strategy&
Part of the PwC network

Beirut explosion impact assessment

September 10th, 2020

Introductory note

! Strategy&'s impact assessment **status update #1** published on August 19th, 2020 **used publicly available information from international and national organizations and interviews with sector experts**.

Since then, the Strategy& team **has developed a detailed impact assessment tool based on:**

Geo-spatial data analysis that incorporated blast radius and damage data from around **60 city districts**

1
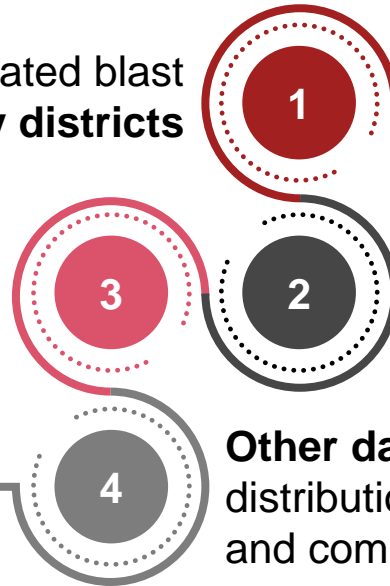
2 **Expert interviews from the various sectors** to validate the assumptions and the cost estimates
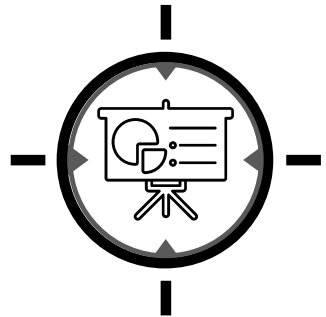
Google maps data **3**

4 **Other data sources and analysis**, such as income level distribution by district, level of damage, revenues per sector and company size

The final report includes the methodology for deriving the assessment for each sector, and the accordingly updated results. The assessment excludes the cost of indirect impacts (e.g., multiplier effect, supply chain disruptions, exports) **and public infrastructure damage** (e.g., port infrastructure, electrical grid, and water supply)
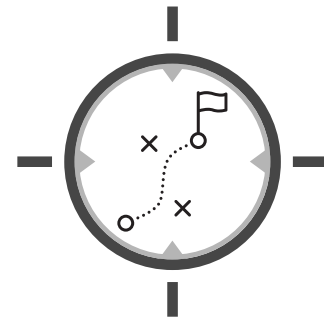
Strategy&'s impact assessment – objectives

Quantify the infrastructure, social and economic effects of the Beirut explosion by district[1] within a 4.1km radius of the explosion

Identify the **funding requirements versus the pledges made by sector** (housing, food, healthcare, education, businesses and culture) **highlighting funding gaps**

Provide a consolidated view of the impact of the explosion on **housing, food, healthcare, education, businesses and culture by district[1]**
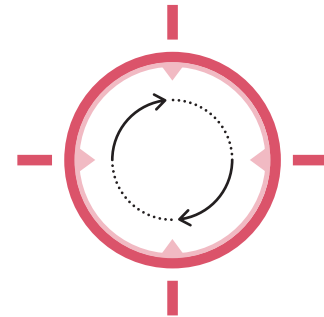
Raise awareness on the sources of donations pledged per sector to reduce duplication in the mobilization of resources

1) Where data is available
Source: Strategy& analysis

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Key findings

Summary of the infrastructure impact
(excludes public infrastructure damages)

Total

US$ ~3.115 Billion

HOUSING

10,610 buildings with minimal damage (**122,890** households)

2,570 buildings with moderate damage (**28,980** households)

240 buildings with severe damage (**2,310** households)

US$ ~1,830[1] **Million** financial requirements

HEALTHCARE

17 damaged hospitals of which 4 severely damaged

16 damaged primary healthcare centers

US$ ~75[2] **Million** financial requirements

EDUCATION

120 damaged schools

20 damaged TVETs[3]

8 damaged universities

US$ ~60 Million financial requirements

BUSINESSES

26,560 businesses with low level of damage

3,870 businesses with medium level of damage

505 businesses with high level of damage

US$ ~865 Million financial requirements

CULTURE

8 historical areas

480 heritage buildings

160 additional buildings with special features

US$ ~285 Million financial requirements

1) Funding required could be less as some affected households can potentially afford to pay for the reconstruction damage independently
2) Upper end of funding; funding has been estimated for the 7 most affected hospitals and 16 primary healthcare centers (PHCs)
3) Technical and Vocational Education and Training
Note: Public infrastructure (e.g., port, grain silos, electricity grids, roads, telecom towers) damages were not covered in the analysis

Summary of the social impact
(within a 4.1 Km radius of the explosion)

Total

US$ ~555 Million

TEMPORARY HOUSING
~31,000 uninhabitable houses and ~13,000 households in need of shelter

Funding requirement of
US$ ~30 Million for up to 18 months

FOOD ASSISTANCE
~172,000 individuals in urgent need and
~135,000 in moderate need of food assistance

Funding requirement of
US$ ~215 Million for 12 months

TREATMENT OF PATIENTS
~6,500 patients treated for physical injuries
~145,000 patients need mental health support

Funding requirement of
US ~80 Million

SCHOOLING
~67,000 students impacted due to schools and TVETs damages

JOBS AND LIVELIHOOD[1]
~130,000[2] jobs directly affected

US$ ~230 Million
of estimated loss of salaries

1) Excludes jobs in the education (nurseries, schools, TVETs and universities) and health (hospitals and medical centers) sectors
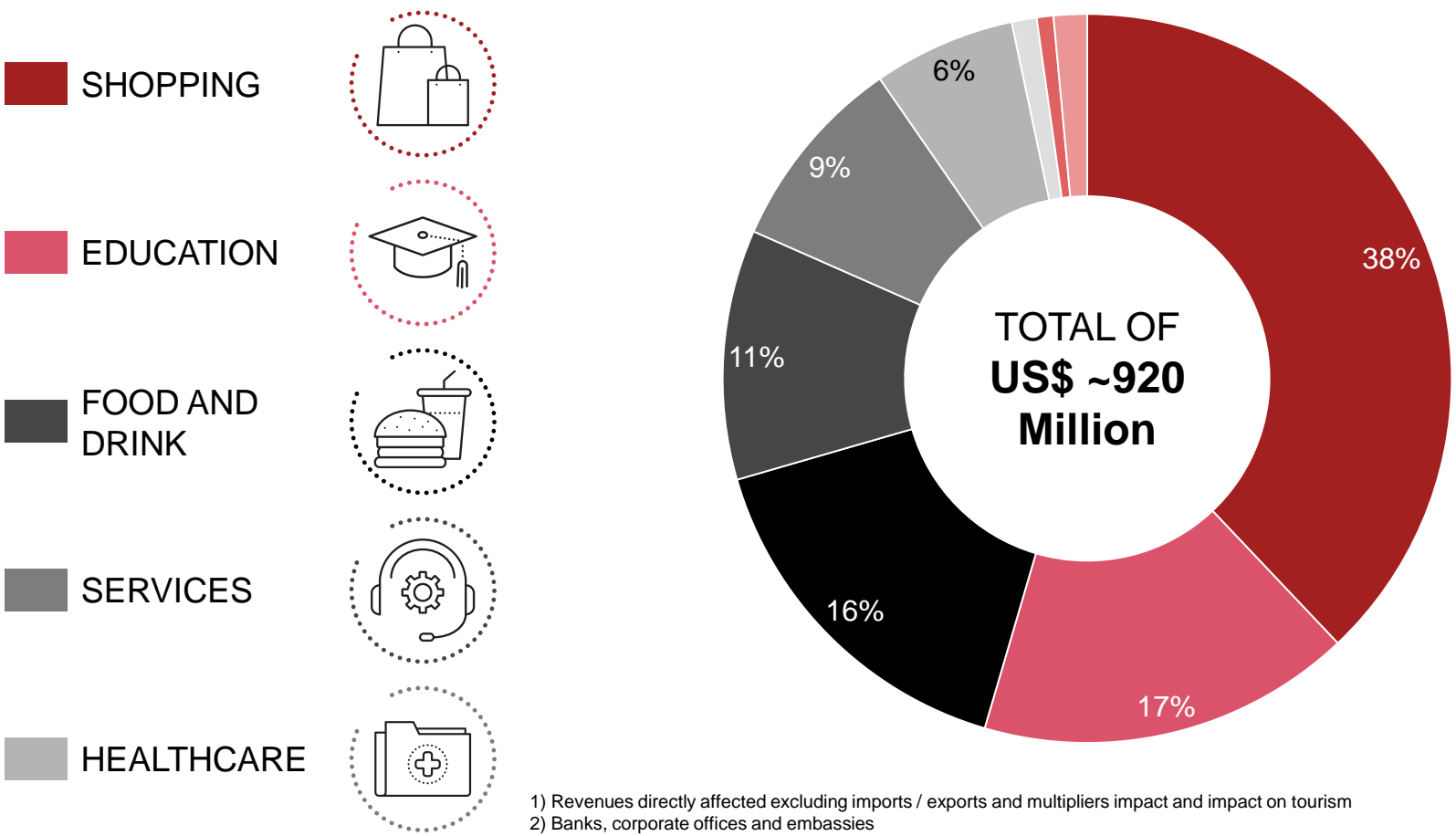2) Jobs affected include temporary and permanent loss. The analysis excludes supply chain and multiplier impact
Source: Strategy& analysis

Summary of the economic impact
(excludes indirect economic impacts)

Total
US$ ~920 Million

REVENUES[1] LOST BY SECTOR – within one from the explosion
(in US$ Million, data from within a 4.1 km radius of the explosion)

! **Micro-businesses with unregistered business locations were not accounted for in the assessment due to limited data**

