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Drought



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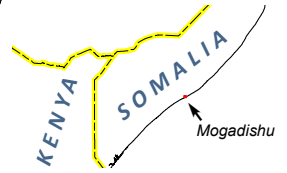
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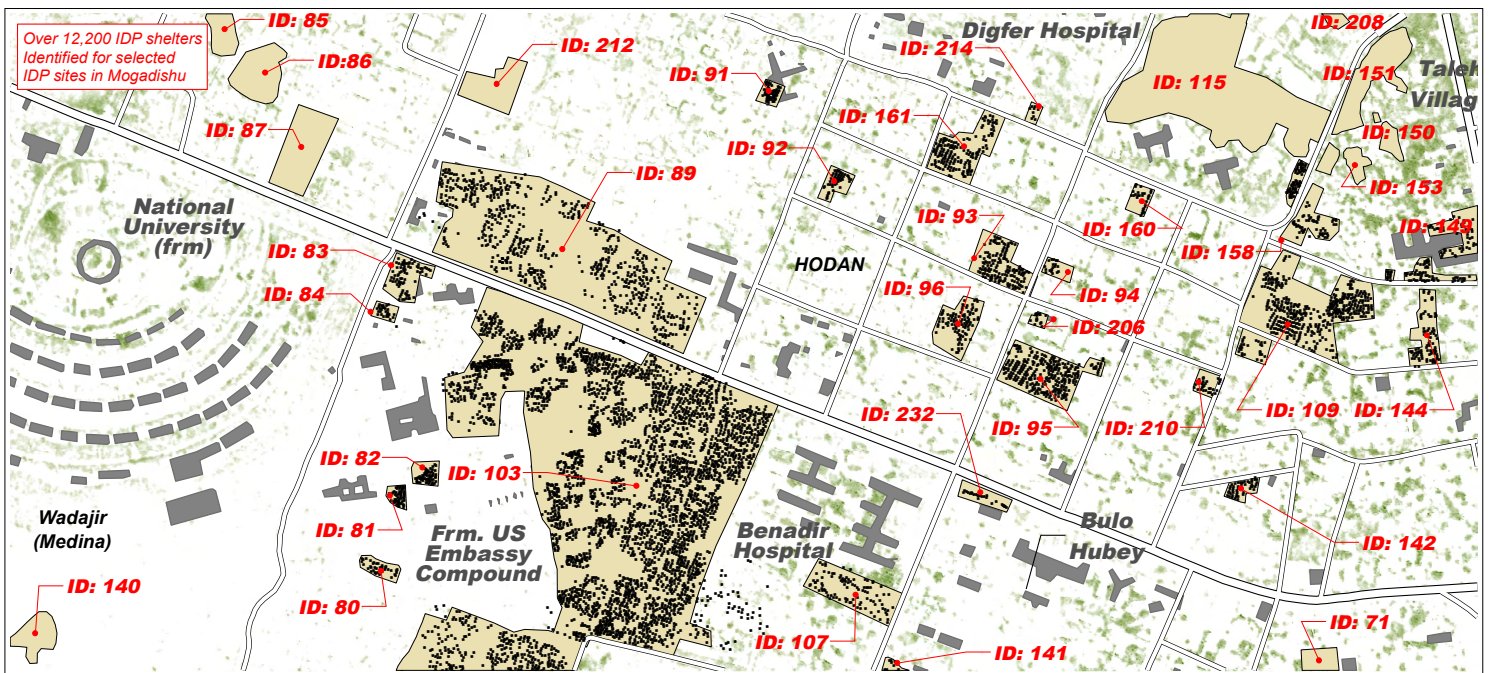
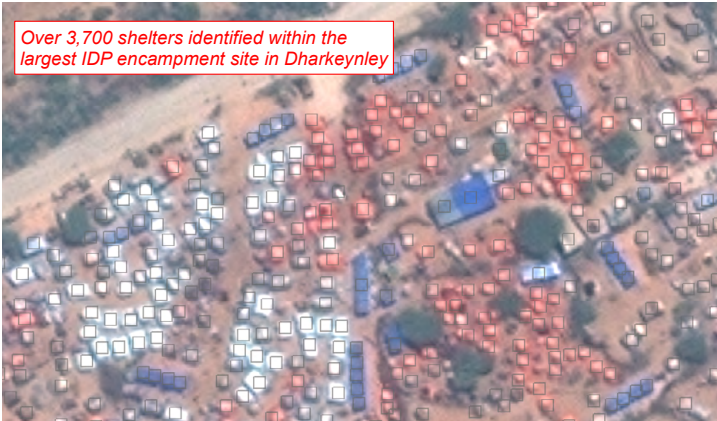
## EMERGENCY ASSESSMENT OF SOMALI IDP SHELTER CONCENTRATIONS IN MOGADISHU, SOMALIA (28 JULY 2011)



