اطار التخطيط الأولي
لإعادة إعمار الموصل

THE INITIAL PLANNING FRAMEWORK FOR THE RECONSTRUCTION OF MOSUL

Engineering Consulting Bureau

Ministry of Culture
State Board of Antiquities & Heritage

UN HABITAT
FOR A BETTER URBAN FUTURE

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This document presents the *Initial Planning Framework for the Reconstruction of Mosul.* It has been prepared by UN-Habitat and UNESCO.

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INTRODUCTION

Since the liberation of East Mosul in January 2017 and West Mosul in July 2017, humanitarian actors have been providing emergency assistance to rehabilitate infrastructure and public facilities in Mosul. However, several actors, including Ninewa Governorate, and international actors have expressed their concern that reconstruction without a coordinated strategy is inefficient and may complicate the long-term development of the city. Indeed, the recovery and reconstruction of Mosul would greatly benefit from a guiding framework that considers emerging needs and takes into account the fast-changing reality on the ground within greater Mosul.

Furthermore, the damage to Mosul's cultural heritage during military efforts to oust ISIL from Mosul and the surrounding areas is severe. Parts of the Old City have been completely destroyed in the final phase of liberation. Several months of armed conflict in the struggle to retake the city has left behind a devastated urban landscape, characterised by destroyed monuments, demolished houses, damaged buildings, destroyed infrastructure, extensive piles of rubble and areas contaminated by human bodies and unexploded ordnance. In particular, along the Tigris River, the historic urban fabric has been severely affected, with an estimated 5,000 buildings in the Old City destroyed or severely damaged.

A multi-disciplinary team from UN-Habitat and UNESCO has developed an Initial Planning Framework for the Reconstruction of Mosul in order to support Mosul's local government with the reconstruction and recovery of the city. This project is an initiative by UN-Habitat and UNESCO, supported by the Deputy Special Representative of the United Nations Secretary-General/ Resident Coordinator/Humanitarian Coordinator.

The Initial Planning Framework aims to define recovery priorities and deliver a comprehensive reconstruction and planning approach for the greater Mosul area, with special attention to the Old City. It aims to provide concrete actions for the revival of the entire Mosul metropolis, supported by desk research, fieldwork, and data. In addition, the document provides recommendations for the implementation of suggested actions.

CONTENTS

EXECUTIVE SUMMARY OF URBAN RECONSTRUCTION RECOMMENDATIONS

This report provides an analysis of the current reconstruction and recovery activities in Mosul and highlights emerging needs for the urban recovery and medium term development of the city. It proposes an action framework to address immediate, short - and medium term reconstruction needs.

The Initial Planning Framework document bases its recommendations on consultation with Mosul's technical directorates, local leaders, civil society organizations, drone imagery analysis of damage to structures, satellite analysis of urban developments, field visits, and desk research. The document addresses the Old City separately from greater Mosul, as many reconstruction and recovery challenges are specific to the Old City.

The framework builds upon earlier studies on Mosul, including: *Reconstruction of the Old City of Mosul Preliminary Study* (October 2017) and the *Reconstruction of Mosul Action Plan* (2018), both by the Engineering Consulting Bureau of Mosul University, as well as other activities conducted by UN-Habitat, most notably, the *City Profile of Mosul* (October 2016), *Planning Prospects for the Reconstruction and Recovery of Mosul* (September 2017), and the *Mosul Portal - Data and Assessments Platform for Humanitarian and Development Actors* (2017).

Key challenges
The report refers to a range of interlinked problems related to reconstruction and recovery, including but not limited to:

- Difficulties for the return of approximately of 15,000 families, currently resident in camps, from Mosul District to their area of origin, with the most common obstacle to return being damage to their homes.
- Inability of the housing market to deliver housing on a large scale, despite demand for accommodation being high due to the destruction of the housing stock and a pre-crisis housing deficit.
- Threat to Mosul's cultural heritage, in particular the Old City, due to the lack of appropriate construction skills and prioritization of swift reconstruction over heritage conservation.
- Complexities of inter-sectoral and interagency coordination in high density areas, such as the Old City.
- reduced local and regional infrastructural connectivity of Mosul, delay its economic recovery.
- increasing inequalities between Mosul's formal and informal developments that potentially increase the chance of a return to violent urban tension.
- Structural problems in the investment sector which retards significant engagement of private investors in the city.
- A lack of attention to the pollution of the urban environment which affects the health of Mosul's citizens and ecosystems.
- Structural problems in the investment sector which hold back significant engagement of private investors in the city.
- A lack of attention to the pollution of the urban environment is affecting the health of Mosul's citizens and ecosystems.

Key recommendations
Local government and international actors need to address the challenges detailed above, which cover both humanitarian and development issues, in order to develop a resilient city which is in a better state than it was before the crisis. The guiding principles of the recommendations listed below aim to facilitate the empowerment of Mosul's citizens to become key players in the reconstruction of their city.

Recommendations for greater Mosul include:
- Facilitate the sustainable return of affected citizens whose houses have been completely destroyed
- Address structural issues in the housing sector that predate ISIL's takeover
- Control the informal expansion of the city
- Create an enabling environment for private sector investments
- Protect and remediate the ecosystem of the Tigris River
- Re-start the development of the Masterplan.

Recommendations for the Old City include:
- Protect Mosul's heritage from further destruction
- Repair/rebuild the Old City through a 'super block' approach
- Support small and medium sized enterprises in the commercial areas
- Assist Old City residents with solving problems with property documentation
- Support the ongoing process of self-reconstruction

In addition to the recommended actions, the Framework defines strategic projects that address a specific obstacle for the recovery and reconstruction of the city.

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10 KEY RECOMMENDATIONS FOR THE GREATER MOSUL

1. FACILITATE THE SUSTAINABLE RETURN OF AFFECTED CITIZENS WHOSE HOUSES HAVE BEEN COMPLETELY DESTROYED
2. ADDRESS STRUCTURAL ISSUES IN THE HOUSING SECTOR THAT PREDATE ISIL'S TAKEOVER
3. CONTROL THE INFORMAL EXPANSION OF THE CITY
4. RECOVER ACCESS TO BASIC SERVICES, STRENGTHEN PUBLIC UTILITIES, AND ADDRESS DISPARITIES BETWEEN DIFFERENT NEIGHBOURHOODS
5. REVITALISE THE ECONOMY BY RECONNECTING MOSUL TO THE WIDER REGION
6. STRENGTHEN THE INTEGRATION OF THE URBAN AND RURAL AGRICULTURAL ECONOMIES
7. CREATE AN ENABLING ENVIRONMENT FOR PRIVATE SECTOR INVESTMENTS
8. RESTORE AND ENHANCE PUBLIC SPACES
9. PROTECT AND REMEDIATE THE ECOSYSTEM OF THE TIGRIS RIVER
10. RE-START THE DEVELOPMENT OF THE MASTERPLAN

10 KEY RECOMMENDATIONS FOR THE OLD CITY

1. PROTECT THE HERITAGE FROM FURTHER DESTRUCTION AS PREREQUISITE FOR RECONSTRUCTION
2. RECOVER THE OLD CITY THROUGH A SUPER BLOCK APPROACH
3. CLEAR THE CITY FROM DEBRIS AND EXPLOSIVE REMNANTS OF WAR
4. ENSURE RECONSTRUCTION THAT RESPECTS THE CITY'S HISTORICAL CHARACTER
5. SUPPORT THE ONGOING PROCESS OF SELF-RECONSTRUCTION
6. SUPPORT SMALL TO MEDIUM ENTERPRISES IN COMMERCIAL AREAS
7. INTRODUCE NEW SCHOOLS AND HEALTH FACILITIES TO THE OLD CITY
8. RECONNECT THE OLD CITY TO WIDER MOSUL
9. ASSIST OLD CITY RESIDENTS WITH PROPERTY DOCUMENTATION
10. IMPLEMENT PRE-CRISIS PLANS TO BUILD BACK BETTER

Limitations of the Initial Planning Framework
The Initial Planning Framework is designed specifically to address existing and potential urban structural issues that constrain, complicate, or prevent the recovery and reconstruction of Mosul and the return of its people. The report and underlying research aims to contribute to the understanding of the short- and medium-term reconstruction challenges that Mosul faces. The recommendations should be understood to supplement, strengthen, and/or consolidate existing recovery activities, not replace them.

Next steps of Initial Planning Framework
The UN-Habitat and UNESCO team suggest that the Framework should be considered for immediate adoption by Ninewa Governorate's office as well as the Prime Minister's Reconstruction Task Force. Subsequently, local and national decision makers are to follow up, advocate, and facilitate the recommended actions. Implementation of the recommendations should be undertaken on a case-by-case basis by the suggested actors, where possible supported by international organizations, and piloted through separate projects.

CHAPTER 1
GREATER MOSUL
RECONSTRUCTION PRIORITIES

This section of the Initial Planning Framework considers challenges, actions, and strategic projects for the recovery of Greater Mosul. For Greater Mosul, three broad challenges are particularly significant: housing, economic recovery and Building Back Better.

Housing
Of the 15,000 IDP families from Mosul in camps, over 80% report partial or significant damage to their homes, and cite this as a key obstacle to returning. Furthermore, as over half of the above mentioned IDPs families report that their houses are completely destroyed, small repairs will be insufficient to cover this caseload. Government and private sector interventions are essential. However, even before the crisis, the housing market was unable to deliver housing at scale, even though demand was high. Key constraints include: access to funding for individuals for the construction or reconstruction of their property, a lack of suitable residential land due to past planning failures, and a government-driven housing delivery model. Nevertheless, private sector initiatives did exist before the crisis, and the local government should consider pathways towards the reactivation of these projects.

Economic recovery
Considering that IDPs consistently cite the lack of livelihoods as the second key obstacle to returning to Mosul, recovery of the economy should be a priority for the recovery of the city. However, shortly after a conflict, local markets generally fail to stimulate generation of labour demand because of a depressed economy. An external impulse to investments and job creation is therefore necessary to stimulate labour demand (Local Economic Recovery in Post-Conflict, International Labour Organization 2010). In Mosul, however, structural problems in the investment sector delay significant engagement of private investors in the city, while significant damage to pre-crisis markets and commercial streets, as well as regional obstacles to trade are likely to constrain economic recovery.

In addition to the destruction of the housing stock, this may reasonably be assumed to be one of the reasons that Ninewa has seen a relatively low reduction in IDPs compared to other governorates in recent months (-6% in Ninewa, -17% Anbar, -12% in Baghdad, UNHCR Flash Update March 2018).

Building Back Better
The conflict provides rare opportunities to build aspects of a city back better than before, as the destruction of assets reduces the relative costs of interventions, such as relocation compensations, or the opening of road surfaces. However, if no action is undertaken, recovery and reconstruction may close the opportunity to make use of these potentials. If not utilized now, initiatives to Build Back Better may become increasingly costly in the future, including:

- The introduction of improved services infrastructure in the Old City due to the completion of damaged roads, and the re-establishment of private basic facilities such as for waste (sewage tanks), electricity (generators) and water (water tanks).

- The development of mixed-use areas in well-located industrial sites, due to the return of manufacturing and industrial facilities.

- The implementation of regionally significant infrastructure projects due to consolidation of informal settlements on reserves.

STRATEGIC PROJECTS

The list below offers a selection of funding opportunities for strategic projects. Individually, these projects can substantially contribute towards the recovery of the Old City. Arguably more importantly, the selection of these projects is based on their ability to have a larger overarching impact on a resilient long-term reconstruction.

1 - PROVIDE NEW RESIDENTIAL INVESTMENT PROJECTS

2 - UPGRADE INFORMAL SETTLEMENTS

3 - REBUILD AGRICULTURAL INDUSTRY FACILITIES

4 - REHABILITATE MARKETS

5 - DEVELOP MOSUL NEW INTERNATIONAL AIRPORT

6 - RECONSTRUCT THE MINISTRY OF WATER RESOURCES BUILDING

7 - RECONSTRUCT THE MINISTRY OF AGRICULTURE BUILDING

8 - DEVELOP THE INFRASTRUCTURE FOR NEW INDUSTRY AREA

9 - COMPLETE THE MOSUL RING ROAD

10 - RECONSTRUCT BRIDGES OVER THE TIGRIS RIVER

11 - REHABILITATE KEY FACILITIES AT AL-SHIFA HOSPITAL

12 - REDEVELOP BUS STATIONS AND BUSES

13 - INITIATE THE REDEVELOPMENT OF MOSUL RAILWAY STATION

14 - INTRODUCE NEW SEWERAGE TREATMENT STATIONS

15 - CREATE SOLID WASTE RECYCLING PLANTS

16 - ESTABLISH A LARGE PUBLIC PARK IN WEST MOSUL

FIGURE 1. The built-up area of greater Mosul
(UNOSAT/ UN-Habitat, 2018)

FIGURE 2. Impression of a camp in Mosul district
The camp is situated around 45 minutes from Mosul. Such a distance is difficult to bridge for many of the IDPs, aggravating the disconnection of the people from their place of origin (UN-Habitat, Jan Willem Petersen, October 2018)

SHORT TERM OBJECTIVE (1-2 YEARS)

1 FACILITATE THE SUSTAINABLE RETURN OF AFFECTED CITIZENS WHOSE HOUSES HAVE BEEN DESTROYED

A significant number of residents of Mosul District are not yet ready to return to the city. This includes approximately 15,000 families currently residing in camps, approximately 90% of whom are currently in camps in Ninewa Governorate (Camp Coordination and Camp Management Cluster, CCCM Cluster , July 2018). For this population group, the most cited obstacle to returning is the damage to their houses.

Even though international organisations should continue to provide shelter assistance to vulnerable housholds for small repairs, the data below suggests that addressing completely destroyed houses is critical to facilitate the return of in- and out-of-camp population to their area of origin. Upon inquiry about the status of their house, more than 50% of interviewees reported that their houses were completely destroyed (CCCM, Intention Survey, August 2018).

This means that a concerted effort by international organisations and local government is needed to facilitate large repairs for properties in Mosul and its surrounding villages, e.g. Batnaya, Telkef, in order to enable the return of citizens whose houses have been destroyed.

Destroyed	8,005	54%
Heavily damaged	2,213	15%
Partially damaged	1,986	13%
Other	2,652	18%

TABLE 3. Status of house as reported by families in camps
As may be expected, figures indicate that interviewees do not reliably distinguish between heavily damaged and destroyed houses, or may have an incentive to report higher damages. However, the number does indicate that severely damaged houses not normally covered by humanitarian actors are a severe obstacle to return (Combined analysis of CCCM Intention Survey August 2018 and Camp Population July 2018).

Priority Action(s)

» International organisations to also address the repair of Category 3 severely damaged houses

» Assist returnees without a home by supporting landlords to rehabilitate additional living spaces and expand the rental market

Possible Actor(s)

International Organisations, Ministry of Construction, Housing, Municipalities and Public Works (MOCHMPW)

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Possible Implementation/ Funding Options

» Release loans for core housing units and large repairs through various channels

» Establish housing sites for temporary residence of returnees that can be re-used as affordable housing once they have rebuilt and resettled in their homes

Indicator

of housing units rehabilitated or established for returnees

Governorate	Families	Percentage
Ninewa	13,175	89%
Erbil	1,107	7%
Dohuk	478	3%
Other governorates	97	1%
Total	14,856	100%

TABLE 4. Families from Mosul in formal camps - indicative (Combined analysis of CCCM, Intention Survey August 2018 and Camp Population July 2018)

Camp name	Estimation families from Mosul
Qayyarah Jad'ah	3,550
Qayyarah Airstrip	1,997
Al Salamyiah	596
Hamam Al Alil 2	1,901
Hamam Al Alil 1	2,011
Haj Ali	839
Khazer M1	794
Hasansham U3	673
Hasansham U2	731
Al Salamyiah Nimrud	83

TABLE 5. Estimation of families from Mosul residing in formal camps and locations in vicinity of Mosul (Combined analysis of CCCM Intention Survey August 2018, Camp Flow Analysis and Camp Population July 2018)

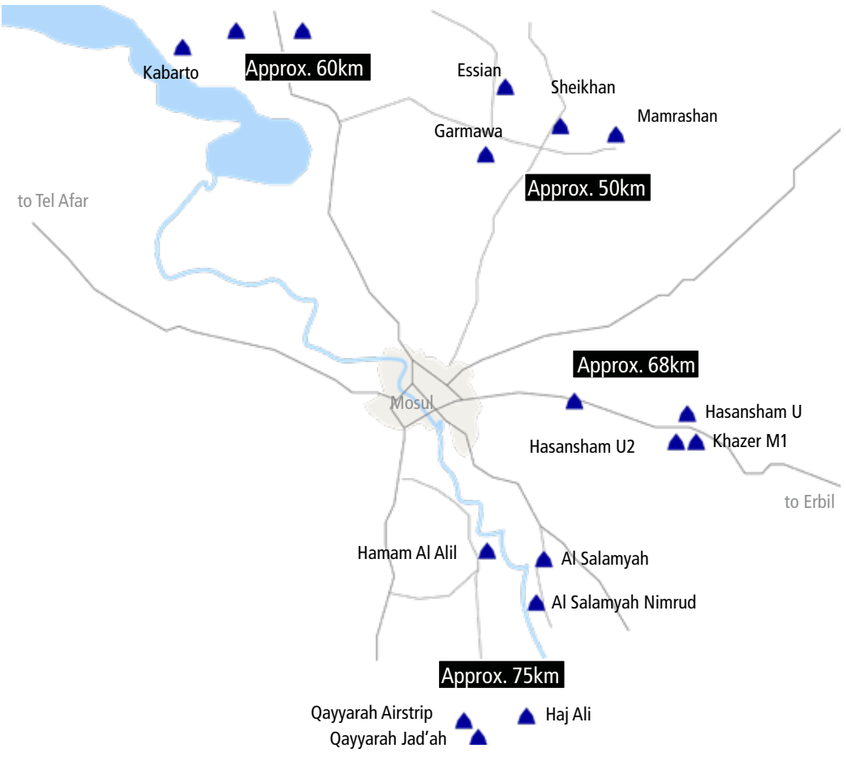
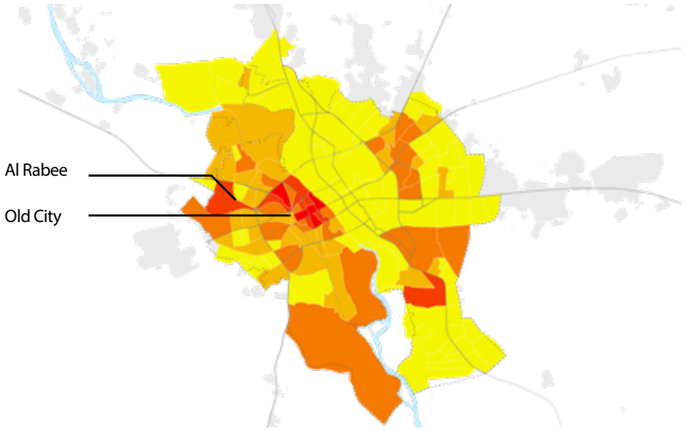


FIGURE 6. Location of camps around Mosul
(UN-Habitat/ CCCM)

FACILITATE THE SUSTAINABLE RETURN OF IDPS HOUSING REHABILITATION ACTIVITIES

Currently, the main actors for housing rehabilitation in Mosul are UNDP, UN-Habitat, UNHCR, Human Appeal, and Norwegian Refugee Council (NRC). Many agencies cover damage categories 1 (minor) and 2 (major) and in exceptional cases 3 (severe) to rehabilitate houses to the minimum repair standard. Repair costs vary but go up to 5,000 dollars. The data below suggests that the housing rehabilitation activities largely match the severity of damage in the city. However, some significant gaps remain:

- Severely damaged/destroyed buildings are in many cases not covered by housing rehabilitation programmes
- Residential dwellings above shops, of which the top floor is often damaged should be considered for repair as it facilitates the return of shopkeepers.
- Coordination in the Old City remains difficult, and using the super block approach described in the Old City chapter is recommended.



Neighborhoods	Sector	Side	Damaged Structures
Khazraj	Old City	West	1,533
Summer	Al Salam	East	1,395
Al Rafidain	Al Rabee	West	1,384
Al Maidan	Old City	West	1,293
Ibn Alather	Al Rabee	West	1,251
Abi Tamam	Al Rabee	West	1,051
Al Mansuriya	Old City	West	1,012
Al Nabi Jarjes	Old City	West	944
Al Abasia	Old City	West	941
Al Shifaa	Al Rabee	West	894

TABLE 7. Top 20 damaged structures per neighborhood
Overview is based on consolidation of satellite damage assessments (UNOSAT/ UN-Habitat/ Ministry of Planning)

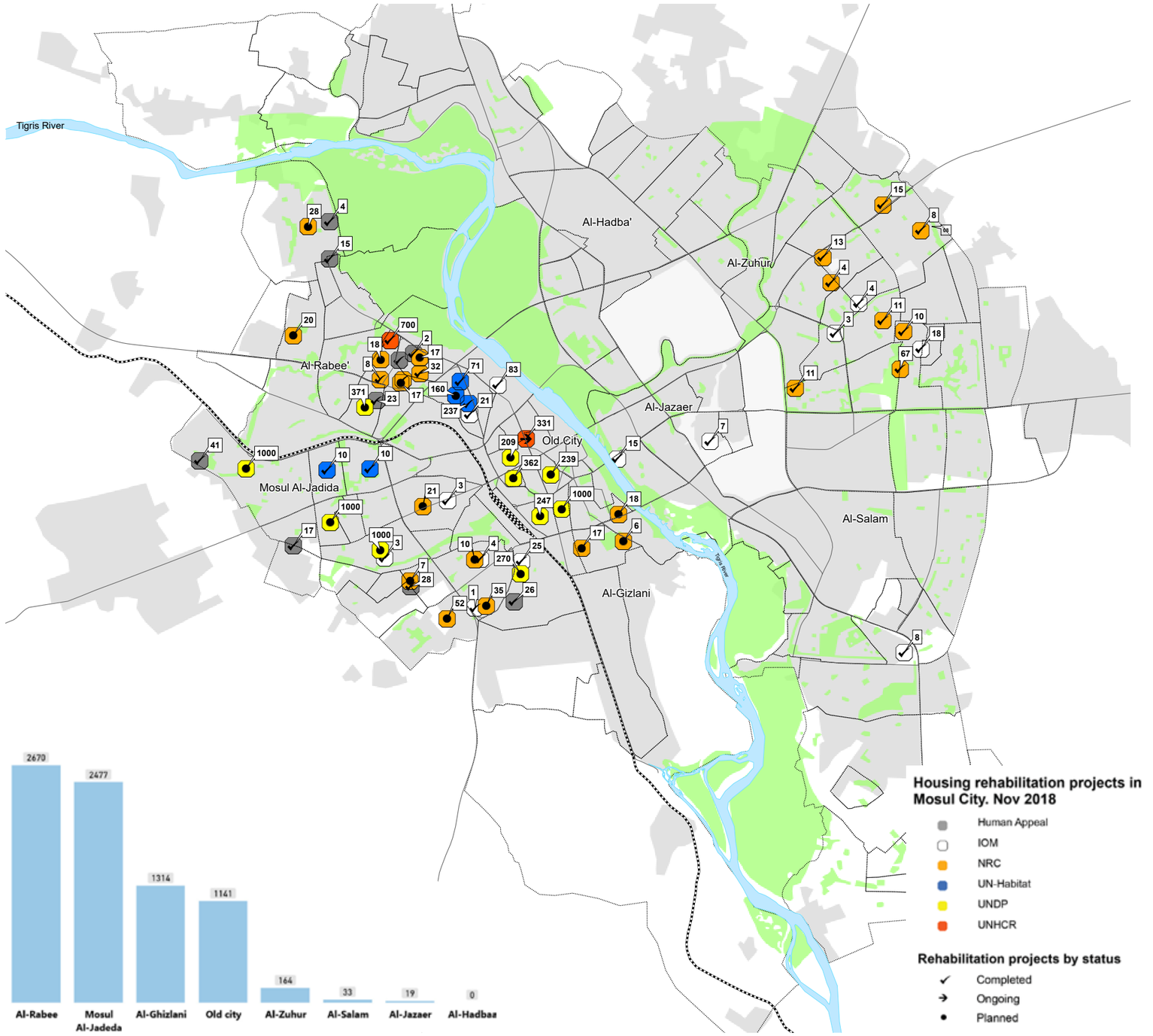


FIGURE 8. Ongoing, planned and completed rehabilitated houses
This includes housing units per municipality that are currently being addressed. They belong mostly to category 1 or 2 (Based on housing rehabilitation data base managed by UN-Habitat/ Shelter Cluster)

FACILITATE THE SUSTAINABLE RETURN OF IDPS

The following 3 approaches are suggested to facilitate and expedite the return of IDPs who have suffered severely damaged houses, to a suitable place of residence. These approaches address both owners and tenants;

Introduce core-housing and repair for destroyed houses

Housing Fund
MOCHMPW should release at least 5,000 loans to citizens whose houses have been totally destroyed through MOCHPW's Iraqi Housing Fund, as per the announcement made on 29 October 2018. As stipulated by the Cabinet's decision on 18 February 2018, it can provide credit to individuals for building or rehabilitating housing units damaged by terrorist and military operations.

The Iraqi Housing Fund is ready to disburse 15-year loans of IQD 30 million, with monthly instalments of IQD 175,000 for the construction of core-housing units of a minimum of 65m2. Loan costs are being recovered through a Sharia-compliant fee of 2%, covered by the Government of Iraq, possibly with the assistance of international financial institutions/ multilateral development banks.

Central Bank Initiative Loan
A parallel housing finance scheme that was recently launched is the "Central Bank Initiative Loan" that offers 10-year loan of IQD 50 million with monthly instalments of IQD 475,000 at 2% interest.

House units	Cost per house	Estimated requirement
5,000	22.5 million IQD ~ 19.000 USD	112.5 billion IQD ~ 103 million USD

TABLE 9. Estimated requirement for 5,000 houses
For more background information, see: Housing Reconstruction and Housing Sector Development Strategy in cities hit by Terrorism and War (UN-Habitat, July 2018).

