corner boxes (9-12 levels)	Affordable rooms with shared communal facilities	13,230	9,418	63*	210	149.5
Totals - Residential		**70,743**	**51,134**	**391**		
*Individual configurations of the spaces for the rooms with communal facilities may vary widely according to demand. In the total of 63 units shown in the column for number of units above, the total space for this purpose on each level is taken as a unit. Each unit, depending on living space and density standards applied in the final design, could contain anything from three to eight individual rooms and/or bedsitters.						
Market retail and commercial space						
Floors	**Description**	**Gross construction area (GCA) m²**	**Gross Lettable area (GLA) m²**	**Number of units**	**GCA per unit m²**	**GLA per unit m²**
Ground floor in corner boxes (one level)	Market retail	1,024	720	4**	256	180
First to third floor in corner boxes (three levels)	Market retail and commercial (offices, light industry) mix	3,072	2,160	12**	256	180
Totals – Market retail and commercial space		**4,096**	**2,880**	**16**		
Total building areas (excluding basement of 6,000m²)		**74,839**	**54,014**			
Total building areas (including basement of 6,000m²)		**80,839**	**60,114**			

**Individual configurations of the market retail and commercial spaces may vary widely according to demand. In the totals of four and 12 such units shown above, the total space on each level for this purpose is taken as a unit.

Source: CAHF own estimates (2021)

i.e. 121m x 121m (1.46 hectares) for the building itself and 150m x 150m (2.25 hectares) total land required;

- Ground plus first floor – 52 duplex HBE units similar to those in the Zone 1 block (140m² GCA/105m² GLA each);
- Second to fourth floors – 180 affordable residential units consisting of a mix of studios, one, two and three bedroom family apartments (average GCA 49.3m² / GLA 42.7m² each);
- Four corner boxes, ground floor – retail space for small-scale enterprise;
- 16 corner boxes, first to fourth floors – rooms with shared communal facilities similar to those in the Zone 1 block;
- No private parking on site;
- Social and green spaces similar to those in Zone 1 block, but reduced to scale.

The above equates to a total of 248 living units made up of 52 HBE units, 180 affordable apartments and 16 collective units. Using the same occupancy rates for HBE and collective units as for the block in Zone 1, a total of 332 households could be accommodated in this block.
The floor area parameters used in the costing for this block are summarised in Table 3.

2.2 Project parameters – in-situ vertical cross-subsidy model for high-rise city block on Zone 1 site

The physical configuration for the high-rise city block on the Zone 1 site remains the same as for 2.1 above. This model is based on the horizontal above vertical in-situ cross subsidy on the same site. In this case the vertically stacked affordable home-based enterprise (HBE) units will be subsidised through a portion of profits from the horizontal middle- and high-income units above, as well as the retail and commercial portions of the development. There is therefore no second building on a Zone 2 site.

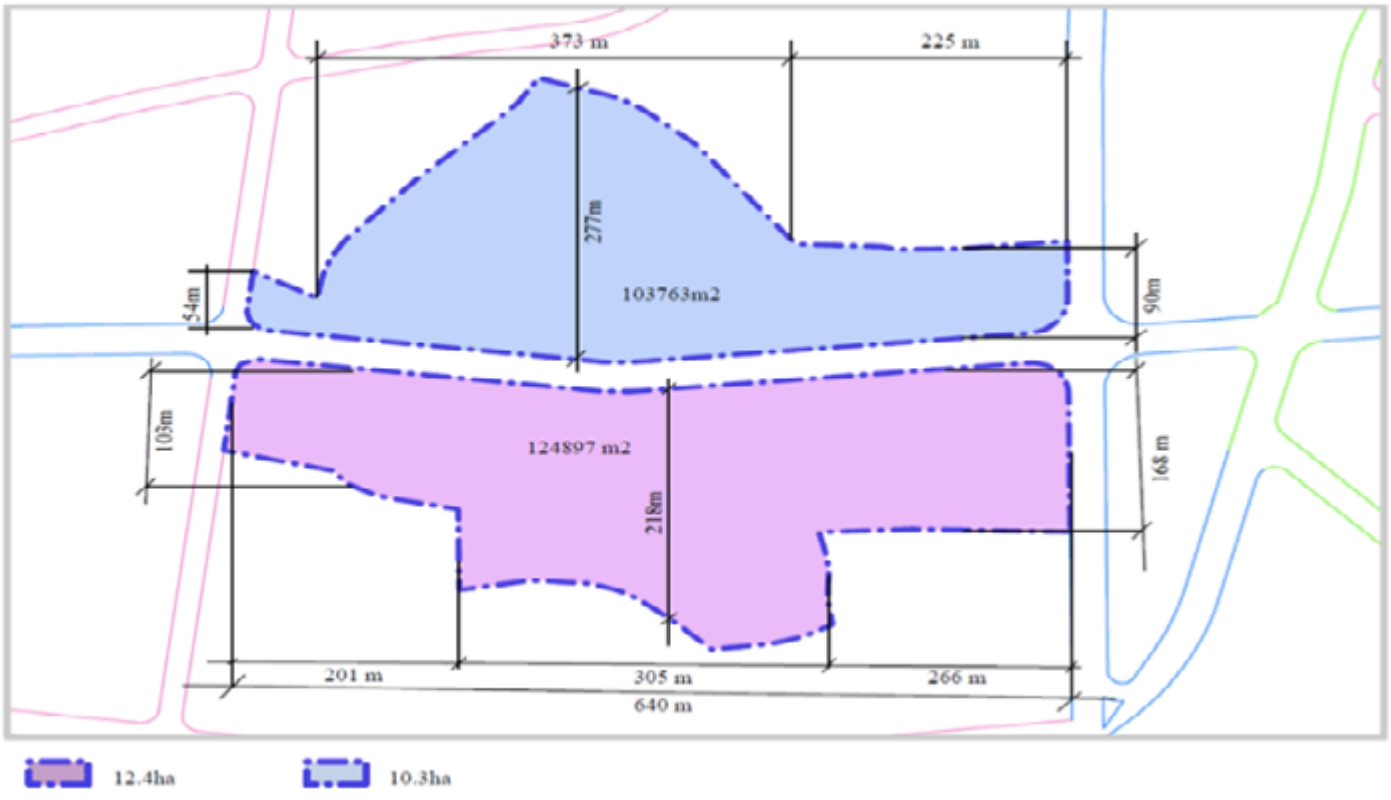

Figure 6: Map showing dimensions of Zone 2 sites

Source: SME Lab (2019). Implementing Addis Ababa's Structure Plan – informing pilots for strategic interventions (page 75)

Table 3: Estimated floor areas used in estimating the cost of the five-storey walk-up city block in Zone 2

Residential space						
Floors	**Description**	**Gross construction area (GCA) m²**	**Gross Lettable area (GLA) m²**	**Number of units**	**GCA per unit m²**	**GLA per unit m²**
Ground and first (two levels)	Affordable home-based enterprise (HBE) and rental units	7,260	5,720	52	139.6	110
Second to fourth (three levels)	Low-income studios and family apartments	8,880	7,900	180	49.33	42.7
First to fourth in corner boxes (four levels)	Affordable rooms with shared communal facilities	3,360	2,390	16*	210	149.9
Totals - residential		**19,500**	**16,010**	**248**		
*Individual configurations of the spaces for the rooms with communal facilities may vary widely according to demand. In the total of 16 units shown in the column for number of units above, the total space for this purpose on each level is taken as a unit. Each unit, depending on living space and density standards applied in the final design, could contain anything from three to eight individual rooms or bedsitters.						
Small-scale enterprise space						
Floors	**Description**	**Gross construction area (GCA) m²**	**Gross Lettable area (GLA) m²**	**Number of units**	**GCA per unit m²**	**GLA per unit m²**
Ground floor in corner boxes (one level)	Small-scale enterprise	1,024	720	4**	256	180
Totals – market retail and commercial space		**1,024**	**720**	**4**		
**Individual configurations of the market retail and commercial spaces may vary widely according to demand. In the totals of four and 16 such units shown above, the total space on each level for this purpose is taken as a unit.						
Total building areas		**20,524**	**16,732**			

Source: CAHF own estimates (2021)

2.3 Development cost estimating assumptions

2.3.1 Land assembly and preparation for redevelopment

The LSE study proposes that the City, as owner of the land, incentivises the pilot project through measures such as free or subsidised access to land and increased bulk and development rights. The land in both zones is largely if not completely occupied and covered with various forms of existing structures. It is not clear from the study, and such level of detailed analysis was presumably not included in its brief, whether access to subsidised or free land implies vacant occupation provided by the City at its own cost, cleared and rehabilitated and ready for redevelopment, or whether the risk and cost of preparing the land would be for the developer or shared in some way between the developer and the City.

If the pilot project is to establish a model with potential for replication at scale, all costs should be reflected, regardless of the cost-sharing arrangements and for whose account.