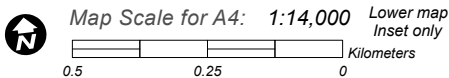
Report Summary: This report presents the results from a satellite-based analysis of Somali IDP shelter concentrations within the capital city of Mogadishu based on imagery recorded the morning of 28 July 2011. A total of 188 spatially distinct IDP shelter concentrations were identified within the city, encompassing a total area of approximately 176ha. The two largest IDP concentrations

in the city were located in Wadajir (Medina) and Dharkeynley. A detailed shelter count assessment for 46 IDP concentration sites resulted in an identification of 12,150 individual shelter structures that ranged from very small informal shelters constructed from sticks to large emergency tents provided by international aid agencies. A projection of the total number of IDP shelters located

within the urban extent of Mogadishu indicated a minimum estimate of approximately 23,000 shelter structures, concentrated almost entirely in the western districts of the city. This is a preliminary assessment and has not yet been validated in the field. Please send feedback to UNITAR/UNOSAT at the contact information below.



- Spatially distinct IDP shelter sites
- Individual IDP shelter structures
- Large Urban Building / Complex
- Tree Cover (15 April 2011)
- Primary Road
- Local / Urban Road



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UNITAR / UNOSAT  
 unosat@unitar.org  
 Palais des Nations,  
 Geneva, Switzerland  
 T: +41 22 767 4020 (UNOSAT Operations)  
 24/7 hotline: +41 76 487 4998  
 www.unitar.org/unosat

Satellite Data: QB02 / WV02  
 Imagery Dates: 30Mar/15 Apr, 28 July 2011  
 Resolution: 0.6 m/0.5 m  
 Copyright: DigitalGlobe 2011  
 Source: European Space Imaging

IDP Camp Data: UNITAR / UNOSAT  
 Landcover: UNITAR / UNOSAT  
 Road Data: Google Map Maker  
 Admin Boundaries: OCHA  
 Other Data: USGS, NGA

Analysis: UNITAR / UNOSAT  
 Coordinate System: UTM Zone 38N  
 Datum: WGS 1984  
 Analysis conducted with ArcGIS v10

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## Emergency Assessment of Somali IDP Shelter Concentrations in Mogadishu, Somalia

**ANALYSIS BACKGROUND:** This assessment of IDP shelter concentrations within the urban extent of Mogadishu was done in support of UN emergency humanitarian planning in the city following the dramatic influx of Somalis displaced by famine and armed conflict. Satellite imagery acquired on 30 March, 15 April and 28 July 2011 was used for this shelter assessment. This assessment provides a detailed count of spatially-distinct concentrations of IDP shelters within the city, an estimate of the total number of IDP shelter structures in the city by camp site as well as by district, and assesses the date periods the camp sites were likely formed. Identified IDP sites were further assessed for construction/shelter type, specifically looking for the presence of emergency tent shelters, a common barometer of active support from international aid organizations and NGOs.