Type	Cost	Units	Requirement
Cash for Repair	2,400k IQD	1,000	2.4 billion IQD
Cash for rent	1,200k IQD	1,000	1.2 billion IQD
Total			3.6 billion IQD

TABLE 10. Estimated requirement for rental support to reach 10,000 individuals (UN-Habitat, November 2018)

Support IDPs with entering the rental market
Of the in-camp population originating from Mosul, about 10,000 individuals indicated they had previously rented a house or apartment prior to the crisis (Intention survey January 2018, CCCM). Furthermore, a significant number of residents who fled West Mosul did not go to camps but sought refuge in East Mosul.

Displaced households within the same district are not recorded as such by Ministry of Displacement and Migration (MODM) or humanitarian agencies, yet should be considered displaced to all intents and purposes. Because of increased demand of already scarce housing, rental prices in East Mosul have increased and are still rising.

The monitoring of new arrivals between January and April 2018 (CCCM) suggested that 50% of new arrivals of approximately 3,400 families were displaced because of financial/economic reasons, for example the lack of jobs or money to pay rent. Around 5%, approximately 340 families indicated that they had been evicted by their landlords. Between March and April 2018, over half of camp registrations in Mosul were secondary displacements. To support IDPs return and reduce secondary displacements, the rental market can be addressed through two main strategies:

A) Expanding the rental market
The following action is suggested to expand rental options:

1. Disburse Conditional Cash-for-Repair vouchers of 2,400k IQD to be paid in conditional instalments to property owners with damaged houses or parts thereof, who sign a 12-month rent-free contract with a homeless tenant – including relatives, also known as a "hosting arrangement". Owners living elsewhere can also apply for the Cash-for-Repair assistance, provided they sign a 12-month rent-free contract. Local authorities are to encourage rental of parts of owner-occupied houses to supplement income for landlords.

2. To assist vulnerable families to access the rental market, and to assist them with their return, Cash-for-Rent Vouchers of 200k IQD could be distributed, for example for 6 months. This would be available to vulnerable households originating from Mosul provided they can prove they do not own property in Iraq.

Both strategies, could be initiated by the Government of Iraq by establishing a Fund for Rental Housing Assistance through MOCHMPW, and be supported by multilateral agencies and donors wishing to support the return of IDPs through the housing sector.

B) Revolving low-cost/ affordable housing
There are more than 5,500 families originating from Mosul District currently living in camps more than 75km from the city. Families face a daily commute of more than 3 hours to reach the city, posing a time and cost burden on already vulnerable households. The temporary location of families to sites closer to their area of origin facilitates the rebuilding of livelihoods.

Such a scheme could be implemented by developing low-cost housing in which returnees can live. This would allow returnees and home owners to save money to rebuild their properties or find a job. It would enable them to rebuild their homes while in Mosul, rather than separated from their families by an hour's journey.

After their initial function as temporary accommodation, the complex could be turned into affordable housing for eligible low-income households. The concept of revolving temporary housing in core-housing housing units has been piloted by UN-Habitat in Anbar, and the construction of low-cost units scheme is currently being developed by UN-Habitat in Bab Sinjar, adjacent to the Old City. Considering the value of serviced urban land, higher density housing schemes are preferable over single housing units.

FIGURE 11. Pilot affordable housing scheme for returnees
Supported by MOCHPW, UN-Habitat is constructing low-cost housing unit sites, which can accommodate vulnerable returnees. Google Earth

FIGURE 12. Mosul faces a large housing deficit that predates ISIL's occupation, resulting in unregulated city expansion
(UN-Habitat, Jan Willem Petersen, October 2018)

MEDIUM TERM OBJECTIVE (2-5 YEARS)

2 ADDRESS STRUCTURAL ISSUES IN THE HOUSING SECTOR THAT PREDATE ISIL'S TAKEOVER

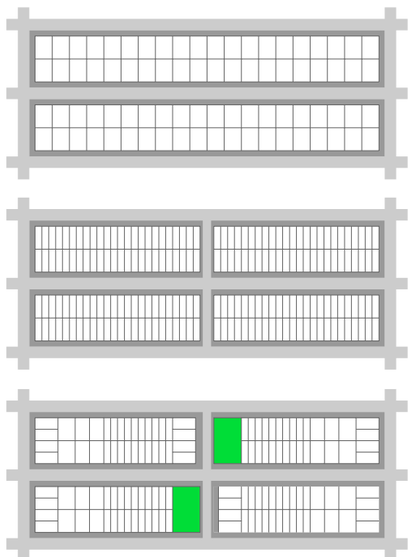
Reconstruction of residential properties will help to address housing needs. However, many of the problems that Mosul's residents and local authorities currently face predate ISIL's occupation. To facilitate the sustainable return of vulnerable IDPs in the medium term, it is vital to address the housing sector problems in a holistic manner. Pre-existing issues included a significant shortage of affordable housing options, structural problems in the housing sector, a lack of land readily available for residential purposes, difficulties in implementing new extension areas inhibited by an obsolete Masterplan, and the long standing practice in Iraq of developing low-density residential areas.

MOCHMPW has already estimated a sizeable housing deficit of 53,000 housing units at city scale before the crisis. As stated in the Iraqi Housing Policy, housing institutions need to embrace a paradigm shift from housing delivery to becoming enabler and facilitator for the housing sector. A new synergy between government as long-term enabler, the international community as short-term assistance, and market for private investment is needed to meet existing and expected demand in terms of quantity, costs and product diversity. There are more than four pathways for housing construction in Mosul, including:
- housing cooperatives
- private construction and individual families
- private-sector investors, some of which pass through the investment board
- government entities, for example MOCHMPW and other Ministries providing housing for their employees

New mixed-size planned subdivisions
Plan new subdivisions on vacant municipal land with the new plot size while dissuading people from seeking to buy non-residential land for housing and enforcing control of construction activities in informal settlements. A concerted effort should be made to distribute these lands to the most vulnerable people.

Priority Action(s)	Possible Actor(s)
» Plan new subdivisions on vacant municipal land for greenfield development and address the increasing development of illegal subdivision of agricultural land	Governorate, Municipalities
» Restart private sector residential projects, supported by the Investment Board, whose construction was interrupted during ISIL	Investment Board
» Enable the construction of apartment blocks to increase the density of new residential areas. Encourage long-term occupants of municipal plots to request their formal transfer of property to the de-facto owner	Governorate, Municipalities

Possible Implementation/ Funding Options	Indicator
» MOCHPW to issue a National Decree that allows for a greater variety of plot sizes – from 120 to 200 m2 – and land uses throughout the city. A wider range of plot sizes matches real demand and accommodates greater flexibility in the regularisation of informal settlements	# of residential plots realized according to minimum planning standard # of housing units built through the MOCHMPW that are occupied within 6 months of their release on the market



Option A: Large plots only
80 plots of 300m2
21 dwelling units/ha
168 people/ha (family size:8)

Option B: Affordable plots only
192 plots of 120m2
50 dwelling units/ha
400 people/ha (family size:8)

Option C: Mixed Plots
80 plots of 120m2 (45%)
16 plots of 200m2 (15%)
16 plots of 250m2 (18%)
8 plots 300m2 (11%)
2 neighborhood plot of 960 m2 (9%)
120 plots in total
31 dwelling units/ha
148 people/ha (family size:8)

FIGURE 13. Proposed layout of vacant land plot subdivisions

Restart of private sector residential projects
Consider the reviving of private sector projects implemented through enticement of foreign investors through the Investment Board or the National Investment Commission, whose construction was interrupted during ISIL. Such projects include the following: Eye of Mosul Project (16,200 housing units), Besan housing complex (4,5 ha), Khazna Tebe housing complex (6.5 ha), Kokjely housing complex (11.5 ha).

FIGURE 14. Example of a private sector project before the crisis ('Eye of Mosul', ldavies.com)

FIGURE 15. After the conflict a huge increase in unregulated developments occurred
Informal settlements have been constructed outside the municipal boundaries north of Mosul (UN-Habitat, Jan Willem Petersen, August 2018).

MEDIUM TERM OBJECTIVE (2-5 YEARS)

3 CONTROL THE INFORMAL EXPANSION OF THE CITY

While the 1974 Masterplan of Mosul expired in 2000, the city and its population did not stop growing. Most growth of built-up areas occurred in villages around Mosul, which until 2000 were non-existent or very small. If we look at all the land within a 7km zone of Mosul in 2002, the built-up area of Mosul was around 144 km2, growing at a rate of approximately 50% to an area of 212 km2 in 2014. In this context, the following is worth noting:

The 2004 'draft Masterplan', which was not implemented, proposed an additional 142km2 of residential area. By 2014, almost 67km2 of additional residential area had been realised within the 7km2 Masterplan extension area and 16km2 of residential areas had been claimed for residential development. That means that almost 60% of the additional residential area proposed in 2014 Masterplan has now been realised. However, this growth occurred without any guiding plan, which is most evident in the fact that most of the growth occurred in East Mosul, while the unimplemented Masterplan proposed city growth areas in West Mosul.

Another trend is that the population density of Mosul,including surrounding villages, remained more or less static at 67 people/ hectare. Given these numbers, it is likely that the city's population growth was accommodated in two ways:
- Some of the existing urban areas densified. More people would live in the same area, for example by subdividing existing plots, or multiple families would occupy the same house.
- The rest of the growth was accommodated in informal settlements, at a lower density than in the existing urban fabric.

One of the most crucial challenges of the present administration lies in how to deal with this unplanned growth now, and in the future. Nationally, recent figures drawn from the informal settlements survey conducted by the Directorate of Poverty Reduction in the Ministry of Planning (MOP), suggest that more than 3.3 million people live in informal settlements in Iraq - excluding conflict-affected governorates and Kurdistan Region of Iraq (KRI). Iraqi authorities are ill-prepared to address this relatively recent phenomenon and have essentially turned a blind eye for lack of alternatives, weak enforcement capacity and electoral logic. More stringent building controls will not be sufficient. This trend can only be restrained by adopting a holistic approach towards the provision of affordable housing, land and formalisations.

Priority Action(s)	Possible Actor(s)
» Upgrade and formalise informal settlements on areas earmarked on the Masterplan as residential purposes within and outside the city boundary of around 40,000 plots	MOCHMPW, Local government, Ministry of Justice (MoJ), Ministry of Agriculture (MoA)
» Start to negotiate urban extension areas outside the city boundary for future urban growth and land-readjustment that includes the densest informal settlements	Local government

Possible Implementation/ Funding Options	Indicator
» The municipality can "lease" land to people who live in informal settlements on municipal land, until the municipality recuperates the 'urbanisation costs' for upgrading the settlements, according to the new law being developed	# of HA of informal settlements formalized
» Re-classify the North Mosul Area as "Residential Investment Area" through the Investment Board, in collaboration with the MOCHMPW and Ministry of Agriculture, making it legal to develop residential buildings and allow for compulsory contributions of land towards the realisation of roads, public services and amenities	

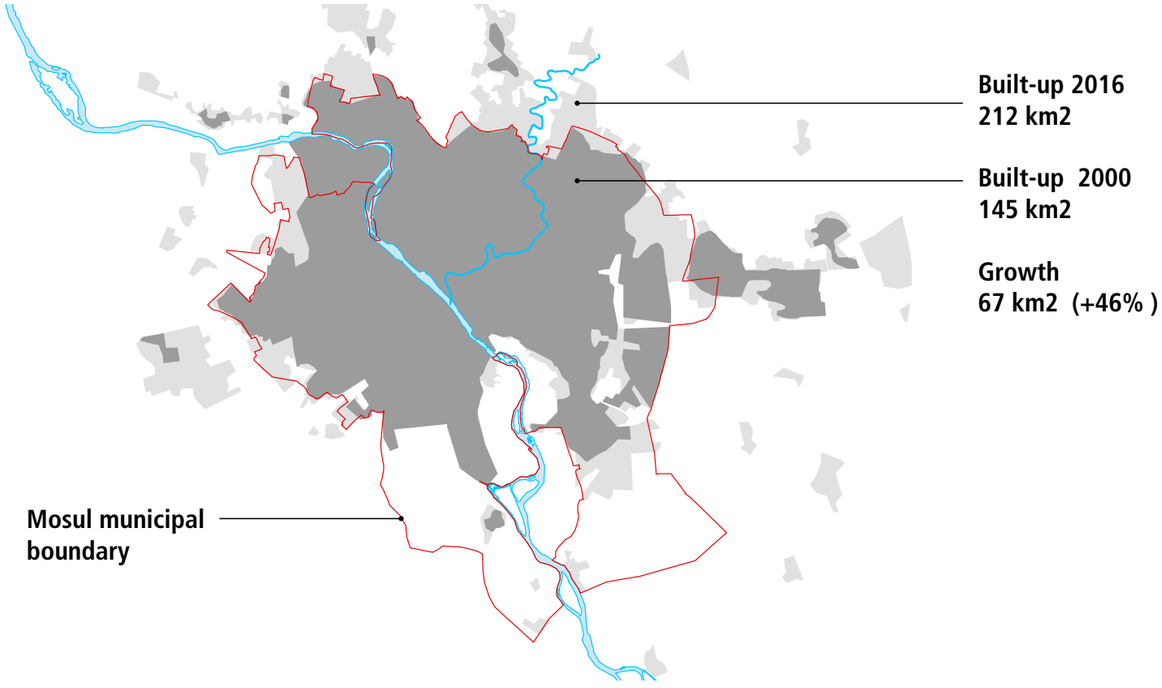


FIGURE 16. Growth of built-up area of Mosul between 2000-2016
(UN-Habitat)

CONTROL THE CITY EXPANSION
INTEGRATE INFORMAL SETTLEMENTS

An initial review of available imagery and data suggests that informal settlements are mainly located on the following sites:

On agricultural land outside the city boundary
In some cases, these areas used to be villages that have been incorporated into the city. In other cases, they are part of speculative schemes of land-owners who wish to realise a higher value for their land by converting it to residential land. Such areas have grown significantly over the past year by over 9%.

In residential areas
Unauthorised subdivision and construction on government-owned land, but without the owner being able to present valid building permissions or without owning the legal title to the land. This number has not grown significantly within the city boundary, probably because most official residential land is already developed.

In slum-like areas
Settlements, both inside and outside villages that have been developed without a regular street pattern, and do not comply to service-level requirements mandated by law, e.g. number of schools, roads, public space. Such settlements have grown organically. Buildings are often temporary in nature and poorly constructed.

On private land
Construction on private land that violates the land use classification prescribed by the masterplan, (land-use transgressions) or encroachment upon dilapidated industrial land.

On excavation sites
Construction on historic sites, such as the settlements developed on the Nineveh excavations site. Approximately 700 dwellings have already been built on historic sites within Mosul, although the number has not grown significantly between 2017-2018.

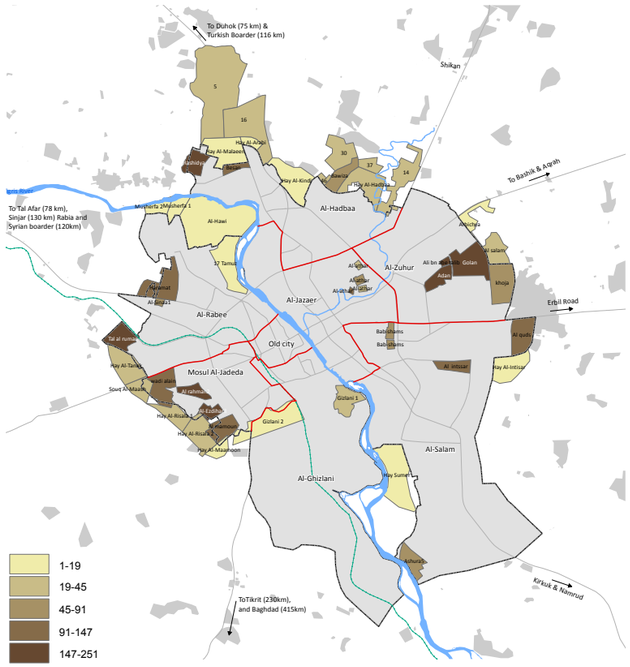


FIGURE 17. Population density informal settlements - people/HA (Urban Planning Directorate/ UN-Habitat)

Type	Feb 2017	Aug 2018	Growth
On agricultural land or green space	9,533	10,401	9%
On heritage sites	668	672	1%
Around existing village areas	1,420	1,547	9%
Other (e.g. on residential land)	24,346	24,935	2%
Grand Total	35,967	37,555	4%

TABLE 18. Informal developments in and around Mosul from official municipality maps and rapid satellite assessments (Urban Planning Directorate/ UN-Habitat)

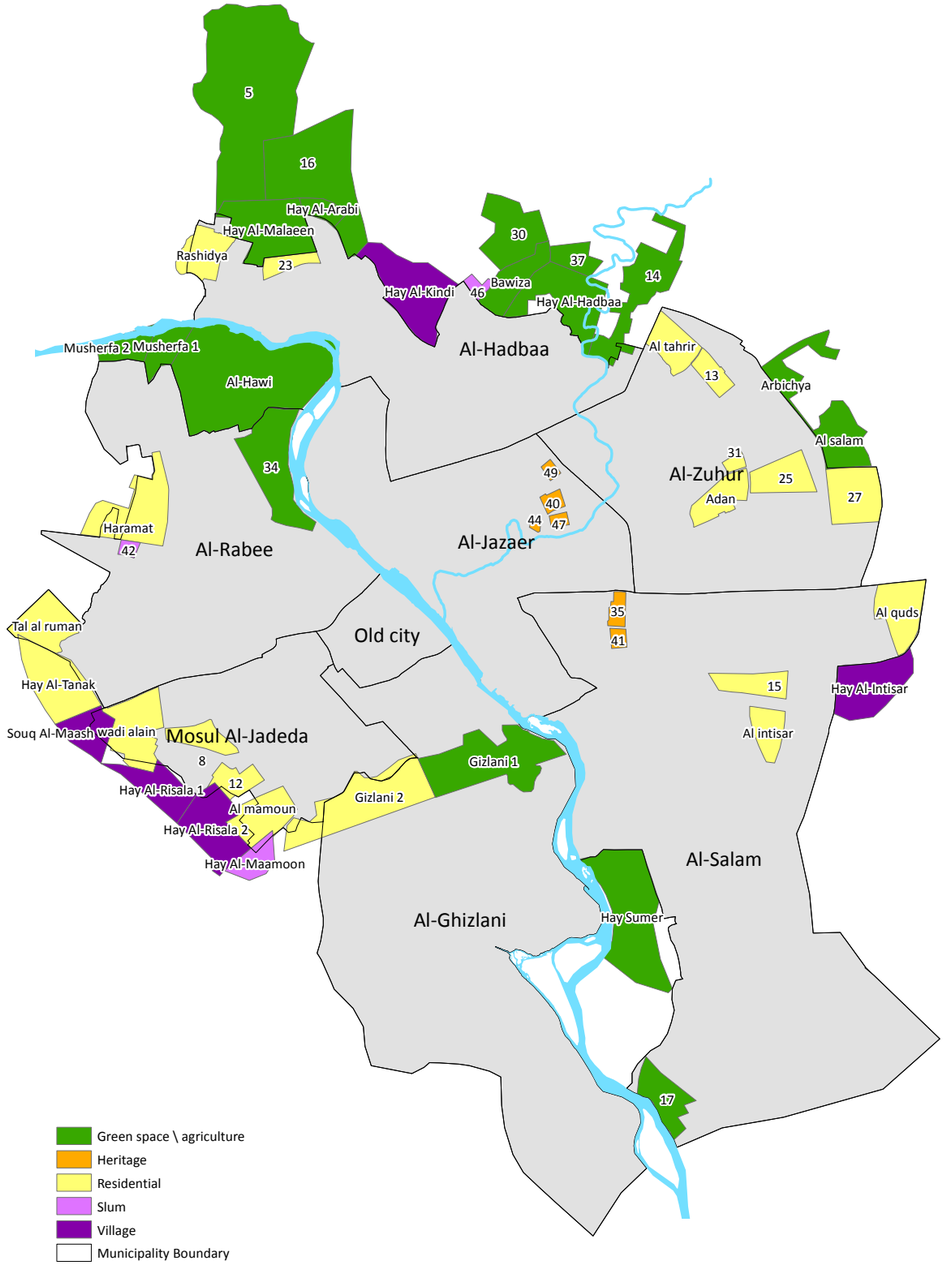


FIGURE 19. Initial classification of informal settlements (Urban Planning Directorate/ UN-Habitat)

A "one size fits all" strategy to regularise all existing settlements across Mosul would be unfeasible. This is due to a variety of ownership arrangements which have far reaching legal implications. For example, informal settlements that de-facto function as a part of the existing city, with a regular street grid, sufficient public functions, but where some owners having no legal title will be much easier to formalise than a settlement that is located on a road reserve, excavation site or flooding area, where a settlement may not be safe for its future residents. For this reason, we propose the following tools to inform the selection of eligible sites, sites ineligible for upgrading, and the most feasible sequencing of implementation of formalisation:

1. Services evaluation
The initial evaluation determines the settlements that would need to be prioritised. Areas with significant amount of 'brown' evaluations, may be more difficult for regularisation at this time, and should not be prioritised.

2. Intervention matrix
Defines exclusion scenarios for regularisation as well as intervention tools.

3. Improving settlements using an "upgrading ladder"
The top (in dark green) represents the end objective of all stakeholders, independently from the starting point of settlements currently located further down the ladder (in lighter green, yellow or orange). The most difficult situations will have to be dealt with separately and may have to be deprioritized (in red). Upward moves on the ladder will require varying investments in surveying, negotiation, planning, upgrading, relocation, land recording and regularization. Stakeholders will have to work jointly to solve each planning, regularization and physical upgrading challenge in an incremental way until the settlement can reach the upper level.

The end objective is a settlement where people reside on a private plot, hold a legal title (or acceptable equivalent), and where zoning allocations are satisfactory, conforming to land use regulations and with an acceptable spatial layout and planning standards.

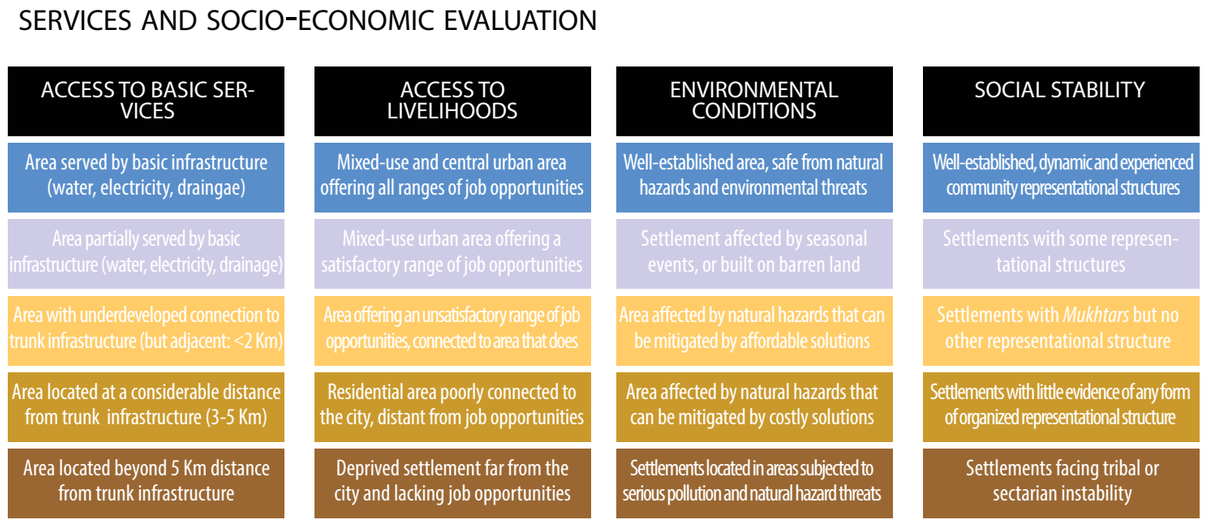


FIGURE 20. Services evaluation for informal settlements, according to which settlements can be evaluated
(UN-Habitat)

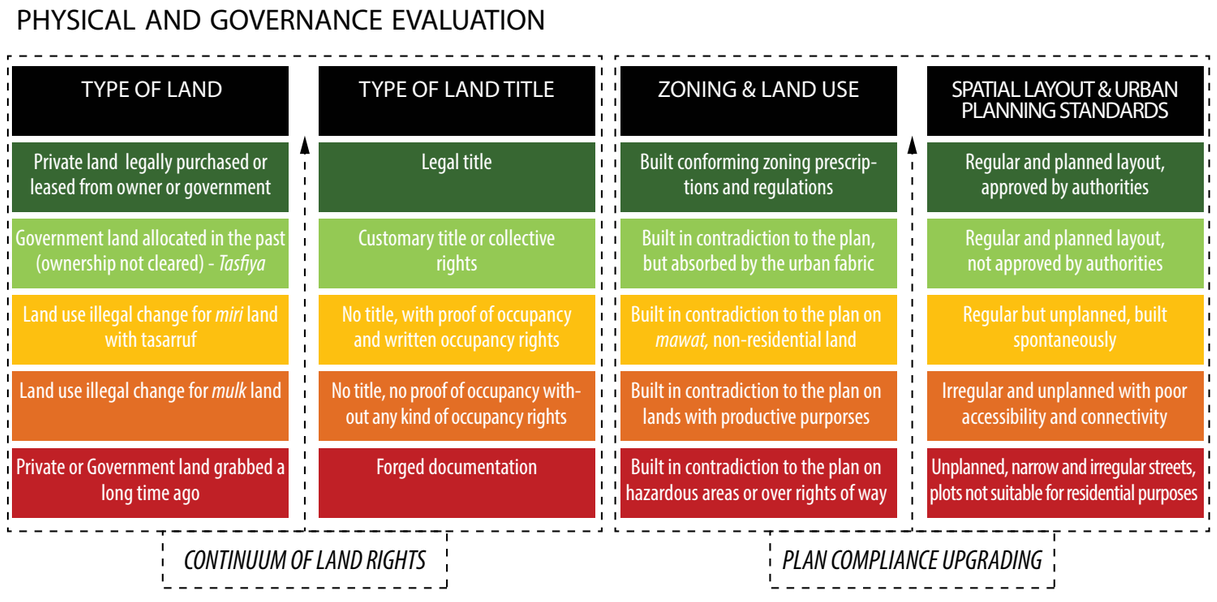
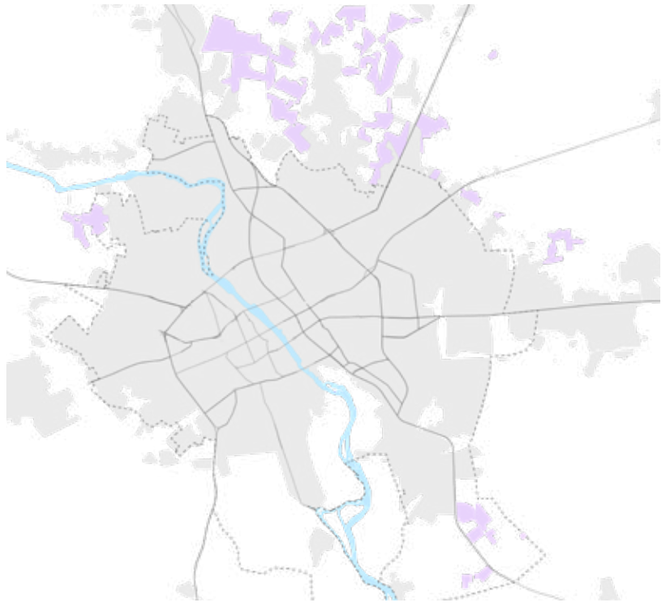


FIGURE 21. "Upgrading ladder" that defines the goals for upgrading according to different thematic areas
(UN-Habitat)

Illegal subdivisions on agricultural land

Approximately 17,550 houses would be needed to address one-third of the pre-crisis housing deficit of Mosul. Arguably, it is the private sector that is the main provider of housing today. Regrettably, much of the most recent housing is considered illegal because it is built on vacant or agricultural land without permission from the local authorities. As these settlements are officially not allowed to be connected to the municipal utility network, residents have taken matters in their own hand by tapping illegally into the trunk infrastructure or extending existing networks. Despite such individual endeavours many of the areas have no to very little access to basic services or facilities, such as schools.