SHOPPING

EDUCATION

FOOD AND DRINK

SERVICES

HEALTHCARE

38%

17%

16%

11%

9%

6%

TOTAL OF
US$ ~920 Million
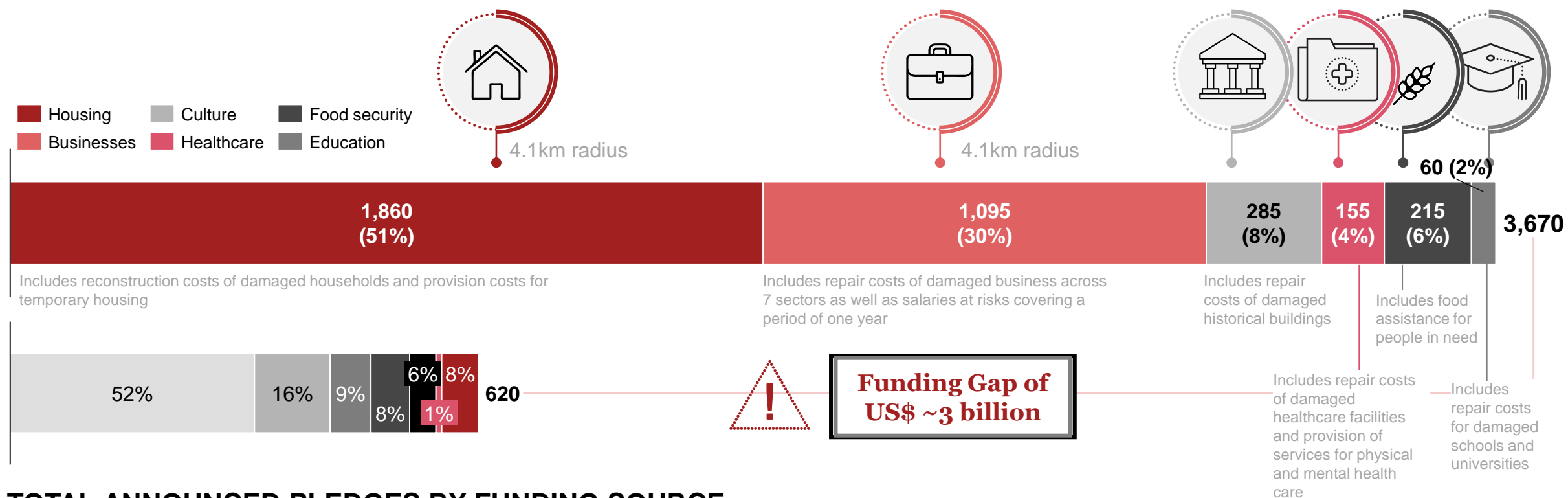
NON-CONSUMER[2]

LEISURE

LODGING

OTHERS[3]

1) Revenues directly affected excluding imports / exports and multipliers impact and impact on tourism
2) Banks, corporate offices and embassies
3) Uncategorized small businesses such as computer shops, beauty salons, art studios
Source: Strategy& analysis

Estimated financial requirements vs. announced pledges

TOTAL FINANCIAL REQUIREMENTS
(US$ Million, Infrastructure and Social Costs)

- Housing
- Businesses
- Culture
- Healthcare
- Food security
- Education

4.1km radius

4.1km radius

60 (2%)

| 1,860 (51%) | 1,095 (30%) | 285 (8%) | 155 (4%) | 215 (6%) | | 3,670 |

Includes reconstruction costs of damaged households and provision costs for temporary housing

Includes repair costs of damaged business across 7 sectors as well as salaries at risks covering a period of one year

Includes repair costs of damaged historical buildings

Includes food assistance for people in need

| 52% | 16% | 9% | 8% | 6% | 1% | 8% | 620 |

⚠ **Funding Gap of US$ ~3 billion**

Includes repair costs of damaged healthcare facilities and provision of services for physical and mental health care

Includes repair costs for damaged schools and universities

TOTAL ANNOUNCED PLEDGES BY FUNDING SOURCE
(US$ Million)

- Others[1]
- Corporates
- Crowdfunding Campaigns - Public
- International Organizations
- Foreign Aid - Countries
- Bilateral Foreign Aid
- Foreign Aid - International Summit
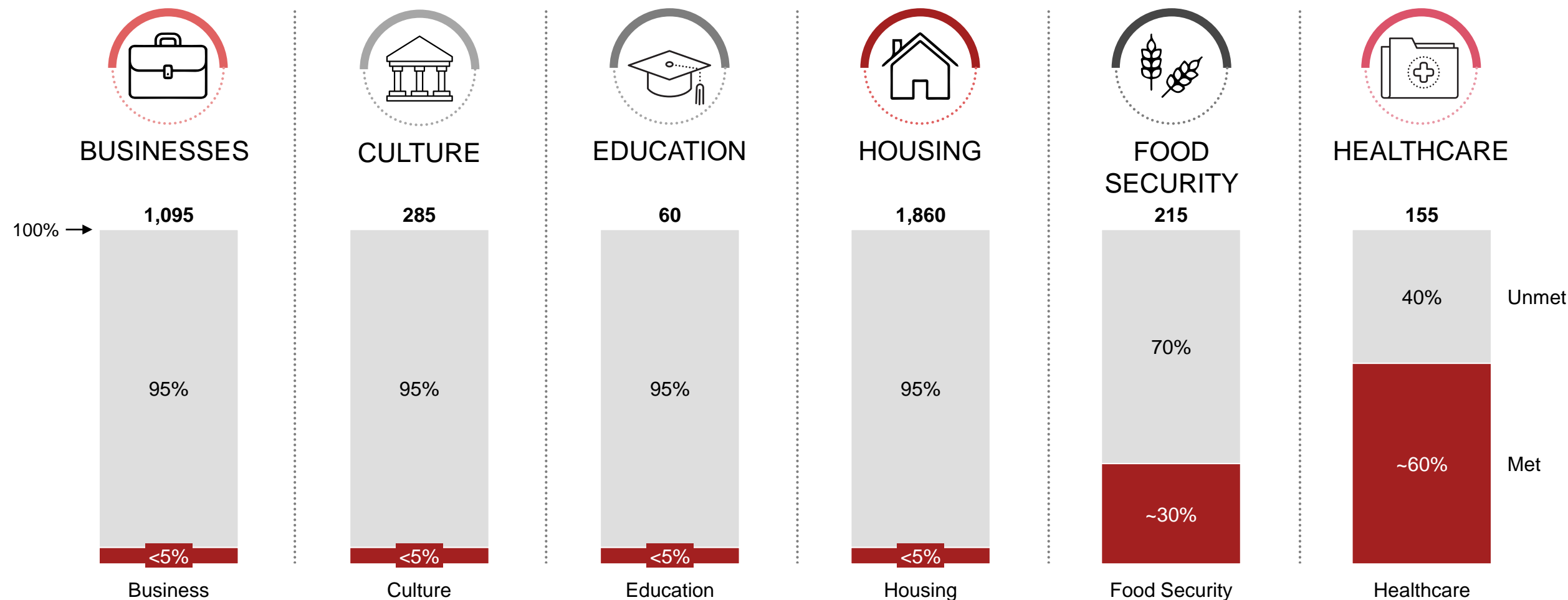
1) Includes estimations for undisclosed funding
Note: Micro-businesses with unregistered locations were not accounted for in the assessment due to limited availability of data
Source: Impact Lebanon, Strategy& analysis

Estimated financial requirements vs. announced pledges by type of need (US$ Million)

Note: Figures below exclude US$ ~325 million in summit commitments which have not been allocated to the sectors yet

	BUSINESSES	CULTURE	EDUCATION	HOUSING	FOOD SECURITY	HEALTHCARE
	1,095	**285**	**60**	**1,860**	**215**	**155**

100% →

	Business	Culture	Education	Housing	Food Security	Healthcare
Unmet	95%	95%	95%	95%	70%	40%
Met	<5%	<5%	<5%	<5%	~30%	~60%

Note: A dynamic tool will be available on our website to track pledges vs. funding required. The tool will allow stakeholders to direct funding to areas that require the most funding
Micro-businesses with unregistered locations were not accounted for in the assessment due to limited data

Source: Impact Lebanon, Strategy& analysis

What's next

- Strategy& estimates the total financial requirements at US$ ~3.7 billion, half of it for housing, and a third for businesses

- Local and international donors have pledged US$ 600 million so far, or only ~15% of financial requirements

- Most of the basic needs for housing, food assistance, education, culture and businesses remain unmet. Funding was received by the healthcare sector but is insufficient

- Although some non-public contributions are not captured in the analysis, unmet needs are still expected to be larger than our estimates, as some high-profile announcements of contribution might not materialize

- Pledges made shortly after a disaster generally account for the vast majority of total pledges, and as such contributions are expected to diminish rapidly

- The **funding gap** is still substantial, and is expected to **persist** for months to come

- Fundraising campaigns should launch a **second round**, with 2 priority areas:

  – **Closing unmet emergency relief** (housing, food assistance, cash assistance)

  – **Longer-term recovery** and **restoration of livelihoods**, with a particular focus on smaller **businesses, to protect the fabric of affected communities**

- NGOs should continue **forming coalitions**, both among themselves and with the **private sector**, to tackle the challenge of scale and avoid duplication of efforts

- Donors can play a key role in **smart-funding** initiatives that are **local, scalable, sustainable,** and **collaborative**

Overview of approach

Beirut explosion impact assessment scope

HOUSING

FOOD SECURITY

HEALTHCARE

EDUCATION

BUSINESSES

CULTURE

INFRASTRUCTURE IMPACT

SOCIAL IMPACT

ECONOMIC IMPACT

Key questions addressed in the final report

HOUSING

- How many **buildings** were damaged in the Beirut explosion, **by damage level and by district?**
- What is the **total cost of rebuilding/ repairing** the damaged buildings?
- As a consequence, **how many households are in need of shelter** support? How much will it cost to fund it?