As already mentioned above, no specific parcel of land for the high-rise city block in Zone 1 is indicated in the report. A detailed survey to identify potential vacant or underutilised sites for the high-density city block in Zone 1 of the pilot fell outside the scope of this study, and for costing purposes the following assumptions were made:

1. That a large enough area to accommodate the 120m x 120m city block concept would be found in Zone 1, or at least in an area with similar characteristics and potential;

2. That it would be unlikely, given the nature of inner parts of the City similar to Zone 1 as observed on satellite maps, to find a vacant parcel of land with one homogenous current land use under one title, large enough (estimated at approximately 2.25 to 2.5 hectares in size);

3. The above implies that land assembly for the project would entail all or most of the following activities:

   3.1 A land legal report to identify separate parcels that would need cadastral survey and consolidation and/or notarial ties and/or re-subdivision as well as any environmental and town planning approvals needed;

   3.2 A physical survey to determine current occupation and land use(s);

   3.3 A community survey to determine the socio-economic profile of exiting occupants, consultation and negotiation with occupants around expropriation of leases, relocation, rehousing, and any financial compensation involved;

4. That some demolition, and clearing and rehabilitation/ decontamination of land would be required, but that this would not involve demolition of (and therefore, compensation for) high value improvements.

   No site development plans are available yet for the two sites identified in Zone 2 for the subsidised affordable housing component. Overlaying the basic 120m x 120m city block footprint, with minor adaptations to size and shape, on satellite maps of the area suggests that it would be possible to implement at least one, probably more, of the blocks on each site without having to demolish what appears to be more substantial improvements than the dominant Kebele and informal residential structures covering the sites, but this would have to be confirmed through proper site analysis and design. For costing purposes, a set of assumptions similar to those for Zone 1 above were made for the sites in Zone 2, including:

5. That land assembly for the project would entail all or most of the following activities:

   5.1 A land legal report to identify separate parcels that would need cadastral survey and consolidation and/or notarial ties and/or re-subdivision as well as any environmental and town planning approvals needed;

   5.2 A physical survey to determine current occupation and land use(s);

   5.3 A community survey to determine the socio-economic profile of exiting occupants, consultation and negotiation with occupants around expropriation of leases, relocation, rehousing and any financial compensation involved;

6. That some demolition, and clearing and rehabilitation/ decontamination of land would be required, but that this would not involve demolition of (and therefore, compensation for) more substantial high value improvements.

2.3.2 External bulk trunk, link and connector engineering services and electrical infrastructure, and upgrades to these for developer account

The main assumption is that government agencies (City or other) would be responsible for installation and cost of bulk services infrastructure, including but not limited to:

- Bulk water supply (reservoirs, pipelines, pump stations, etc.);
- Bulk sanitation (sewer disposal, pipelines, pump stations, effluent treatment plants, etc.);
- Bulk storm water disposal;
- Transportation networks;
- Solid waste disposal;
- Bulk energy supply;
- Public parks.

Requests to various agencies for information that could

be used in calculating or at least estimating the costs of the above, and therefore, the value of any form of contributions (bulk or development charges) from developers for a specific project yielded no usable results. The general view is that some of these costs are covered in water and electrical connection fees and charges, but that the contribution from these sources is significantly inadequate.

The World Bank *Doing Business* report for Ethiopia 2019 sets out the procedures and some estimated costs of registering property, obtaining statutory approvals such as construction permits, obtaining water and electricity connections for a case study of a typical warehouse development.[10]

While useful for understanding how some of it works, it is not possible to extrapolate the values of the small case study to a project of the nature and scale of the city block concept.

In the absence of usable local data the DC Calculator used by the City of Cape Town, South Africa[11] , as informed by the City's Development Charges Policy[12] and its implementation guide[13] was adapted for use as an indicative proxy for this costing study. The adaptation method involved comparing the costs of bulk civil works in Ethiopia, for which some information was available in various reports, with those similarly available for Cape Town, and then applying an "Addis Ababa correction factor" derived in that way to the results of estimates done for the city block case study, using the calculator.

It is likely that most, if not all, of the estimated costs of the above will not be borne directly by the developer as an allocated project cost, but indicative estimates of those are nevertheless shown in the costing.

2.3.3 Internal engineering services and electrical reticulation infrastructure

Although some areas of Addis Ababa are not well served by sanitation infrastructure, access to water and electricity supply often appears to be less problematic. Conducting an engineering services and electricity availability and capacity investigation for the pilot sites falls outside the scope of this cost estimating study.

It is assumed therefore, given that the sites are in well-developed inner parts of the City, that it would be possible to connect to all public services grids, and that no on-site works such as boreholes, well-points or private sewer treatment or septic/conservancy tank installations are required. Estimated internal reticulation and grid connection costs, as well as storm water run-off attenuation on site have been included in the costing.

2.3.4 Building construction

No specific information is available on geotechnical (subsoil) conditions, topography (contour plans) or other physical features of the sites aside from the fact that they are occupied, covered by Kebele and informal housing and some other structures. Assumptions in this regard are:

1. That no special foundations (deep piling) are required and that the structure can be founded on normal reinforced concrete column pads and wall footings at normal depths;
2. That no excessive amounts of hard rock requiring blasting will be encountered in the excavations for the basement, services and foundations (an allowance of 15% of the total volume of such excavations is made in the costing);
3. That the sites have moderate slopes, and that there is no need for extensive bulk earthworks and platforming (cut to fill, cut to spoil, or imported material for bulk fill and layer work).

Detailed specifications of building materials and finishes are not yet available, but for costing purposes the following assumptions are made (broad outline only), based on a broad scan of project news articles and developer brochures:

1. Parking basement – reinforced concrete shell with tanking, seepage drains behind walls and under floors, and small sump pumps for disposal of ground water. Low lighting (possibly motion-activated) and very basic finishes (mostly unfinished exposed concrete);
2. Structural frame – conventional in-situ reinforced concrete frame consisting of columns and flat slabs, with beams where required over large spans e.g. over the basement, and infill non-load bearing masonry as detailed below. (Alternatives to be explored in the relevant sections below.)
3. External envelope:
   - 3.1 Ground floor market retail areas - glazed shop fronts and security grilles where required;
   - 3.2 HBE units – solid block walls with small shop front elements on ground floor "trading" elevations facing streets and the central courtyard;
   - 3.3 All other elevations – solid block non-load bearing infill walls with glazed aluminium windows (and patio sliding doors where balconies are indicated), and hardwood entrance doors;
4. Internal divisions – solid non-load bearing block walls;

[10] World Bank. (2019). Doing Business 2019 – training for reform. Economy profile, Ethiopia.

[11] City of Cape Town. (2014). Development Charges calculator Version 2.0. June 2014.

[12] City of Cape Town. (2014). Development Charges Policy for Engineering Services. 28 November 2014.

[13] City of Cape Town (2018). City of Cape Town Development Charges – An Implementation Guide to the Development Charges Policy for Engineering Services. 28 November 2018.

5. Roofs – flat reinforced concrete slabs with graded waterproofing, protection for trafficable services, edge parapets with copings, and appropriate rainwater disposal system (outlets and downpipes) connected to rainwater harvesting tanks and irrigation systems for common areas;

6. External wall finishes – cement plaster and durable paint generally (There are indications of clay brick and face brick manufacturing in the south of the country, but it is not known if there are efficient ways of procuring for Addis Ababa. Also all the examples in the news articles and brochures show plaster and paint);

7. Stair, walkway and balcony balustrading and handrails – anodised aluminium grid;

8. Internal wall finishes – plaster and paint generally, with glazed ceramic tiling in wet areas;

9. Floor finishes:

   9.1 Ground floor market retail areas – high-grade glazed ceramic and/or porcelain tiling;

   9.2 Commercial areas in the corner boxes, first to third floors – mix of high-grade tiling and carpeting;

   9.3 HBE units, ground to third floors – medium-grade glazed ceramic tiling;

   9.4 High-income residential units, fourth to seventh floors – mix of high-grade glazed ceramic or porcelain tiling, laminated engineered wood or bamboo flooring and carpeting;

   9.5 Middle-income residential units, eighth floor and above – mix of medium-grade glazed ceramic tiling and carpeting;

   9.6 Rooms with shared communal facilities – durable, low-maintenance glazed ceramic tiling;

   9.7 External walkways, lobbies, stairs and landings – durable, low-maintenance tiling;

   9.8 Paved common areas on ground level - mix of durable, low-maintenance tiling, and natural stone cobble paving.Electrical installation – incoming mains, mini-subs, switchgear, energy-efficient power and lighting, including area lighting for pavements and courtyard per load requirements, and provision for standby generators;

10. Water and sanitation - fully reticulated and fitted bathrooms and kitchens, with water-saving fittings, grade and facilities appropriate to end-user market. Grey water recycling systems have not been provided for in the generic cost estimate;

11. Built-in kitchens and wardrobes – appropriate allowances related to different end-user markets;

12. Shop fitting and tenant allowances – standard basic allowances made;

13. Loose furniture, appliances and furnishing – no allowances made;

14. Fire protection – per regulation;

15. Lifts (elevators) – two per wing as shown on the layouts (eight in total), and one for each corner box (not shown, but required unless layout changes to allow for sharing with the general wings of the building);

16. Electronic installations – allowance made for access control and security, communication systems;

17. Sun control – no allowance for special systems such as movable louvres, retractable canopies, etc.;

18. Social and green spaces – allowances made for hard and soft landscaping, playground equipment, etc.

2.3.5 Other development costs

Allowances have been made for other development costs, such as:

- Professional and project management fees;
- Promotion and marketing costs, and letting/selling commissions;
- Capitalised cost of securing construction finance, and interim interest on draw-downs during the development period.

No allowance has been made for capitalised interim land holding costs such as property rates during the development period due to land ownership always vesting in the City.