In North of Mosul, there are thousands of illegal subdivisions laid out on agricultural land by real estate developers. They set up "cooperatives" by buying land from farmers, exploiting legal loopholes and acquired Tasarruf land, formerly owned by MOA for agricultural purposes, taking advantage of the lack of law enforcement. More than 1,620 h of unregulated subdivisions have been made since 2004, which is about 8 times the size of the Old City. Although these are considered illegal, they do answer a real demand for new expansion areas. A process for regularisation should be considered. If no action is taken, Mosul will continue on a pathway to a two-tier city, where a quarter of the city's population live in unregulated and badly serviced areas.



RATIONAL	LOCATION OF INFORMAL SETTLEMENT	LEGAL INSTRUMENTS FOR LAND REGULARIZATION OR PREVENTION		PLANNING TOOLS AND UPGRADING MEASURES FOR URBAN INTEGRATION OR PROTECTION			
				Areas to be upgraded and integrated in the city		Areas to be safeguarded and protected from encroachment	
		Areas located within the city boundaries	Areas located outside the city boundaries	URBAN PLANNING TOOLS	URBAN UPGRADING MEASURES	PROTECTION PLANNING TOOLS	PROTECTION MEASURES
High risk for people's health and/or life threatening	**Hazardous area** (e.g. vulnerable to flooding)	▪ **Enforce building ban** unless flood defence measures are in place ▪ **Offer incentives for the gradual relocation** of households on safer grounds (minimum plot and/or housing finance)	*No regularisation or servicing allowed within affected area* *Apply evironmental planning legislation* *Encourage households to relocate on safer grounds through public outreach and incentives*	▪ **Adopt strategic, holistic and long-term approach** that includes a mix of 'hard' and 'soft' measures: - flood defence measures, - mitigation of flood risk, and - adaptation strategies that increase resilience to flooding events ▪ **Improve urban storm water and flood risk management:** - Drain water in a natural way - Making "space" for water - Retain water for irrigation of gardens, recharging aquifers, flush toilets etc	Available options: ▪ **Gabion walls** for flood defence ▪ **Reforestation upstream** ▪ **Floodways** (channels for diverting floodwater to an alternative flood area) for risk mitigation ▪ **Water storage areas** (including attenuation and infiltration systems) for adaptation and to increase resilience ▪ **Encourage people to improve / wetproof their homes' and businesses'** design and materials to increase domestic resilience ▪ **Introduce permeable paving and sidewalks and gardens** to limit storm water runoff	▪ **Improve environmental planning legislation** ▪ **Create '*Flood Protection Areas*'** to increase the environmental resilience of the entire city ▪ **Ban new developments** within the *Flood Protection Areas* and any Environmental Buffer Zones ▪ **Reduce urban sprawl** over agricultural land and natural wetlands	Available options: ▪ **Protect wetlands that act as "sponges"** ▪ **Reforestation of upstream areas** to slow down waters when rivers overflow and land erosion ▪ **Protect natural flood plains / introduce water storage areas** to improve entire ecosystem
	Contaminated and polluted area (e.g. landfill sites, heavy industry, mineral extraction, quarrying, petrochemicals etc)	▪ **Apply existing environmental and health legislation** ▪ **Enforce building ban** unless polluting source and soil is removed ▪ **Incentives for the gradual relocation** of households on safer grounds (minimum plot and/or housing finance)		▪ **Plan alternative site(s) for polluting activities located in urban areas** ▪ **Conduct Environmental Impact Assessment (EIA)** ▪ **Designate the area as a '*Brownfield Redevelopment Zone*'** for affordable housing and/or light industry expansion to prevent urban sprawl	▪ **Entrepreneurs to relocate polluting activities elsewhere** ▪ **Removal of contaminants and top soil removal, water remediation** as per EIA recommendations ▪ **Implementation of 'Site & Services' scheme**	▪ **Dra action plan** to reduce pollution and environmental risks ▪ **Define boundaries of required buffer zone** around polluting industries as per EIA recommendation ▪ **Identify suitable landfill sites** for the proper disposal of toxic substances and hazardous waste	▪ **Introduce recreational parks or barriers** for sound abatement in noise polluted areas and/or to absorb air pollution ▪ **Greening** with selected plant types that absorb pollution ▪ **Prevent any contamina on of nearby water bodies and aquifers**
Obstruc ng projects and/or damaging areas of regional or na onal interest	**Railway reserve** (2-way rail) **Planned ring road** (to be reviewed under future Master plan) **Road reserve** of key regional roads, new by-passes **Electric power lines or pipelines** **Fly path** to the airport **Irrigation canals** (e.g. Al Jazeera project)	*Regularisation or servicing or evictions not permitted unless alternatives are available*		*Only to be undertaken if Master Plan is changed and the areas in question are earmarked for urban development:* ▪ **Develop *Detailed Community Action Plan* for each area that include realistic options to incrementally improve urban standards with the least destruction of housing**, including: - Land and/or plot readjustment - Plot readjustment	▪ **Upgrading subject to compliance to regional or na onal plans for infrastructures** ▪ **Implementation of *Detailed Community Action Plan*** through: - Land readjustment (or "on site relocation" with a ceiling of max 5% relocations) - Plot readjustment (no relocation) - In situ services and tenure security	▪ **Hold stakeholder dialogue** with the affected community (home or vacant plot owners) to avoid conflict and infringements of rights ▪ **Identify boundaries of *infrastructure buffer zone*** ▪ **Joint drafting of a *Phased Relocation Action Plan*** that introduces negotiated measures to avoid forced eviction (including adequate and reasonable notice, info on options and alternative low-cost housing or resettlement sites within the city boundaries ▪ **Protect area** from further encroachment	▪ **Implement the *Phased Relocation Plan* through a single administrative body** to avoid confusion ▪ **Prepare appropriate resettlement sites** on land earmarked for affordable housing ▪ **Support phased resettlement** through incentives and housing finance ▪ **Immediate fencing of the vacated areas** to avoid new occupations

Areas with illegal subdivisions	1,620 ha
Density 21 dwelling unit/ha	34,020 dwelling units
Familiy size 5 persons/dwelling unit	170,100 inhabitants

TABLE 22. Map and overview of the extent of illegal subdivisions on agricultural land around Mosul (UN-Habitat)

TABLE 23. Above and right: Available/ recommended legal, planning and upgrading instruments and measures (UN-Habitat)

RATIONAL	LOCATION OF INFORMAL SETTLEMENT	LEGAL INSTRUMENTS FOR LAND REGULARIZATION OR PREVENTION		PLANNING TOOLS AND UPGRADING MEASURES FOR URBAN INTEGRATION OR PROTECTION			
				Areas to be upgraded and integrated in the city		Areas to be safeguarded and protected from encroachment	
		Areas located **within** the city boundaries	Areas located **outside** the city boundaries	URBAN PLANNING TOOLS	URBAN UPGRADING MEASURES	PROTECTION PLANNING TOOLS	PROTECTION MEASURES
Damaging cultural heritage	**Archaeological site** (Nineveh)	***Regularisation or servicing not permitted in settlements established after 2014 (TBC)***		**Only applicable to older settlements** ▪ **Adopt planning measures that mitigate development impact on possible underground artefacts** (e.g. prohibit excavations for basements, underground parking, heavy traffic roads etc)	*Upgrading subjected to approval by SBAH and other authorities* ▪ **Limit the depth of underground cabling networks** so as not to affect artefacts ▪ **Limit passage of heavy vehicles by using traffic calming devices**	▪ **Establish clear boundaries of Nineveh Archaeological Site** ▪ **Ban all new buildings activities and planned infrastructure within the Nineveh Archaeological Zone**	▪ **Monitor closely through sites visits and satellite imagery** ▪ **Demolish new constructions as a demonstration act**
	Religious and historic sites (shrines, mosques, churches, monasteries)	▪ **Permitted only with the approval of land owner, urban planning and municipal authories and SBAH** ▪ **Expansion to be discouraged** and controlled	▪ **Permitted only with the approval of land owner, urban planning authorities and SBAH** ▪ **Expansion to be discouraged** and controlled	▪ **Enhance the relationship between urban fabric and heritage sites/buildings** (religious/cultural landmarks) ▪ Introduce pedestrianisation	*Upgrading subjected to approval by SBAH and other authorities* ▪ **Limit passage of heavy vehicles by using traffic calming devices**	▪ **Define buffer zones** where to enforce building ban	***Upgrading subjected to approval by SBAH and urban planning authorities (TBC)***
Encroaching on MOA land	**Illegal subdivisions of agricultural property of MOA** (*tasarruf*)	▪ Regularisation to be led by the Urban Planning Directorate, as a planned city extension	▪ Prioritise the drafting of City Extension Plans that incorporate these areas	▪ **Enforce land readjustment** scheme to rationalise plot distribution and introduce services and facilities ▪ **Reduce** plot size to 120-150m2 as a measure to contain **urban sprawl**	***Upgrading subjected to compliance to new urbanisation standards***	▪ **Define clear boundaries** beyond which enforce building ban	***Upgrading subjected to compliance to city extension plan***
Non-compliant to Master Plan zoning and/or land use prescri☒ons	**Land earmarked for public services** (schools, clinics, police, public administration)	▪ **Enforce building ban** to prevent any further building or housing expansions		▪ **Draft City Extension Plans** that incorporate these areas ▪ **Allocate alternative land** to compensate for loss of land for services in the same catchment area ▪ **Allow the relaxation of zoning restrictions** in favour of a 3-4 storey-high public facility building ▪ **Promote the construction of quick temporary buildings hosting services** and fence these plots, that can be upgraded later	*Upgrading subjected to approval by Municipality and Urban Planning Directorate*	▪ **Hold stakeholder dialogue** with the affected community to avoid conflict and infringements of rights; ▪ **Define clear boundaries** within which to enforce building freeze ▪ **Joint dra☒ing of a *Phased Relocation Action Plan*** that introduces negotiated measures to avoid forced eviction (including adequate and reasonable notice, info on options and alternative low-cost housing or resettlement sites <u>within</u> the city boundaries). ▪ **Protect area** from further encroachment	***<u>Upgrading not permitted</u>*** ▪ **Implement the *Phased Relocation Plan*** ▪ **Prepare appropriate resettlement sites** on land earmarked for affordable housing ▪ **Support phased resettlement** through incentives and housing finance ▪ **Immediate fencing of the vacated areas** to avoid new occupations
	Land earmarked for industry	▪ **Explore opportunities for change of land uses** where appropriate	▪ **Introduce buffer zones around industrial areas where to enforce building ban**	▪ **Plan for change of land use** ▪ **Conduct Environmental Impact Assessment (EIA)** ▪ **Decontaminate where required** ▪ **Designate the area as a '*Brownfield Redevelopment Zone*'** for affordable housing and/or light industry expansion to prevent urban sprawl	*Implement area upgrading subjected rules applicable to 'Brownfield Development'*		
	Land earmarked for greenery	▪ **Enforce Building ban**	▪ **Enforce building ban unless an alternative site is found**	▪ **Plan for change of land use** ▪ Save remaining pockets of green spaces	*Upgrading subjected to approval by Municipality and Urban Planning Directorate*		▪ **Support the creation of interconnected green spaces** for public amenities, parks and peri-urban farming land
	Land earmarked for farming	▪ **Request for transfer of land** from MOA to MOCHMPW ▪ **Implement new law on informal settlements to trigger lease agreements** ▪ **Explore the possibility to link urban farming with educa☒on** through *'School-to-Farm Programmes'*	▪ **Enforce building freeze** unless land not productive any more	▪ **Plan for change of land use** ▪ Protection of remaining cultivated areas for peri-urban agriculture	*Upgrading subjected to plot readjustment and building freeze* ▪ **Implement lease agreements with occupants** as per new law (not approved yet)		
Non-compliant to Iraqi urban planning standards	**Poor accessibility and mobility** (roads and streets)	▪ **Compensation for land readjustment**	▪ **Offer incentives for the gradual relocation** of households on better connected areas	▪ **Introduce land or plot readjustment in areas to amend irregular street pattern**	*Upgrading subjected to land or plot readjustment*	▪ **Relocation of households** in better connected areas	***Upgrading not permitted***
	Poor access to social services (schools, clinics, police, public administration etc)	▪ **Compensation for land readjustment**	▪ **Offer incentives for the gradual relocation** of households on areas closer to services	▪ **Land readjustment in areas characterized by exclusively residential purposes**	***Upgrading subjected to land readjustment***	▪ **Relocation of households** in better served areas	***Upgrading not permitted***
Usurpation of private property	**Occupation of private land without authorisation** / land grabbing	***Encourage the adoption of the continuum of land rights***			***Upgrading subjected to land tenure/ownership definition – disputes resolution***		***Upgrading subjected to land tenure/ownership definition – disputes resolution***

The phased upgrading and regularisation of eligible settlements would contribute to a considerable reduction in housing needs in Mosul, allow access to utilities, and activate the mandate of the municipalities to supply adequate health and education facilities. The following implementation mechanisms are suggested, depending on the type of settlement:

Lease to transfer

According to the new law on informal settlements that has been submitted to the Parliament, the municipality will be able to lease the informal plots on which people are living, until it has recovered the urbanisation costs for upgrading the settlements (paving, water supply, electricity, etc). If the land use is not residential, reclassification could be considered in some cases.

Initiate land readjustment

Land readjustment is a means to assemble poorly partitioned land whereby households voluntarily contribute the land they occupy so that it can be reorganised more effectively. This includes minimum road standards, infrastucture, open spaces, and public facilities. In return, each landowner receives a serviced plot of a smaller size, but usually at a higher value, within the same neighborhoood. In 2001, the Directorate of Planning successfully implemented a plot readjustment operation in Gogjali.

Reclassification as "Residential Investment Area"

Identify "Residential Investment Areas" through the Investment Board in collaboration with the MOCHMPW and MOA, making it legal to develop residential buildings, but introducing land readjustment to make space for social services and public space, as per the required planning standards in Iraq.

Relocation to vacant municipal land

Informal settlements are to relocate from critical sites, such as railway reserves, ring road reserves, or historic sites, once projects like railway construction, archeological excavations and road implementation, are considered. Forced evictions are to be avoided. Relocations should be well communicated and implemented by offering an incentive, e.g. access to affordable land and housing loans.

CONTROL THE CITY EXPANSION
FACILITATE AND PLAN URBAN EXTENSION AREAS

Having acknowledged that expropriation is unrealistic and socially undesirable, and the provision of social housing to all informal dwellers is questionable and unaffordable, it is evident that most existing informal areas will have to be considered for integration into the city. Even the worst cases, including the highly contentious settlements on MOA owned Tasarruf land, will at some point be absorbed into the growing city. Only some remote and ill-advised land subdivisions developed for speculative purposes might never be integrated. All others will continue to attract dwellers seeking affordable housing and gradually consolidate themselves.

This underlines the need to start immediately with negotiating formal regularisation processes for urban extension areas, as well as clearly communicating what type of areas will not be formalised in the future. There are several potential extension areas currently around Mosul:

North Mosul Area
This is an area that has significant informal developments. It started developing because of its perceived greater safety, as well as its position on important trade routes.

Al Ghizlani Area
The former military area that is located a on a route towards Baghdad and has the potential to be developed into a mixed-area development (See Economy chapter).

West Mosul towards Tel Afar
If the new airport is created, this land will most likely develop as an industrial and logistics corridor. However, behind this corridor residential areas would be well placed because of its good location in relation to existing infrastructure.

West Mosul around and under Rajem Hadeed Area
There is a relatively flat plain with informal developments. The Rajem Hadeed Village in particular has grown significantly in recent years.

As the agricultural area, east of Mosul was indicated as an irrigation protection area in the unimplemented 2014 Masterplan. extensions and further subdivisions in this area should be discouraged.

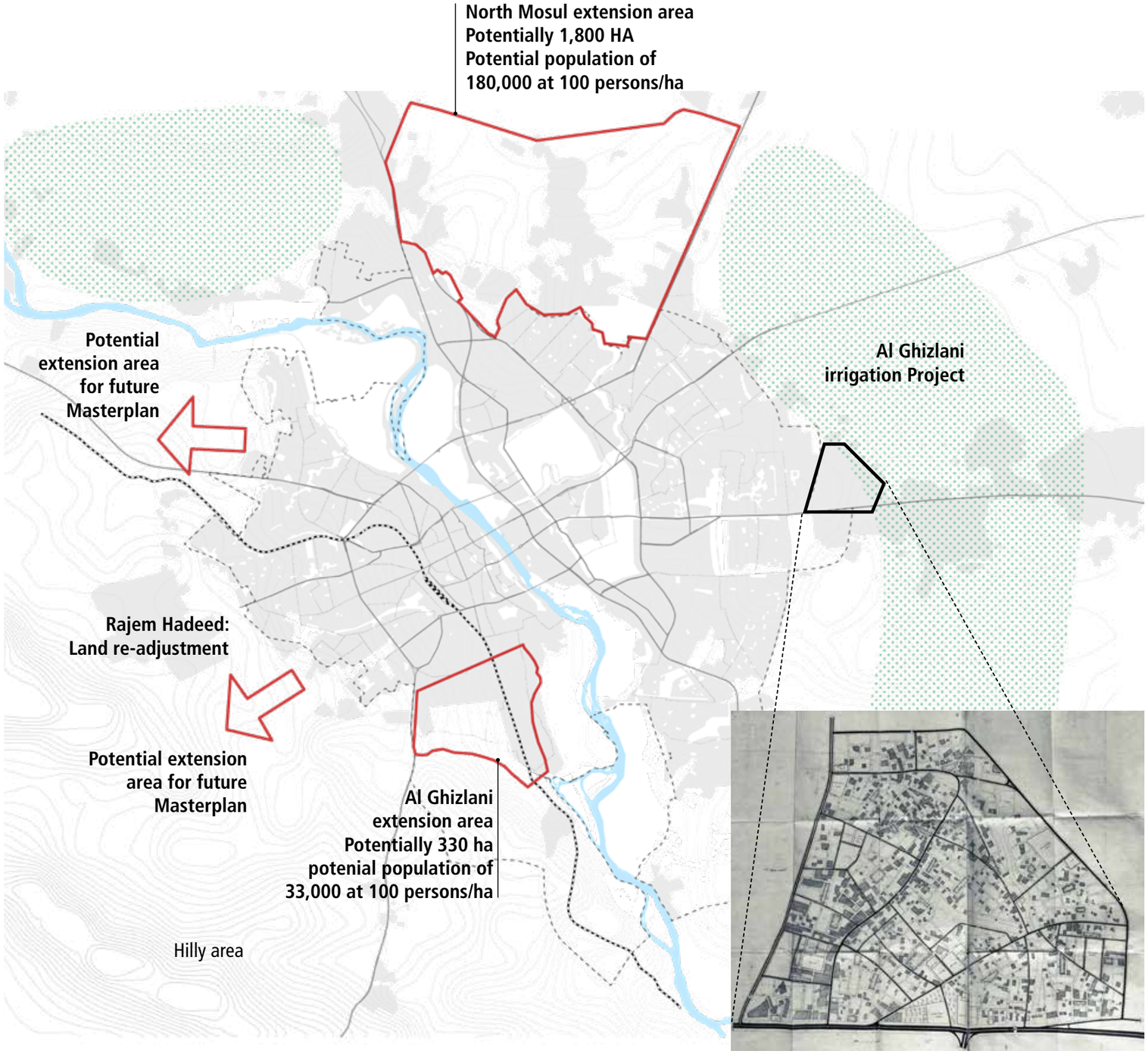


FIGURE 24. Potential urban extension areas around Mosul
(Urban Planning Directorate/ UN-Habitat)

FIGURE 25. Land readjustment scheme
Implemented of Order No. 256 for 2001 Gogajli village.
(Urban Planning Directorate Mosul)

	Business as usual	Relocation	Regularisation	HA	% of total	Potential amount of inhabitants (147 persons/ ha)
Marked areas	Construction may take place without permissions. Access to services likely to be low	-	Rapid and substantial increase of available residential land. Leverage over level of service provision.	927	34%	92,700
Empty areas	Land appropriation and land-use conv ersion likely	-	Incremental but substantial increase of available residential land. Leverage over level of service provision.	867	31%	86,700
Informal areas	Developments consolidate, without formal control	Further reduction of available housing stock.	Providing security and improved environment for investments and urban development.	962	35%	96,200

Study area
The area north of Mosul falls under the authority of the MOA. The land would first need to be acquired by the Municipality, after which a process of land-use change can be initiated.

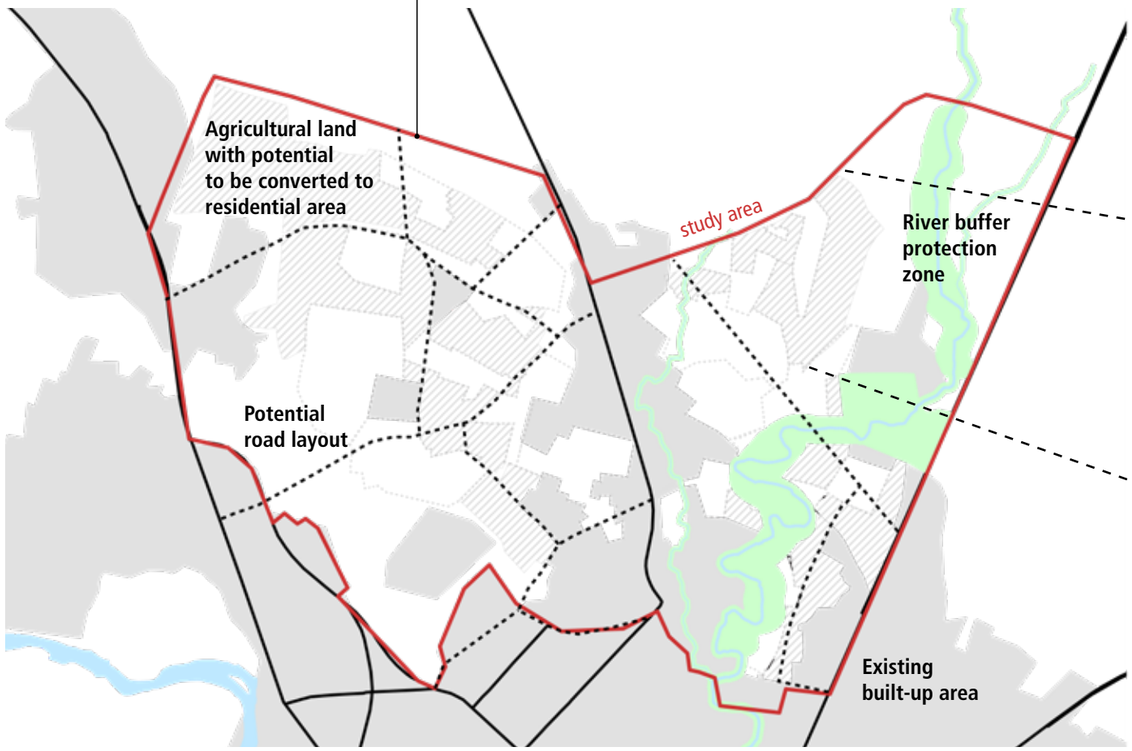


FIGURE 26. North Mosul example of possible regularisation
(UN-Habitat)

FIGURE 27. Example of subdivision on agricultural land located to the north-west of the city
These areas are sought after because they are located in the direction of Dohuk and Erbil, and as such are considered escape routes in the event of a security breakdown (Satellite imagery /DigitalGlobe, February 2017: US Department of State, NextView License).

FIGURE 28. Efforts are made by individuals to meet demands for basic services in informal expansion areas
(UN-Habitat, Jan Willem Petersen, October 2018)

SHORT AND MEDIUM TERM OBJECTIVE (1-5 YEARS)

4 RECOVER ACCESS TO BASIC SERVICES, STRENGTHEN PUBLIC UTILITIES, AND ADDRESS DISPARITIES BETWEEN DIFFERENT NEIGHBOURHOODS

Before the crisis, the basic services infrastructure network did not cover the totality of the population. Several areas were under-serviced. The success of the reconstruction and subsequent return of the population is dependent on the rebuilding of public services and utilities to at least at pre-conflict levels. The rehabilitation of basic services, which includes access to a water network, sewage, education and health services – should therefore be prioritised on the short- and medium term as the groundwork for reconstruction and recovery. In a survey of traders in West Mosul, 93% of retailers said that damage to electricity infrastructure had a severe impact on their business, while 78% of retailer and 73% of key wholesaler informants reported that damage to water infrastructure had a severe impact on their businesses (Joint Rapid Assessment of Markets, Cash Working Group/REACH, August 2017).