FOOD SECURITY

- How many **individuals** are in urgent or significant **need for food assistance in each district?**
- What is the **total cost to fund food assistance** for one year?

HEALTHCARE

- How many **hospitals and primary care centres** were damaged in the Beirut explosion?
- What is the **total cost of repairing** the damage?
- What are the **costs** related to **treating physical injuries and providing mental care support**?

EDUCATION

- How many **schools (including TVETs[1]) and universities** were damaged in the Beirut explosion?
- What is the **total cost of repairing** the damage?
- How many **students are at risk of not having access** to their schools?
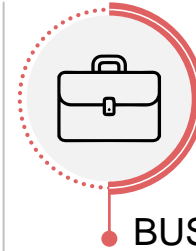
BUSINESSES

- How many **businesses** were damaged in the explosion, **by sector, level of damage, and district?**
- How many **jobs are on hold temporarily** (for a few weeks or months) in each sector?
- How many **jobs were lost**?
- What are the **forgone salaries?**

CULTURE

- How many **historical sites, heritage buildings or others similar in nature** were damaged in the Beirut explosion?
- What is the **total cost of repairing** them, while preserving their heritage value?

- What is the **economic impact of the explosion** in terms of revenue losses?

1) Technical and Vocational Education and Training
Source: Strategy& analysis

High-level overview of the methodology for infrastructure impact assessment

HOUSING

Based on **geo-spatial data from within a 4.1 km radius of the explosion**

- For each district (around 60), estimated the **number of buildings, apartments, and households affected by level of impact**
- Estimated the **explosion impact level** for each building based on **distance from explosion using Arc GIS**
- Derived the **construction costs per apartment** based on impact level, size and building status

FOOD SECURITY

No related infrastructure impact

HEALTHCARE

Based on damages **assessed by hospitals and healthcare centers**

- Identified **7 affected hospitals and 16 primary healthcare centers**
- Estimated the **damage per facility** based on the cost and damage information provided by each hospital and primary health care center

EDUCATION

Based on data **from within a 4.1 km radius of the explosion**

- Listed **all education establishments** based on **Google Maps data for a 2Km radius**
- Estimated the **explosion impact level** based on **radius from the explosion**
- Estimated **costs** based on **impact level and size of establishment**
- Extrapolated the costs within a 4.1 km radius of the explosion

BUSINESSES

Based on data **from within a 4.1 km radius of the explosion**

- Listed all businesses **based on Google Maps data** (on a 2km radius) **and segmented businesses into sectors**
- Estimated the **explosion impact level** based on **radius from the explosion**
- Estimated **costs** based on **impact level and size of establishment by sector**
- Extrapolated costs to a 4.1 km radius of the explosion to derive total cost

CULTURE

Based on data in the **districts affected by the explosion**

- Based on **Beirut Build Heritage Rescue, August 2020 report**:
  - Quantified the number of cultural sites and buildings
  - Estimated the reconstruction costs depending on severity of damages

Note: Public infrastructure (e.g., port, grain silos, electricity grids, roads) damage was not covered in the analysis
Source: Strategy& analysis

High-level overview of the methodology for social impact assessment

HOUSING

Based on geo-spatial data within a 4.1Km radius of the explosion and MySay survey

- Estimated **uninhabitable households by district**, assuming only houses with severe/moderate damage are no longer habitable
- Estimated **need for temporary housing** (e.g., rent subsidy) by residents' proxy income level[1] per district
- Derived **total costs of sheltering households**, assuming specific cost per month and length of stay, based on damage level and urgency of need

FOOD SECURITY

Based on geo-spatial data within a 4.1Km radius of the explosion and MySay survey

- Estimated the **percentage of people in urgent or significant need for food by district (~15)**, using survey results and factoring in income levels
- Estimated the **cost of providing food per individual per month** over a specified duration, depending on the need
- Derived **total cost of food assistance provision** for a period up to 12 months

HEALTHCARE

Based on data within a 4.1Km radius of the explosion, interviews, and MySay survey

- Estimated the **costs of treating all physical injuries**
- Estimated **number of people requiring mental health support** in highly affected districts only, using survey results

EDUCATION

Based on UNICEF's report; and public database on schools' capacity

- Estimated the average **number of students per school**
- Estimated **number of students at risk of not being able to go back** to schools / TVETs
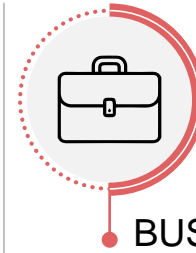
BUSINESSES

Based on geo-spatial data within a 4.1Km radius of the explosion and MySay survey

- Estimated the **percentage of businesses that are back to work, will be back in weeks, months or will never be back**, by damage level and company size
- Identified **average salary per sector**
- Estimated **number of jobs at risk or lost**; and related share of salaries lost within one year from the explosion

CULTURE

Lost jobs in culture have been accounted for under businesses

1) Estimated based on real estate price index per district
Source: Strategy& analysis

High-level overview of the methodology for economic impact assessment

APPROACH

- Categorized businesses based on sector, size of employment (S, M, L)[1] and damage level from the explosion (none / insignificant, minimal, moderate and severe; based on location)
- Estimated total revenues lost for each sector for a period of one year from the explosion by company size, factoring in damage level and time to return to work

KEY ASSUMPTIONS

- Estimated number of businesses within a 4.1Km radius of the explosion
- Percent of businesses that are back to work, need weeks to return, months to return or will never return, by damage level and company size
- Average revenues per sector and company size
- Percent of revenues lost for businesses that are back to work, need weeks to return, months to return or will never return

SOURCES

- Google Maps data, Expert interviews, MySay survey

1) Small businesses are assumed to have an average of 5 employees, medium businesses an average of 30 employees; and large businesses an average of 100 employees
Note: Micro-businesses with unregistered locations were not accounted for in the assessment due to limited data
Source: Strategy& analysis

Impact on housing

Methodology for housing assessment
(within a 4.1 Km radius of the explosion)

METHODOLOGY FOR INFRASTRUCTURE ASSESSMENT

APPROACH

- Estimated the number of buildings, apartments, and households affected by level of impact for ~60 districts on Arc GIS
- Estimated the explosion impact level for each building based on distance from explosion
- Derived the construction costs per apartment based on impact level, size and building status
- Derived the total cost of the damage

KEY ASSUMPTIONS

- Impact level coefficients and costs by severity of damage
- Size of property coefficients (Small, Medium, Large Size)
- Building status coefficients (Low, Mid to Low, Mid, Mid to High, High-End)

SOURCES

- UN-OCHA, Expert Interviews, HOTOSM Lebanon Buildings, Khatib & Alami, MySay survey

METHODOLOGY FOR SOCIAL ASSESSMENT

APPROACH

- Estimated the number of households that are severely or moderately damaged by district, and based on infrastructure assessment of residential buildings' damages
- Derived the number of people requiring urgent or minor housing support, based on residents' proxy income level[1] per district and MySay survey results
- Derived the total costs of providing shelter for eligible households

KEY ASSUMPTIONS

- Only severely or moderately damaged houses are considered uninhabitable
- Income levels for each district (L, L+, M, M+, H)
- Percent of households requiring urgent or minor shelter support (survey)
- Average cost of shelter per month, and length of stay required

SOURCES

- UN-OCHA, Expert Interviews, MySay survey

Overall impact on housing
(within a 4.1 Km radius of the explosion)

Total

US$ ~ 1.86 billion

INFRASTRUCTURE IMPACT

None / Insignificant damage
Some glass failure

~2,440 buildings   ~39,210 households

Minimal damage
Glass failure, limited damage to house structures (e.g., false ceiling, wood panels)

~10,610 buildings   ~122,890 households

Moderate damage
Space made uninhabitable/ usable, furniture, window frame, and wood panels damaged

~2,570 buildings   ~28,980 households

Severe damage
Partition walls shattered, steel frame buildings distorted and pulled away from foundation

~240 buildings   ~2,310 households
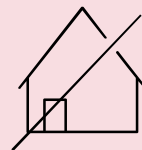
TOTAL   ~15,860   ~193,390

US$ ~1,830 million total financial requirements

SOCIAL IMPACT

~31,300
uninhabitable houses due to severe or moderate damage

~13,000[1]
households with minor to urgent need for temporary housing (e.g., rent subsidy)

US$ ~30 million total financial requirements for rental[2] cost to support displaced people in need of housing

1) Assumes residents of remaining uninhabitable houses possess second homes or can afford to rehouse themselves
2) Rental cost covers a period of 18 months for houses with severe damage and 4 months for houses with moderate damage
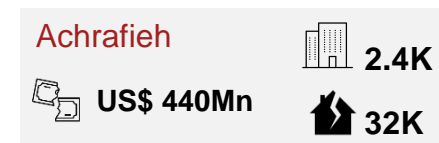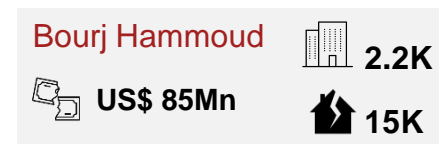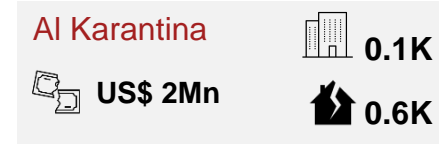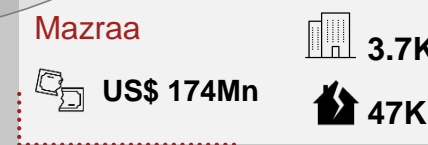Source: Expert Interviews, UN-OCHA, HOTOSM Lebanon Buildings, Khatib & Alami, MySay survey, Strategy& analysis