This is a preliminary assessment and has not yet been validated in the field. Please send feedback to UNITAR/UNOSAT at the contact information below. Geographic datasets produced for this assessment and additional UNOSAT Horn of Africa products are available at <http://www.unitar.org/unosat/horn-africa-data>. This report is part of an on-going satellite monitoring program of UNITAR/UNOSAT of the Horn of Africa crisis in support of international humanitarian assistance and created to respond to the needs of UN agencies and their partners.

### ANALYSIS RESULTS:

#### 1. IDP SHELTER CONCENTRATIONS

A total of 188 spatially distinct IDP shelter concentrations were identified within the city, encompassing a total area of approximately 176ha. The two largest IDP concentrations in the city are located in the districts of Wadajir (Medina) and Dharkelynley; these two districts also contain the largest proportion of shelter sites (67) covering over 88ha in area. Although the vast majority of shelter locations are located in the western districts of the city under the control of AMISOM and TFG forces, there are a few potential IDP shelter locations within the eastern half of Mogadishu which was until 7 August 2011 under al Shabaab control, most notably a large complex of mixed buildings and informal structures in Karan district. The table presented below contains a detailed breakdown of the IDP shelter analysis by district, and contains both actual shelter structure counts and projected shelter estimate numbers (see Section 2). The overview map on the following page (page 3) presents the location and distribution of the 188 IDP shelter sites identified across the city.

<b>Mogadishu Districts:</b>	<b># of distinct IDP shelter sites</b>	<b>Mean area of IDP shelter sites (m2)</b>	<b>Total area of IDP Shelter sites (m2)</b>	<b>a. Selected IDP Site Shelter Count</b>	<b>b. Projected IDP Site Shelter Estimate</b>	<b>Total Shelter Count estimate (a. Actual counts + b. Projected)</b>
Wadajir (Medina)	41	11,749	481,710	4,910	2,330	7,240
Dharkeynley	26	15,373	399,710	3,920	1,220	5,140
Hodan	39	8,256	321,980	2,910	1,620	4,530
Karan	3	77,723	233,170		1,500	1,500
Waberi	14	7,155	100,180		1,390	1,390
Huriwa	3	15,336	46,010		610	610
Hawl-Wadag	14	2,949	41,290	160	690	850
Deyninle	1	31,523	31,520		400	400
Bondhere	9	2,201	19,810		370	370
Hamar-Weye	13	1,516	19,710	50	300	350
Hamar Jab-Jab	8	1,741	13,930	200	150	350
Wardhigley	7	1,306	9,140		160	160
Shingani	6	1,123	6,740		130	130
Shibis	1	5,356	5,360		100	100
Yaqshid	3	738	2,210		40	40
<b>Totals</b>	<b>188</b>		<b>1,732,470</b>	<b>12,150</b>	<b>11,010</b>	<b>23,160</b>