Priority Action(s)	Possible Actor(s)
» Reduce service inequalities between neighborhoods to mitigate social tensions	Local government, Municipalities
» Rehabilitate the main health facilities and hospitals that serve the whole city and the wider region	Local government, Municipalities, UN agencies
» Restore the electricity network and substations, in particular in West Mosul	Local government, Municipalities, UN agencies
» Restore the solid waste collection, treatment, and disposal in safe landfill sites, including medical waste processing facilities	Local government, Municipalities, UN agencies
» Repair the water network and provide potable water to areas with vulnerable households	Local government, Municipalities, UN agencies, NGO s

FIGURE 29. Housing and street layouts are first to emerge on the outskirts of Mosul.
Many areas lack basic services or facilities (UN-Habitat, Jan Willem Petersen, October 2018)

Reduce service inequalities between the centre and the fringes of the city. In particular, in low-income settlements on the fringes, there are practically no social services such as schools and health centres. Only about 10% of the areas have access to a school within reasonable walking distance. Addressing this services gap is an important way to reduce grievances between communities, to improve the quality of life for residents living in low-income settlements, and to reduce grievances between communities. To address this service gap, regularisation of informal settlements should be considered as the first step.

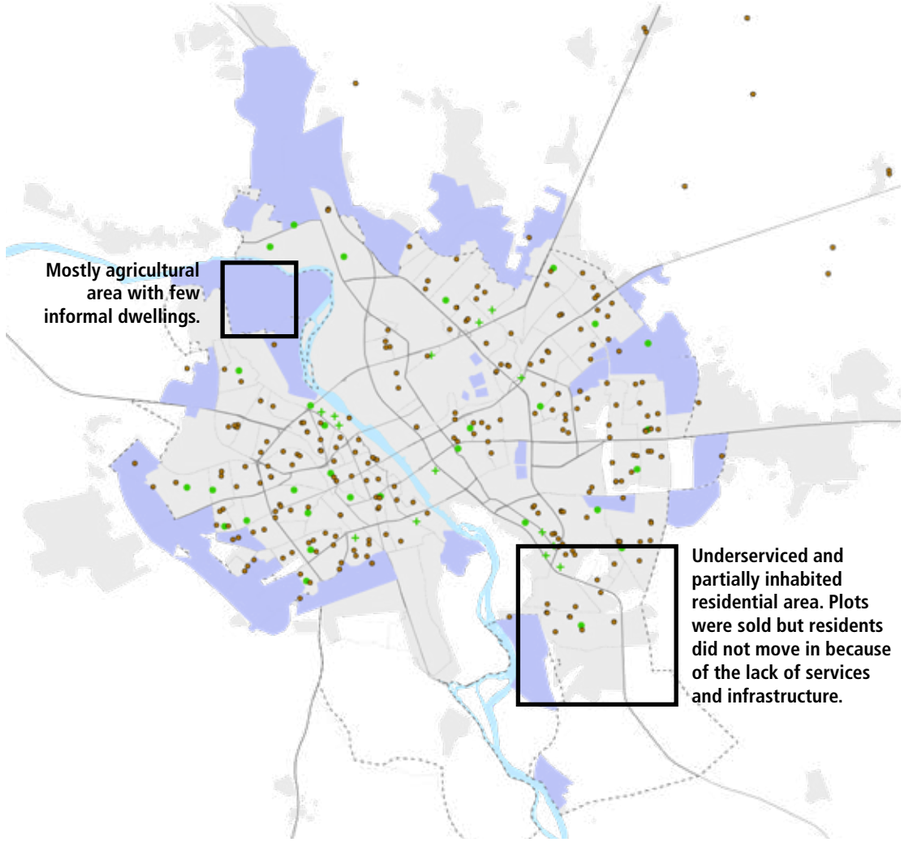


FIGURE 30. Basic services in Mosul
The fringes of the city do not have access to services despite the number of inhabitants residing there (Local government /UN-Habitat)

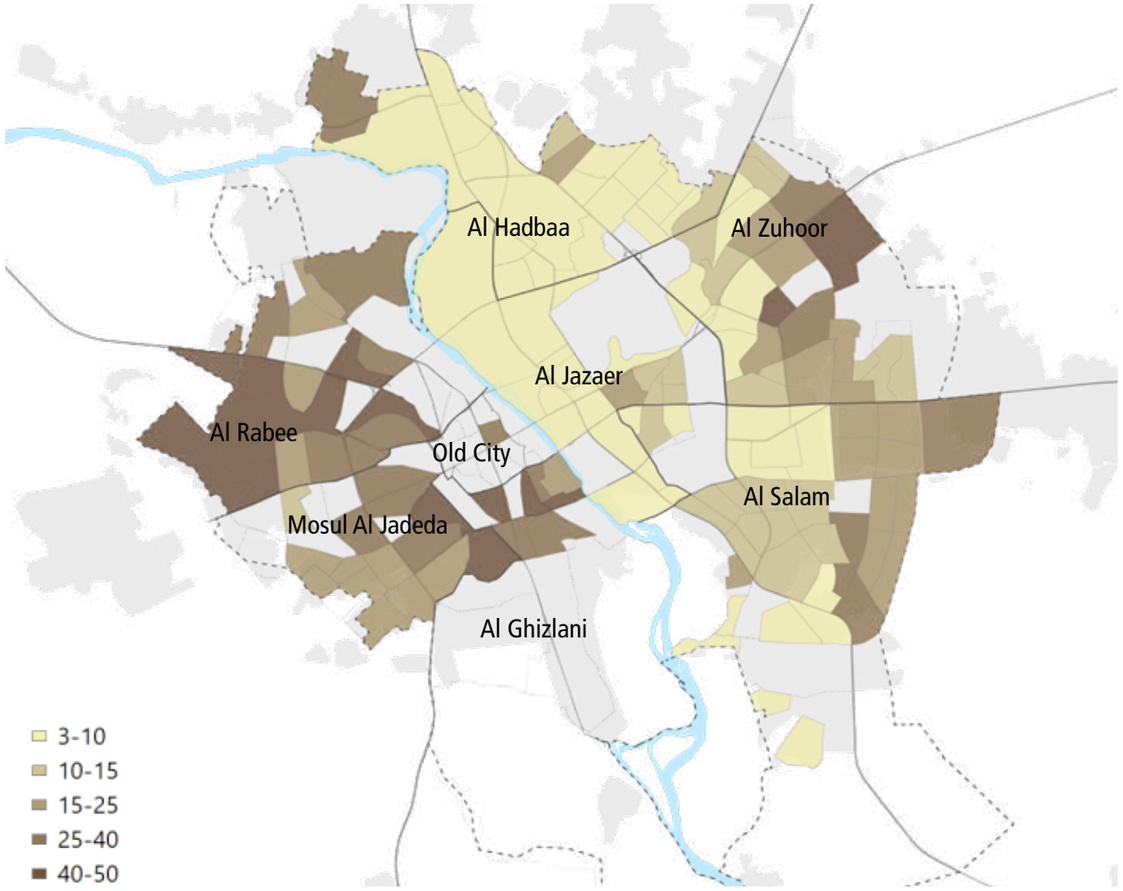


FIGURE 31. Percentage of neighborhood with limited access to water, as estimated by the Water Directorate in August 2018. Not all neighborhoods have been assessed (Local government, August 2018)

The water network has seen significant damage. In particular Al Rabee, Mosul Al Jadeda and the outer fringes of Al Zuhoor have limited access to water. Even though the Old City area has not yet been assessed comprehensively, initial field visits suggest that the damage could be even more extensive. Repairing the water network, in particular in poorer areas, is a primary concern.

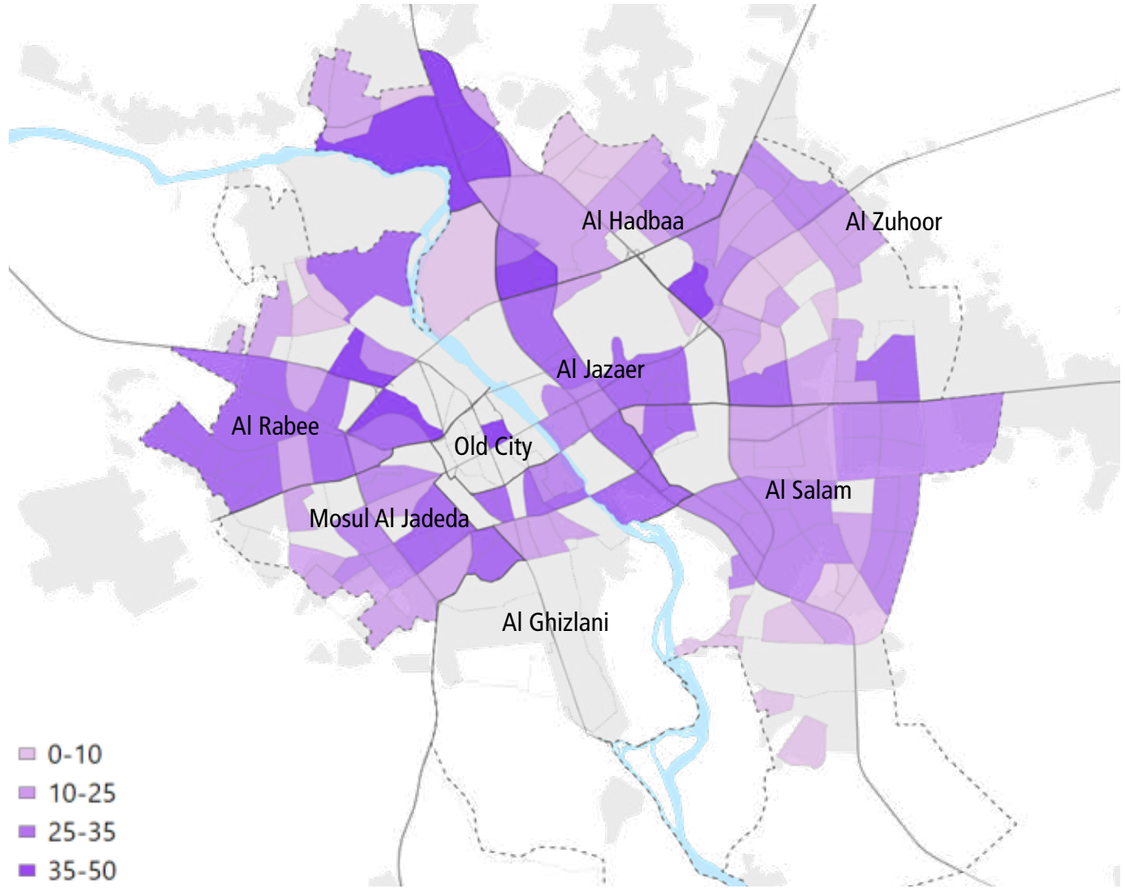


FIGURE 32. Percentage of damage to the water network per neighborhood, as estimated by the Water Directorate. Several neighborhoods, e.g. in the Old City have not been assessed (Local government, August 2018)

Name	Location in Mosul	Municipal sector	Damage to water network (%)
Al Araby 2	East	Al Hadbaa	75
Al Muthana	East	Al Zuhoor	75
Al Araby 1	East	Al Hadbaa	75
Al Araby 3	East	Al Hadbaa	75
Al Araby 4	East	Al Hadbaa	75
Al Shortah	East	Al Hadbaa	75
Al Refaee	West	Al Rabee	60
Abe Tammam	West	Al Rabee	60
Ammo Al Bakal	West	Old City	60

TABLE 33. Top 10 neighborhoods with highest damage to water network, as estimated by the Water Directorate (Local government, August 2018)

Health facilities

The Health Directorate reported that 24 health facilities such as primary health centers, health centers and health facilities are in the process of rehabilitation. Many hospitals were under construction before the crisis, but the work had stopped due to the subsequent financial crisis and insecurity. Special attention should be given to developing facilities for the processing and safe disposal of medical waste, which is currently reportedly being dumped with the regular municipal waste. Several damaged hospitals, such as the Al Salam Hospital, have been supported with provisionary medical facilities e.g. post-operative care facilities, by World Health Organization (WHO).

#	Hospital Name	Status	Damage %	Rehabilited by
1	Blood Center Ibn Alather Hospital	unknown	15	-
2	Al Batool Hospital	operative	65	UNDP
3	Republican Education Hospital	non-operative	100	-
4	Al Salam Hospital	non-operative	70	-
5	Shifa Hospital	non-operative	10	Directorate
6	Al Mosul General Hospital	operative	30	UNDP
7	Spinal Cord Injuries Hospital	operative	5	-
8	Turkish Eye Hospital	non-operative	20	-
9	Blood Bank	non-operative	100	UNDP
10	Al Khansaa	operative	75	UNDP
11	Ibn Sina General Hospital	non-operative	80	UNDP
12	Oncology Hospital	non-operative	90	UNDP
13	Ibn Alather Hospital	operative	45	UNDP
14	Mosul Al Jadeed	non-operative	100	Kuwait
15	Al Rabee	non-operative	80	UNDP
16	Al Hadba Training	non-operative	100	-

TABLE 34. Status of hospitals before rehabilitation in West Mosul

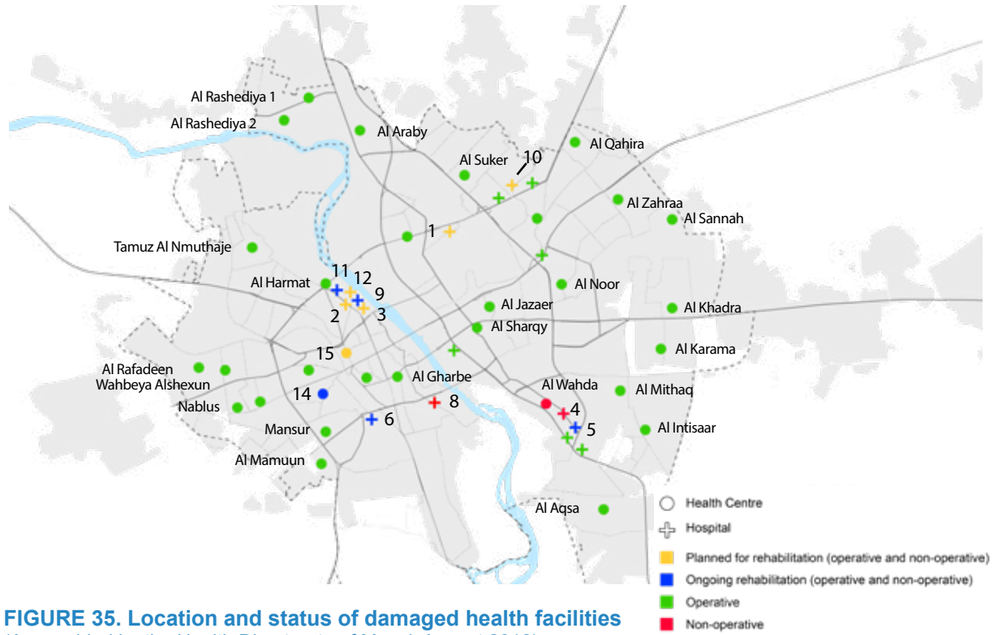


FIGURE 35. Location and status of damaged health facilities
(As provided by the Health Directorate of Mosul, August 2018)

Electricity substations

Most of the substations in Mosul are currently being planned or are in the process of rehabilitation by either Reconstruction Fund for Areas Affected by Terrorist Operations (REFAATO) or United Nations Development Programme (UNDP). However, the 7 completely destroyed stations in West Mosul will require more time to reinstall, as key equipment needs to be imported from abroad. Reconstruction of stations that have not yet been funded are the Tal Al Raman (41,000 beneficiaries), Al Malutha Al Aymen (37,500 beneficiaries) and Rajam Hadid (41,000 beneficiaries).

This means that the neighborhoods on the outer western edges of the city may still experience reduced access to electricity for a considerable period of time. It is crucial to rehabilitate these substations as soon as possible so as not to exacerbate the already existing service inequalities between the fringes and the centre of the city. The destruction of a large amount of generators is an opportunity to introduce cleaner power-generating technologies to reduce the number of

#	Substations	Type	Damage %
1	Al Mansoor	132/33/11KVA	80
2	Al Dawasa	31/11 KVA	100
3	Bab Al Beth	31/11 KVA	100
4	Tal Al Roman	31/11 KVA	moderate
5	Al Nasij	31/11 KVA	100
6	Bab Al Tob	31/11 KVA	100
7	Al Yarmook	132/33/11 KVA	80
8	Al Nahrawan	31/11 KVA	100
9	Bab Sinjar	31/11 KVA	minimal
10	Molawwatha Al Ayman	31/11 KVA	minimal
11	Rajem Hadeed	31/11 KVA	minimal
12	17 Tamoz	31/11 KVA	moderate
13	Al Shifaa	31/11 KVA	100
14	Al Warshan	31/11 KVA	100
15	West Mosul	132/33/11 KVA	70
16	Al Sinaea Ayman	31/11 KVA	moderate
17	Al Haramat	31/11 KVA	moderate
18	Moujamaa Al Mostashfaiyat	31/11 KVA	100
19	Badoosh	132 KVA	moderate

FIGURE 36. Status of electricity substations before rehabilitation in West Mosul

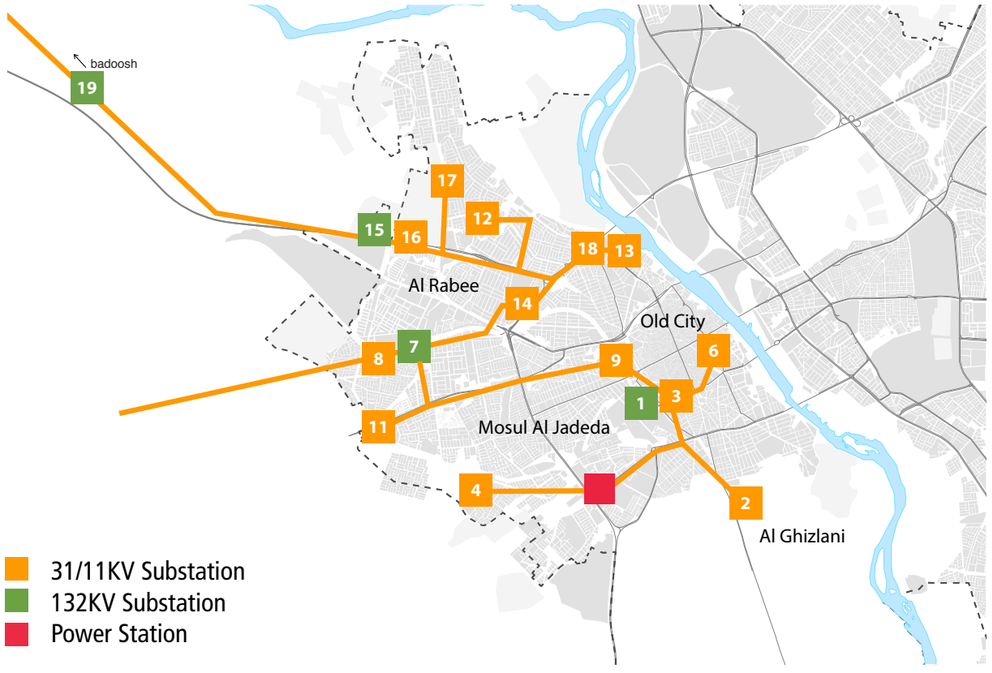


FIGURE 37. Location and status of electricity stations
(As provided by Local government/ UNDP, August 2018)

FIGURE 38. The Fifth bridge over the Tigris River has been partially destroyed. A temporary Irish crossing has been put in place to facilitate some freedom of movement
(UN-Habitat, Jan Willem Petersen, November 2018)

SHORT AND MEDIUM TERM OBJECTIVE (1-5 YEARS)

5 REVITALISE THE ECONOMY BY RECONNECTING MOSUL TO THE WIDER REGION

The deterioration of regional and national infrastructure connections and heightened security measures between Mosul, Baghdad, Duhok, Erbil, Turkey and Syria have increased the cost of doing business for trade and other commercial activities. Trucking of freight accounts for about 40% of the traffic on Iraqi highways (IAU 2012). Prior to the occupation by ISIL, the decline of infrastructure was already an issue. Years of under-investment have also degraded what was once considered a good road network and disrupted key trade routes, affecting the country's economic performance. This is not limited to transport by road. The railway that once connected Europe to Baghdad and Basra, through Turkey and Syria was rendered non-operational by the conflict. According to the Iraq Country Profile 2011 (World Bank (WB)), 63% of Iraqi SMEs are severely impacted firstly by high transportation costs, followed by poor road network connectivity. Currently, Iraq ranks 179/190 in trading across borders in the Doing Business Report (WB, 2018).

To enhance the competitiveness of Mosul in the Mashreq region, the Governorate Urban Strategies (developed under LADP II/ UN-Habitat, 2018) recommend focusing on a development corridor linking Tel Kaif, Mosul and Al Hamdinaya to Kirkuk, Baghdad and Turkey, which is particularly important for cities Tel Kaif and Hamdaniya. The competitiveness of private enterprises and revitalizing the economy of secondary cities entails enabling improved mobility and efficient access to markets of the larger cities. The rehabilitation and improvement is critical to reduce the high cost of trade within Iraq and between Iraq and its neighbors. Currently, regional economic activity is restricted due to the poor condition of the roads and related trading services and the missing railway link. Furthermore, the transport of goods is primarily rerouted through Erbil increasing transport costs.

Priority Action(s)	Possible Actor(s)
» Rehabilitate the 8 main transportation stations in Mosul that have been damaged or destroyed to improve mobility within the city and its region	Local Government, MOCHMPW, Directorate of Roads and Bridges
» Strengthen key regional economic corridors and prioritise the repair of road networks on major regional trade corridors, such as Mosul-Baghdad, Mosul-Turkey, Mosul-Duhok, and Mosul-Erbil	Ministry of Transportation (MOT)
» Improve the facilitating infrastructure for trade, e.g. by setting up dedicated freight lanes at checkpoints to expedite the clearance processes of goods	MOT
» Reconstruct Mosul railway infrastructure and adopt a transit oriented development (TOD) approach for Baghdad Terminal by adopting TOD principles	Local Government, Municipalities
» Initiate the construction of the new Mosul International Airport as per approved plans	MOT

Possible Implementation/ Funding Options	Indicator
» Involve the private sector in implementing the comprehensive long-term transportation plan, utilizing Iraq's geographical location as a link between East (Asia) and West (Europe), as stipulated in the National Development Plan 2018-2022 - Railway activity	Improvement of import-export index

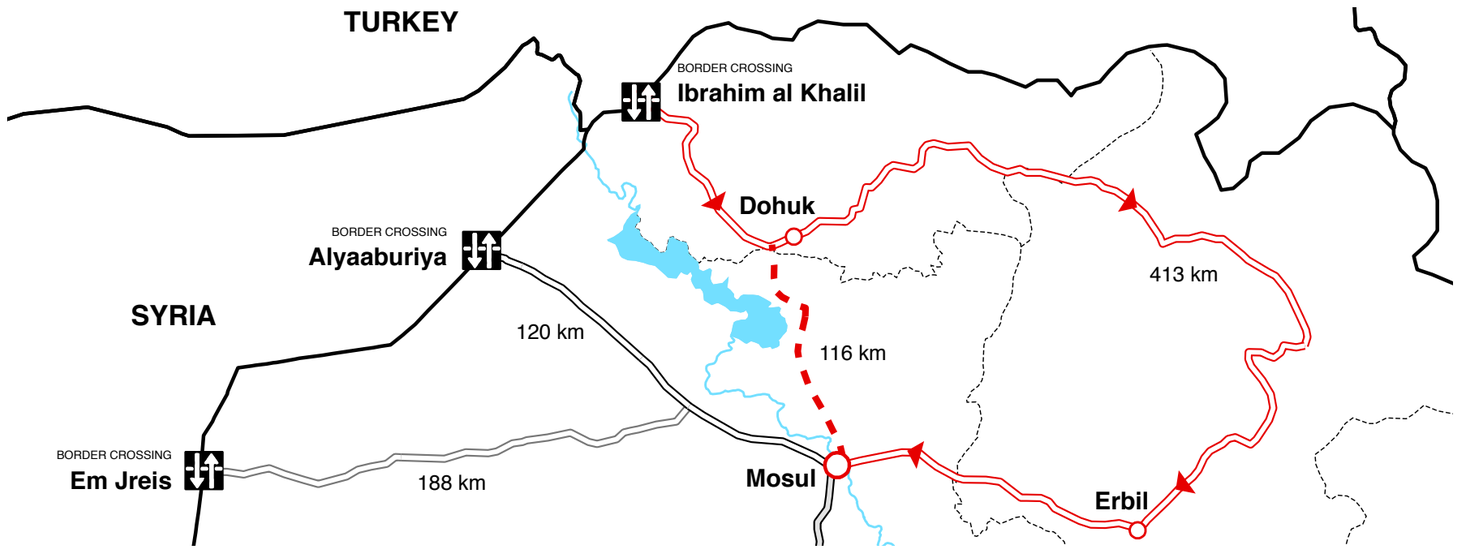


FIGURE 39. Economic corridors to Mosul
Currently, the shortest connection to Mosul for import and export is not fully utilized. Goods are primarily rerouted through Erbil increasing transport costs (UN-Habitat)

RECONNECT MOSUL TO THE WIDER REGION
RELOCATE THE AIRPORT TO NEW SITE

In 2007, Mosul airport received a category 1 status i.e., able to meet international standards after undergoing extensive renovations of the terminal and runway. Currently, the airport of Mosul is out of operation due to the destruction of its runway and service buildings, as well as substantial ERW contamination. For Mosul to regain its position as a regional and national hub, the connection by air is of great importance. The destruction of the former airport and its adjacent military base owned by Ministry of Defense, offers an opportunity to relocate the airport. Such plans have been approved and should be prioritised for implementation. Ministry of Transport (MOT), in joint consultation with local authorities should explore funding the development of the new Mosul International Airport through a phased land sale of the Al Ghizlani site and PPPs, e.g. Build-Operate-Transfer.

The Al Ghizlani area offers a good location for city extension, known as 'brownfield development', and potentially address a significant amount of the current shortage of land for suitabled wellings. The plan for development should integrate several informal developments which have sprung up after 2014, west of the the Al Ghizlani site.