Infrastructure impact – Housing
(within a 4.1 Km radius of the explosion)

Total
US$ ~1.8Bn[2]   15.8K   193K

Mina El-Hosn
0.3K
US$ 23Mn[1]   2.4K

Marfaa
0.2K
US$ 32Mn   0.9K

Saifi
0.3K
US$ 59Mn   1.8K

Medawar
0.5K
US$ 239Mn   4.5K

Dar El-Mreisseh
0.3K
US$ 20Mn   3.8K

Al Karantina
0.1K
US$ 2Mn   0.6K

Ras Beirut
1.6K
US$ 39Mn   22K

Rmeil
1.1K
US$ 489Mn   14K

Zuqaq El-Blat
0.3K
US$ 15Mn   4.2K

Bourj Hammoud
2.2K
US$ 85Mn   15K

Mousaitbeh
2.7K
US$ 141Mn   40K

Bachoura
0.4K
US$ 75Mn   5.1K

Mazraa
3.7K
US$ 174Mn   47K

Achrafieh
2.4K
US$ 440Mn   32K

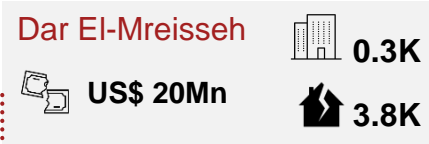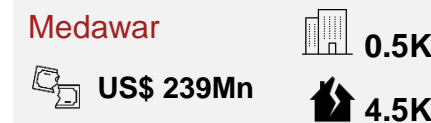Map labels: 0.8 km, 1.6 km, 4.1 km, Marfaa, Medawar, Dar El-Mreisseh, Mina El-Hosn, Ras Beirut, Saifi, Al Karantina, Rmeil, Zuqaq El-Blat, Bourj Hammoud, Bachoura, Achrafieh, Mousaitbeh, Mazraa

Legend:
- Estimated damage cost
- Number of buildings impacted
- Number of households impacted
- Severe damage
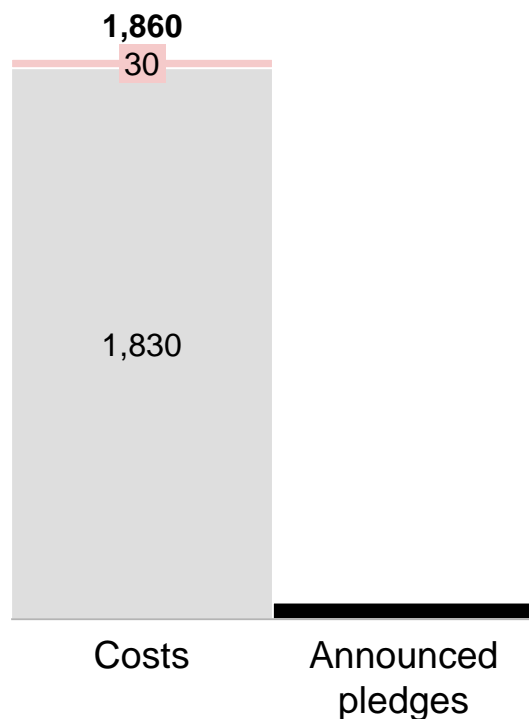- Moderate damage
- Minimal Damage

1) Million   2) Billion
Source: Expert interviews, HOTOSM Lebanon Buildings, Khatib & Alami, MySay survey, Strategy& analysis

Financial requirements vs. announced pledges – Housing

FINANCIAL REQUIREMENTS AND ANNOUNCED PLEDGES (US$ Million)

1,860
30

1,830

Costs

Announced pledges

- Cost for temporary housing
- Cost of reconstruction

SELECTED EXAMPLES OF ANNOUNCED DONATIONS

US$ 35 million from UNHCR to shelter and protect the most vulnerable Lebanese, refugees and migrant households in Beirut over the coming months

UNHCR The UN Refugee Agency

US$ 2+ million from corporations such as Google, Facebook, Procter & Gamble, PepsiCo and Chanel

Google · f · P&G · PEPSICO · CHANEL

US$ 2+ million raised through **public crowdfunding campaigns**

gofundme · GlobalGiving · JustGiving

SELECTED EXAMPLES OF IN-KIND DONATIONS

138 tons of glass donated by the UAE to help repair more than 1,000 destroyed homes and small businesses by covering ~9,000 sqm

UAE

Quantities of aluminum and glass to be provided by private companies in Cyprus

Cyprus

Hundreds of free shelters offered by the Lebanese community and hotels

Lebanon

Note: Announced pledges do not include in-kind donations
Source: Impact Lebanon for announced financial pledges, Strategy& analysis

Impact on food security

Methodology for food security assessment
(within a 4.1 Km radius of the explosion)

METHODOLOGY FOR SOCIAL ASSESSMENT

APPROACH

- Estimated the percentage of people in urgent or significant need of food by district, using MySay survey results and factoring in the average income level of the districts' residents
- Estimated cost of providing food per individual for a month and number of months required (based on urgency of need)
- Derived total cost of providing food assistance

KEY ASSUMPTIONS

- Percentage of people requiring moderate or urgent need of food assistance in lower income districts
- Cost of providing food assistance per individual, by need level
- Number of months of food provision needed

SOURCES

- UN-OCHA, MySay survey, Expert Interviews

Social impact – Food security
(within a 4.1 Km radius of the explosion)

Total
US$ ~215 Mn
172K
135K

Marfaa
US$ 0.5Mn
0.1K
0.1K

Saifi
US$ 1.5Mn
1K
1K

Medawar
US$ 3Mn
2.3K
2.3K

Al Karantina
US$ 33Mn
27K
19K

Ras Beirut
US$ 3.2Mn
2.5K
2.5K

Rmeil
US$ 10.5Mn
7.8K
7.8K

Zuqaq El-Blat
US$ 910Mn
8.2K
5.7K

Bourj Hammoud
US$ 18.5Mn
15K
11K

Mousaitbeh
US$ 30Mn
23K
23K

Bachoura
US$ 9.5Mn
7.8K
5.5K

Mazraa
US$ 73Mn
61K
42K

Achrafieh
US$ 21Mn
16K
16K

Map labels: 0.8 km, 1.6 km, 4.1 km; Marfaa, Medawar, Dar El-Mreisseh, Mina El-Hosn, Ras Beirut, Saifi, Zuqaq El-Blat, Rmeil, Al Karantina, Bourj Hammoud, Bachoura, Achrafieh, Mousaitbeh, Mazraa

Level of funding required
Low — High
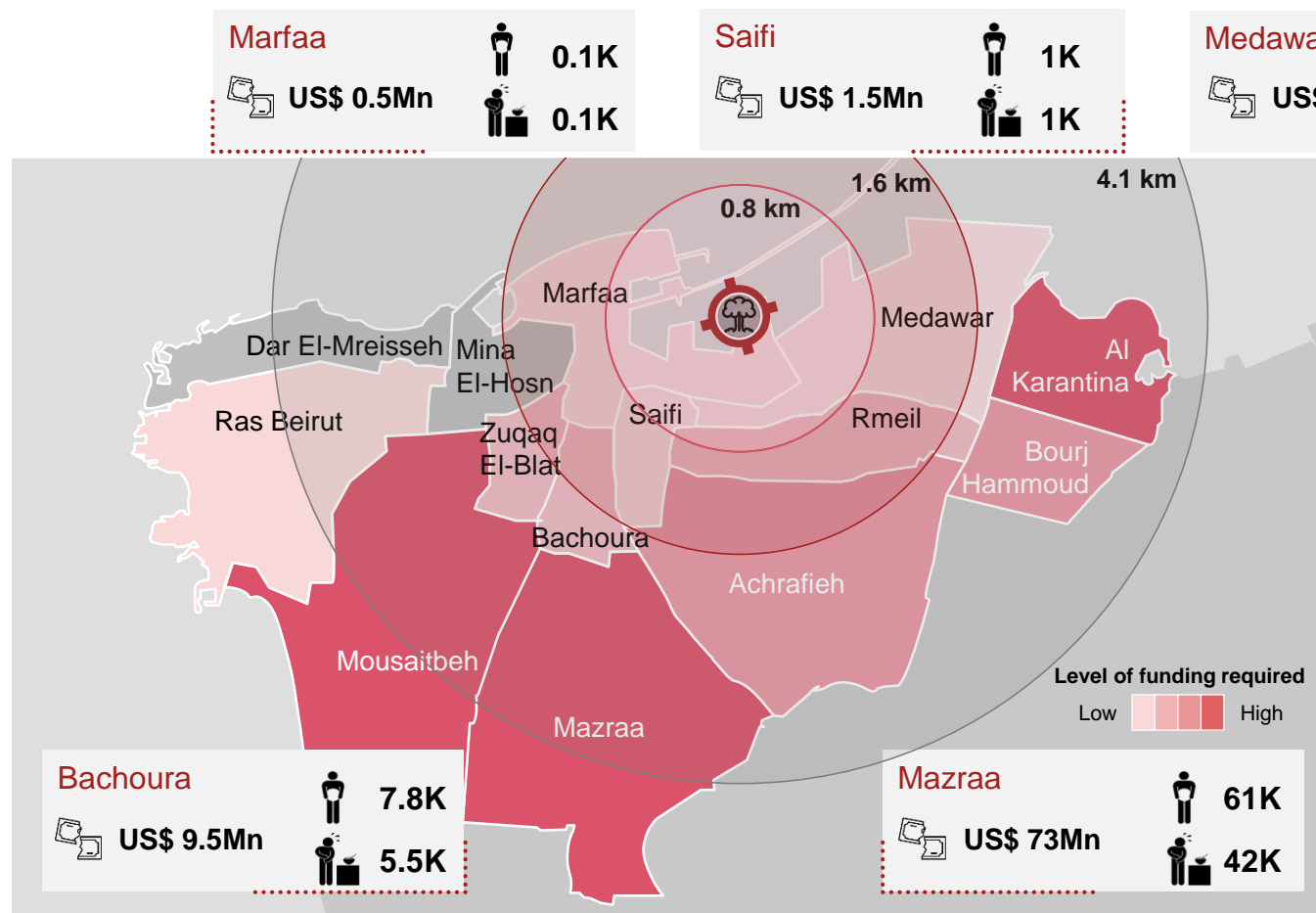
Estimated cost of providing food assistance
Urgent need for food
Moderate need for food