3. Methodology

The methodology used in the estimating exercise is as follows:

1. Collect relevant desktop data with regard to total residential property development and construction process and costs in typical inner-city areas of Addis Ababa. This would include information available on the internet as well as requests to local authorities, practitioners, developers, contractors and suppliers for case-study and general cost data, such as:

   1.1 Typical materials and technologies used for affordable high-density housing;

   1.2 Statutory tariffs and fees involved in land transactions, statutory compliances and construction permits;

   1.3 Obtaining bulk (trunk) infrastructure connections;

   1.4 Development cost estimates, bills of quantities, plans and specifications;

   1.5 Materials price lists;

   1.6 Labour task and wage rates;

   1.7 Plant outputs and costs.

2. Measure quantities for the city blocks in Zones 1 and 2, break down the measured items of work into its primary resource components of labour, plant and materials involved, contractor preliminaries, overheads and profit mark-up to arrive at total construction cost;

3. Add all other development costs for each typology such as land and land registration costs, planning and other compliances and approvals costs, external and internal engineering and electrical infrastructure services, professional fees, promotion, marketing and letting/selling costs, interim capitalised land holding and construction finance costs;

4. Set out all the above in a summary table under appropriate headings reflecting total costs, and cost per m^2 of GCA and GLA respectively in both local currency and equivalent US Dollar;

5. Investigate, analyse and report on possibilities and cost impacts for greater use of locally resourced conventional, alternative and greener technologies and materials.

The LSE study refers to the Basket of Construction Components (BOCC) approach to comparing construction costs across different African countries.[14] The BOCC method looks only at construction cost and does not take into account all of the additional development costs related to land, planning and approvals, infrastructure and more. The detailed CAHF methodology as outlined above is considered more accurate for comprehensive cost estimating of different typologies.

[14] Executive MSc in Cities (EMC) Lab, London School of Economics. (2019). Implementing Addis Ababa's Structure Plan – informing pilots for strategic interventions. Draft Report, 25 August 2019. P. 25

4. Limitations of the study and main challenges

The following limitations are noted:

- The study is only a costing exercise and not a feasibility study;
- It does not include an analysis of land and property markets in Addis Ababa;
- It does not include affordability analysis and target market segmentation, or any other form of socio-economic investigation and analysis;
- It does not venture into any urban and project design issues and does not purport to be a design review.

The main challenges included:

- Due to budgetary and time constraints, no country visit was undertaken, and therefore, there was no opportunity for personal interviews and in-situ observations. All information was remotely obtained, mainly through on-line searches, literature review and requests for information;
- Responses to direct requests for information were poor. It was hoped that the planned workshop would stimulate more interest and appetite to provide information, but unfortunately the workshop did not take place due to restrictions in response to the COVID-19 pandemic;
- Many of the substantive reports on the topic are somewhat dated, going back to 2015 and before. The combined effect of fluctuations in construction cost inflation, land and housing markets, and US Dollar exchange rates in the intervening period makes it difficult to provide meaningful updates and comparisons.

5. Cost estimating

5.1 Estimated total development cost (TDC) and price

Residential property development is undertaken with one of two aims or a combination of two aims in mind:

- To sell completed units for a profit (selling schemes),
- And/or to hold as an investment and rent the units out for a return on that investment (investment or rental schemes).

In both instances the developer needs to determine the size of the investment and then set selling prices or rentals that will result in an acceptable profit or return on investment, as the case may be. The amount of the investment equates to all development costs capitalised up to the point of sale for selling schemes, or occupation and commencement of operations for rental schemes.

The total development costs (TDC), often also referred to as total capital outlay (TCO), usually include all or most of the following:

- Land assembly or property acquisition and associated transaction costs;
- Statutory and professional fees incurred in obtaining the necessary land use rights, construction permits and the like;
- Bulk infrastructure development contributions to local authorities or designated agencies;
- Internal engineering and electrical servicing and connections;
- Top structure construction, including contractor mark-up and associated project management and professional fees – new build and/or refurbishment or conversion of existing buildings;
- Land or property holding costs during the development period, for instance, municipal rates;
- Initial marketing, selling and leasing costs (in some cases these are excluded from TDC and accounted for as a cost against profits or as operational costs);
- Cost of securing development/construction finance and capitalised interest on drawdowns during development/ construction;
- Overall development management fee.

In selling schemes, once TDC has been determined, depending on the developer's own financial objectives and reigning market conditions, the developer will then add a percentage mark-up or margin on TDC to arrive at a selling price that will meet the desired profit objective. The price, therefore, is the TDC plus a margin that then becomes the developer's profit.

5.2 Estimated total development cost of high-rise mixed-use, mixed-income commercially viable city block (120m x 120m) in Zone 1

In the following tables the total cost of each headline cost item is presented in local currency and equivalent US Dollar amounts, as well as per square metre of Gross Construction Area (GCA), per square metre of Gross Lettable Area (GLA) and as a percentage of total cost. GCA is defined as the total enclosed building floor area under roof on all levels of the building or buildings, inclusive of service areas such as storage and plant rooms, and horizontal and vertical circulation areas. GLA is defined as the enclosed internal unit areas under roof on all levels of the building or buildings excluding service areas such as storage and plant rooms, and horizontal and vertical circulation areas.

Table 4 summarises the total cost of construction and associated development costs, excluding land assembly and preparation.

Table 5 summarises the total cost of land assembly and preparation (clearing and rehabilitation, temporary relocation and compensation for loss of rights and disruption in small enterprise), and development charges for bulk, link and connector engineering services and electrical infrastructure. Cost sharing arrangements among the City, other agencies (eg, water and electricity), and the developer needs to be determined before these costs can be correctly allocated.

If the cost of land preparation and bulk infrastructure charges are included, the total development cost is as in Table 6.

The total building construction and associated development costs above are allocated to the different uses in Table 7. The costs for each use in Table 7 include escalated final construction costs, contractor mark-ups, contingencies, professional and project management fees, marketing, capitalised development finance costs and overall development fee, but exclude land preparation costs and bulk infrastructure charges.

Table 4: Estimated total construction cost of the Zone 1 high-rise block (cost of land assembly and preparation, development charges for external bulk infrastructure excluded)

COST ELEMENT	ESTIMATED COSTS						
Building construction and associated development costs (excluding land preparation)	**Total cost Ethiopian Birr (Br)**	**Cost per m² of GCA (Br)**	**Cost per m² of GLA (Br)**	**Total cost US Dollar (US$) Rate = 43.9**	**Cost per m² of GCA (US$)**	**Cost per m² of GLA (US$)**	**% of total cost**
Direct construction cost – labour and materials	1,699,911,915	21,028	28,325	38,643,144	478	644	40.11%
Preliminaries (11%)	186,990,311	2,313	3,116	4,250,746	53	71	4.41%
Sub-total	**1,886,902,226**	**23,341**	**31,441**	**42,893,890**	**531**	**715**	**44.52%**
Contractor mark-up (profit and overhead):							
Overhead (5%)	94,345,111	1,167	1,572	2,144,695	27	36	2.23%
Profit (10%)	188,690,223	2,334	3,144	4,289,389	53	71	4.45%
Total contractor mark-up	**283,035,334**	**3,501**	**4,716**	**6,434,084**	**80**	**107**	**6.68%**
Estimated current building cost	**2,169,937,560**	**26,842**	**36,157**	**49,327,974**	**611**	**822**	**51.20%**
Construction escalation:							
Pre-contract escalations (12 months at 2021/22 blended rate of 11.5% p.a.)	249,542,819	3,087	4,158	5,672,717	70	95	5.89%
Escalation during construction (24 months at 8.4% p.a. x 0.4 cash-flow factor)	162,589,081	2,011	2,709	3,696,046	46	62	3.84%
Total construction escalation	**412,131,900**	**5,098**	**6,867**	**9,368,763**	**116**	**157**	**9.73%**
Sub-total	**2,582,069,460**	**31,940**	**43,024**	**58,696,737**	**727**	**979**	**60.93%**
Construction contingency allowance (5%)	129,103,473	1,597	2,151	2,934,837	36	49	3.05%
Estimated final building cost	**2,711,172,933**	**33,538**	**45,175**	**61,631,574**	**763**	**1,028**	**63.98%**
Professional and project management fees:							
Professional fees (13%)	282,091,883	3,490	4,700	6,412,637	79	107	6.66%
Project management (3%)	65,098,127	805	1,085	1,479,839	18	25	1.54%
Total professional and project management fees	**347,190,010**	**4,295**	**5,785**	**7,892,476**	**97**	**132**	**8.20%**
Total: Construction cost and professional fees	**3,058,362,943**	**37,832**	**50,960**	**69,524,050**	**860**	**1,160**	**72.18%**
Other development costs (Marketing and selling/letting)	104,225,849	1,289	1,737	2,369,308	29	39	2.46%
Sub-total	**3,162,588,792**	**39,121**	**52,697**	**71,893,358**	**889**	**1,199**	**74.64%**
Capitalised interim development finance cost	301,421,156	3,729	5,023	6,852,038	85	114	7.11%
Sub-total	**3,464,009,948**	**42,850**	**57,720**	**78,745,369**	**974**	**1,313**	**81.75%**
Overall development contingency (2.5%)	86,600,249	1,071	1,443	1,968,635	24	33	2.04%
Developer fee (5%)	173,200,497	2,143	2,886	3,937,270	49	66	4.09%
Total building construction and associated development costs excluding land preparation (excluding taxes)	**3,723,810,694**	**46,064**	**62,049**	**84,651,301**	**1,047**	**1,412**	**87.88%**

Source: CAHF own estimates (2021)