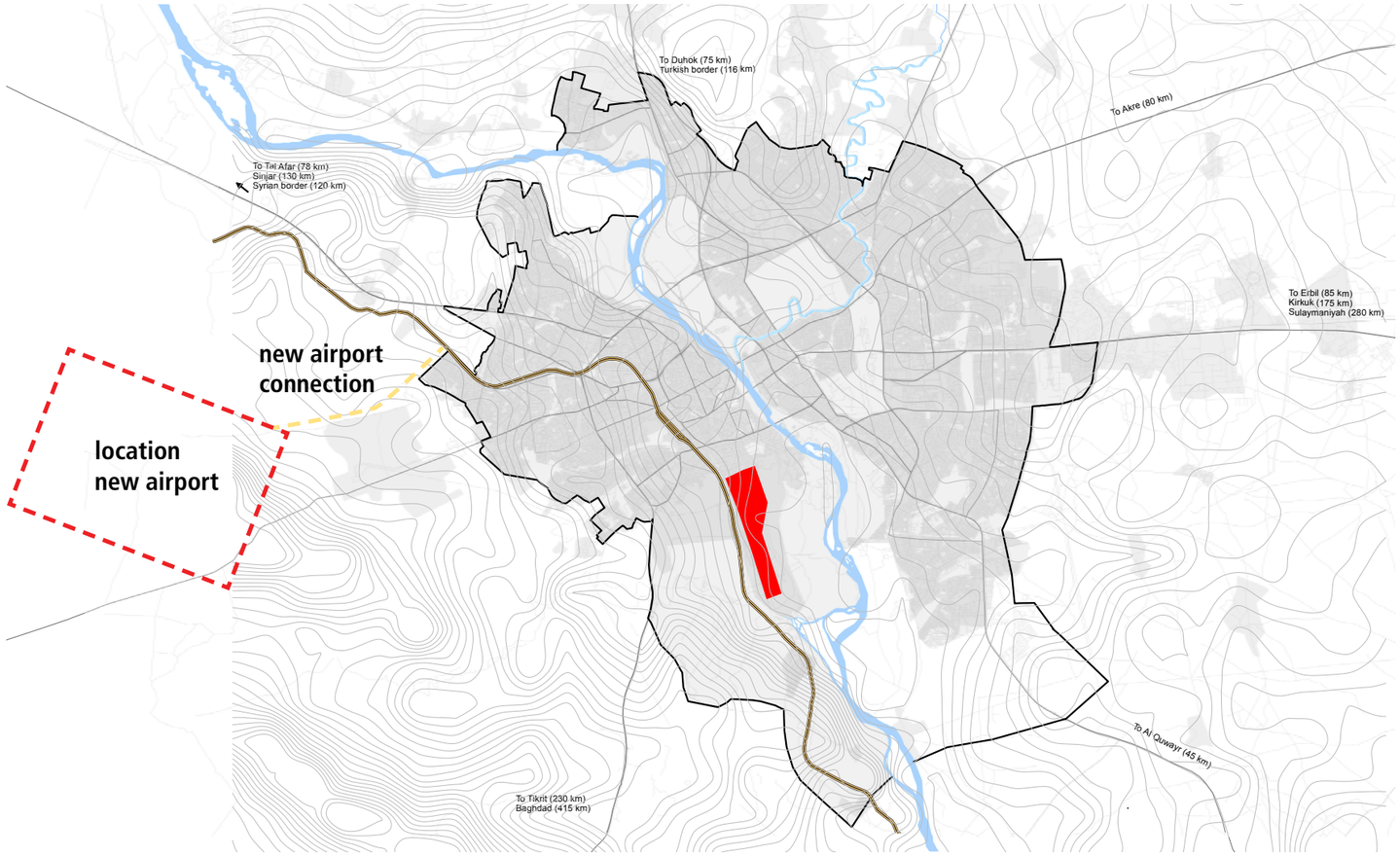


FIGURE 40. Al Ghizlani
The current site of Mosul Airport (Satellite imagery, 2014)

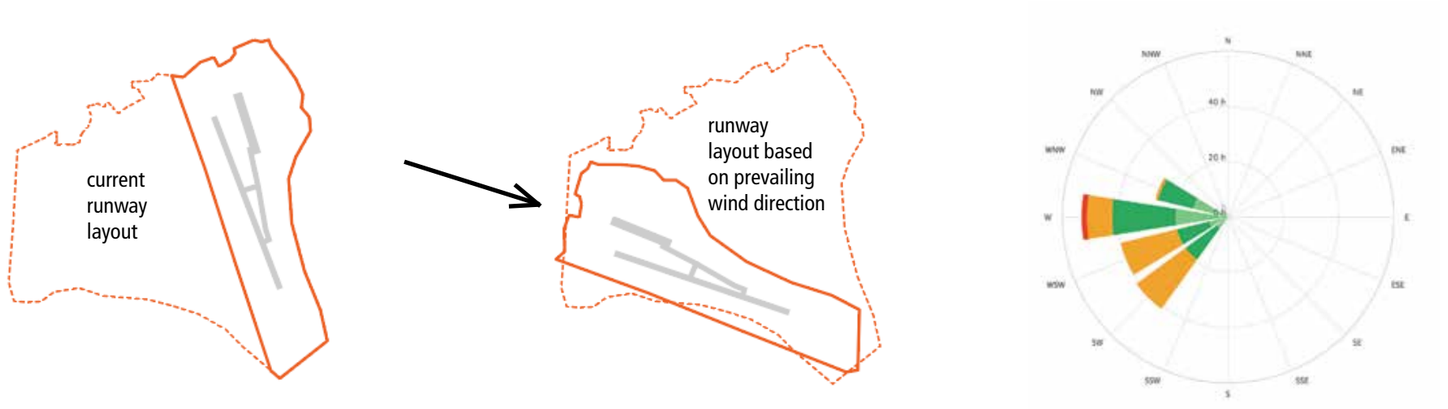


FIGURE 41. Ideal orientation of airport in relation to the prevailing wind direction
Fixed-wing aircraft benefit from head winds to provide additional lift. The current landing strip is oriented in such a way that much of the year, landing aircraft experience side winds. A more suitable orientation would involve rotating the landing strip and associated services towards the prevailing winds, as shown in the diagram below. However, in this case, possible future expansion of the airport may be expensive, because it requires major land removal works. For this reason, the approved site for the new Mosul International Airport appears more appropriate (UN-Habitat/ Wind Rose Mosul June/July 2018).

RECONNECT MOSUL TO THE WIDER REGION
CONNECTING EAST & WEST MOSUL

The Ninewa Roads and Bridges Directorate, operating under MOCHMPW conducted an assessment of the bridges. Their status is shown in the table below. The Directorate estimates that the full rehabilitation of damaged bridges will take at least 2 years. The Directorates stated the importance of two planned bridges over the River Tigris on the city's outskirts. These are known as the Sixth and Seventh bridges. The planned ring road bridges (#6 and # 7) will connect a planned ring road and improve the connection between East and West Mosul, alleviating the traffic through the city centre. The rehabilitation of crossings #4 or #2 should be considered to allow for heavy truck movements.

#	Bridge Name	Status	Actor	Connection
1	New 'Oberoi' Br.	100% operational	New	2-way, incl trucks
2	Fourth Br. (Qadissia)	100% operational	World Bank	2-way, vehicles only
3	Old Br.	100% operational	World Bank	2-way, vehicles only
4	Al Huria Br (temporary & existing)	50% Damaged - 25% Operational	World Bank	1-way. West to East, vehicles only
5	Fifth Br.	55 % Damaged - 25 % Operational	Ministry of Defense	1-way. East to West, vehicles only
6	Sixth Br.	Planned	-	-
7	Seventh Br.	Planned	-	-
8	Shuhada Br.	40% Damaged, Out of operation	-	Not Accessible

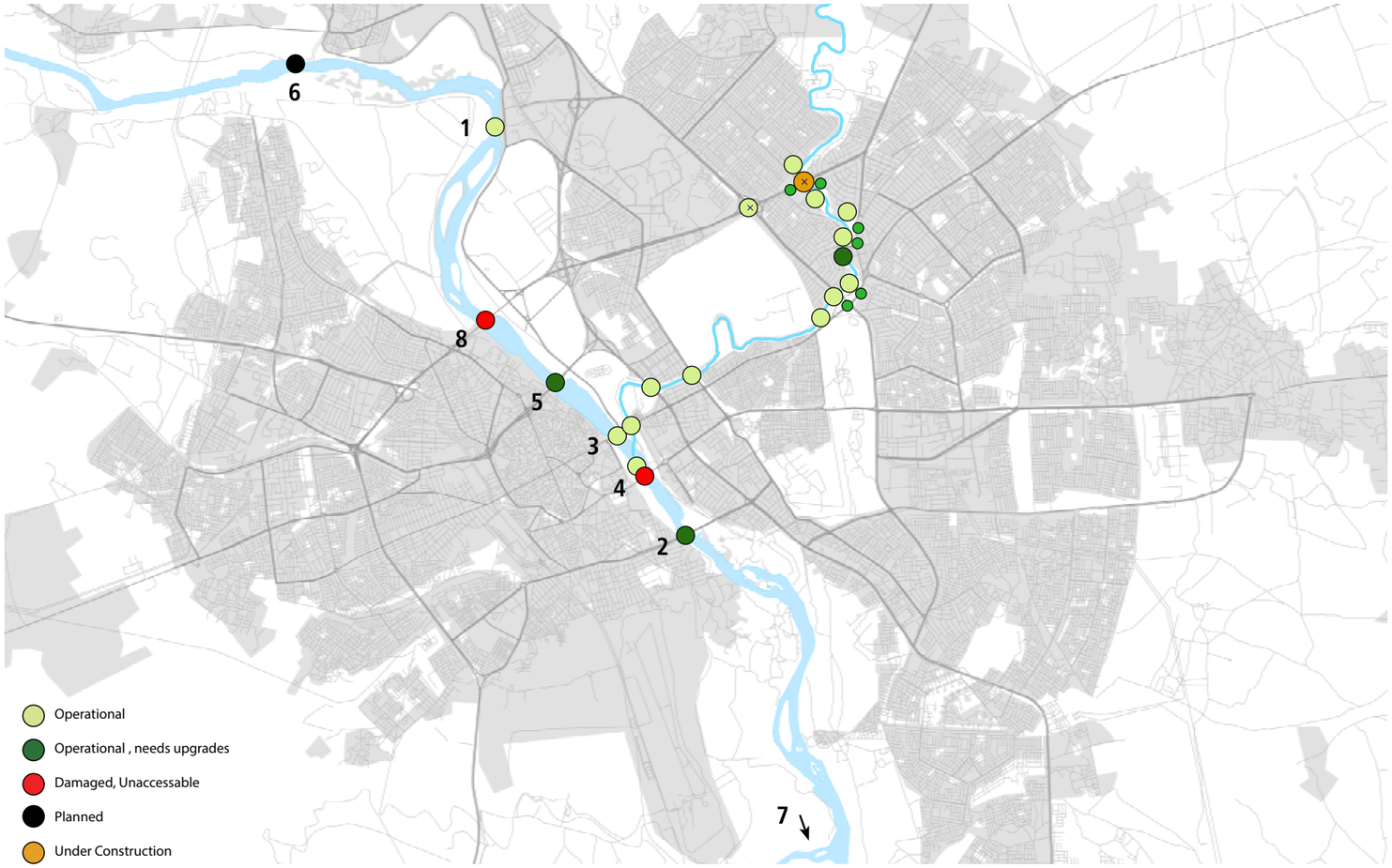


FIGURE 42. The temporary Al Huria Bridge (Victory Bridge) over the Tigris River
(UN-Habitat/ Jan Willem Petersen, 2018)

RECONNECT MOSUL TO THE WIDER REGION
RECONSTRUCT MOSUL TRAIN INFRASTRUCTURE

Ninewa lies on the Northern Branch of the railway system that used to connect Basra to Syria through Baghdad, with 82 km of tracks within Syrian territory and Turkey. This branch passes through Mosul City. The train station of Mosul has a rich history. The station was part of a historic German-Ottoman rail project to link Baghdad with Berlin. Built between 1903 and 1940, the trajectory linked Europe to the Middle East with a 1,600 kilometre line that went through modern-day Turkey, Syria, and Iraq. Mosul became a gateway for cargo and passenger trains from Syria and Turkey to Baghdad and Basra in the south. Traffic thinned during the 1990s when Iraq was under UN sanctions, as little was spent on maintenance. Since 2012, the rail service from Mosul has been suspended due to the deteriorating security situation. Despite efforts by the authority to reopen the city's train station and restart regular trains to Turkey and Baghdad, there has been no train service since Mosul's occupation in 2014.

The lack of railway services – for goods and people – hinders efforts for Mosul to regain its regional position. The revival of the rail network is a priority in the National Development Plan 2018-2022. Its first objective is upgrading and developing the railway system, and increasing its operational capacity.

The reconstruction of Mosul station and rail network is likely to be a medium-term objective. Strengthening the private sector role is required to implement a comprehensive long-term transportation plan, taking advantage of Iraq's geographical location as a link between Asia and Europe.

Most of the railway tracks were looted by ISIL to support its war efforts. The remaining sections were damaged during the liberation operations. Presently, residents construct new homes on the former railway reserve. Local authorities should communicate expressly that these reserves are planned to be cleared in the future to prevent further encroachments on the area, in particular to keep space for a planned second track adjacent to the existing one.

Type	Infrastructure	Damage
5 stations	Mosul, Til Oiynat, Wa'liya, Qaiara, Jurkaf	100%
4 bridges	Ashik bridge	70%
	HI Tink bridge	100%
	Ghizlani bridge	82%
	Jurkaf bridge	25%
3 arch bridges		100%
6 trains		75%
150 wagons		45%

FIGURE 43. (top left) Destroyed railway infrastructure
Damage to railway facilities in the region (as assessed by the General Company of Iraqi Railways).

FIGURE 44. (middle left) Destroyed railway sections
(As assessed by the General Company of Iraqi Railways)

FIGURE 45. (top right) Current state of railway station (Satellite imagery/ UN-DigitalGlobe, February 2017: US Department of State, NextView License))

FIGURE 46. (bottom) Encroachments on the railway reserve (DigitalGlobe, February 2017: US Department of State, NextView License)

RECONNECT MOSUL TO THE WIDER REGION
REHABILITATE THE EIGHT BUS STATIONS

There are eight main transportation hubs and one temporary stop in Mosul, that either serve regional routes or are dedicated to urban transportation. There are more regional transportation hubs in East Mosul because of their infrastructural connections to the northern regions of Ninewa. Most of the damaged transportation hubs are located in West Mosul, where four out of five hubs are currently out of operation. The following prioritisation criteria for recovery are suggested:

1st priority - Local/ urban connections
Ensuring that people displaced from West to East Mosul can commute effectively.

2nd priority - Regional connections
Ensuring that people displaced in the Ninewa region can commute effectively.

3rd priority - National connections
Ensuring that national linkages are strengthened.

For urban transportation, the bus stops Number 7 and Number 8 west of the Old City should be prioritised to expedite the recovery of the Old City. For medium term economic development, the major interchange (Number 4) to the south of the Old City is an important project to link Mosul to Baghdad and the rest of Iraq generally.

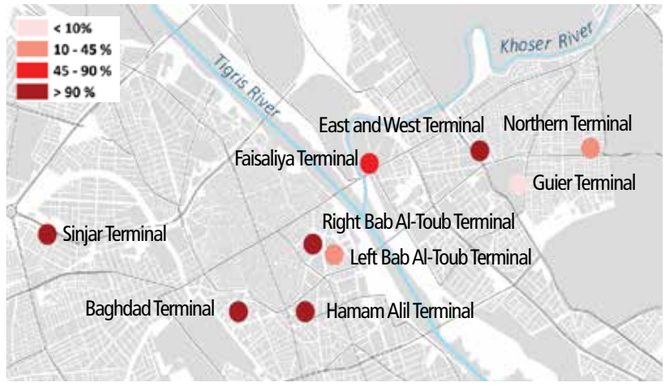


TABLE 47. Damage level of main transportation hubs in Mosul
(Transportation Directorate)


1 - North garage on Erbil road.
East Mosul to Duhok, Erbil, Sulimaniyah, Kirkuk


2 - Al Kuwer garage on Al Kuwer road
East Mosul to Guer, Hatra, Gayar


3 - Al Faisaliah garage on Fasilia road.
East Mosul to Tel Kaif, Al Qush, Faida, Wana


4 - Baghdad Garage
West Mosul to Baghdad, South Hamam Alil


5 - Garage in Sihha Neighborhood
West Mosul to Talafer, Rabia, Syria


6 - Temporary stations
East Mosul to East Bank and West BBank


7 - Left side garage
West Mosul to East Bank


8 - Right side garage
West Mosul to West Bank


9 - Garage close to Al Jamhuria road
West Mosul to Hammam Allil, Al Busaif

#	Type	Transport to	Status	Location
1	regional	Duhok, Erbil, Sulaymaniya, Kirkuk	in operation	East Mosul
2	regional	Guer, Hatra, Gayara	in operation	East Mosul
3	regional	Tel Kaif, Al Qush, Faida, Wana	not in operation	East Mosul
4	regional	Baghdad, Salah Al Din and others	not in operation	West Mosul
5	regional	Talafer, Rabia, Syria	in operation	West Mosul
6	local	East, West (temporary)	in operation	East Mosul
7	local	East Bank	not in operation	West Mosul
8	local	West Bank	not in operation	West Mosul

TABLE 48. Bus terminals in East and West Mosul
Travel destinations, type and status. The bus stations are managed by the Public Transportation Management Co, operating under the Ministry of Transport.

FIGURE 49. View of the Old City periphery towards Al-Shuhadaa Martyrs park
(Drone image, UNESCO/ Iconem, 2018)

SHORT AND MEDIUM OBJECTIVE (1-5 YEARS)

5 STRENGTHEN THE INTEGRATION OF URBAN AND RURAL AGRICULTURAL ECONOMIES

Agriculture has historically been a main contributor to the economy of Mosul and the Ninewa plains a "breadbasket" for the region. Ninewa has the largest wheat and barley cultivations in the country; it used to yield 40-45% of the countries annual wheat and barley production, and operated about 30% of the agriculture equipment available in Iraq. However, since the takeover by ISIL, Iraq has lost approximately 40% of agricultural productivity, due to damaged or poorly maintained machinery, the displacement of local farmers, the contamination of lands with ERW, destroyed silos, storage and crop processing facilities (Food and Agriculture Organization (FAO), 2018). In addition, insecurity and armed clashes led to a significant displacement of local farmers in Ninewa. Although some farm villages have remained untouched, others have been severely damaged, with the reduction of the labor force for agricultural production as a consequence. The rehabilitation of houses in rural areas and repopulating the villages is hence of great importance for the revival of agriculture and the economy of Mosul as a whole.

Another significant constraint to increasing agricultural output is the availability of water. While most of the agriculture in northern Iraq is rain fed, the biggest challenges are increasing water fluctuation, seasonal availability and local water shortages. Iraq was once self-sufficient in terms of food, but now imports 70% of its needs, largely through Turkey. Currently, only about 20% of farmers in Nineveh are estimated to have access to irrigation, compared with 65% prior to the crisis. Furthermore, about 90% of pipes, sprinklers, water pumps, channels, and wells were looted or destroyed (FAO, 2018). The repair of the irrigation network and the provision of temporary watering systems in Ninewa plains, for example in the form of new wells or extended water transportation pipes is much needed.

In addition, providing improved access to serviced warehousing facilities, cold storage, packaging/processing enterprises and serviced markets that enable the agricultural produce to be sold, will strengthen the integration of the rural hinterland and the urban areas of Mosul.

Priority Action(s)		Possible Actor(s)
»	Address the increasing development of illegal subdivision of agricultural land. Protect the Al Jazeera irrigation area east of Mosul from unregulated informal residential subdivisions	Local Government
»	Improve the supply chain and key facilities for the production and selling of goods, including transport, post-harvest storage, processing facilities, and dry ports	Local Government
»	Rehabilitate the houses in key villages on the Nineveh plains and rural areas to facilitate the return of farmers	Local Government
»	Develop a network of market sites along strategic corridors, dedicated to the sale of agricultural produce	Local Government, Municipalities

#	Type of markets in Mosul
1	Unofficial markets that emerged or expanded after the liberation
2	Important markets made up of roadside stalls (and are a traffic concerns)
3	Markets introduced under ISIL control, but out of operation
4	Special markets for specific goods, like agriculture produce, gold, or books
5	Main markets before ISIL
6	Industrial areas that include crafts like blacksmiths, car repairs, or simple factories
7	Markets with roadside stalls
	Strategic corridors rural-urban economy

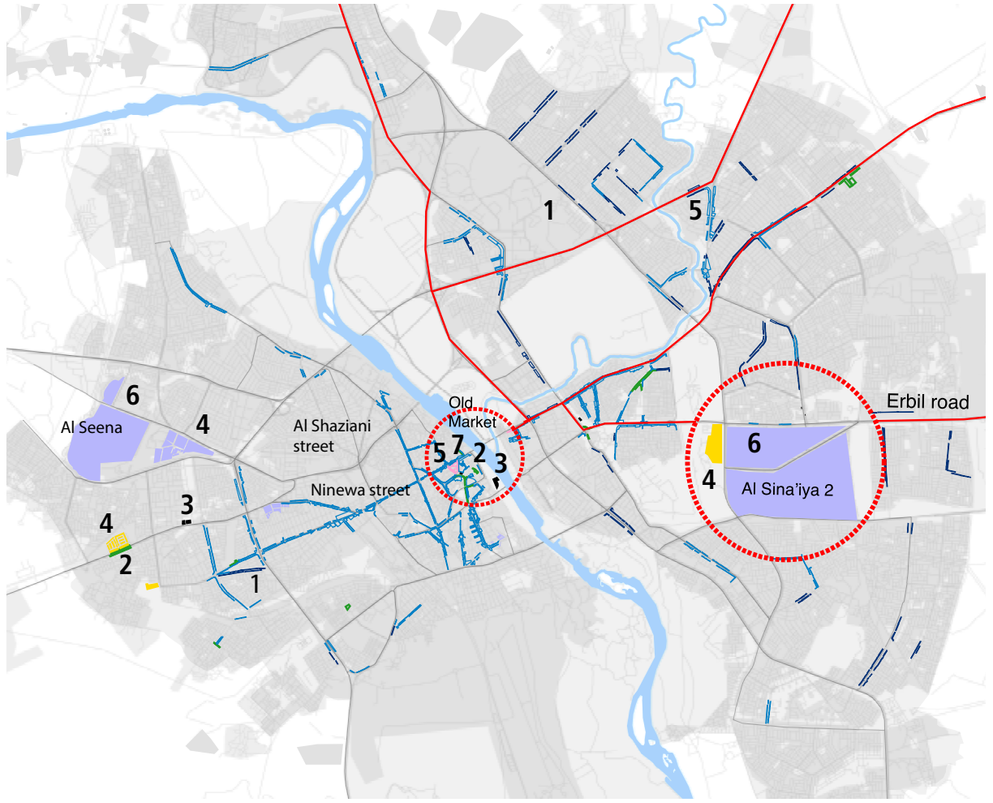


FIGURE 50. Main connections to the agricultural hinterland
Need to develop a network of market sites targeted to sell agricultural produce by introducing a market along strategic corridors. One potential location is outlined to improve the connectivity between the rural and urban economy (Urban Planning Directorate/ UN-Habitat).

STRENGTHEN URBAN AND RURAL INTEGRATION
PROTECT THE AL JAZEERA IRRIGATION AREAS

In the 1990s the central government initiated 3 large irrigation projects using water from Mosul Dam:

1) The Northern Al Jazeera Irrigation Project
100 km northwest of Mosul in Rabi'a sub-district and serves 58,700 hectares of agricultural lands. The project was functional until 9 June 2014.

2) The Eastern Al Jazeera Irrigation Project
30 km northeast of Mosul and serves 85,000 hectares of lands. It was in the first stages of construction when ISIL took control of Mosul.

3) The Southern Al Jazeera Irrigation Project
40 km southwest of Mosul city and serves 187,500 hectares of agricultural lands. The latter remains unimplemented.

#	Neighborhood	Area (Ha)	# of houses in 2017	# of houses in 2018	Growth rate %
1	-	173	785	1,104	40%
2	Arbichya	69	121	143	18%
3	Al Salam	104	437	460	5%
4	-	163	420	475	13%
5	Al Quds	131	1,613	1,630	1%
6	Hay Al Intisar	1431	22	22	0%
7	Hay Sumer	272	268	370	38%
8	-	84	847	851	0.47%

Name	Area (ha)
A	7
B	65
C	5
D	10
E	25
F	5
G	73
H	44
I	37
J	23
K	13
L	4
M	22
N	16

FIGURE 51. Urban expansion
Above: Informal settlements. Below: Unregulated subdivisions of agricultural land that potentially impacts on the realisation of the Southern Al Jazeera Irrigation project, jeopardizing agro-businesses of South Ninewa (Satellite imagery).