Note: Food assistance requirements were assessed based on MySay survey results; which asked about food needs as a consequence of the blast. However, these needs could be accentuated or influenced by pre-explosion conditions (COVID-19 impact and / or economic crisis)

Source: OCHA, MySay survey, Expert Interviews, Strategy& analysis

Financial requirements vs. announced pledges – Food security

FINANCIAL REQUIREMENTS AND ANNOUNCED PLEDGES[1] (US$ Million)

215

Costs

Announced pledges

Cost of food assistance
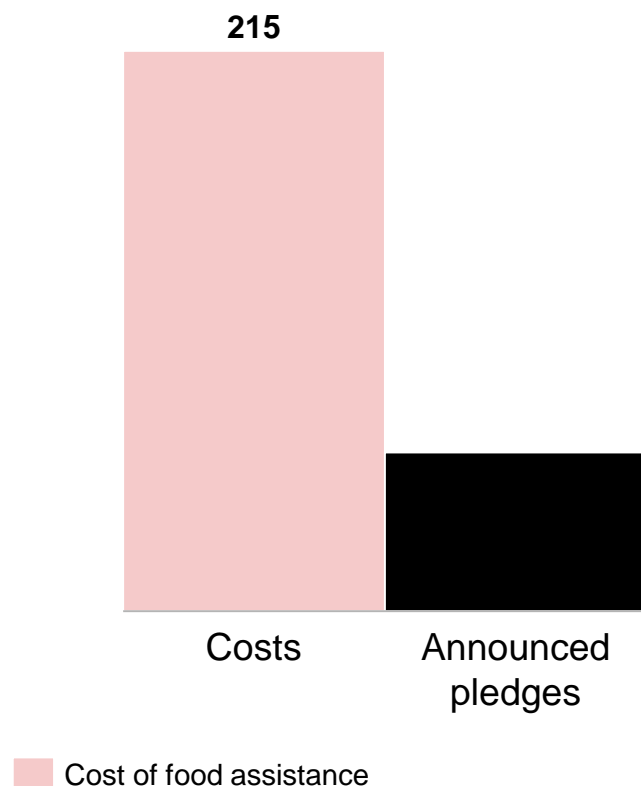
SELECTED EXAMPLES OF ANNOUNCED DONATIONS

US$ ~25 million in foreign aid from international countries

Canada USA UK Australia Denmark Hungary

US$ ~7.5 million USAID

US$ ~2.5 million from corporations such as Google, Facebook, Procter & Gamble, PepsiCo, Chanel, Citi, H&M Foundation

Google PEPSICO H&M FOUNDATION

f P&G CHANEL Citi

SELECTED EXAMPLES OF IN-KIND DONATIONS

~660 tons of food

France

295 tons of food

Morocco

10 tons of flour

Spain

1.5 million portions of cheese

HANILOR
LACTALIS

1 million portions of Kiri and Picon

bel for all for good

1) Factors for in-kind donations
Source: Impact Lebanon, Strategy& analysis

Impact on healthcare

Methodology for healthcare assessment

METHODOLOGY FOR INFRASTRUCTURE ASSESSMENT

Based on data shared by service providers

APPROACH

- Identified 17 affected hospitals and 16 primary healthcare centers
- Estimated the damage per hospital and primary healthcare center based on the cost and damage information provided by each facility

KEY ASSUMPTIONS

- N/A

SOURCES

- Service Providers, Expert Interviews, Lebanon Needs

METHODOLOGY FOR SOCIAL ASSESSMENT

Based on data within a 4.1km radius of the explosion

APPROACH

- Estimated cost of treating all physical injuries
- Estimated percentage of people in highly affected areas that require limited, moderate and urgent mental heath support
- Estimated number of people requiring mental health support, and the ones requiring medical support, in highly affected areas only, using survey results

KEY ASSUMPTIONS

- Residents of damaged houses are more prone to require mental health support
- Only people with moderate to high need of support are accounted for
- Number of sessions required for moderate or intensive treatment
- Average cost of hospitalization and average length of stay by injury severity
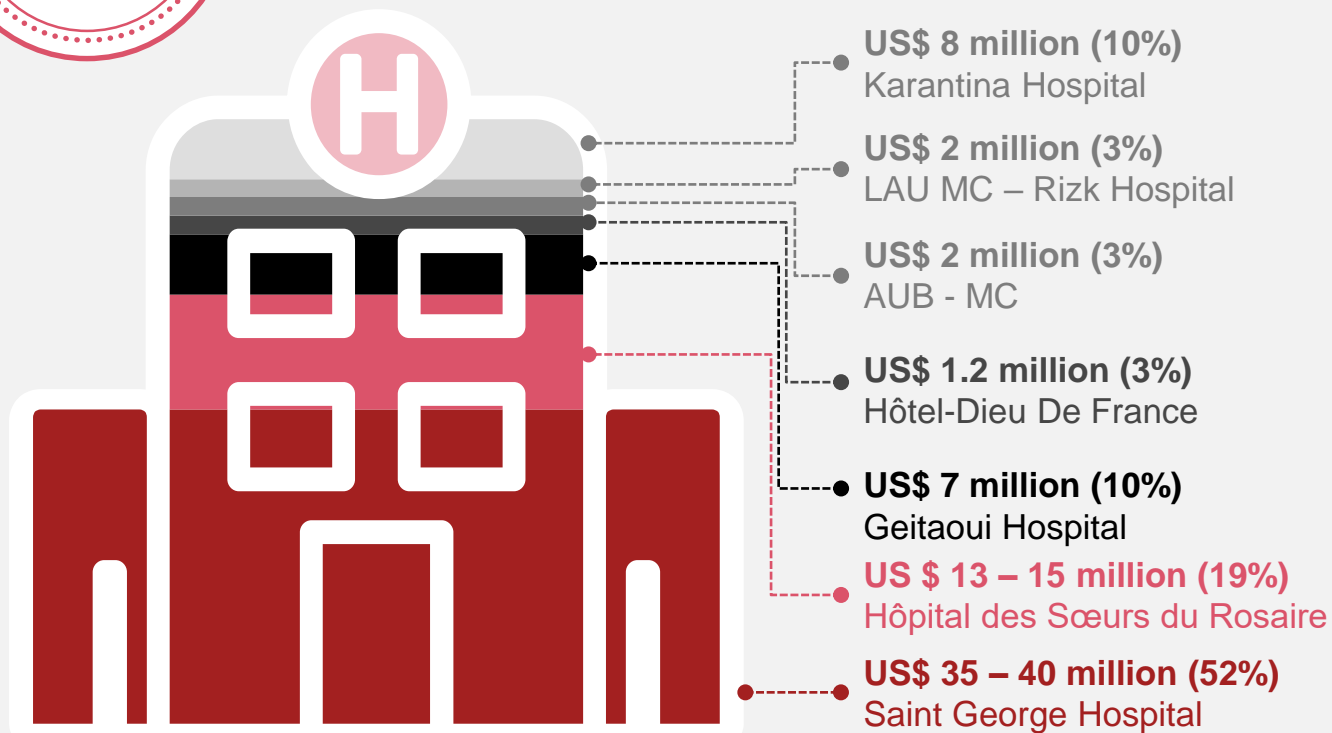- Cost per psychology session and cost of medical treatment

SOURCES

- MySay survey, Expert Interviews

Infrastructure impact – Healthcare

Total US$ 68 – 75 million for 7 out of the 17 damaged hospitals;
US$ ~66 million are for the 4 severely damaged ones

Total US$ ~70K for
16 damaged Primary Health Care
Centers

US$ 8 million (10%)
Karantina Hospital

US$ 2 million (3%)
LAU MC – Rizk Hospital

US$ 2 million (3%)
AUB - MC

US$ 1.2 million (3%)
Hôtel-Dieu De France

US$ 7 million (10%)
Geitaoui Hospital

US $ 13 – 15 million (19%)
Hôpital des Sœurs du Rosaire

US$ 35 – 40 million (52%)
Saint George Hospital

Social impact – Health
(within a 4.1 Km radius of the explosion)

SOCIAL IMPACT

~6,500
Individuals with moderate to critical injuries *(hospitalized)*

~1,300
of hospitalized individuals underwent surgery

~145,000
Individuals needing psychological support

Moderate need for mental care	**~121,000** Individuals
Urgent need for mental care	**~24,000** Individuals

80

US$ Mn[1]
total financial requirements

Financial requirements vs. announced pledges – Healthcare

IMPACT LEBANON

FINANCIAL REQUIREMENTS[1] AND ANNOUNCED PLEDGES[2] (US$ Million)

155

80

US$ 18 Mn for physical injuries (covered by the Lebanese Ministry of Health), and US$ 62 Mn for mental health