# OVERVIEW OF IDP SHELTER CONCENTRATIONS IN MOGADISHU, SOMALIA (AS OF 28 JULY 2011)

**Drought**



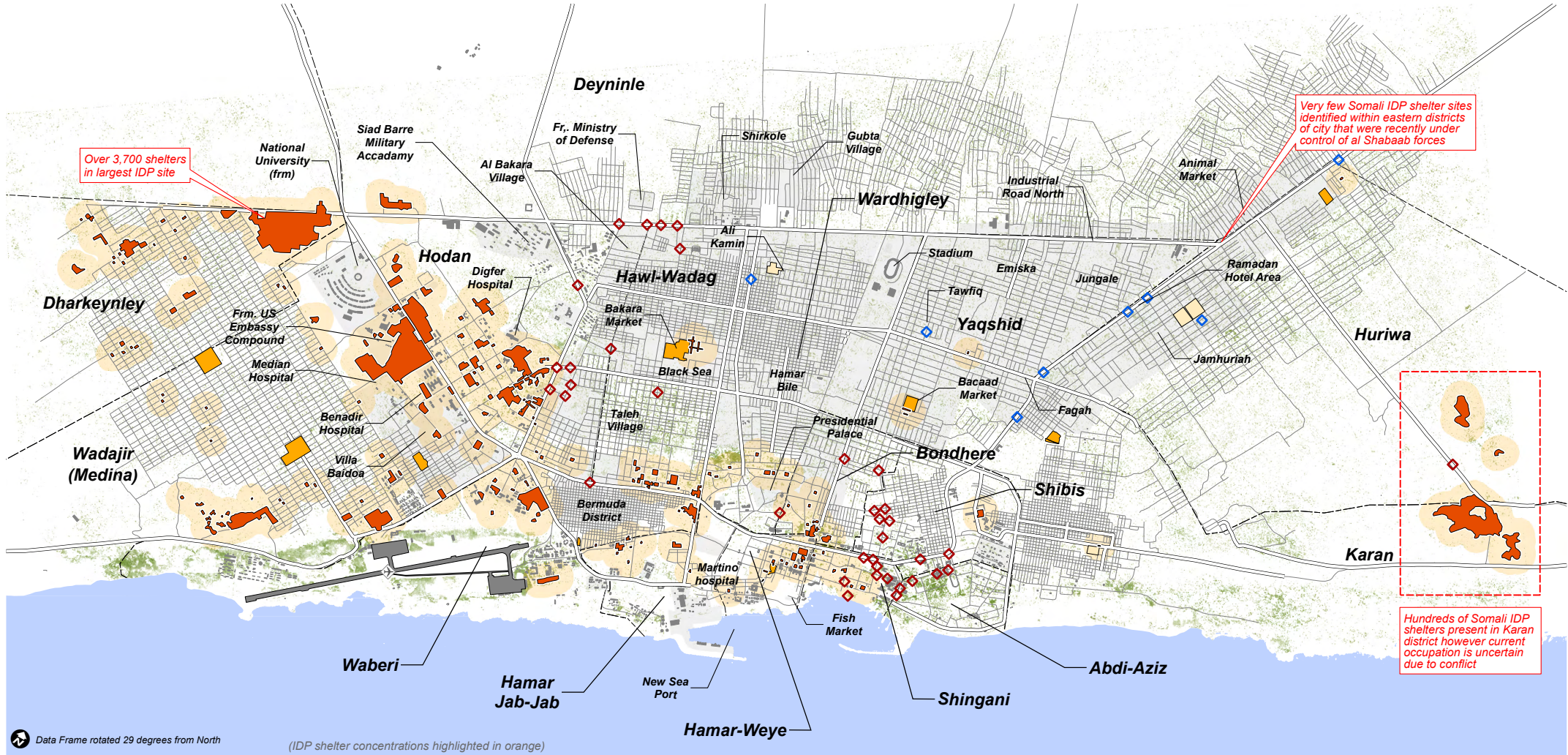
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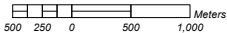
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Data Frame rotated 29 degrees from North

(IDP shelter concentrations highlighted in orange)

Map Scale for A4: 1:64,000



UNITAR / UNOSAT  
unosat@unitar.org  
Palais des Nations,  
Geneva, Switzerland  
T: +41 22 767 4020 (Operations)  
24/7 hotline: +41 76 487 4998  
www.unitar.org/unosat

- Large concentration of IDP shelters
- Market Area which likely contains small informal IDP shelters
- Market Area unlikely to have IDP shelters in vicinity

Satellite Data: QB02 / WV02  
Imagery Dates: 15 April, 28 July 2011  
Resolution: 0.6 m/0.5 m  
Copyright: DigitalGlobe 2011  
Source: European Space Imaging

- Roadblock / Checkpoint
- Road flooding
- Mogadishu Int. Airport
- Primary Road
- Local / Urban Road