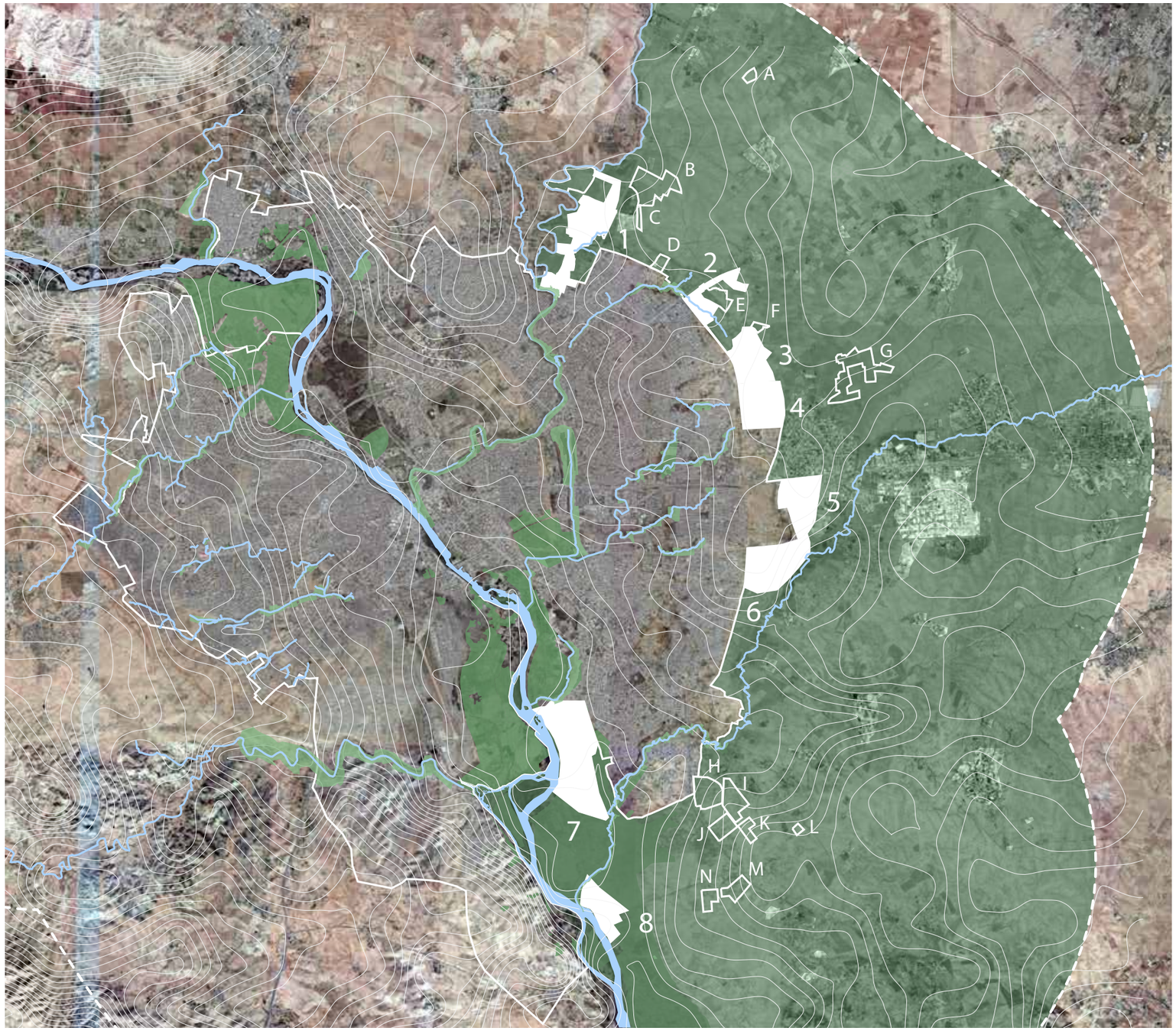


FIGURE 52. Unregulated encroachment on agricultural land
The Al Jazeera irrigation area at the eastern periphery of Mosul, as indicated in the 2008 Masterplan Study (not implemented). Informal settlements (white) and further developments (white outline) encroach on valuable agricultural land (Satellite imagery/ UN-Habitat).

STRENGTHEN URBAN AND RURAL INTEGRATION
REHABILITATE HOUSES IN RURAL AREAS

#	Neighborhood (rehabilitation - green)	Buildings eligible for rehabilitation
1	Al Mourfaqia	172
2	Bashiqa-Bahzani	209
3	Baybokht	6
4	Tobzawa	58
5	Tahrawah	59
6	Bertella	249
7	unknown	345
8	Bashiqa & Bahzani	352
9	Khazna	348
10	Teliskuf	27
11	Al Hamdaniya	1,250
12	Baashiqa	125
13	Bartalla	540
14	Al Muafaqia	140
15	Bertella	100
16	Ghadir	104
17	Khazna	346
18	Manara	76
19	Khorsebat	650
20	Batnaya	130
21	Kabarli	42
22	Bazwaya	57
23	Balawat	18
24	Kharabat Sultan	27
25	Qarqasha	19
26	Bashiqa & Bahzani	17
27	Bashiqa / Tis Kharab Kabeer	178
28	Bashiqa	29
29	Manara Shabak	100

#	Neighborhood (assessed - red)	Damaged buildings
1	Baqofah	82
2	Telskuf	944
3	Hasan Jalad	0
4	Kafruk	106
5	Shiekh Ameer	159
6	Tarjella	182
7	Badna Qaber	187
8	Zahra Khaton	117
9	Badna Kabir	90
10	Zahra Soghra	19
11	Majidia	40
12	Al Hayat Complex	61
13	Qaryat Shaikh Ameer	75
14	Al Lak	88
15	Zahra Khatun Kabeer	75
16	Zahra Khatun Sageer	7
17	Badna Soghra	32
18	Kerzekan	155
19	Kabarli	131
20	Bazgirtan	90
21	Barima	225
22	Asqof	45
23	Bartella	1,563
24	Qaraqosh	6,726
25	Karamles	569
26	Bahzani	570
27	Tal Al-Laban	175
28	Badna Saghir	17
29	Al-Nawaran	9
30	Qaryat Kanona	3
31	Taiskharab Kabeer	44
32	Taiskharab Sagheer	23
33	Umar Qabchi	16
34	Qawsiyat	0
35	Kharabat Kojar	150
36	Mehweer South	200
37	Bazwaya	40
38	Qaryat Talyara	32
39	Qaryat Bybokht	28
40	Khurseebat	28
41	Al Fadhliyah	26
42	Derik	19
43	Daraweesh	58
44	Al Samaqi	17
45	Flyfl	152
46	Baashiqa	1,865
47	Bartella	628
48	Telskuf	480
49	Batnaya	630
50	Batnaya	938
51	Tilkaef center	59
52	Al Hamdaniya	1,796

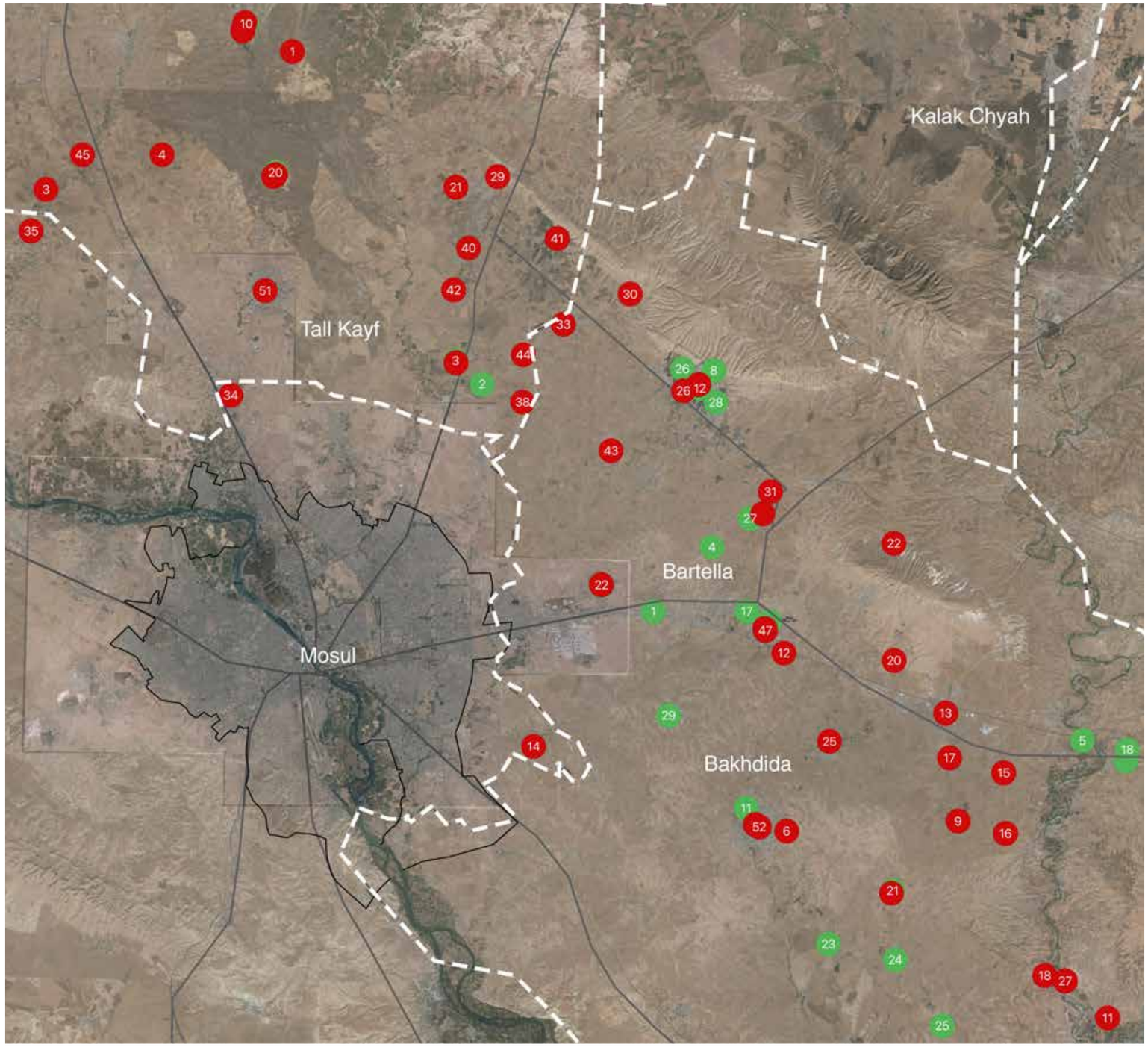


FIGURE 53. Overview of rehabilitation of rural villages
Various agencies have reported to the Housing Rehabilitation Database on assessments and rehabilitations in Ninewa Plains. The rehabilitation of houses in rural areas and the return of farmers is fundamental to recover the agricultural production in Ninewa plains (Housing Rehabilitation Database/ UN-Habitat/ Shelter Cluster, Satellite Imagery Google Earth).

FIGURE 54. Initiating new mixed use areas, including housing development, are important to lessen the sizeable housing deficit in Mosul
(UN-Habitat, Jan Willem Petersen, October 2018)

MEDIUM TERM OBJECTIVE

6 CREATE AN ENABLING ENVIRONMENT FOR PRIVATE SECTOR INVESTMENTS

With limited public resources committed to Ninewa for reconstruction, involving the private sector in the recovery of the city is crucial. However, the investment sector is still in its infancy. The country still relies heavily on public investments of funds accrued from the oil sector which represented over 51% of Gross Domestic Product (GDP) in 2015. (National Development Plan 2018). Iraq ranks 168 out of 190 on the Ease of Doing Business Index of 2018, with poor scores on Trade Across Borders and Getting Credit (179 and 186 out of 190 respectively).

In labor market assessments conducted by International Rescue Committee (IRC) in East Mosul in, nearly all the interviewed SMEs stated that their business revenues would be determined by the payment of government salaries, to which demand for non-essential items is closely linked. Furthermore, several respondents stated that the main challenge to doing business is the lack of personal funds and government support to start, rehabilitate, or expand local businesses, and that they had currently no access to loans in Mosul. (Labor Market Assessment, IRC 2017).

Furthermore, the Investment Board has seen significant turnovers in recent years, complicating the general management of the investment sector. A renewed culture of investments, with the appropriate tools for the implementation of existing laws and in line with the principle of subsidiarity, is crucial for expediting the required investments in the city. For example, some investors with investment licenses to whom land has been allocated, do not initiate projects for a long time, hogging the land and preventing alternative projects from being implemented. To address this, the Governorate should enforce existing provisions in the 2006 Investment Law No. 13 of 2006 which states that investors can commence the implementation of projects after their investment licenses have been granted, but can lose their land allocation if no action has been taken before a cut-off time for reallocation to other more promising investors ("sunset clause"). Other options would be to levy an incremental tax on vacant non-productive land allocated by the Investment Board (i.e. the larger the land, the higher the tax per donum).

Priority Action(s)	Possible Actor(s)
» Define four new Mixed-Use Investment Areas	Governorate, Local Government, Municipalities, Investment Board
» Define a new Industrial Investment Area in East Mosul including the realisation of a dry port for the handling of bulk cargoes that enter or leave Mosul through road, railway or air	Local Government, Municipalities, Investment Board
» Activate the available infrastructure financing mechanisms to fund basic infrastructure improvements	GOI
» Designate new officially approved market areas within Mosul	Local Government, Municipalities
» Clearly communicate and issue transparent rules and regulations with regard to investment procedures within Mosul	Investment Board, National Investment Commission (NIC)
» Enforce the "Sunset clause" provided for in the 2006 Investment Law	GOI

Possible Implementation/ Funding Options	Indicator
» A working group, spearheaded by the Directorate of Municipalities and the National Investment Commission, will determine and verify the ownership of identified locations within the city boundary for medium-rise residential projects. Required ownership transfers and land-use changes will be negotiated accordingly. Land will be designated for the urgent implementation of medium-rise housing for civil servants in infill areas in the city. These could be teachers, doctors, public administrators, martyrs or other professionals required by Ministry of Education (MOE), Ministry of Health (MOH), and military personnel by Ministry of Defence (MOD), as mentioned in Article 48 of the Federal Budget of 2018.	# of private sector investment projects

CREATE AN ENVIRONMENT FOR PRIVATE INVESTMENTS
DEFINE MIX-USE INVESTMENT AREAS

According to the National Investment Commission (NIC) 2018 Investment Map, the NIC has started to prepare investment zones in line with Article 9 of amended Investment Law No. 13/ 2006. The development of such a zone needs to be accompanied by a clear investment strategy that benefits the population, with appropriate accountability measures in place. Without such a strategy, there is a likelihood that the selection of projects could be determined by chance or political expediency, and selected projects may not survive the political cycle. This would create additional insecurity for investors. The Governorate, together with the Investment Board, should recommend expanding the concept from 'Investment Projects' to 'Mixed-Use Investment Areas', which defines a package of mixed investments that are eligible to receive incentives and the fast-track approval of projects that are considered a priority in terms of providing local jobs and benefit the local economy, i.e. less real estate, more SMEs and Mid Market Enterprises (MMEs). Approval of such projects will imply the negotiation of required public and private investments in infrastructure and services, i.e. "planning gains". The Urban Planning Directorate should define the requirements and conditions for at least 4 of such new Mixed-Use Investment Areas: Mosul Old City River Front (for public amenities, tourism and residential), North Mosul (for residential and peri-urban agri-business), Al Sina'a (for residential and commercial), and Al Ghizlani (for residential, services, logistics/industry).

Land Division	Recommended percentage	Without airport	With airport
Streets	30%	300	177
Open/green space	15%	150	88.5
Built-up area	55%	550	324.5
Hectare	100%	1,000	590

Built-up area			
Commercial & services	40%	220	88
Residential	60%	330	198
Single Tenure	(50%)	(165)	(99)
Affordable housing	(50%)	(165)	(118.8)
Hectare	100%	550	324.5

Street length	18 km/km2	180	106.2

TABLE 55. Potential mixed-use scenario Al Ghizlani
Example of land use repartition of the current airport site. The area offers a suitable city extension to address the current housing shortage (UN-Habitat).

Investment projects
Commercial investment projects as defined by the MOCHMPW at the investors conference held in Baghdad in August 2018.

1 - Commercial tower complex
2 - Commercial buildings & parking
3 - High-rise residential block
4 - Mixed use open yard
5 - Shops & parking
6 - Commercial complex & marketing
7 - Tourist city waterfalls
8 - Amusement park
9 - Waste recycling plant
10 - Old Mosul tram
11 - Al Asriyahe slaughterhouse
12 - Commercial tower

Investment projects	125 ha
Commerce (in Mosul)	6 ha
Other (in Ninewa)	119 ha

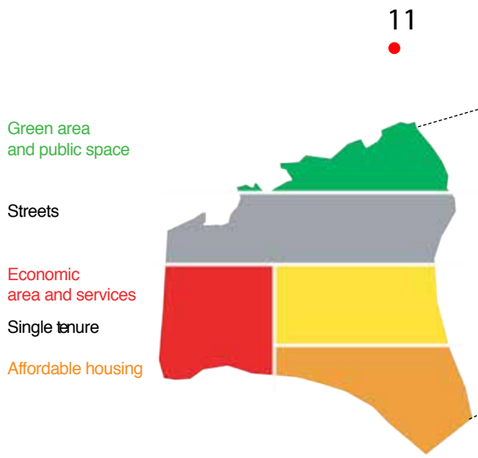


FIGURE 56. Possible land use repartition
(UN-Habitat)

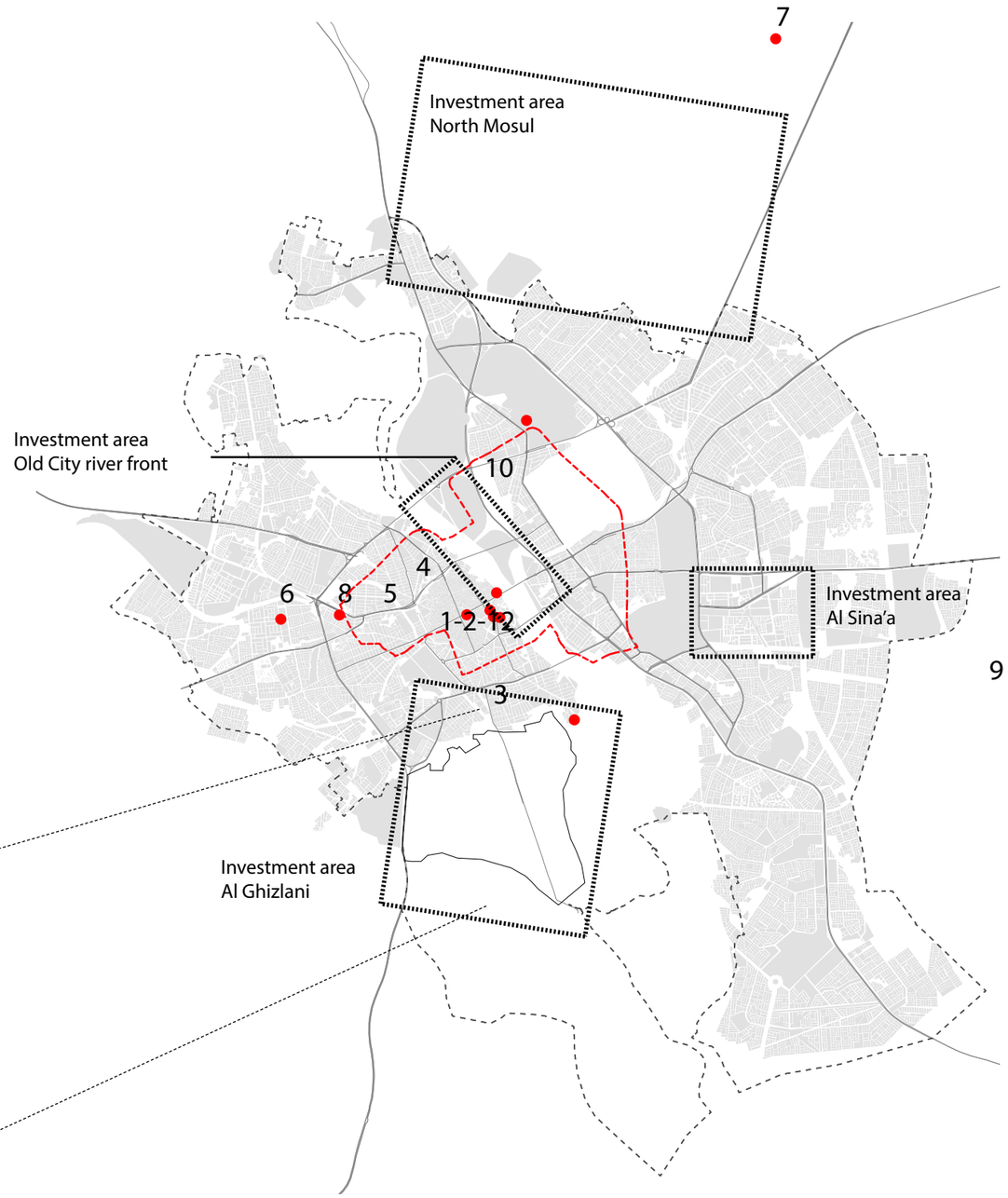


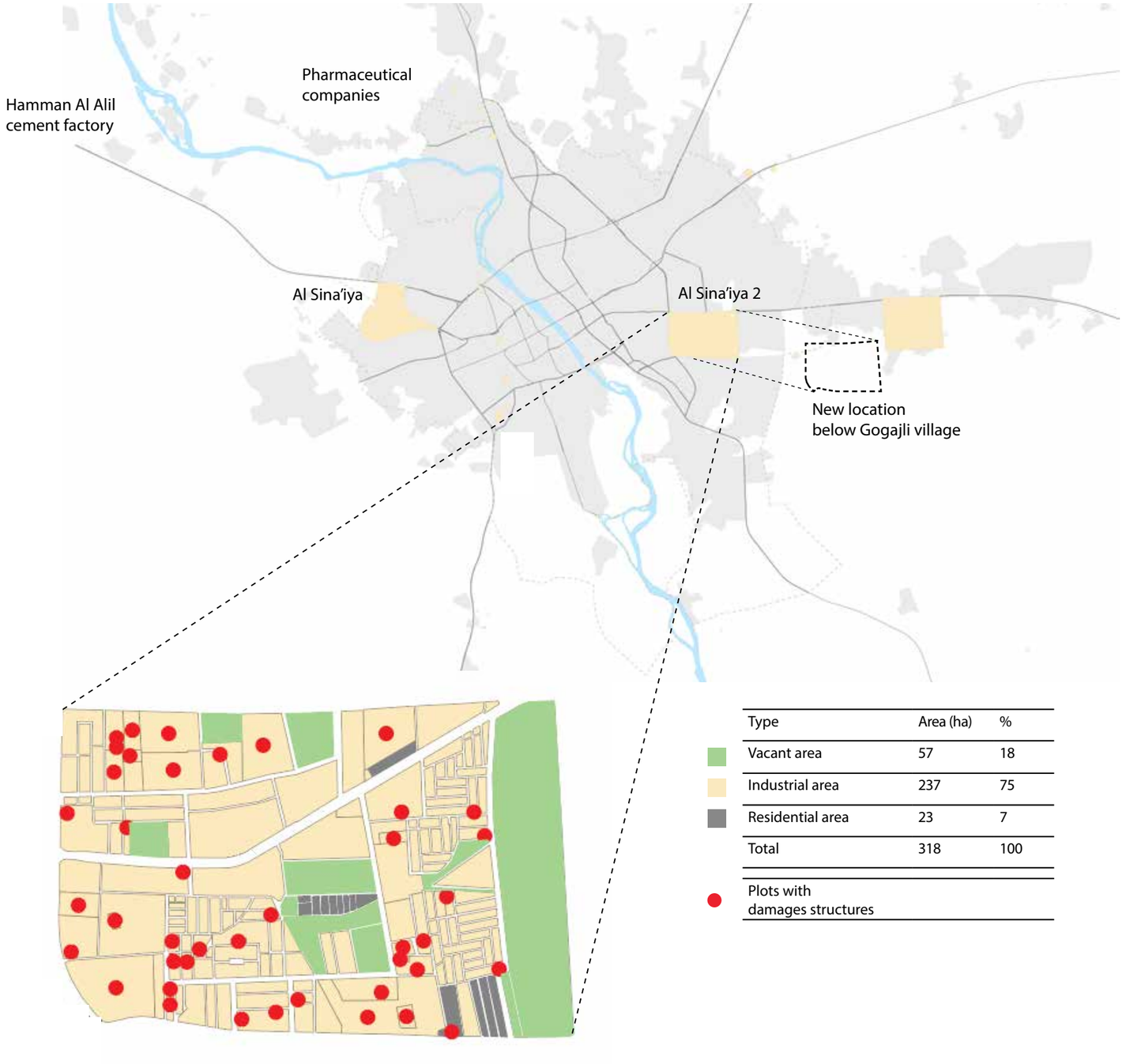
FIGURE 57. Post-war investment projects
Locations of investment projects proposed by MOCHMPW, and areas in and around Mosul. Suggested investment zones West, East and Centre (Local Municipality/ UN-Habitat).

UN HABITAT
FOR A BETTER URBAN FUTURE

CREATE AN ENVIRONMENT FOR PRIVATE INVESTMENTS
DEFINE A NEW INDUSTRIAL INVESTMENT AREA IN EAST MOSUL

Industrial and manufacturing facilities in key industrial areas of the city have been heavily damaged, and the access to basic services, e.g. constant supply of electricity and water and logistical support are insufficient. As a result of this destruction, there is an opportunity to relocate part of damaged industrial areas from the inner city to the periphery of Mosul to make space for mixed-use investments. A similar relocation scheme has already moved industries from west of the Old City to the current Al Sina'iya area, when this area was still on the outskirts of the city. The relocation of industries in the Al Sina'iya area to the area close to the Erbil road should be considered for facilities that have been destroyed and whose lease agreements with the municipalities are set to expire in the near future. This process can be facilitated by offering relocation incentives, such as a reduced cost of land lease agreements with the municipality, tax breaks, or shared investment in infrastructure. The area that is released as a result of this, should be utilized to address the housing crisis, introduce new market areas in support of surrounding neighborhoods; alleviating congested areas, and prevent further illegal economic expansion by providing formal commercial zones. In addition, investment in basic off-site infrastructure and service at new industrial areas, for instance security, cable/fiber-optic communication, and renewable energy sources, through national or international loans should be considered to attract potential industrial investments.