75

Costs   Announced pledges
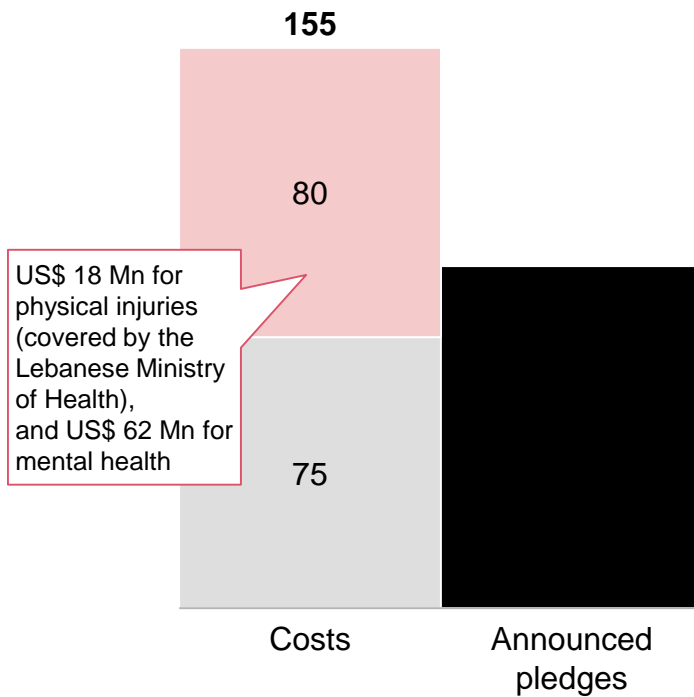
Cost of treatment   **Cost of reconstruction**

SELECTED EXAMPLES OF ANNOUNCED DONATIONS

US$ ~30 million in foreign aid from regional and international countries

Canada   USA   UK   Australia   Italy

US$ ~7.5 million   **USAID**

US$ ~2.5 million from corporations

Google   f   P&G   PEPSICO   H&M FOUNDATION   CHANEL   citi

US$ 2+ million raised through **public crowdfunding campaigns**

gofundme   GlobalGiving   JustGiving   JUST HELP

SELECTED EXAMPLES OF IN-KIND DONATIONS

Medical supplies

60 tons Jobs for Lebanon   **40 tons** UAE   **40 tons** Norway

21 tons Morocco   **20 tons** WHO   **20 tons** Iraq

18 tons France   **9 tons** Italy   **5 tons** US Army

Field hospitals

550 beds Qatar   **58 beds** Jordan   **50 beds** Russia   **50 beds** Morocco

Other

600 chemical protection suits

Denmark

1) Financial requirements do not cover cost of medical supplies required
2) In-kind donations in the form of medical supplies have been excluded; however cost of treating physical injuries have been included as it is assumed to be covered by MoH

Impact on education

Methodology for education assessment
(within a 4.1 Km radius of the explosion)

METHODOLOGY FOR INFRASTRUCTURE ASSESSMENT

APPROACH

- Listed all education establishments (schools and universities) based on Google Maps data within 2km radius from the explosion
- Calculated impact level based on distance from explosion
- Estimated costs based on impact level and size of establishment
- Derived the final cost of damages
- Extrapolated the cost of damages to a 4.1km radius from explosion

KEY ASSUMPTIONS

- Impact level coefficients and costs by severity of damage
- Size of property coefficients (Small, Medium, Large Size)
- Average Capex cost per m^2

SOURCES

- UNCHR Reports, Expert Interviews, Google data, MySay survey

METHODOLOGY FOR SOCIAL ASSESSMENT

APPROACH

- Listed all schools and TVETs based on Google Maps data within 2km radius from the explosion
- Identified number of students in each of these schools
- Estimated average number of students for the ones with no data
- Derived number of students at risk of not being able to go back to school or TVETs, based on total number of schools and TVET centers damaged

KEY ASSUMPTIONS

- Average number of students in a school (extrapolated based on available data)

SOURCES

- Google maps data, UNICEF, UN-OCHA, Ministry of Education

Overall impact on education
(within a 4.1 Km radius of the explosion)

INFRASTRUCTURE IMPACT

~8 universities damaged[1]

~140 schools and TVETs damaged within 4.1Km radius

US$ ~60 million total financial requirements

SOCIAL IMPACT

~67,000 students impacted due to schools and TVETs damages

1) Larger than 4.1Km radius from the explosion
Note: Costs to cover tuition fees were not factored for in this assessment
Source: UNCHR Reports, Expert Interviews, Google data, Khatib & Alami, MySay survey, Strategy& analysis

Financial requirements vs. announced pledges – Education

FINANCIAL REQUIREMENTS[1] AND ANNOUNCED PLEDGES (US$ Million)

60

Cost | Announced pledges
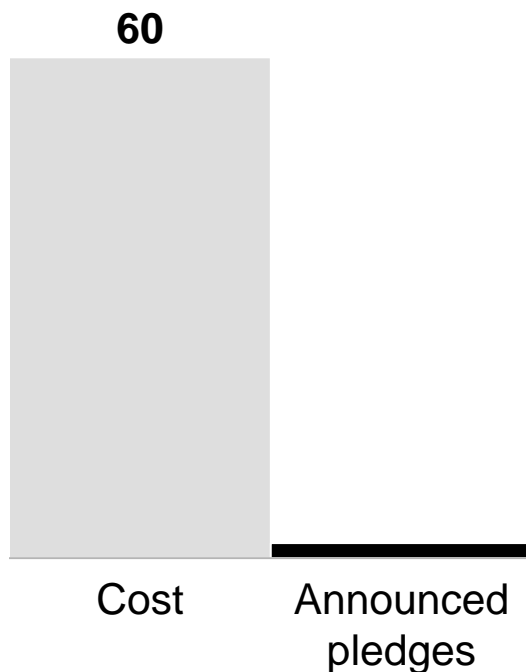
Cost of Reconstruction

SELECTED EXAMPLES OF ANNOUNCED DONATIONS

US$ 1.2 million from UNESCO

US$ 0.4 million raised through public crowdfunding campaigns

1) This assessment did not include the cost of covering tuition fees
Source: Impact Lebanon, Strategy& analysis

Impact on businesses

Methodology for businesses assessment
(within a 4.1 Km radius of the explosion)

METHODOLOGY FOR INFRASTRUCTURE ASSESSMENT

APPROACH

- Listed all business establishments based on Google Maps data (2Km) and segmented them into 7 sectors: Food and Drink, Shopping, Leisure, Lodging, Non-Consumer, Services, Other
- Calculated impact level based on distance from explosion
- For each sector, estimated costs based on impact level and size of establishment
- Derived the final cost of damage
- Extrapolated the cost of damage within a 4.1km radius of the explosion

KEY ASSUMPTIONS

- Impact level coefficients and costs by severity of damage
- Size of property coefficients (Small, Medium, Large Size)
- Average Capex cost per m^2

SOURCES

- Expert Interviews, Google Maps data, MySay survey

METHODOLOGY FOR SOCIAL ASSESSMENT

APPROACH

- Categorized Google Maps data on businesses based on sector, size of employment and severity of damage
- Estimated total jobs that are temporarily on hold and total jobs lost; and related share of foregone salaries, by sector, within one year from explosion
- Extrapolated the cost of damage within a 4.1km radius of the explosion

KEY ASSUMPTIONS

- Percentage of businesses that are back to work, in weeks, months or not returning, by damage level and company size; and expected percent loss in salaries for each
- Businesses that are beyond 2km radius faced low or minor level of damage
- Average salary by sector

SOURCES

- Expert Interviews, Google Maps data, MySay survey

1) Small businesses are assumed to have on average 5 employees, medium businesses an average of 30 employees; and large businesses an average of 100 employees
Note: Micro-businesses with unregistered locations were not accounted for in the assessment due to limited data
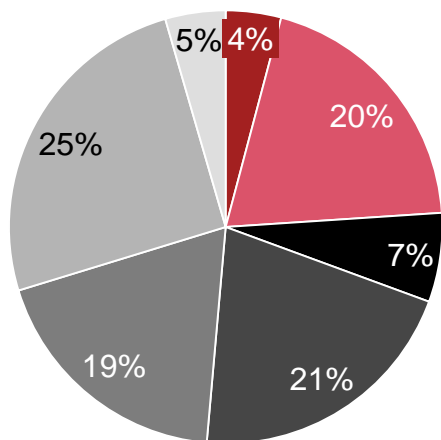Source: Strategy& analysis

Infrastructure impact – Businesses by sector
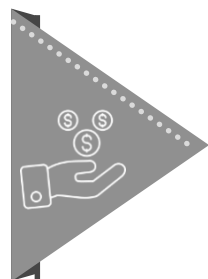## *(within a 4.1 Km radius of the explosion)*
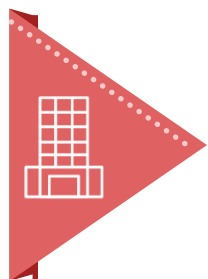
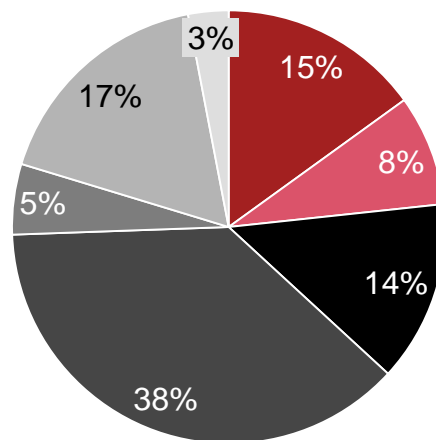### NUMBER OF BUSINESSES PER SECTOR