Table 5: Rough order of magnitude estimate of land and bulk infrastructure costs

COST ELEMENT	Total cost Ethiopian Birr (Br)	Total cost US Dollar (Rate = 43.99)
Land preparation	329,640,180	10,269,164
Bulk development charges	148,340,200	4,621,190
Sub-total	477,980,380	14,890,354

Source: CAHF own estimates (2021)

Table 6: Estimated total construction cost of the Zone 1 high-rise block (cost of land assembly and preparation, development charges for external bulk infrastructure included)

COST ELEMENT	Total cost Ethiopian Birr (Br)	Cost per m^2 of GCA (Br)	Cost per m^2 of GLA	Total cost US Dollar (US$)	Cost per m^2 of GCA (US$)	Cost per m^2 of GLA (US$)	% of total cost
Total building construction and associated development costs	**3,723,810,693**	**46,065**	**62,049**	**84,651,300**	**1,047**	**1,411**	**87.87%**
Land costs							
Land preparation	354,363,194	4,384	5,905	8,055,540	100	134	8.36%
Bulk infrastructure charges	159,465,715	1,973	2,657	3,625,045	45	60	3.76%
Total land costs	**513,828,909**	**6,357**	**8,562**	**11,680,585**	**145**	**194**	**12.12%**
TOTAL DEVELOPMENT COST INCLUDING LAND	**4,237,639,602**	**52,422**	**70,611**	**96,331,885**	**1,192**	**1,605**	**100.00%**

Source: CAHF own estimates (2021)

Table 7: Total building construction and associated development costs allocated to different uses (land preparation and bulk infrastructure charges excluded)

COST ELEMENT	ESTIMATED COSTS		
Building construction and associated development costs (excluding land preparation)	**Total cost Ethiopian Birr (Br)**	**Total cost US Dollar (US$) Rate = 43.99**	**% of total cost**
Residential accommodation:			
Affordable rooms with shared communal facilities	515,629,674	11,718,856	12.17%
Affordable home-based enterprise (HBE) and rental units	525,999,364	11,954,531	12.41%
Middle income apartments	1,035,362,085	23,530,956	24.43%
High income apartments	1,075,200,230	24,436,369	25%
Sub-total: Residential accommodation	**3,152,191,353**	**71,640,712**	**80.00%**
Commercial space:			
Ground floor market retail	89,627,438	2,036,987	2.12%
Market retail and commercial (offices, light industry) mix	239,361,523	5,440,035	6.00%
Sub-total commercial space	**328,988,961**	**7,477,022**	**2.12%**
Basement (Parking and small production units)	174,786,982	3,972,431	4.12%
Total - Buildings	**3,655,967,296**	**83,090,165**	**86.27%**
Common use and open spaces:			
Social space	54,271,430	1,233,442	1.28%
Playground	7,229,021	164,296	0.17%
Green and recreational areas	6,342,946	144,158	0.15%
Sub-total: Common use and open spaces	**67,843,397**	**1,541,896**	**1.60%**
Total building construction and associated development costs	**3,723,810,693**	**84,632,061**	**87.88%**

Source: CAHF own estimates (2021)

Table 8: Estimated total construction cost of the Zone 2 five-storey walk-up block (cost of land assembly and preparation, development charges for external bulk infrastructure excluded)

COST ELEMENT	ESTIMATED COSTS						
Building construction and associated development costs (excluding land preparation)	**Total cost Ethiopian Birr (Br)**	**Cost per m2 of GCA (Br)**	**Cost per m2 of GLA (Br)**	**Total cost US Dollar (US$) Rate = 43.99**	**Cost per m2 of GCA (US$)**	**Cost per m2 of GLA (US$)**	**% of total cost**
Direct construction cost – labour and materials	381,069,693	18,567	22,775	8,662,644	422	518	38.83
Preliminaries (9.5%)	36,201,621	1,764	2,164	822,951	40	49	3.69
Sub-total	417,271,314	20,331	24,939	9,485,595	462	567	42.52
Contractor mark-up (profit and overhead):							
Overhead (5%)	20,863,566	1,017	1,247	474,280	23	28	2.13
Profit (10%)	41,727,131	2,033	2,494	948,559	46	57	4.25
Total contractor mark-up	**62,590,697**	**3,050**	**3,741**	**1,422,839**	**69**	**85**	**6.38**
Estimated current building cost	**479,862,011**	**23,381**	**28,680**	**10,908,434**	**531**	**652**	**48.90**
Construction escalation:							
Pre-contract escalations (12 months at 2021/22 blended rate of 11.5% p.a.)	55,184,131	2,689	3,298	1,254,470	61	75	5.62
Escalation during construction (15 months at 8.4% p.a. x 0.4 cash-flow factor)	22,471,938	1,095	1,343	510,842	25	31	2.29
Total construction escalation	**77,656,069**	**3,784**	**4,641**	**1,765,312**	**86**	**106**	**7.91**
Sub-total	**557,518,080**	**27,165**	**33,321**	**12,673,746**	**617**	**758**	**56.81**
Construction contingency allowance (5%)	27,875,904	1,358	1,666	633,687	31	38	2.84
Estimated final building cost	**585,393,984**	**28,523**	**34,987**	**13,307,433**	**648**	**795**	**59.65**
Professional fees and construction project management:							
Professional fees (12%)	57,583,441	2,806	3,442	1,309,012	64	78	5.87
Project management (3%)	14,395,860	701	860	327,253	16	20	1.47
Total fees and project management	**71,979,301**	**3,507**	**4,302**	**1,636,265**	**80**	**98**	**7.34**
Total: Construction cost and professional fees	**657,373,285**	**32,030**	**39,289**	**14,943,698**	**728**	**894**	**66.99**
Other development costs (marketing and selling/letting)	14,018,601	683	838	318,677	16	19	1.43
Sub-total	**671,391,886**	**32,713**	**40,127**	**15,262,375**	**744**	**913**	**68.42**
Capitalised interim development finance cost	43,551,121	2,122	2,603	990,023	48	59	4.44
Sub-total	**714,943,007**	**34,835**	**42,730**	**16,252,398**	**792**	**972**	**72.86**
Overall development contingency (2.5%)	17,873,575	871	1,068	406,310	20	24	1.82
Developer fee (5%)	35,747,150	1,742	2,137	812,620	40	49	3.64
Total building construction and associated development costs excluding land preparation (excluding taxes)	**768,563,733**	**37,448**	**45,935**	**17,471,328**	**851.4**	**1,045**	**78.32**

Source: CAHF own estimates (2021)

5.3 Estimated total development cost of five-storey affordable housing city block (120m x 120m) in Zone 2

Table 8 does not reflect the cost of land assembly and preparation and development charges for bulk, link and connector engineering services and electrical infrastructure.

Table 9 summarises the total cost of land assembly and preparation (clearing and rehabilitation, temporary relocation and compensation for loss of rights and disruption in small enterprise), and development charges for bulk, link and connector engineering services and electrical infrastructure. Cost sharing arrangements among the City, other agencies (e.g. water and electricity), and the developer need to be determined before these costs can be allocated correctly.

If the cost of land preparation and bulk infrastructure charges are included, the total development cost is as shown in Table 10.

Note the following with regard to the costs above of land preparation and bulk infrastructure charges for the Zone 1 and Zone 2 buildings respectively:

1. Land preparation costs – equates to Br4,484 (US Dollar 100) per square metre of GCA for the Zone 1 high-rise tower, and Br8,793 (US$200) per square metre of GCA for the Zone 2 five-storey walk-up. This apparent discrepancy is because although the land itself (compensation for expropriation of leases, etc.) may be less expensive in Zone 2 than in Zone 1, the land area that needs to be cleared and prepared for the city block footprint is the same for both zones (clearing and rehabilitation, temporary relocation, etc.). The total cost of the latter, albeit similar in Zone 2 to Zone 1, now is expressed over a much smaller total construction area, hence the much higher rate per square metre for the smaller building in Zone 2;
2. Bulk services charges – the change in intensity of land use (density, order of land use) for Zone 2 (residential) is less pronounced than that for Zone 1 (mixed-use-residential and commercial), hence the much lower rate per square metre of GCA.

The total building construction and associated development costs above are allocated to the different uses in Table 11. The costs for each use in Table 6 include escalated final construction costs, contractor mark-ups, contingencies, professional and project management fees, marketing, capitalised development finance costs and overall development fee, but exclude land preparation costs and bulk infrastructure charges.