FIGURE 58. Damaged car repair shops in the Al Sina'a area
(UN-Habitat, Ivan Thung, August 2018)



Type	Area (ha)	%
Vacant area	57	18
Industrial area	237	75
Residential area	23	7
Total	318	100

Plots with damages structures

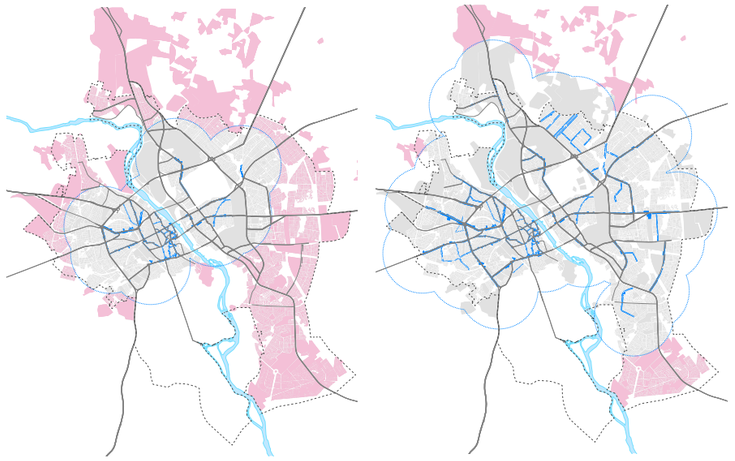
FIGURE 59. Main industrial sites in Mosul and potential relocation areas
(UNOSAT/ UN-Habitat)

FIGURE 60. Old City Market area
(Drone image, UNESCO/ Iconem, 2018)

CREATE AN ENVIRONMENT FOR PRIVATE INVESTMENTS
DEFINE MIXED-USE INVESTMENT AREAS

Even before ISIL, there was a lack of formal, suitable, and legally serviced marketplaces. Proliferation of informal shops and makeshift stalls emerged all around Mosul after the conflict. Currently, informal markets make up the bulk of commercial activities, which are predominantly located along existing residential streets. This gives the local government little control and limited revenue generating mechanisms from commercial licenses. However, the markets provide an important service, providing goods and daily essentials to the population. This phenomenon is typical of recovering economies after conflicts and natural disasters, as a coping strategy by people who have lost their jobs. This was also pointed out in the National Development Plan 2018-2022, which remarks that "deterioration of the investment climate has led to the expansion of small economic activities that are not subject to government control and operate outside the tax and insurance framework of the state, which are not included in the calculations of the gross national income and at the expense of the activities of the formal economy". The municipalities are to provide licenses for temporary stalls that do not intrude on critical public domain, clearly communicating the prohibition of permanent materials, e.g. bricks, concrete blocks and steel structures at sites allocated as temporary markets. Furthermore, municipalities should assess the closure of those that cause major congestion at critical roadways and intersections but are to avoid forced relocations by adopting mediation approaches and by offering incentives.

Initial assessments suggest that a quarter of the people do not live within a walking distance of a functioning market. Based on initial satellite damage assessment and catchment areas, the following streets should be considered for assistance; a) The Old City along the main commercial streets; b) Old Mosul Market; c) Commercial streets north-west of the Old City in Al-Rabee; d) selected streets in East Mosul in Al-Zuhur; e) selected streets in the Mosul Al-Jadeda (see Fig 46).



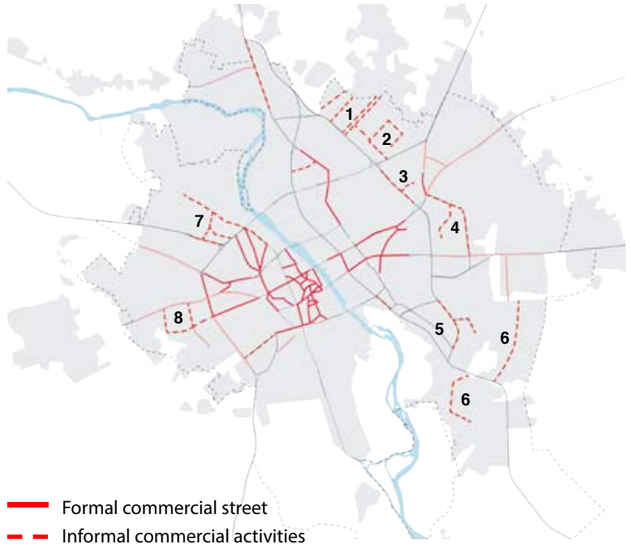
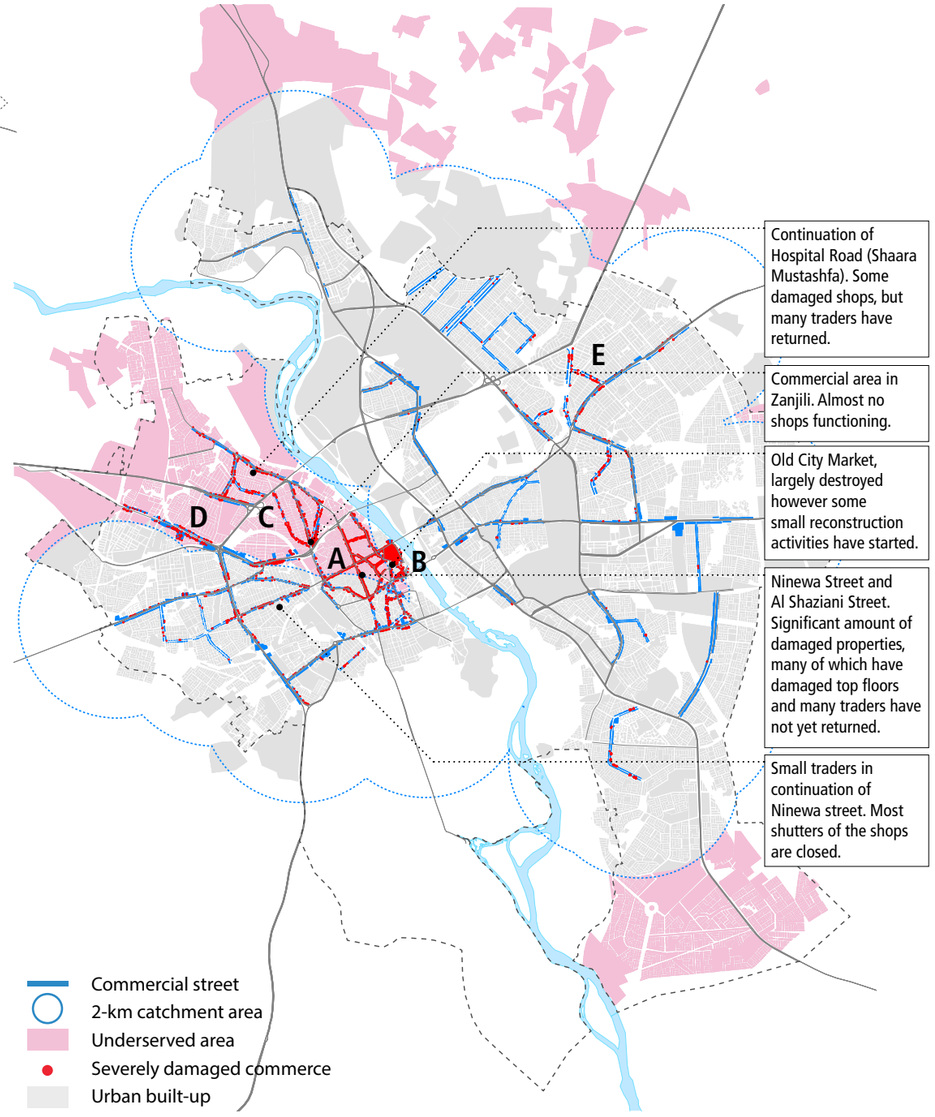


FIGURE 61. Official commercial streets (left)
2-km catchment areas of streets designated by the municipality as formal. If only formal commercial streets would be active, a significant part of Mosul would be underserved areas.

FIGURE 62. Official & unofficial commercial streets (right)
2-km catchment areas of streets designated by the municipality as formal and informal. A significant number of informal streets should be formalized to serve the population of the city effectively.



Mosul	People within distance to functioning markets
Within 2km	77%
Within 5km	15%
> 5km	8%
Total	100%

Name	# Streets	Length of street	% of total
Commercial axes	15	24,467 m	24%
Existing	45	39,422 m	37%
Suggested	28	39,420 m	39%
Total	88	101,206 m	100%

FIGURE 63. Main commercial streets
Expansion of informal commercial activities that emerged after the conflict, predominantly in residential areas, as mapped by the directorate of Municipalities. 1. Al Hadbaa area connecting to northern informal settlements, 2. Al Zuhur area connecting to north-south axis that connects West Mosul, 3. Regional road next to heritage areas, 4. Urban throughway close to residential area, 5. Serving Al Wehda area, 6. Serving Al Rasheed area, 7. Reaching into North-West Mosul, 8. Serving Al Risaala and western informal settlements.

FIGURE 64. Map of extensive damage
Damage to commercial properties in areas indicated as formal or informal commercial streets by the urban planning department, assessed through satellite imagery. Pink areas are expected to have reduced access to markets (Satellite imagery/ UN-Habitat).

LONG TERM OBJECTIVE (5-10 YEARS)

7 RESTORE AND ENHANCE PUBLIC SPACES

There are very few public parks in Mosul. This is partly the result of deliberate policies giving up public parks to irreversible conversion of green spaces for residential purposes enforced during the previous regime, when all municipalities were ordered to provide plots for military personnel. Mosul currently hosts 140 public green spaces, with a total of 141 ha. The situation is particularly dire in West Mosul, with 17 ha, amounting to a mere 0.2 m2 per capita compared to cities in the region. In comparison, Erbil has 5 m2 of green public space per person.

Additionally, due the lack of green infrastructure, the city has limited sites for the filtration of storm water into the ground during peak rain events, leading to flooding in several areas of the city. Despite the lack of few accessible green spaces, there is vacant space to increase the number of public spaces, e.g. sports grounds of schools that can be opened to the public after school hours. To achieve 2 m2 of green space per person, approximately 20% of 934 ha vacant areas needs to be converted. Types of potential areas to be converted, are former industrial spaces, areas near watersheds and urban "leftover" spaces, including under flyovers and bridges. These offer an abundance of opportunities, including sports facilities for youth or evening markets, that can be initiated by local community.

Priority Action(s)	Possible Actor(s)
» Rehabilitate one large park as the symbol of the recovery	Local Government
» Initiate an "urban acupuncture strategy" for small to medium sized parks to bring back community green space, for social cohesion through place making, or in anticipation of increased heat waves as a result of inadequate green spaces	Local Government
» Encourage owners of vacant plots to allow their temporary conversion as low-investment sports grounds for youth.	Local Government
» Explore the potential to create a new linear park to the north of Mosul along the river bend and one to the south at the Ghizlani area	Local Government

Possible Implementation/ Funding Options	Indicator
» Set-up a designated Park and Wadis Authority under the directorate of Municipalities, responsible for park upkeep, prevention of encroachment, and resource mobilisation for the development of facilities for youth	# of residents with (walking distance) access to public parks
» Pilot the strategy by selecting small existing parks in East and West Mosul, as well as in the Old City, for greening, rehabilitation and addition of facilities for youth	

FIGURE 65. Urban parks in Mosul
Example of neighborhood encroachment on public garden gradually rendering the city without any meaningful public green spaces. Limited water filtration during peak rainfalls results in more chances of flooding in residential areas

FIGURE 66. Green spaces in Mosul
Example of a typical "green" space allocated to each neighborhood, today dilapidated and encroached upon (UN-Habitat, Ivan Thung, 2018)

RESTORE AND ENHANCE GREEN SPACES
INTRODUCE NEIGHBORHOOD PARKS

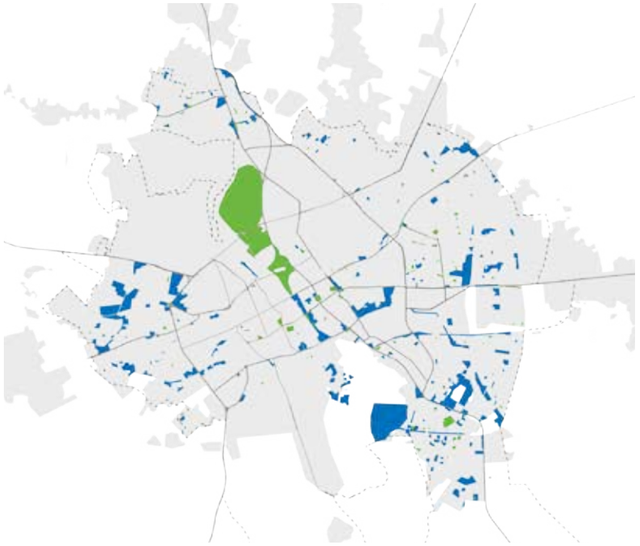


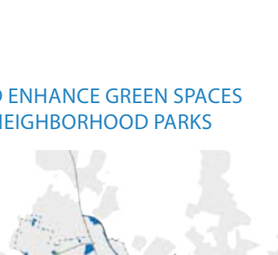
FIGURE 67. Existing & potential green spaces in Mosul
Green public spaces per capita within the municipal boundaries of Mosul. Even though currently there are very few accessible public green spaces, there is sufficient space in the city to achieve this. This overview is a mapping of these potential areas, not taking into consideration potential challenges regarding with ownership (UN-Habitat)

Range (h)	Existing	Potential
0-0.5	74	39
0.5-1	27	32
1-2	18	53
2-5	5	58
5-10	2	30
10-50	2	18
50-100	0	1
100-200	0	1
200-400	1	0

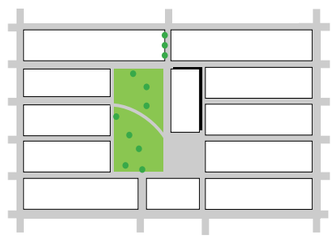
TABLE 68. Public parks and gardens in Mosul

Range (ha)	Erbil	Mosul
0-0.5	283	74
0.5-1	56	27
1-2	18	18
2-5	6	5
5-10	6	2
10-50	4	2
50-100	0	0
100-200	1	0
200-400	0	1

TABLE 69. Comparison of green spaces between Mosul and Erbil
Comparisons show that the greatest disparity concerns the green areas of 0-1 ha - small to medium sized neighbourhood parks. A hierarchy of small, medium and large parks is suggested to make Mosul green again.



Small green >0.5 ha
Various relatively small patches of green can be found in Mosul, often located on road reserves, intersections, or areas surrounded by heavy transport infrastructure. Such small green ribbons and spots can visually provide a sense of public green and contribute to a more sustainable living environment. There are several examples around the world of such patches being 'adopted' and maintained by the surrounding communities - under the condition that they remain open to the public.



Neighborhood park 1-5 ha
Medium parks in residential neighborhoods provide inhabitants with a pleasant environment to meet and socialize, often containing trees and flowerbeds. They also provide shade and mitigate the effects of extreme heat waves. Those areas should be enhanced and protected from encroachment. Some parks demonstrate an active cultivation by residents, providing a potential model to manage green areas effectively. The adoption of a community management model needs to be encouraged.

Urban park 5-45 ha
Large scale parks, like Mosul's amusement park along the Tigris River front in East Mosul, offer a city-scale space for public leisure and amenities. The rehabilitation and enhancement of such key urban parks provide an opportunity to kick-start the revival of the city. The re-installation of a large-scale park in West Mosul could become a landmark of the on-going reconstruction.

Forest 220 ha
The forest of Mosul, on the left riverbank, surrounded by heavy transport infrastructure, suffered from the conflict. Its size and its design, characterized by the high density of trees, allow for it to be rendered into a metropolitan park.

FIGURE 70. Different types of parks and gardens for Mosul
Comparing the green area distribution of green spaces in Mosul and Erbil, it is clear that the greatest disparity is in the number of areas of 0 - 1 ha, which are small to medium sized neighborhood parks. In addition, Erbil has about 2-3 times as many medium to large sized parks as Mosul (UN-Habitat).

FIGURE 71. View on the extensive destruction of the Old City along the riverfront
The historic riverfront of Al-Maidan suffered greatly from the conflict. The preservation of heritage elements and safeguarding of the cultural identity is of national importance (UN-Habitat, Jan Willem Petersen, August 2018).

SHORT AND LONG TERM OBJECTIVE (1-10 YEARS)

8 PROTECT AND REMEDIATE THE ECOSYSTEM OF THE TIGRIS RIVER

While immediate lifesaving concerns are of prime importance, environmental challenges often receive less attention. However, neglecting the environment in reconstruction efforts might have long term consequences on people's wellbeing and cause future problems requiring costly remedial measures. The contamination of the Tigris River, for example, is a major challenge for the city that was already recognised by the government before the crisis. Around 100,000 tonnes of salt and chemicals were finding their way into the river every year. With an estimated 1,250 tonnes of garbage generated per day, solid waste management is another great challenge facing Mosul. On the West Bank, the poorly regulated dump site at Al Sahaji has created extremely negative public health and environmental threats. Furthermore, the semi-engineered dump site on the East Bank near Gogjali is almost full and has a limited operational life. Arguably the greatest pollution concern is the waste water system. According to the UNDP quarterly May 2018 report on stabilization, West Mosul has seen widespread collapse of sections of the underground network, the sewerage infrastructure. The lack of environmental concerns predate ISIL as is outlined in National Development Plan 2013-2017. Around 65% of households use an unsafe sanitation method and 83% of wastewater is not subjected to sufficient treatment, which leads to dangerous environmental problems. This puts the health of citizens at risk and forms an obstacle to achieving sustainable development. It is estimated that at its peak, the city had 172 sources of sewage pouring about half a million cubic meters of waste water into the river daily (Ninewa Sewerage Directorate). This demonstrates the need to protect the river ecosystem and better integrate the city with its environment. Looking ahead, a sustainable environment also means being able to reduce risks and increase the city's resilience for future challenges, like the potential impacts of climate change with record high temperatures (52 degrees C) being recorded in the country. Sufficient access to water resources is a crucial matter of concern for Mosul's long-term prosperity. With Euphrates flows reduced by half due to upstream damming, Iraq is increasingly dependent on the Tigris River for its water supply. Decreasing water quantities and acutely declining water quality of the Tigris River have reached unprecedented levels and pose increasingly urgent challenges. The building of dams in Turkey and Iran has contributed to a significantly reduced inflow of water, rendering the land more arid and vulnerable to desertification. Combined with reduced rainfall trends, it has forced farmers to leave their lands, and herdsmen to abandon their livestock.

Priority Action(s)	Possible Actor(s)
» Make the Tigris River Protection a national planning project	GOI
» Prevent further pollution by completing the two sewerage treatment plants envisioned by Nineveh Sewerage Directorate	Local Government
» Enforce the prohibition to dispose of any home, industrial, chemical, and agricultural waste or debris into water sources	Local Government, Internatoinal Community
» Encourage reuse of recycled debris materials, reducing demand for new raw materials from quarries	Local Government
» Establish new engineered landfill sites in East and West Mosul	Local Government

Possible Implementation/ Funding Options	Indicator
» Implement the 2011 Sewerage Renovation Plan to improve the sewerage network and mitigate further pollution	% of reduced pollution level

#	Name
1	Al Shortah
2	Al Sadeeq 1
3	Al Sadeeq 2
4	Al Hadba 1
5	Al Hadba 2
6	Al Faw
7	Al Anabi Sheet
8	Al Dawassa 1
9	Al Dawassa 2
10	Al Dawassa 3
11	Al Kuwait
12	Al Tayaran
13	Al Egedat
14	Al Ghizlani 1
15	Al Ghizlani 2
16	Bab Al Jadeed
17	Al Nabi Younis 2
18	Al Sharqia
19	Al Nabi Younis 1
20	Al Malya
21	Al Thawra
22	Al Orooba
23	Al Safaa
24	Al Jadeeda 3
25	Al Jadeeda 2
26	Al Jadeeda 1
27	Mala Othman Al Mosle
28	Al Egedat
29	Al Tyran

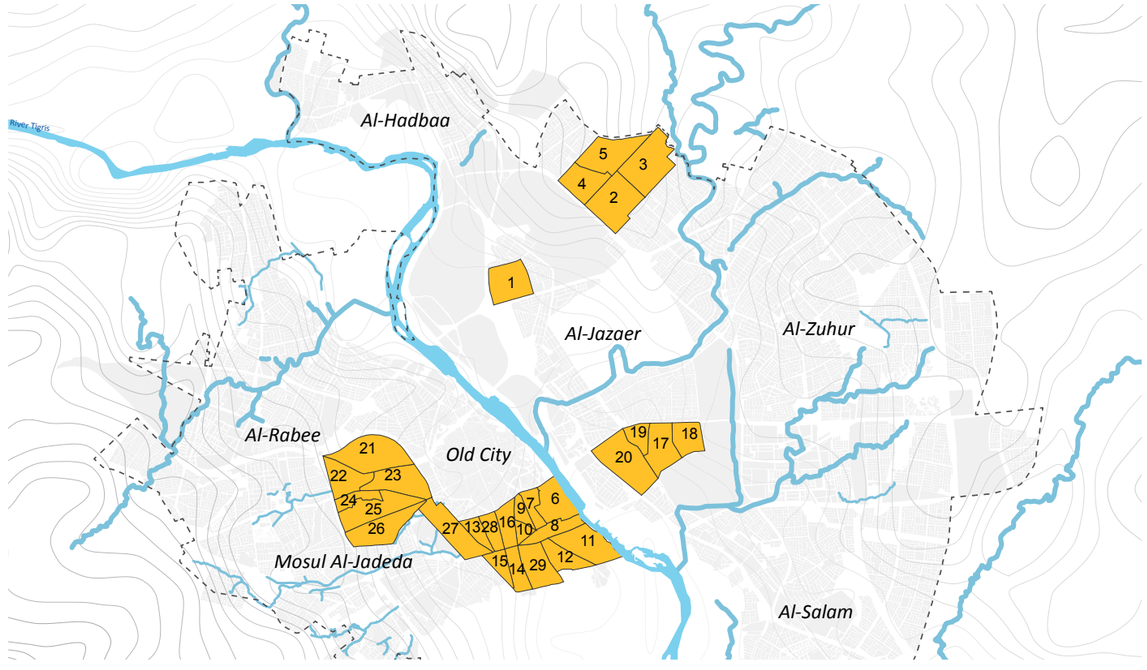
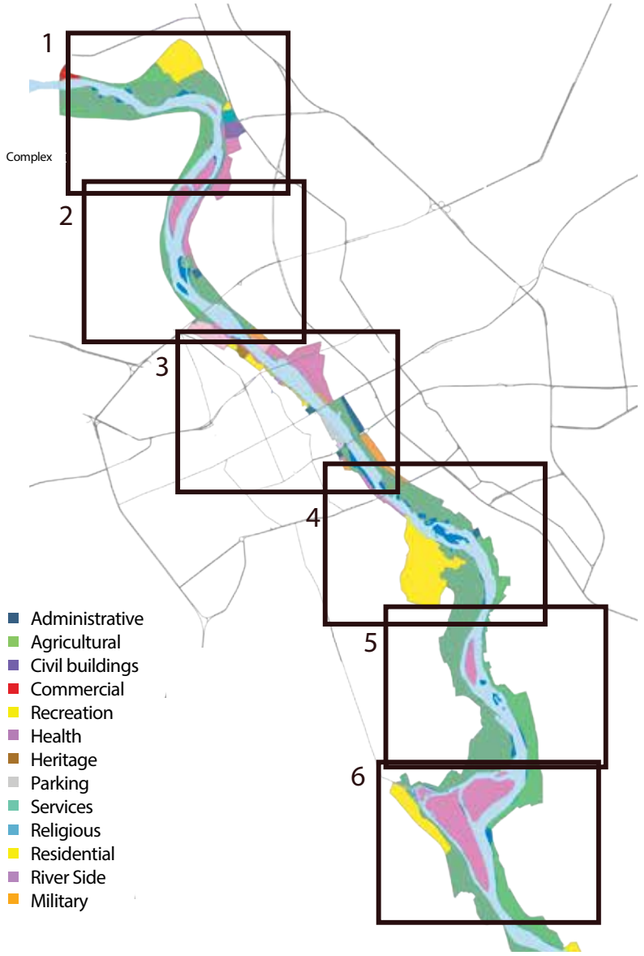


FIGURE 72. Mosul sewerage and drainage
Some areas are prone to flash flooding due to the lack of an adequate storm drainage system. Flooding is particularly severe in the low-lying areas surrounding the Old City. Flooding in these areas restricts accessibility to the Old City. The design of green areas that can absorb heavy rainfall, combined with drainage facilities is recommended (Sewerage Directorate/ UN-Habitat).

PROTECT AND REMEDIATE THE TIGRIS RIVER
MAKE THE TIGRIS A NATIONAL PROJECT

Before the crisis, there were several tourist sites along the river, with cafes, parks and sports grounds lining the waterfront. Some of the small islands and mudflats in the river could be reached by boats or pedestrian bridges, where residents of Mosul had access to recreational facilities as well. The waterfront area facing Al-Maidan is largely vacant as it used to be reserved as a flooding space before the establishment of the Mosul Dam. Together with Al Maidan, this area has significant potential for development. The Mosul section of the Tigris River should be studied as a separate project that can combine tourism, environmental management, and various investment possibilities. In particular, promoting sustainable tourism will allow citizens to fully enjoy its public green space.