Total **~31K businesses**

4%
20%
7%
21%
19%
25%
5%

~45% of the businesses affected are shopping and services related

FUNDING NEEDED PER SECTOR

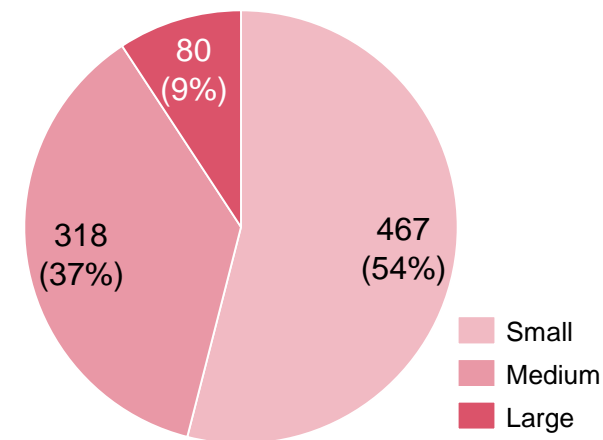Total US$ ~865 Million

15%
8%
14%
38%
5%
17%
3%

Non-consumer, lodging and leisure businesses will need around **70% of funding**, around **US$ 570 million**
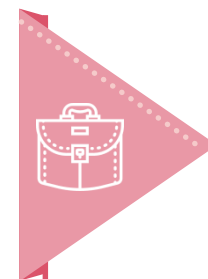
FUNDING NEEDED BY SIZE[1] OF BUSINESS

Total US$ ~865 Million

80 (9%)
467 (54%)
318 (37%)

Small
Medium
Large

Most of the affected businesses are **small businesses**, requiring around **US$ 470 million**

■ Lodging ■ Food & drink ■ Leisure ■ Non-consumer[2] ■ Shopping ■ Services ■ Other[3]

1) Size of business in square meters
2) Banks, corporate offices and embassies
3) Uncategorized small businesses such as computer shops, beauty salons, art studios
Source: Expert Interviews, Google Maps data, MySay survey, Strategy& analysis
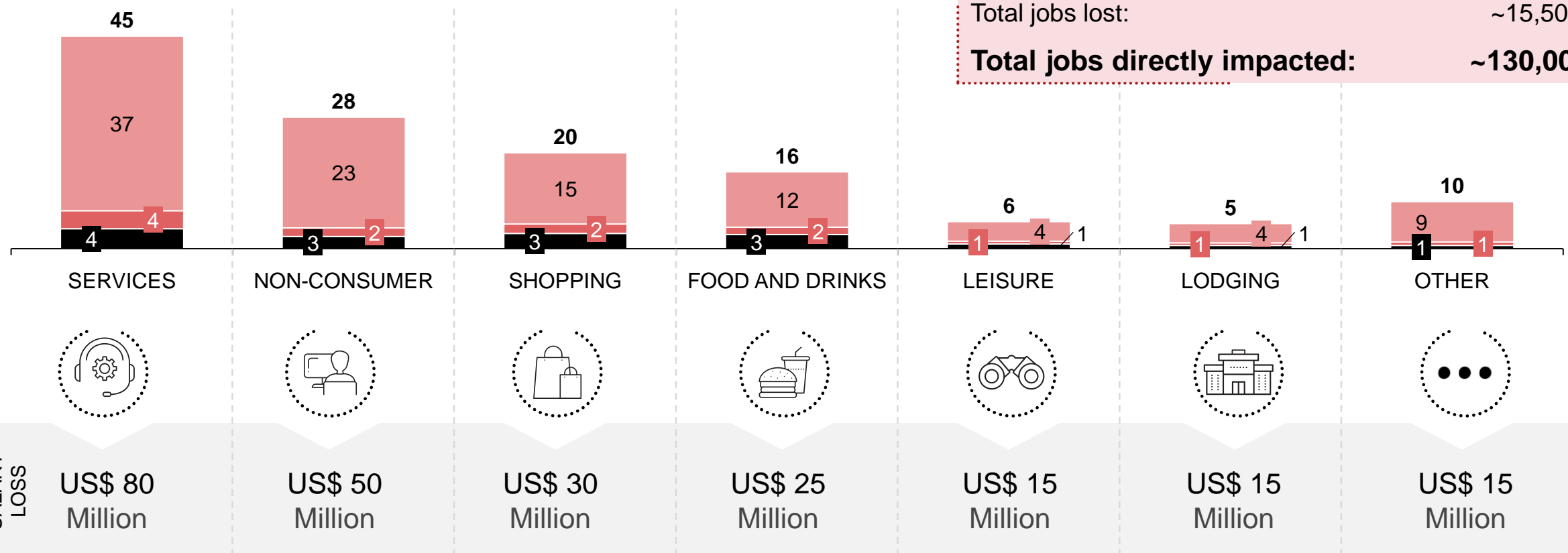
Social impact – Businesses by sector
(within a 4.1 Km radius of the explosion)

NUMBER OF JOBS AFFECTED (in 000s)

Legend:
- ▆ Jobs on hold for weeks
- ▆ Jobs on hold for months
- ▆ Jobs lost

	Total jobs on hold for weeks:	~104,000
	Total jobs on hold for months:	~10,500
	Total jobs lost:	~15,500
	Total jobs directly impacted:	**~130,000**

SERVICES — 45 (37, 4, 4) — US$ 80 Million
NON-CONSUMER — 28 (23, 2, 3) — US$ 50 Million
SHOPPING — 20 (15, 2, 3) — US$ 30 Million
FOOD AND DRINKS — 16 (12, 2, 3) — US$ 25 Million
LEISURE — 6 (4, 1, 1) — US$ 15 Million
LODGING — 5 (4, 1, 1) — US$ 15 Million
**OTHER** — 10 (9, 1, 1) — US$ 15 Million

EQUIVALENT SALARY LOSS

Note: Some examples of businesses under services include airlines, banks, training centers, doctors' clinics. Other section includes art studies, designers, shipping.
Micro-businesses with unregistered locations have been excluded from the assessment
Source: Expert Interviews, Google Maps data, MySay survey, Strategy& analysis

Financial requirements vs. announced pledges – Businesses

FINANCIAL REQUIREMENTS AND ANNOUNCED PLEDGES (US$ Million)

1,095

230

865

Financial requirements

Announced pledges
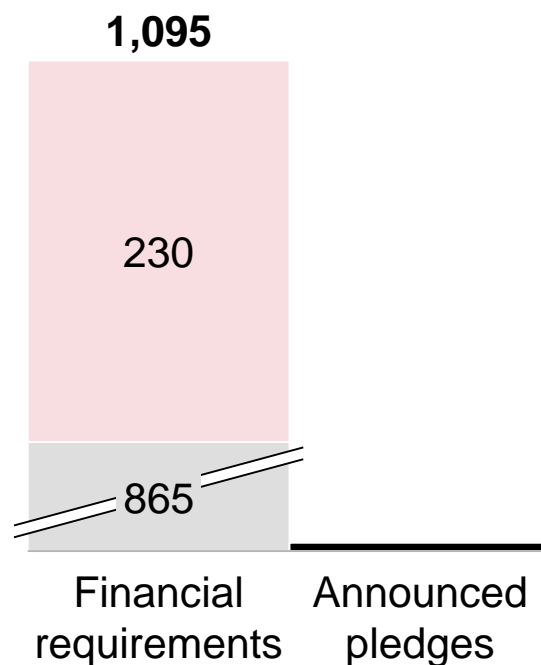
■ Estimated Salary Losses   ■ Cost of Reconstruction

SELECTED EXAMPLES OF ANNOUNCED DONATIONS

US$ 0.75 million raised through public crowdfunding campaigns and associations

gofundme   GlobalGiving   JustGiving   مفردات Mophradat

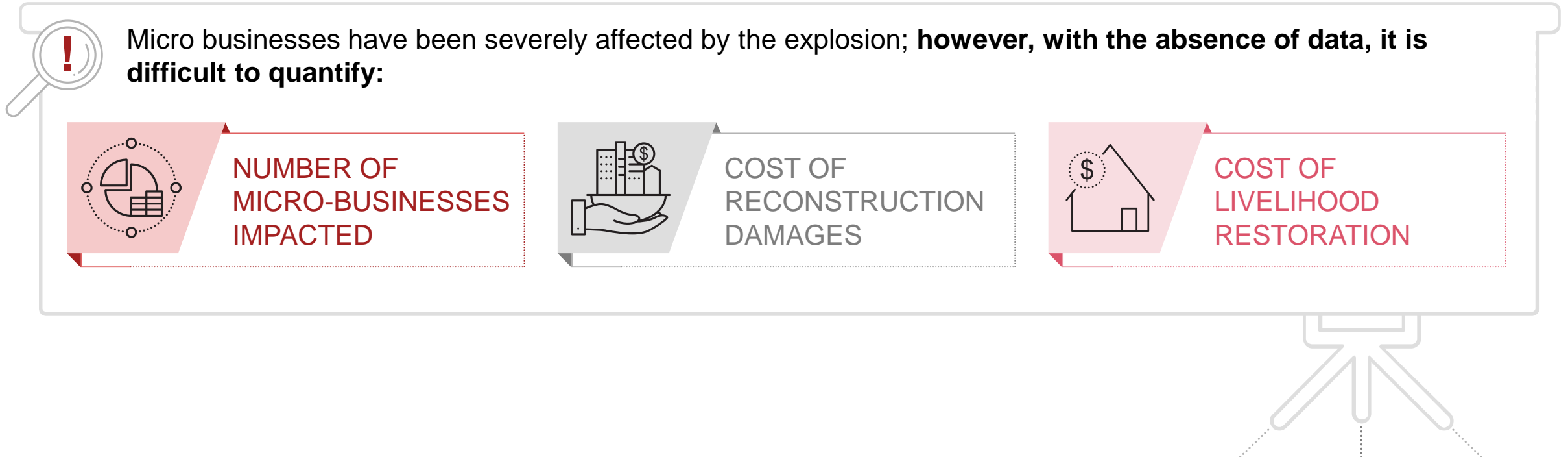**US$ 0.3 million** from Facebook Journalism Project and the International Center for Journalists

facebook Journalism Project   ICFJ International Center for Journalists

Infrastructure and social impact – Micro businesses

Micro businesses have been severely affected by the explosion; **however, with the absence of data, it is difficult to quantify:**

|		
NUMBER OF MICRO-BUSINESSES IMPACTED	COST OF RECONSTRUCTION DAMAGES	COST OF LIVELIHOOD RESTORATION

▷ Out of a sample size of ~1,550 micro-businesses within 5km of the explosion, nearly ~115 have been damaged (11 total destruction, 55 major damages, and 50 minor damages)