Table 9: Rough order of magnitude estimate of land and bulk infrastructure costs

COST ELEMENT	Total cost Ethiopian Birr (Br)	Total cost US Dollar (Rate = 43.99)
Land preparation	180,458,481	4,102,261
Bulk development charges	32,335,467	735,064
Sub-total	**212,793,948**	**4,837,325**

Source: CAHF own estimates (2021)

Table 10: Estimated total construction cost of the Zone 2 five-storey walk-up block (cost of land assembly and preparation, development charges for external bulk infrastructure included)

COST ELEMENT	Total cost Ethiopian Birr (Br)	Cost per m² of GCA (Br)	Cost per m² of GLA (Br)	Total cost US Dollar (US$) Rate = 43.99	Cost per m² of GCA (US$)	Cost per m² of GLA (US$)	% of total cost
Total building construction and associated development costs	**768,563,733**	**37,447**	**45,934**	**17,471,328**	**851**	**1,044**	**78.32%**
Land costs							
Land preparation	180,458,481	8,793	10,785	4,102,261	200	245	18.39%
Bulk infrastructure charges	32,335,467	1,575	1,933	735,064	36	44	3.29%
Total land costs	**212,793,948**	**10,368**	**12,718**	**4,837,325**	**236**	**289**	**21.68%**
TOTAL DEVELOPMENT COST INCLUDING LAND	**981,657,681**	**47,815**	**58,652**	**22,308,653**	**1,087**	**1,333**	**100.00%**

Source: CAHF own estimates (2021)

Table 11: Total building construction and associated development costs allocated to different uses (land preparation and bulk infrastructure charges excluded)

Residential unit type	Units	TDC	Per unit Br	Per m² of GCA Br	Per m² of GLA Br	TDC per unit US$	Per m² of GCA US$	Per m² of GLA US$
Affordable home-based enterprise (HBE) and rental units	52	259,516,102	4,990,694	35,746	45,370	113,451	813	1,031
Low-income studios and family apartments	180	379,830,063	2,110,167	42,774	48,080	47,969	972	1,093
Affordable rooms with shared communal facilities	16	129,217,568	8,076,098	38,458	54,066	183,589	874	1,229
Totals	**248**	**768,563,733**	**15,176,959**		**147,516**	**345,009**	**2,659**	**3,353**

5.4 Cost mitigation strategies, including shifting to alternative building technologies (ABTs) and greening initiatives

The purpose of this cost estimating study was to compile detailed total development cost estimates of the pilot project in a way that considers typological implications for construction costs and also shifts to local supply chains and ecologically advantageous building materials as a further big priority for the Task Force's work. Cost mitigation strategies need to be explored further through engagement with all stakeholders and role-players in the proposed pilot project or projects under headings such as:

- Application of all known economic design principles and exploring new ones, including passive thermal design approaches;
- Reviewing existing procurement and contracting strategies;
- Designing systems and procedures for effective construction project and cost management;
- Value engineering exercises involving design teams, property management staff, government officials; and others involved in the development and property management processes;
- Evaluating alternative delivery mechanisms – formal large-scale contractors vs. small-scale SMME contractors and co-operatives;
- Structuring economical financing mechanisms;
- Exploring and evaluating the use of local materials, alternative building technologies (ABTs) and greening measures, including but not limited to:
  - Cross-laminated timber (CLT) and mass timber
  - Typha/cane cob
  - Steel/concrete composite structures
  - Lightweight steel framed structures
  - Concretes with plant fibre additives
  - Concretes from recycled plastics, desert sands, previously uncommon clays
  - Industrialised building/pre-fabrication on and off site
  - Walling alternatives such as light-weight framed systems, rammed earth, stabilised compressed earth blocks, Agrostone panels, Agrowaste composite boards, Strawtech, etc.
  - Fenestration with low heat gain/loss properties
  - Alternative roofing and ceiling systems
  - Bamboo technology
  - Waterless toilets and other water saving devices
  - Low-cost filtration systems for storm water recovery
  - Grey water recycling
  - Energy saving lighting and other devices and systems
  - Alternative domestic hot water provision
  - The SUDU house
  - Supplementary on-site power generation through, for example, photovoltaic (PV) solar, small-scale wind turbines, co-heat and power, biomass-fired boilers, waste to biogas digesters.

At the very least, however, it is worth considering the space efficiency of the contemplated units, both in terms of an oversupply of non-GLA space (circulation, common space, etc.) and the actual size of the units themselves.

6. Conclusions and recommendations

6.1 The argument for internal within project cross-subsidisation in public-private partnership affordable housing provision

Developers normally would pay market prices for privately held high-value well-located inner-city land, affecting project viability and requiring substantial upfront capital investment and resulting opportunity cost or loss of interest on equity. Depending on local regulatory prescripts, the same principle would apply where private developers wish to acquire public land for commercial for-profit development. In addition, developers usually would be required to bid for the land in an open competitive bidding process, meaning their chances of securing the land for profitable development are reduced. This conventional process also results in the permanent "loss" of strategic public land to the market, inevitably leading to displacement of people of low income.

If instead, the City called for competitive bids on the proposed basis that a developer be given free or subsidised access to high-value public land and other incentives in exchange for internally subsidising more affordable housing for low-income people as part of the project, it would be possible to create a win-win situation for all parties – the City, the developer, and low-income people already residing in the area.

For the developer it creates the opportunity they might not otherwise have had, of executing a highly profitable development and creating a valuable income-producing asset. For the City, a way of achieving its objective of facilitating the development of affordable, well-located housing while avoiding displacement of low-income residents and disrupting their established livelihoods and social networks, through a form of public private partnership (PPP) requiring no or little public capital investment and making use of private sector expertise and capacity. Additional benefits include substantial economic injection into the area, opportunities for local economic development and job creation, improvement of the public environment, establishment of a substantial rates base for the city, and others.

The arrangement could be structured to allow for in-situ vertical cross-subsidy on the same site or horizontal cross-subsidy from one site to another, but within the structure of the same project. The cross-subsidy required from the developer would be equal to at least the value of the land and other incentives to which they are given access, but it could be argued that because of being given the opportunity to create construction and development work (and profits) and asset value for themselves, they should be willing as part of their competitive bids to also plough back a proportion of profits from sales and/or rentals of the high-value parts of the development into the affordable housing component.

Although more work would need to be done regarding how best to structure these competitive bid-based cross-subsidy models and procurement processes in a way that satisfies regulatory requirements around release of public land while at the same time extracting maximum advantage for the City and its objectives, it is believed that this proposed type of public-private partnership could in principle be a highly effective mechanism for achieving the stated City objectives. In this report both horizontal and in-situ vertical cross-subsidy options are explored.

The high-rise city block horizontal above vertical design concept correctly incorporated the vertically stacked affordable HBE units on ground and lower levels, the implied principle being that subsidy for these HBE units should be allocated from profits made on other parts of the same building.

6.2 Assessment of potential for horizontal cross-subsidy of the affordable housing in the five-storey walk-up block in Zone 2

This section assesses the potential for cross-subsidising the Zone 2 units with the returns likely to be generated from the sale of the Zone 1 units. It also considers other cost mitigation opportunities to improve the likelihood of the proposed approach.

The overall approach of the horizontal cross-subsidy concept as proposed in the 2019 study is that a private developer be given free or subsidised access to land, and increased bulk and development rights in a high-value area of the inner city with potential for maximum commercial market value extraction, (Zone 1), in exchange for subsidising the development of affordable housing in well-located areas of the inner city (Zone 2).

In practical terms, what this would mean is that the Zone 1 units would need to be sold at a market price with sufficient profit to both support the developer's requirements for a margin, and realise a surplus to cover the TDC of the Zone 2 units. A key consideration, therefore, is that the Zone 1 units are competitively priced.

For this model all cross-subsidy from the high-rise city block on the Zone 1 site is allocated to reducing the costs of the affordable units on the Zone 2 site. This report has not modelled the viability of the part-ownership part-rental affordable HBE units as a standalone component of the whole development, and this would have to be done as part of an overall feasibility study including all sales and rentals.

To assess the potential for cross-subsidising the costs of affordable housing provided in the five-storey walk-up block in Zone 2 from a share of profits generated through the sale of market units in the high-rise block in Zone 1, the total attributable and recoverable development cost (TDC) of each type of residential unit in both blocks needs to be estimated.

In the normal course of property development, TDC and price would differ, the difference being the developer's profit mark-up or margin on TDC. In the case of this pilot project, the objective is that the developer will be given free access to public land in Zones 1 and 2, on the condition that he or she may extract full commercial benefit (profit and/or return on investment) from the development in Zone 1, but in exchange will then develop affordable housing in Zone 2 for a low-income target market. The understanding is that the developer would be expected to invest a proportion of profits from the sale of open market units in Zone 1 in the Zone 2 property as a way of so-called horizontal cross-subsidy to bring down the TDC and therefore the price at which the units in Zone 2 will be sold to buyers in the target market.

In this case, for Zone 2, price and TDC are seen to be the same thing. In other words, the developer will not add any profit to the TDC of the development in Zone 2 and even will be required to set selling prices at less than TDC to make the units affordable to low-income households. The losses so incurred on the sale of units in Zone 2 will therefore, be funded from profits made by the developer in the Zone 1 development.

To arrive at a total attributable and recoverable development cost per unit of the residential units in the high-rise block in Zone 1, the cost of parking and other common spaces (social, green and recreation, playground) should be allocated to the different unit types in proportion to their relative values. The result is shown in Table 12, where land preparation costs and bulk infrastructure charges are excluded in the totals on the first assumption that these will be borne by the City and other agencies and will therefore not have to be recovered from project revenues by the developer.

A scan of many websites of real-estate companies selling apartments in Addis Ababa show offerings of units built in 2020-2021 across different parts of the inner city and similar areas in the following ranges generally[15]:

- Low-priced units ranging from Br1.02m to Br2.4m (approximately US$23,000 – US$54,545), from 24m² studios to 80m² one and two-bedroom units
- Moderately-priced units ranging from Br7m to Br11m (approximately US$160,000 – US$250,000), from 120m² to 160m² two- and three-bedroom units
- High-priced luxury apartments in areas such as Bole Central and similar ranging from Br14.5m to Br18m (approximately US$330,000 – US$409,000), from 214m² to 240m² three- and four-bedroom units
- A small number of exceptionally luxurious apartments ranging from Br22m to Br25m (approximately US$500,000 – US$568,000) for units of 260m² to 320m² with multiple bedrooms and bathrooms

In comparison, as shown in Table 12, the estimated total escalated development costs, exclusive of land and infrastructure, and inclusive of contractor mark-up and developer fee, but excluding selling mark-up, amount to US$160,508 for the middle-income units as proposed in the concept, and US$509,479 for high-income units. This already points to the fact that the estimated unit costs in the concept are approaching the top selling prices of similar existing offerings in the marketplace, even though those marketplace units do likely include land and infrastructure.