IDP Camp Data: UNITAR / UNOSAT  
Landcover: UNITAR / UNOSAT  
Road Data: Google Map Maker  
Admin Boundaries: OCHA  
Other Data: USGS, NGA

- Large Urban Building / Complex
- Tree Cover (15 April 2011)

Analysis: UNITAR / UNOSAT  
Coordinate System: UTM Zone 38N  
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## 2. ESTIMATING A GLOBAL IDP SHELTER COUNT FOR MOGADISHU

A detailed shelter count assessment for 46 selected IDP concentrations across the city sites was conducted as a rapid basis for projecting a global shelter estimate for the 188 sites identified. Approximately 12,200 individual IDP shelter structures were identified visually, which ranged from very small, informal shelters constructed from local materials to large emergency tents provided by international aid agencies.

A projection of the total number of IDP shelters located within Mogadishu on 28 July 2011<sup>1</sup> resulted in a minimum estimate of approximately 23,000 individual shelters in the 188 sites, concentrated almost entirely in the western districts of the city. This is a preliminary shelter projection, and is likely to represent a reliable minimum estimate; actual IDP shelter numbers within Mogadishu are likely to be larger.<sup>2</sup>

The relative magnitude and distribution of the shelter count and estimated values per IDP shelter site is shown in Figure 1 below. Of note is the tendency for very small IDP shelter sites with less than 50 structures (usually constructed almost exclusively from informal building materials) to be located within multiple shelter clusters, adjacent to significantly larger IDP camp sites. The estimated number of IDP shelters aggregated by urban district is shown in Figure 2 below.

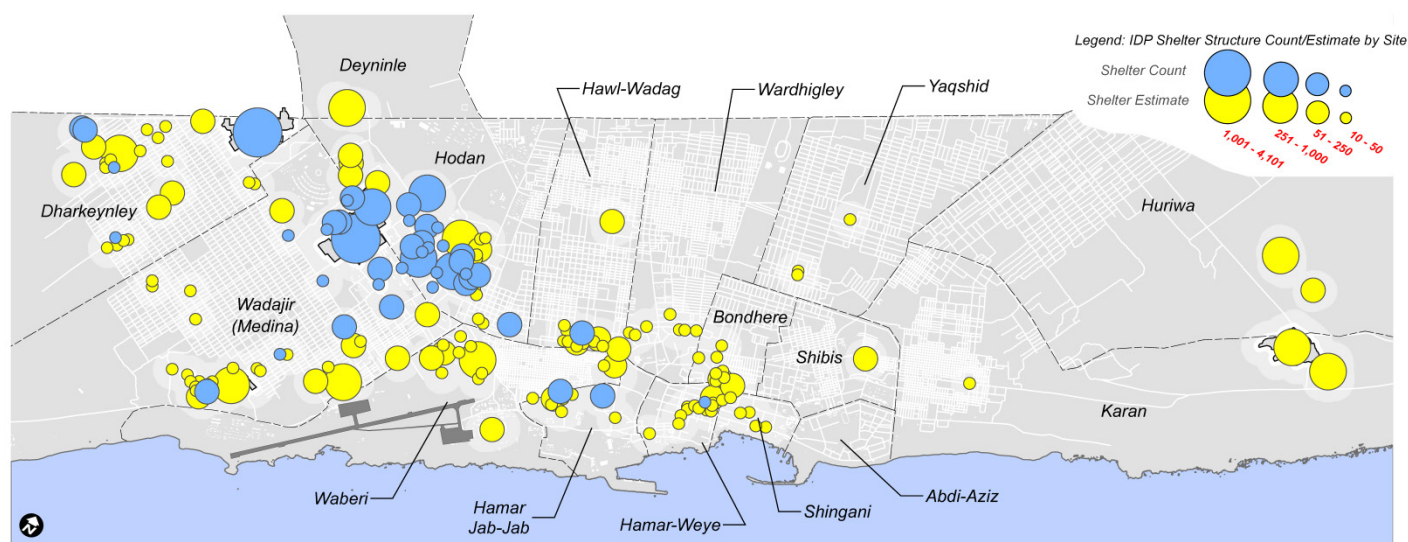


Figure 1 - Map of the number of IDP shelter structures (both counted and estimated) by distinct shelter site