▷ On average, cost of reconstruction per sampled micro-business ranges between US$ 1,000 and US$ 3,000

Source: Almajmoua, Strategy& analysis
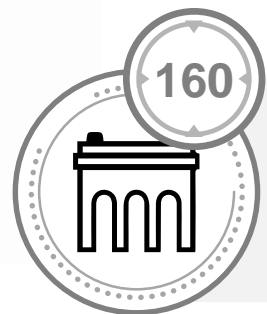
Impact on culture

Damage to cultural heritage
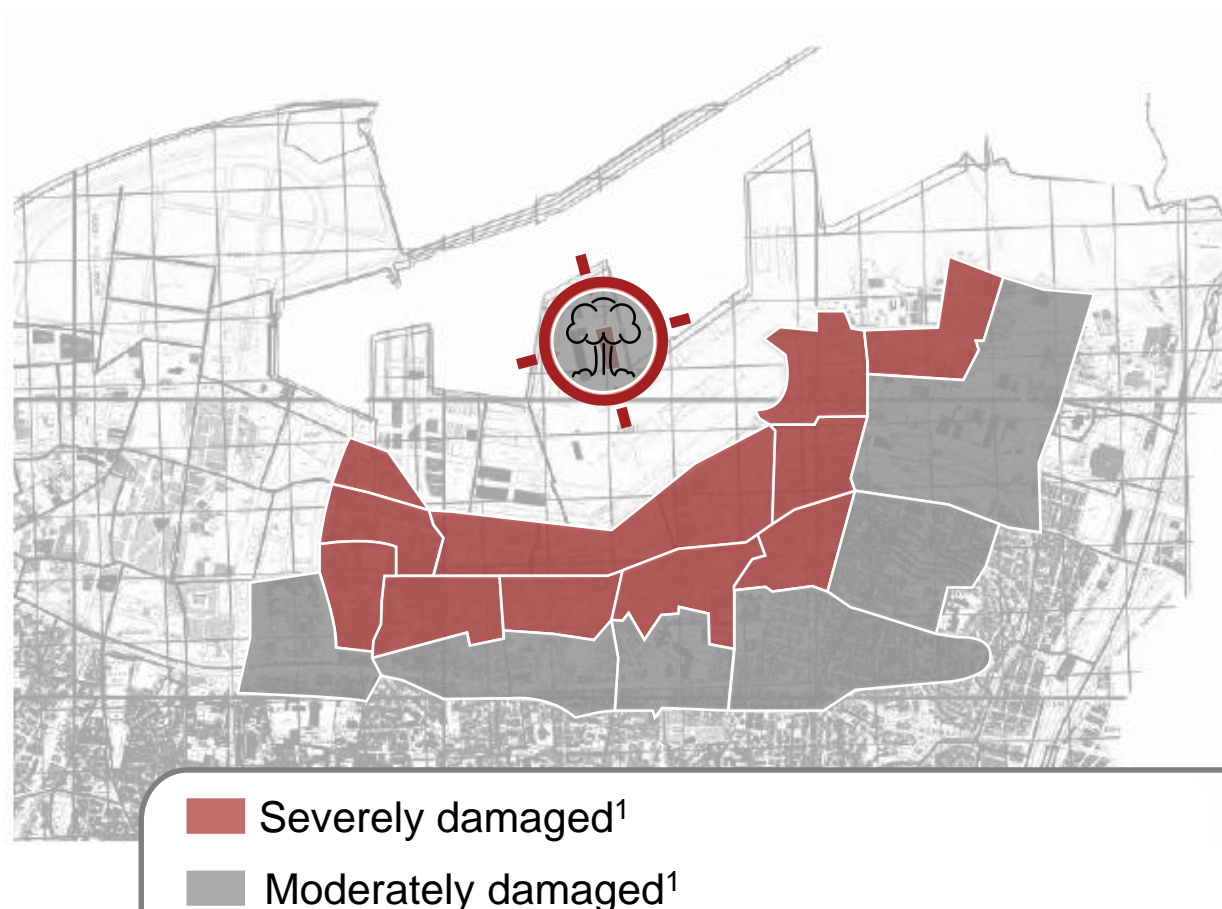
8 **historical areas and cultural fabric have been damaged in:** Mar Mkhayel, Sayfi, Gemmayze, Jeitawi, St Nicolas, Zukak blat, Minat al Hosn and Bachura
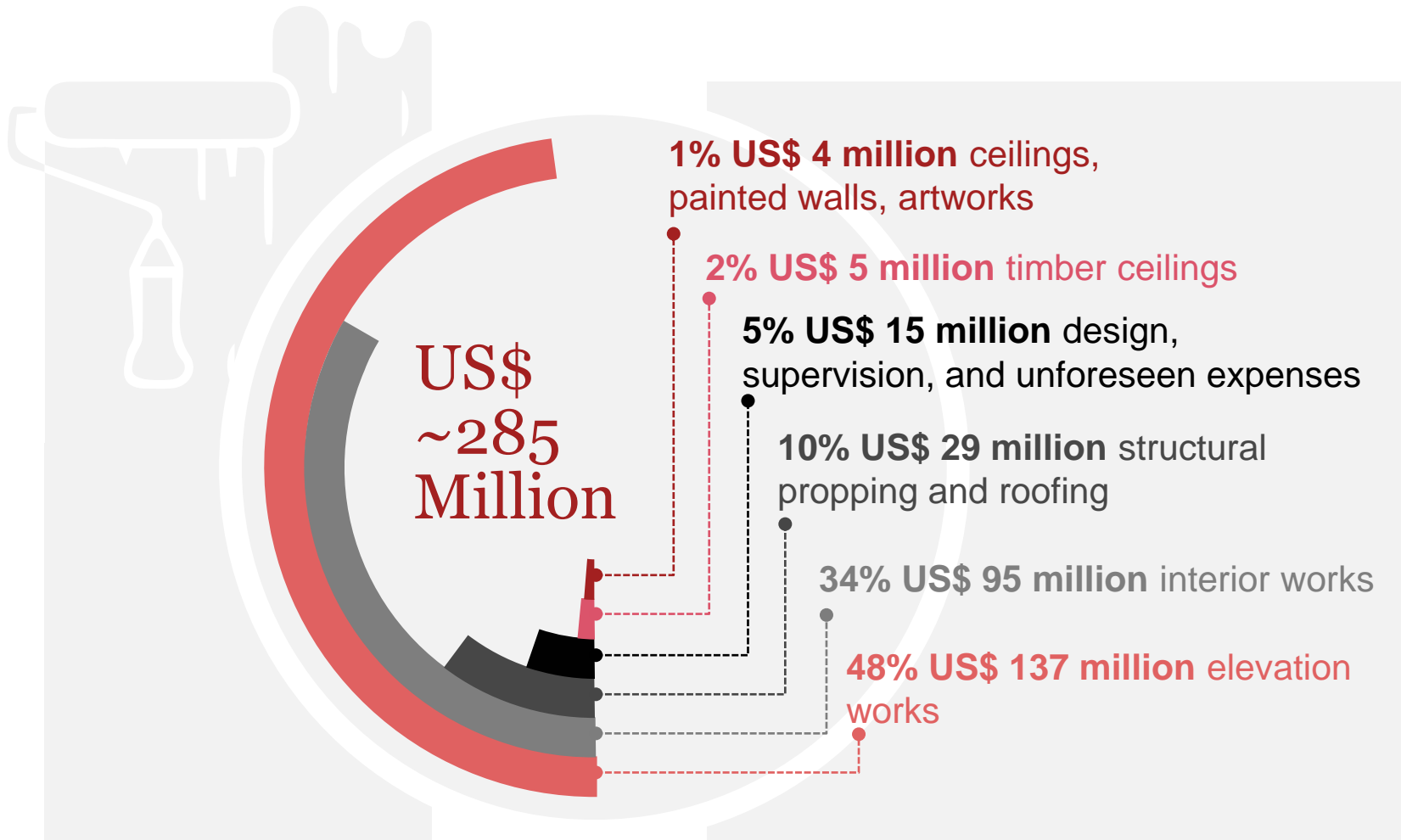
480 **heritage buildings have been damaged:** 85 severely damaged, 370 moderately damaged and 25 slightly damaged

160 **additional buildings with special features** (e.g., pitched roof from the 19th century**) in surrounding areas** (e.g., Medawar) have been also affected

Severely damaged[1]

Moderately damaged[1]

1) Damage ranges from loss of openings and cracks, to detachment of elements of the building, to total collapse

Source: Ministry of Culture – Directorate General of Antiquities' Beirut Built Heritage Rescue 2020 Report, Strategy& analysis

Cultural heritage funding requirements

US$ ~285 Million

1% US$ 4 million ceilings, painted walls, artworks

2% US$ 5 million timber ceilings

5% US$ 15 million design, supervision, and unforeseen expenses

10% US$ 29 million structural propping and roofing

34% US$ 95 million interior works

48% US$ 137 million elevation works

- **Funding required covers the reconstruction of 640 affected cultural buildings** (480 heritage buildings and 160 buildings with special features)

- **UNESCO launched the "Li Beirut" initiative** to support the rehabilitation of schools, historic heritage buildings, museums, galleries and the creative economy

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