The escalated total development cost of affordable housing units in the five-storey walk-up block in Zone 2 are shown in Table 13.

[15] As drawn from various real estate websites, listed under References at the end of this report. Note: These have not been verified as actual confirmed and registered sales and should be seen merely as indicative price levels.

Table 12: Total attributable and recoverable development cost (TDC) of residential units in the high-rise block in Zone 1 with costs of parking and other common spaces (social, recreational, playground) allocated proportionate to value (excluding land preparation)

Residential unit type	Units	TDC – no allocated parking or other Br	Parking cost allocated Br	Other cost allocated Br	TDC with parking and other allocated costs Br	Per unit Br	TDC with parking and other allocated costs US$	Per unit costs US$
Affordable home-based enterprise (HBE) and rental units***	104	525,999,364	0	10,251,001	536,250,365	5,156,254*	12,190,279	117,214* (or 58,607 / household)
Middle income apartments	160	1,035,362,085	74,180,779	20,177,777	1,129,720,642	7,060,754	25,681,306	160,508
High income apartments	64	1,314,561,753	94,184,649	25,618,993	1,434,365,396	22,411,959	32,606,624	509,479
Collective units (affordable rooms with shared communal facilities)***	63	515,629,674	0	10,048,910	525,678,584	8,344,105** (or 2,781,368 / household)	11,949,956	189,682** (or 63,227 / household)
Totals	**391**	**3,391,552,876**	**168,365,428**	**66,096,681**	**3,626,014,987**		**82,428,165**	

* The concept envisages the occupation of each of the 104 HBE unit by at least two households (one owner and one rental tenant), resulting in a total of 432 households accommodated in the 328 living units.

**The concept further envisages occupation of each collective unit by at least three households, resulting in the 63 units accommodating 189 households for a total of 621 households in the 391 combined living units.

*** Parts of both developments comprise spaces that are assumed to be for rental, including for instance, retail and mixed commercial facilities (Zone 1); basement parking and small production units (Zone 1); and collective residential units – studios and rooms with shared ablutions and other communal facilities (Zones 1 and 2). Some or all of the above facilities may well be sold off as well, but in the calculations for this exercise it is assumed that these facilities will remain as rental and that the net operating revenues from them will produce acceptable returns on those parts of the overall investment (TDC) attributable to them. Only profits from sales in Zone 1 have therefore been considered in the cross-subsidy calculations and not revenues from the rental portions. Once a proper detailed feasibility on the overall project (Zones 1 and 2, selling and rental parts) is conducted, comprehensive financial modeling will need to be done in order to assess whether all financial objectives are likely to be met. Note also that the duplex Home-Based Enterprise (HBE) units are proposed to be occupied in part by the owner who could rent out one floor of it. In this exercise such rentals are considered the business of the individual owners post-purchase and have not been brought into any calculations.

Source: CAHF own estimates (2021)

Table 13: Total attributable and recoverable development cost (TDC) of residential units in the high-rise block in Zone 1 with costs of parking and other common spaces (social, recreational, playground) allocated proportionate to value (excluding land preparation)rastructure costs

Residential unit type	Units	TDC Br	Per unit Br	Per m² of GLA Br	TDC per unit US$	TDC per unit US$	Per m² of GCA US$	Per m² of GLA US$
Affordable home-based enterprise (HBE) and rental units***	52	259,516,102	4,990,694	35,746	45,370	113,451* (or US$56,726/ household)	813	1,031
Low-income studios and family apartments	180	379,830,063	2,110,167	42,774	48,080	47,969	972	1,093
Affordable rooms with shared communal facilities***	16	129,217,568	8,076,098	38,458	54,066	183,589** (or US$61,196/ household)	874	1,229
Totals	**248**	**768,563,733**	15	116,978	147,516		2,659	3,353

*The concept envisages the occupation of each of the 104 HBE unit by at least two households (one owner and one rental tenant), resulting in a total of 310 households accommodated in the 232 living units.

**The concept further envisages occupation of each collective unit by at least three households, resulting in the 16 units accommodating 48 households for a total of 358 households in the 248 combined living units.

*** Parts of both developments comprise spaces that are assumed to be for rental, including for instance, retail and mixed commercial facilities (Zone 1); basement parking and small production units (Zone 1); and collective residential units – studios and rooms with shared ablutions and other communal facilities (Zones 1 and 2). Some or all of the above facilities may well be sold off, but in the calculations for this exercise it is assumed that these facilities will remain as rental and that the net operating revenues from them will produce acceptable returns on those parts of the overall investment (TDC) attributable to them. Only profits from sales in Zone 1 have therefore been considered in the cross-subsidy calculations and not revenues from the rental portions. Once a proper detailed feasibility on the overall project (Zones 1 and 2, selling and rental parts) is conducted, comprehensive financial modeling will need to be done in order to assess whether all financial objectives are likely to be met. Note also that the duplex Home-Based Enterprise (HBE) units are proposed to be occupied in part by the owner who could rent out one floor of it. In this exercise such rentals are considered the business of the individual owners post-purchase and have not been brought into any calculations.

Source: CAHF own estimates (2021)

Table 14: Total TDC per unit of units in Zone 2 block and subsidy per unit required from Zone 1 block

Zone 2 block:	TDC per unit at different levels of subsidy from Zone 1 block				Subsidy required from Zone 1 if the unit were offered to the beneficiary for US$10,000: US$
Unit types	**At 0% subsidy**	**At 25% subsidy**	**At 50% subsidy**	**At 75% subsidy**	
TDC: Affordable home-based enterprise (HBE) and rental units	113,451	85,088	56,726	28,363	
Subsidy/unit required from Zone 1 block	**0**	**28,363**	**56,726**	**85,088**	**103,451**
TDC: Low-income studios and family apartments	47,969	35,977	23,985	11,992	
Subsidy/unit required from Zone 1 block	**0**	**11,992**	**23,985**	**35,977**	**37,969**

Source: CAHF own estimates (2021)

The total unsubsidised average per unit development costs of US$113,451 and US$47,969 for the HBE and low-income studios and family apartments respectively compare unfavourably with marketplace offerings to the potential target market of US$23,000 to US$54,454 per unit. It is worth noting also that even housing in this range (US$23,000 to US$54,454 per unit) is unlikely to be affordable to more than one percent of the urban population.[16]

The TDC per unit for HBE and low-income apartments respectively at different levels of subsidy are shown in Table 14. The far column on the right speculates the subsidy required if the unit were offered to the beneficiary for a flat price of $10,000.

Table 14 suggests that subsidy levels of between at least 50% and 75% would be required to make the housing units in the Zone 2 block affordable enough to compete effectively in the marketplace.

Table 15 shows the minimum selling prices required for middle and high-income open market units in the high-rise Zone 1 block to achieve the different levels of subsidy for the affordable housing in the five-storey walk-up Zone 2 block.

It is generally considered unrealistic to expect developers to add only a break-even mark-up to TDC in order to achieve the cross-subsidy levels shown in the following tables.

Table 16 shows the mark-ups on TDC required at different levels of subsidy and different profit-sharing ratios. The illustrative mark-ups are after tax percentages as the tax implications for this type of arrangement are unknown and will differ from case to case. An analysis thereof falls outside the scope of this exercise. To convert the after-tax percentages to pre-tax ones in the table, effective tax rates would have to be added, and this should form part of further work recommended in Section 7.2.

Table 16 suggests that an estimated after-tax profit-sharing ratio of 25% would require quite substantial after-tax (and by implication also pre-tax) mark-up percentages of 80.85% to 121.27% on TDC for the middle-income apartments and 25.47% to 38.21% on TDC for high-income apartments at 50% and 75% levels of subsidy respectively. To achieve a sales price of US$10,000 per unit for the affordable units in the Zone 2 block the percentages would be 135.88% and 42.81% respectively.

An estimated after-tax profit-sharing ratio of 50% would require less substantial and possibly more realistic after-

Table 15: Minimum break-even selling prices of Zone 1 open market residential units required to provide the subsidies to units in Zone 2 block at the different levels of subsidy

Zone 1 block	Minimum selling prices per unit to break even at different levels of subsidy from Zone 1 block: US$				Sale price in Zone 1 if the Zone 2 unit were offered to the beneficiary for US$10,000: US$
Equal subsidy from all market units:	0% subsidy	25% subsidy	50% subsidy	75% subsidy	
Middle-income apartments	160,508	176,729	192,950	209,171	215,034
High-income apartments	509 479	525 700	541 921	558 142	564,005
Break-even % mark-up on TDC: Middle-income apartments	0.00%	10.11%	20.21%	30.32%	33.97%
Break-even % mark-up on TDC: High-income apartments	0.00%	3.18%	6.37%	9.55%	10.70%
All subsidy from high-income market units only:	**0% subsidy**	**25% subsidy**	**50% subsidy**	**75% subsidy**	**Sale price in Zone 1 if the Zone 2 unit were offered to the beneficiary for US$10,000: US$**
High-income apartments	509,479	566,252	623,025	679,798	700,321
Break-even % mark-up on TDC: High-income apartments	0.00%	11.14%	22.29%	33.43%	37.46%

Source: CAHF own estimates (2021)

[16] See CAHF's housing affordability calculator: https://housingfinanceafrica.org/documents/calculating-mortgage-and-housing-affordability-in-africa/ In Ethiopia, a $ 23,000 house would cost $ 696/month, and $165,221 over the term, at an interest rate of 12.5% over 18 years, assuming 20% deposit. All else being equal this is affordable to 1% of the urban population.