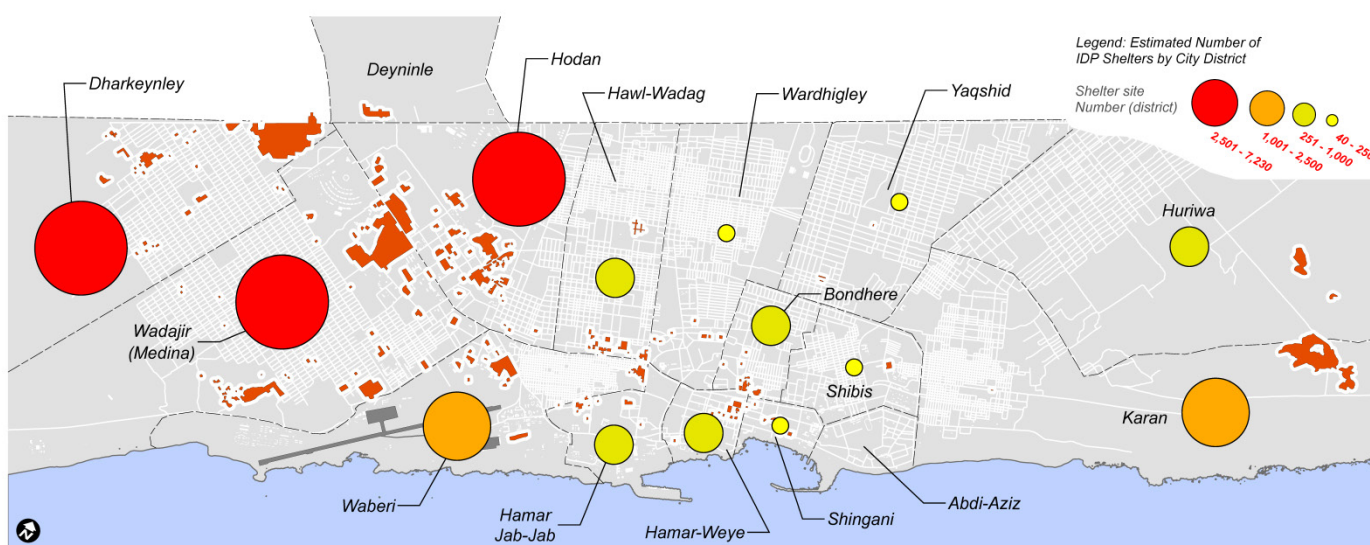


Figure 2 - Map of the estimated number of IDP shelter structures by city district

<sup>1</sup>Individual shelter structure estimates were obtained for the 188 sites based on a linear function of the average tent density of the 46 control sites.

<sup>2</sup>It is probable that hundreds of IDP shelters are located under trees and roof-overhangs along buildings thus preventing identification in satellite imagery.

### 3. SHELTER CONCENTRATION TIME SERIES ANALYSIS

In order to better understand the recent spatial chronology of IDP camp site formation in the city, the 188 identified shelter sites were individually assessed through a short time series of satellite imagery from 2006 and 2011. Of the 188 sites in the city, 65 (or 35% of the total) were formed within the last four months (between 15 April and 28 July 2011); a further 13 sites (7%) were formed between 30 March and 15 April 2011; the majority of identified IDP sites (99 sites representing 52% of the total) were formed before 30 March 2011; the remaining 11 sites (6%) were formed before March 2006.

As shown in Figure 3 below, there are several interesting spatial clusters of IDP sites by data of formation. The oldest continuously occupied IDP sites are located mostly in Hodan district, situated between the former Digfer hospital and Tribunka Square (north of the International airport). A majority of the newer IDP sites formed before 30 March 2011 are located west of this historic cluster, distributed widely across the districts of Wadajir (Medina), Dharkeynley and Hodan.

Of special interest is the apparent eastward shift of IDP site formation between 15 April and 28 July 2011, falling within three main cluster areas: the first immediately to the east of the former Digfer hospital; the second surrounding the Bermuda neighborhood; and the third immediately east of the Presidential Palace. A majority of these IDP sites formed after 15 April were located in direct proximity to the front line separating al Shabaab and AMISOM/TFG forces, and thus were likely exposed to significant levels of direct and indirect small arms and artillery fire over the course of the last four months.

It is also important to note that there are direct indications that a significant number of IDP sites have been abandoned/closed and relocated multiple times within the last six months, suggesting a highly dynamic situation likely driven by a combination of the armed conflict and local property/clan disputes.

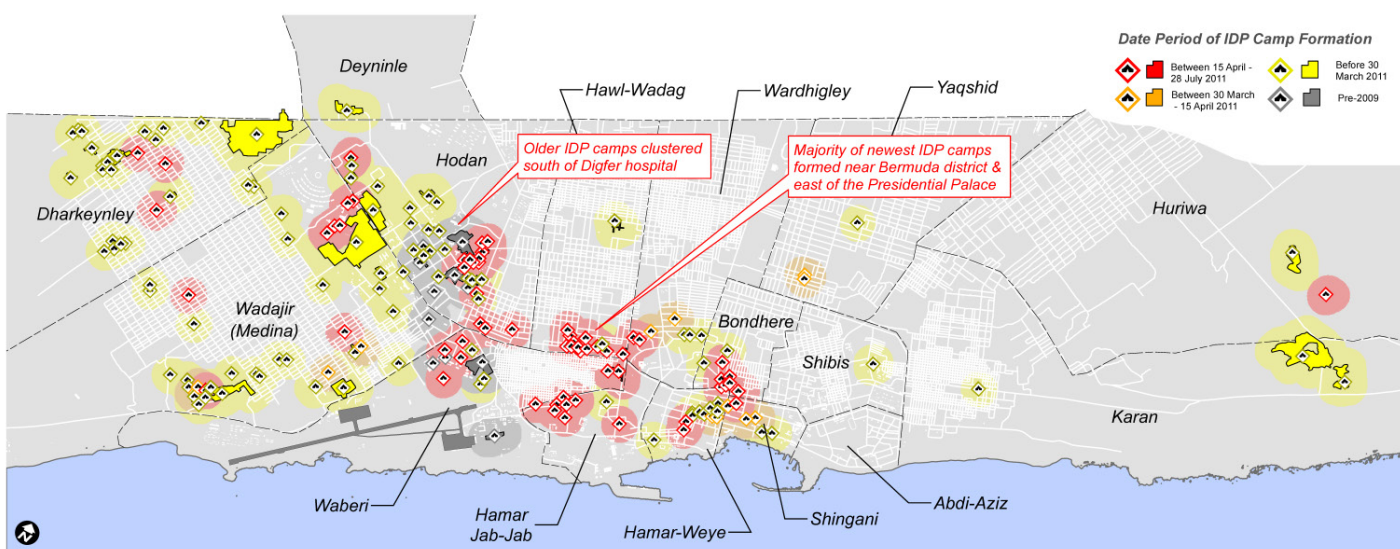


Figure 3 - Map of the date period of IDP camp site formation

### 4. RAPID CHARACTERIZATION OF IDP SITES BY SHELTER TYPE

A significant majority of the 188 IDP sites assessed for this report appear to be composed of shelter structures constructed from informal materials, likely wood/sticks and covered with paper or plastic debris<sup>3</sup>. The notable visual absence from most sites of standard emergency tent shelters suggests that a majority of IDP sites within Mogadishu have yet to receive direct humanitarian support by international aid agencies. As illustrated in Figure 4, a preliminary characterization of the 188 IDP sites across the city indicated that the presence of formal tent shelters appears to be mostly restricted to the largest IDP camps situated along the border between Wadajir (Medina), Dharkeynley and Hodan districts; leaving a majority of smaller and more recently formed IDP sites without adequate, temporary emergency shelter.