Table 16: Minimum selling prices of Zone 1 open market residential units required to provide the subsidies to units in Zone 2 block at the different levels of subsidy and after-tax profit-sharing ratios of 25% and 50% respectively

Zone 1 block:	Minimum selling prices per unit to achieve different after-tax mark-up percentages at different profit-sharing ratios and different levels of subsidy from Zone 1 block				Sale price in Zone 1 if the Zone 2 unit were offered to the beneficiary for US$10,000: US$
Equal subsidy from all market units:	**At 0% subsidy**	**At 25% subsidy**	**At 50% subsidy**	**At 75% subsidy**	
Middle-income apartments	160,508	176,729	192,950	209,171	215,034
High-income apartments	509,479	525,700	541,921	558,142	564,005
After-tax % mark-up on TDC at 25% profit share: Middle-income market apartments	**0%**	**40.42%**	**80.85%**	**121.27%**	**135.88%**
After-tax % mark-up on TDC at 25% profit share: High-income market apartments	**0%**	**12.74%**	**25.47%**	**38.21%**	**42.81%**
After-tax % mark-up on TDC at 50% profit share: Middle-income apartments	**0%**	**20.21%**	**40.42%**	**60.64%**	**67.94%**
After-tax % mark-up on TDC at 50% profit share: Middle-income apartments	**0%**	**6.37%**	**12.74%**	**19.10%**	**21.40%**

Source: CAHF own estimates (2021)

Table 17: Total attributable and recoverable development cost (TDC) of affordable HBE residential units in the high-rise block in Zone 1 with costs of parking and other common spaces (social, recreational, playground) allocated proportionate to value (excluding land preparation)

Residential unit type	Units	TDC - no allocated parking or other Br	Parking cost allocated Br	Other cost allocated Br	TDC with parking and other allocated costs Br	Per unit Br	TDC with parking and other allocated costs US$	Per unit costs US$
Affordable home-based enterprise (HBE) and rental units***	104	525,999,364	0	10,251,001	536,250,365	5,156,254*	12,190,279	117,214* (or 58,607 / household)

Source: CAHF own estimates (2021)

tax (and by implication also pre-tax) mark-up percentages of 40.42% to 60.64% on TDC for the middle-income apartments and 12.74% to 19.1% on TDC for high-income apartments at 50% and 75% levels of subsidy respectively. To achieve sales price of US$10,000 per unit for the affordable units in the Zone 2 block the percentages would be 67.94% and 21.4% respectively.

The above figures should be seen as illustrative and must be tested for accuracy and achievability through detailed feasibility studies based on updated market rates.

6.3 Assessment of potential for vertical in-situ cross-subsidy of the affordable housing in the high-rise city block in Zone 1

As already noted above, the main parameters applying to this model are:

1. The high-rise city block horizontal above vertical design concept incorporates the vertically stacked affordable HBE units on ground and lower levels, the implied principle being that subsidy for these HBE units should be allocated from profits made on other parts of the same building;
2. The physical configuration and total development cost for the high-rise building remains the same as in 6.2 above;
3. For this model all cross-subsidy from the horizontal middle- and high-income residential units in the high-rise solid block on the Zone 1 site is allocated to reducing the costs of the vertically stacked affordable HBE units on the ground and lower levels on the same site.

This report has not modelled the viability of the part-ownership part-rental affordable HBE units as a stand-alone component of the whole development, and this would have to be done as part of an overall feasibility study including all sales and rentals.

Table 17 shows the total development cost of the 104 HBE units at Br525,999,364 (US$12,190,279), or Br5,156,254 (US$117,214) per unit, or Br2,578,127 (US$58,607) per household on the basis that at least two households would occupy each unit, one as owner-occupant and one as renter.

The total unsubsidised average per-unit development costs of US$113,451 and US$47,969 for the HBE and low-income studios and family apartments respectively compare unfavourably with marketplace offerings to the potential target market of US$23,000 to US$54,454 per unit as indicated in section 6.2.

In order to render the HBE units truly affordable to the target market, a subsidy level of around 50% of total development costs would be required, translating to subsidies of between US$24,969 and US$58,997 per unit respectively. If these subsidies are added to the selling price per unit of the middle and high-income apartments, the required portions of mark-ups on total development costs that developers would need to forfeit and plough back into the affordable units would range between approximately 14% for the middle-income apartments to 12% for the high-income apartments.

At the 50% subsidy level, middle-income apartments would have to sell at around US$192,950 and high-income units at around US$541,921 per unit respectively. For middle-income units the required selling price falls within the indicative market price range of US$160,000 to US$250,000, but high-income units would have to be marketed in the ultra-luxury bracket of US$500,000 to US$568,000 for the cross-subsidy model to work.

The final configuration of unit mix, specifications, sizes and projected target market segments is to be tested through detailed feasibility studies, but the above indicative values are considered to be not unreasonable given the value to prospective developers of access to land, incentives and the opportunity to create construction and development work and profits and valuable long-term asset portfolios.

6.4 Overall concluding remarks

The main preliminary conclusion is that with further work aimed at value engineering and cost mitigation (see Sections 5.4 and 6.5), and exploration of additional funding streams, reasonable opportunities to achieve realistic workable cross-subsidy arrangements framed by proper public private partnership structures, and confirmed through detailed updated feasibility studies could well be created in the future.

It is noted furthermore that the feasibility of the envisaged subsidy system has been looked at only with reference to indicative existing marketplace offerings and without an in-depth analysis of real affordability in the low-income sector; this falls outside the scope of this exercise. That said, simple back-of-the envelope assessments and a use of CAHF's Housing Affordability Calculator [17] demonstrate that affordability even for the so-called 'affordable' units, is somewhat challenged. At the very least, the concept should consider whether there will be sufficient buyers for the Zone 1 units at the projected price levels that will create realistic opportunities for both the in-situ horizontal above vertical cross-subsidy model for Zone 1 and the horizontal cross-subsidy model for the Zone 2 units – and whether this can be replicated beyond the 639 units envisioned for the pilot.

[17] https://housingfinanceafrica.org/documents/calculating-mortgage-and-housing-affordability-in-africa/

In addition to testing the potential viability of the cross-subsidy options, any feasibility studies should explore potential additional funding streams and sources, and test the applicability and replicability of these by way of the envisaged pilot project. The report has for instance looked only at internal project-based subsidisation through the public-private partnership arrangement and has not considered or incorporated in the calculations any existing or possible future government infrastructure and housing subsidies at any level – local, regional or national. Bringing such subsidies into the equation should contribute positively to the viability of the models proposed.

6.5 Recommendations for further work to be done

The main task ahead is to conduct a detailed feasibility study for the envisaged pilot project based on actual concept designs for development on actual designated and reserved sites for both the high-rise mixed-use mixed-income block and the low-rise walk-up affordable housing block meant to receive cross-subsidisation from the former. The actual conditions for conducting such a feasibility study are not known currently and adequate detailed information about many aspects is unavailable.

In order to conduct a realistic feasibility study, the following actions need to be undertaken:

1. Identification of real sites for both the Zone 1 high-rise and Zone 2 affordable housing blocks;
2. Refinement of the Zone 1 high-rise design following any planned workshops and other relevant interactions;
3. Development of a concept design for the affordable housing in Zone 2;
4. More detailed legal (zoning, cadastral, land rights), physical (topographical, geotechnical, environmental, access and linkages), socio-economic and market analysis of all the sites;
5. Social, affordability and other surveys of existing communities occupying the sites to establish the effective demand for re-housing within the pilot project and potential future replications thereof;
6. Establishing and agreeing relocation and temporary accommodation arrangements, costs, etc.;
7. Evaluating the profit potential on the Zone 1 component of the pilot, and following from that formulation of realistic mechanisms and arrangements for horizontal cross-subsidisation. Refer for instance to precedents elsewhere such as the initiatives underway in Cape Town, South Africa, where the City (then with the involvement of Task Force member councillor Brett Herron), assisted by the Rooftops Canada Equal Spaces (ES) Programme and the National Association of Social Housing Organisations (NASHO), has made available a number of well-located publicly owned properties for redevelopment under the cross-subsidisation model;
8. Income and other tax implications and mitigation strategies to maximise the amount of profit available for profit-sharing for cross-subsidy purposes;
9. Profit-sharing mechanisms and arrangements with the private developer;
10. In addition to land and bulk services subsidies, discounts and waivers, possible further contributions from the City (and other public agencies?) in cash and kind to supplement funding of the affordable housing in both the Zone 1 and Zone 2 developments should the profit share be insufficient to cover all the costs of the Zone 2 affordable housing project;
11. A proper risk analysis and risk mitigation strategy and plan dealing with all potential risks, including but not limited to legal, financial, funding, market, economic, social, political, regulatory, physical risks and possibly unexpected ones such as downward raiding of affordable housing;
12. More detailed investigation into potential cost mitigation strategies through the use of alternative technologies and greening, including the feasibility of procuring such in the Addis Ababa market environment as set out in Section 5.4.

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Addis Ababa Urban Age Task Force Reports

Theme 1 | Urban Housing and Retrofitting

Policy Brief 1 | *The Addis Ababa City Block: a high-density, mixed-use and inclusive housing solution for the urban core*

Technical Report 1.1 | *The Addis Ababa City Block: inclusion and livelihood though the horizontal-above-vertical concept*, by Elias Yitbarek Alemayehu

Technical Report 1.2 | *Finding Housing Affordability: cost estimates and affordability paths for the Addis Ababa City Block,* by Jacus Pienaar

Technical Report 1.3 | *Sustainable Building Materials: exploring green construction options for new housing in Addis Ababa*, by Hannah Langmaack, Peter Scheibstock and Thomas Kraubitz (Buro Happold)

Theme 2 | Transport and Mobility Services

Policy Brief 2 | *Beyond Car Growth: digital van service as alternative to private car use in Addis Ababa*

Technical Report 2.1 | *Digital Van Service Demand: gauging interest in mobility alternatives among current and aspiring car owners in Addis Ababa*, by Philipp Rode, Bethany Mickleburgh, Jennifer Chan and Rebecca Flynn

Technical Report 2.2 | *Digital Van Service for Addis Ababa: understanding the transport landscape and the potential for digital bus aggregation in Ethiopia's capital* by Chris Kost and Gashaw Aberra (Institute for Transportation and Development Policy (ITDP))

Theme 3 | Green and Blue Infrastructure

Policy Brief 3 | *Working with Nature: next generation green and blue infrastructure for Addis Ababa*

Technical Report 3.1 | *Green and Blue Infrastructure in Addis Ababa: a review of challenges and response strategies*, by Hailu Worku

Technical Report 3.2 | *The Social Functions of Green and Blue Infrastructure: international case studies and insights for Addis Ababa*, by Santiago del Hierro, David Jácome and Tigist Kassahun Temesgen

Theme 4 | Urban Governance and Planning

Policy Brief 4 | *Urban Governance and Strategic Planning: how Addis Ababa could benefit from human-centred, inclusive design, participatory pilot projects and improved data management*

Technical Report 4.1 | *Participatory City Making: polycentric governance and human-centred, inclusive urban design,* by Meinolf Spiekermann and Marc Steinlin

Technical Report 4.2 | *Urban Knowledge Management: solutions for the Addis Ababa City Administration*, by Bersisa Berri

Technical Report 4.3 | *International Building Exhibitions (IBA): an approach to innovative city making in Addis Ababa* by Efrem A. Tesfaunegn, Anka Derichs and Michael von der Mühlen

Technical Report 4.4 | *Addis Ababa Spatial Compendium: mapping and urban analytics for Ethiopia's capital*, by Alexandra Gomes and Philipp Rode (LSE Cities)

Addis Ababa Urban Age Task Force

Founding Partners

The Task Force is a partnership between the Addis Ababa City Administration Plan & Development Commission (AAPDCo), LSE Cities at the London School of Economics and Political Science, the Alfred Herrhausen Gesellschaft, and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH.

Members

Dereje Fekadu (Co-Chair), Commissioner, Plan and Development Commission (2018-2020), Special Chief of Staff, Mayor's Office, Addis Ababa City Administration, Addis Ababa, Ethiopia

Philipp Rode (Co-Chair), Executive Director, LSE Cities and Urban Age, LSE, London, UK

Elias Yitbarek Alemayehu, Architect and Associate Professor, EiABC, Addis Ababa University, Addis Ababa, Ethiopia

Elleni Ashebir, Cities and Urban Mobility Manager, Ross Centre for Sustainable Cities, WRI Africa, Addis Ababa, Ethiopia

Ricky Burdett, Director, LSE Cities and Urban Age, LSE, London, UK

Anka Derichs, Senior Strategic Urban Development Advisor, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, Eschborn, Germany

Timnit Eshetu, CEO, Construction Enterprise, Addis Ababa City Administration (2019-2021), Addis Ababa, Ethiopia

Brett Herron, Former Member of the Mayoral Committee: Transport and Urban Development, Cape Town, South Africa

Olusola Ikuforiji, Environmental Specialist, African Development Bank, Abidjan, Côte d'Ivoire

Clarisse Linke, Country Director, Brazil, Institute for Transportation and Development Policy (ITDP), Rio de Janeiro, Brazil

Elisabeth Mansfeld, Cities Project Area, Alfred Herrhausen Gesellschaft, Berlin, Germany

Michael von der Muehlen, Former State Secretary and Participant of International Building Exhibition (IBA) "Emscher Park", Dortmund, Germany

Jennifer Semakula Musisi, First City Leader in Residence, Bloomberg Harvard City Leadership Initiative, Harvard Kennedy School, Cambridge, USA, Executive Director, Kampala Capital City Authority (2011-2018), Kampala, Uganda

Henk Ovink, Special Envoy for International Water Affairs, Kingdom of the Netherlands, and Sherpa to the High Level Panel on Water, United Nations, The Hague, Netherlands

Kecia Rust, Executive Director and Founder, Centre for Affordable Housing Finance in Africa, Johannesburg, South Africa

Semere Jelalu Shafi, Deputy General Director, Addis Ababa City Traffic Management Agency, Addis Ababa City Government, Addis Ababa, Ethiopia

Jagan Shah, Senior Infrastructure Adviser, Department for International Development (DFID), British High Commission, New Delhi, India

Marc Steinlin, Managing Director, Complex(c)ity Ltd., Helsinki, Finland and Basel, Switzerland

Zeleke Teferi, Department Head, Catchment Management and Water Quality Control, Addis Ababa Water & Sewerage Authority, Addis Ababa, Ethiopia

Cecilia Vaca Jones, Executive Director, Bernard van Leer Foundation, The Hague, Netherlands and Quito, Ecuador

Hailu Worku, Chair of Environmental Planning and Landscape Design and Deputy Scientific Director of EiABC, Addis Ababa University, Addis Ababa, Ethiopia

Governing Board

Dereje Fekadu (Co-Chair), Commissioner, Plan and Development Commission (2018-2020), Special Chief of Staff, Mayor's Office, Addis Ababa City Administration, Addis Ababa, Ethiopia

Anna Herrhausen (Co-Chair), Executive Director, Alfred Herrhausen Gesellschaft, Berlin, Germany

Ricky Burdett, Director, LSE Cities and Urban Age, LSE, London, UK

Anka Derichs, Senior Strategic Urban Development Advisor, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, Eschborn, Germany

Timnit Eshetu, CEO, Construction Enterprise, Addis Ababa City Administration, Addis Ababa, Ethiopia

Philipp Rode, Executive Director, LSE Cities and Urban Age, LSE, London, UK

Partner Co-ordinators

Emily Cruz, Outreach Manager, LSE Cities, London, UK

Anka Derichs, Senior Strategic Urban Development Advisor, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, Eschborn, Germany

Elisabeth Mansfeld, Cities Project Area, Alfred Herrhausen Gesellschaft, Berlin, Germany

Moges Tadesse, Chief Resilience Officer, Addis Ababa City Resilience Project Office, Addis Ababa, Ethiopia

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The Urban Age Programme, jointly organised with and supported by the Alfred Herrhausen Gesellschaft, is an international investigation of the spatial and social dynamics of cities. The programme consists of conferences, research initiatives, task forces and publications. Since 2005, 17 conferences have been held in rapidly urbanising regions in Africa and Asia, as well as in mature urban regions in the Americas and Europe.

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Addis Ababa Plan Commission

Addis Ababa City Plan and Development Commission is committed and fully dedicated to preparing research-based city-wide short, medium and long term strategic development plans (both socio-economic and spatial) in order to transform the city to one among the middle-income cities in the world; create a liveable city for the citizen; and make Addis Ababa the best destination for investment in Africa. The commission is accountable to promote urban economy and jobs; deliver urban renewal and housing for citizens; improve urban environment and quality of life; and support policy decisions that will register accelerated, sustainable and equitable economic growth and a climate resilient green economy.

The Alfred Herrhausen Gesellschaft

The Alfred Herrhausen Gesellschaft promotes a free and open society and its cohesion. Democracy, the social market economy and sustainability are the foundations of such a society. Our work is based on the values of Alfred Herrhausen: on freedom and responsibility, on competition and compassion. Alfred Herrhausen thought and acted with the aim of crossing and overcoming boundaries. In his memory, the Alfred Herrhausen Gesellschaft creates platforms for discussions to enrich relevant discourses during selected events, and in publications and other media.

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Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)

As a service provider in the field of international cooperation for sustainable development and international education work, GIZ is dedicated to shaping a future worth living around the world. GIZ has more than 50 years of experience in a wide variety of areas, including economic development and employment promotion, energy and the environment, and peace and security. We work with businesses, civil society actors and research institutions, fostering successful interaction between development policy and other policy fields and areas of activity. Our main commissioning party is the German Federal Ministry for Economic Cooperation and Development (BMZ).

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LSE Cities

LSE Cities is an international centre at the London School of Economics and Political Science that carries out research, conferences, graduate and executive education and outreach activities in London and abroad. It studies how people and cities interact in a rapidly urbanising world, focusing on how the physical form and design of cities impacts on society, culture and the environment. Extending LSE's century-old commitment to the understanding of urban society, LSE Cities investigates how complex urban systems are responding to the pressures of growth, change and globalisation with new infrastructures of design and governance that both complement and threaten social and environmental equity.

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