<sup>3</sup> Consistent with both multiple field reports and recent media footage from camps in Mogadishu. The preponderance of such building materials indicates an elevated risk of cooking related fires which could easily destroy the camps within matter of minutes.

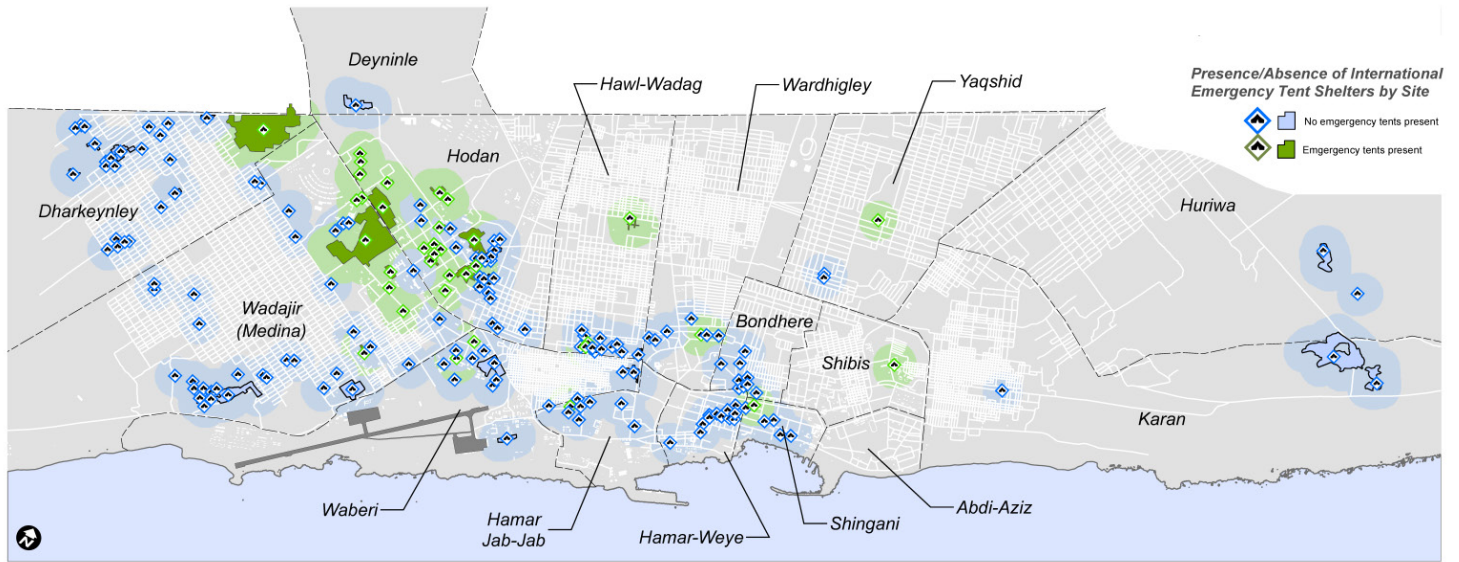


Figure 4 - Map of the presence of standard emergency tent shelters by IDP site

*This is a preliminary assessment and has not yet been validated in the field. Please send feedback to UNITAR/UNOSAT at the contact information below.*

**Contact Information:**

Please send additions / corrections to UNITAR / UNOSAT:

[unosat@unitar.org](mailto:unosat@unitar.org)

Palais des Nations,

Geneva, Switzerland

T: +41 22 767 4020 (UNOSAT Operations)

24/7 hotline: +41 76 487 4998

[www.unitar.org/unosat](http://www.unitar.org/unosat)