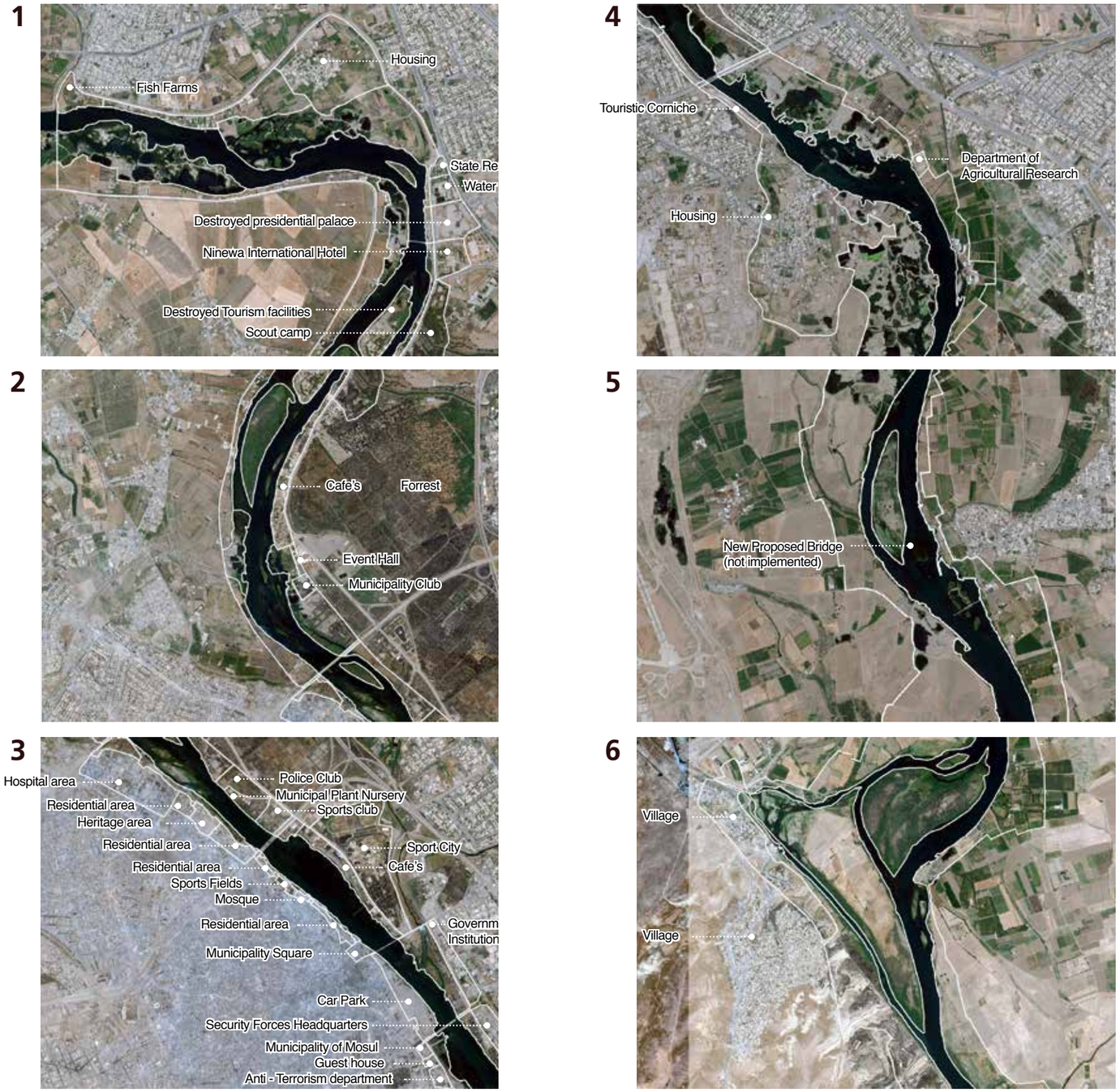


FIGURE 73. Land-use along the Tigris River within greater Mosul
(Satellite imagery/DigitalGlobe, February 2017: US Department of State, NextView License))

PROTECT AND REMEDIATE THE TIGRIS RIVER
SUBSTITUTE QUARRY MATERIALS

Mosul's reconstruction has led and will continue to lead to an enormous demand for raw materials and aggregates, primarily sand, gravel and crushed stone . A significant amount of the required materials are extracted from the bottom of the Tigris River and cause changes of the turbidity levels in the water. Moreover, riverbed quarrying is banned under Iraq's environmental law as it is highly destructive, impacting the natural environment substantially over a long period of time (Mosul Debris Management Assessment, UN Environment 2018.)

FIGURE 74. Quarry activities along the Tigris River
Above map depicting the location of quarries north of Mosul (Satellite imagery).

INITIATE A NATIONAL TIGRIS RIVER PROTECTION PROJECT

The sustained provision of water is fundamental for the future of Mosul and for the rest of Iraq. Many of the pressing water challenges are a legacy of financial and political considerations. Negotiations between Iraq, Turkey, Iran and Syria about transboundary natural resources, water quotas, and water rights are a precondition for future water security. Additionally, within Iraq, an integrated water management strategy should be prioritised, which will equitably addresses the demands for drinking water, agriculture, industry, tourism, and environmental protection. Within Mosul, the Khawsr River on the East Bank, which has almost dried-up and is used virtually as an open sewer, could serve as a pilot river remediation project that could significantly enhance the city's natural capital.

Measures to rehabilitate the most important infrastructures require funds that exceed the 2018 budget of the Ministry for Water Resources by more than tenfold (Federal State Budget for the Republic of Iraq for the Fiscal Year 2018). International experience has proven that making a river a national planning project is an important tool in streamlining interventions across ministries and administrative boundaries.

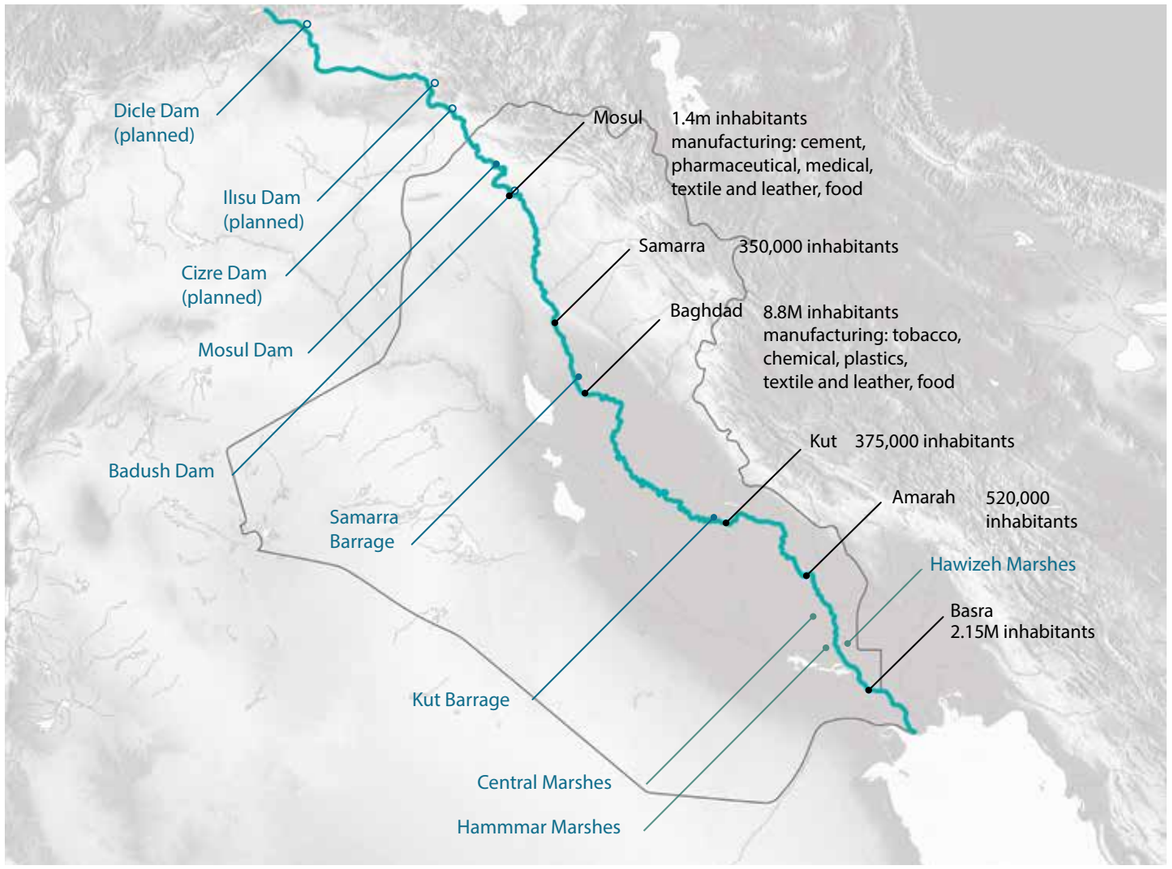


FIGURE 75. Sample of points of pollution along the Tigris River
The trajectory of the Tigris River with the main sources of pollution and obstacles. The Tigris River is 1,850 km long, with 400 km in Turkey, 32 km on the border between Turkey and Syria and 1,418 km in Iraq (UN-Habitat).

FIGURE 76. Perspective of the Old City markets and hinterland with its agricultural significance
(Drone image, UNESCO/ Iconem, 2018)

MEDIUM TO LONG-TERM OBJECTIVES (2-5 YEARS)

9 RE-START THE DEVELOPMENT OF THE MASTERPLAN

Over the last 18 years, the city has developed without a plan. Re-starting the planning process is fundamental to ensure equitable and sustainable growth prospects for Mosul. The previous Masterplan for Mosul was developed in 1974 and guided the growth of the city for 25 years. By 2000, the plan had expired. The previous Masterplan was generally considered to be successful in managing the growth of the city. Most of the provisions in the masterplan have been realised as planned, with the exception of some major ring roads (See next page). In 2000, local authorities recognised that a new masterplan for the next 25 years would be needed, as most of the residential land provided for in the old masterplan was occupied, with the exception of under-serviced land in the south-east of Mosul.

However, due to the political situation at the time, it took almost 8 years before a budget was released for drafting a new plan. Thus the development of a new masterplan only started in 2008. Furthermore, the development of a new masterplan proved more difficult than expected, and the resulting plan was rejected for a variety of reasons, including the following:

- No integrated plan of transport and urban development was included in the plan. At the same time, local government officials had their doubts about whether a proposed northern bypass, which was designed to serve very few areas of the existing city, and crossed right through the irrigation areas could justify its considerable costs.

- Many of the proposed extension areas were located too far from the commercial heart of the existing city, and some were on areas with significant slums which would have entailed large infrastructure investments and required long commuting times.

- There was no concept for the integration of the extension areas with the existing city, nor were there suggestions on how to deal with existing poor and underserviced areas.

- The Masterplan ignored the challenge of informal settlements.

It would be a mistake to see the failure of the 2008 proposal as simply reflecting the capacities of the consultancy responsible for developing the plan. The reality is that as a city expands in a context with few green fields, and thus finds itself increasingly in competition

Priority Action(s)	Possible Actor(s)
» Develop the Terms of Referenece based on the Initial Planning Framework for updating the 1973 Masterplan	Urban Planning Directorate

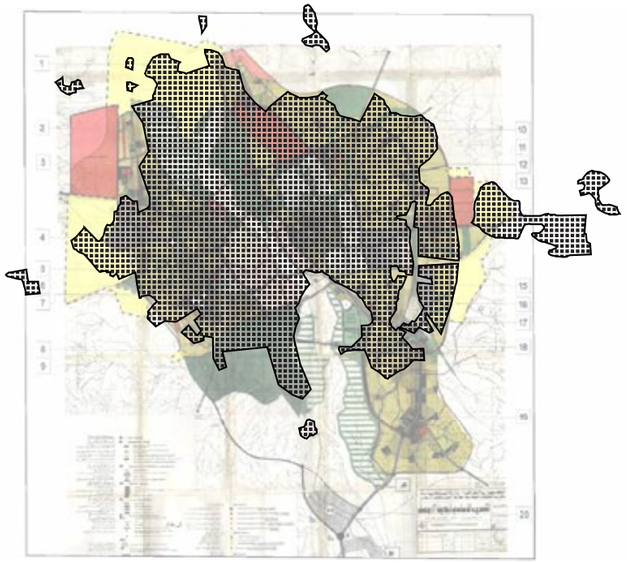


FIGURE 77. Built-up area in 2000 overlaid on the 1974 Masterplan by MOCHMPW

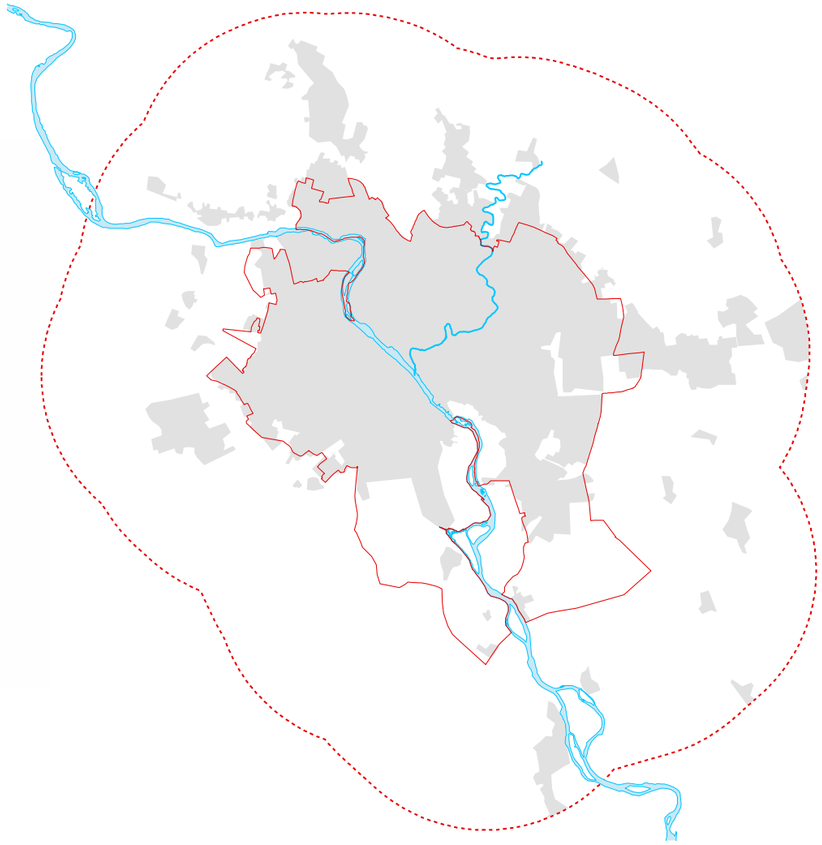


FIGURE 78. New future masterplan of 2008, with villages and built-up areas outside of the Mosul city boundary

for space with other (economic) activities, the challenges to using the 'masterplan' as the main planning tool become increasingly complex. While a Masterplan, which, by its nature is a top-down planning tool, excels in the technical organisation of spaces, such as defining l and-uses in greenfield areas, zoning and major infrastructural projects, for more complex urban development challenges such as brownfield development, urban regeneration, densification strategies and informal settlement upgrading, a masterplan is a blunt tool, and more participatory approaches are required. By Iraqi law, a new masterplan needs to consider a 7km buffer around the existing city boundary as its study and planning area. However, within this boundary there are already many significant urban developments, few of which are legal or conform to planning standards, which need to be considered. For this reason, although detailed 'master plans' can be considered for specific areas, it would need to be accompanied by a strategic planning approach to be able to address the complex challenges at hand. This Initial Planning Framework has outlined some of the initial areas of study, each of which need significant project development and institutional backing to be implementable.

FIGURE 79. Road section C in East Mosul, a large 4-lane road ends abruptly in a residential development, rendering the trajectory obsolete
(UN-Habitat/ Jan Willem Petersem, October 2018)

RE-START THE DEVELOPMENT OF THE MASTERPLAN
UPDATE THE MASTERPLAN BASED ON PLANNING FRAMEWORK

1974 masterplan infrastructure

Due to a lack of funding, significant parts of the infrastructure planned in the 1974 Masterplan were not implemented. Notably, this includes the major road connecting the outer settlements of the city, as well as some road connections between major roads within the city and two bridges. In total, approximately 33 km of main roads have not been implemented. This puts a strain on the infrastructure in the inner city, as traffic that aims to reach a location in the outer areas of the city from another location in the outer areas, has to pass through the inner city. In addition, the lack of outer roads also fosters a center-periphery infrastructure model, which hinders economic development in the outskirts but also causes problems for traffic that should bypass Mosul, e.g. Baghdad-Duhok, as it needs to pass through the city. However, without adequate development control, the future implementation of the roads may prove too costly, lengthy and complicated as it would need to bear the cost of expropriation of a significant amount of residential properties.

FIGURE 80. Unimplemented road sections of the 1974 Master Plan
After the 2014 invasion, significant informal developments have taken place along the road reserve,of which section B could complicate future implementation if the development trend continues. Section C is precluded from future implementation because of significant residential development (Satellite imagery 2014, Google Earth).

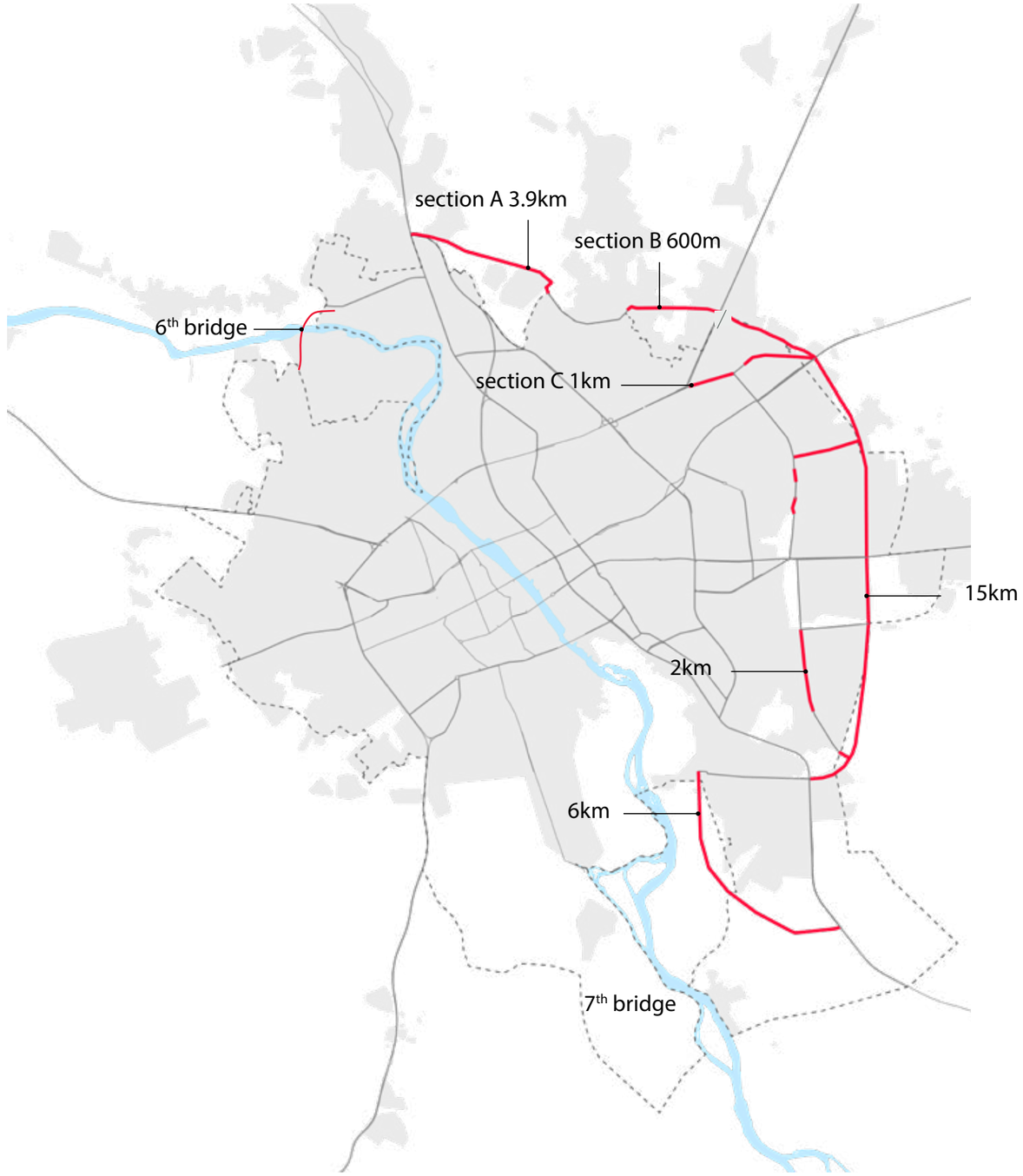


FIGURE 81. Roads that were planned in the 1974 Masterplan but not implemented
(Urban Planning Directorate/ UN-Habitat)

CHAPTER 2
MOSUL OLD CITY RECONSTRUCTION PRIORITIES

Mosul is one of Iraq's richest cities in terms of cultural heritage and contains numerous archaeological, historical, cultural and religious sites, monuments and landmarks. There are about 486 Islamic monuments and historic Mosques, as well as 32 ancient churches and 6 monasteries in Mosul City (C&R Rizvi 2010). Many of these historic buildings, which are a testament to Mosul's rich historical and cultural background in Iraq and the wider region, have been severely damaged.

As social and political pressure for the swift reconstruction of the Old City complicates the preservation of the historic buildings and characteristics of the Old City, there is an increasing need to raise awareness of the historic value of the Old City of Mosul, which has been nominated as a UNESCO World Heritage Site.

A major potential for preserving historic elements lies in empowering reconstruction actors – in particular local residents, landlords, and religious endowments – to take responsibility for the sensible reconstruction of the Old City to recover their sense of identity and belonging, and to engage in a constructive dialogue about their common past and shared values. In order to do that, residents need to be facilitated with the means and provided with the skills and tools to contribute individually and collectively to the reconstruction activities.

In addition to empowering local residents, increased coordination between the local government, UN agencies, and (I)NGOs is key to recover the Old City and to facilitate the sustainable return of internally displaced persons. While it is widely acknowledged that the sustainable return of IDPs requires a multi-sectoral recovery of areas, most reconstruction and recovery activities have heretofore been scattered, with little inter-sectoral coordination.

UN-Habitat and UNESCO suggest tackling the reconstruction of the Old City through an area-based recovery approach. This so-called super block model renders the large and seemingly insurmountable challenges to practical and more manageable proportions and promotes a model for improved coordination.

STRATEGIC PROJECTS

The list below offers a selection of funding opportunities for strategic projects. Individually, these projects can substantially contribute towards the recovery of the Old City. Arguably more importantly, the selection of these projects is based on their ability to have a larger overarching impact on a resilient long-term reconstruction.

1 - PILOT SUPER BLOCK RECOVERY APPROACH

2 - REHABILITATE PART OF THE OLD CITY MARKET

3 - RECONSTRUCT THE TRADE CENTRE BUILDING

4 - RESTORE KEY HERITAGE AND LANDMARKS BUILDINGS

5 - CONSTRUCT STORAGE SITES FOR HERITAGE ELEMENTS

6 - ESTABLISH OLD CITY SELF-REBUILDING FACILITY

7 - PILOT AFFORDABLE HOUSING SCHEME FOR IDPS

8 - EXPAND SEWERAGE AND ELECTRICITY NETWORK

9 - REHABILITATE THE MAIN OLD CITY BUS STATION

10 - CREATE LONG-TERM DEBRIS RECYCLE PLANTS

11 - INITIATE RIVERFRONT REGENERATION

FIGURE 82. The built-up area of the Old City after the conflict
(UNOSAT/ UN-Habitat, 2018)

FIGURE 83. Advanced visual analysis of the Old City
Impression of detailed drone images translated into a 3D computer model, providing unprecedented insights into the extent of the destruction and possible means for the recovery of the Old City (7cm drone imagery 2018, UNESCO/ Iconem)

PREREQUISITE FOR RECONSTRUCTION

1 PROTECT HERITAGE FROM FURTHER DESTRUCTION

While substantial areas of the Old City have been damaged to such an extent that they will require extensive rubble clearance, these areas also contain historic structures with a high heritage value. Selective areas need to be immediately protected from further destruction. Clearance in these areas demands supervision by specialized heritage teams authorized by State Board of Antiquities and Heritage of Iraq and UNESCO. Unsupervised clearance should cease.

A stretch of destroyed areas along the Al-Maidan riverfront in the Old City was completely cleared in 2017, with the exception of the residual structure of the Yahya Abu Al Qasim Shrine. While large-scale clearance operations have been temporarily halted, a lack of awareness regarding the value of some damaged buildings may lead residents and other local actors to further demolish and clear residual structures that are sometimes hundreds of years old, inadvertently inflicting further damage on Mosul's cultural heritage.

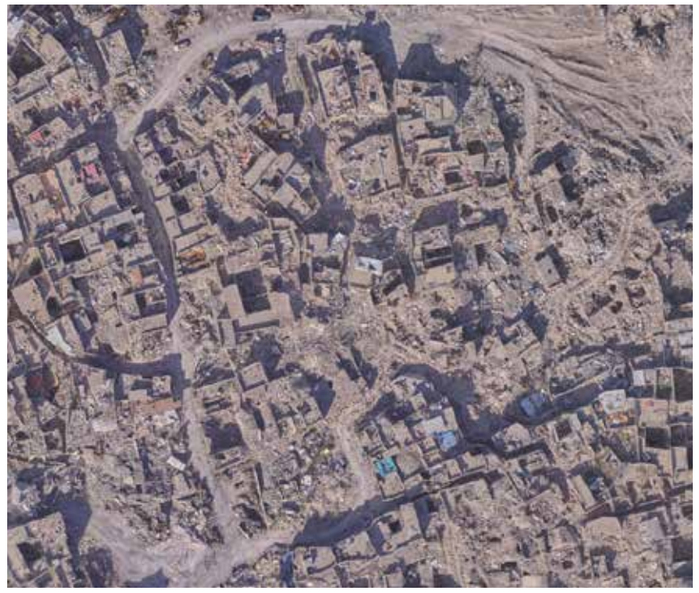


FIGURE 84. Example of area requiring clearance protection
Although the Al-Maidan area suffered heavy damage, it still contains numerous significant surviving historic structures. These buildings are in need of protection from clearance activities until specialized heritage teams can be put in place (7cm drone imagery 2018, UNESCO/Iconem).

Priority Action(s)	Possible Actor(s)
» Define clearance protection zones and commence supervised debris clearance in selected areas	Old City Task Force, SBAH, Provincial Council
» Temporarily freeze reconstruction activities along the riverfront of Al-Maidan	Old City Task Force, Local Government, Provincial Council
» Safeguard vulnerable heritage sites from looting and weathering by restricting access, closing off sections, and protecting valuable interiors with tarpaulins or waterproof protective materials	Old City Task Force, Local Government, SBAH
» Rebuild and retain the historic pre-conflict urban layout of the Old City, specifically roads, streets and alleyways, particularly those in extensively destroyed areas	Local Government, SBAH
» Set up heritage depots at which homeowners can temporarily store historic architectural elements that can be reused in the restoration and reconstruction proces	Old City Task Force, SBAH, UNESCO

Possible Implementation/ Funding Options	Indicator
» Issue a Provincial Council directive that prohibits clearance of surviving severely damaged structures without supervision by specialist heritage teams in selected areas	# of structures assessed and heritage remnants safeguarded
» Issue a Provincial Council directive to temporarily put reconstruction on the riverfront on hold, pending the finalisation of building guidelines and detailed design plans	Area covered under protective directives
» Set up specialized heritage damage teams to identify buildings that should be retained, as well as heritage elements to be moved to a storage site in advance of continuing debris clearing activities in selected areas in the Old City	
» For the Al Maidan waterfront, the "Iraq Reconstruction and Development Financing Facility" mentioned in the Iraq Reconstruction and Investment Framework (February 2018) should be explored for landlords that own multiple properties - such as the religious endowments - to access compensation for lost property. Residual reconstruction financing could be realized through Public Private Partnerships and the commercial reuse of property.	

PROTECT HERITAGE FROM FURTHER DESTRUCTION
SUPERVISED DEBRIS CLEARANCE PROTECTION

Immediate protection from destruction
Severely damaged blocks (Figure 88) that still have a significant number of surviving structures with a high historic value need to be protected immediately from further unsupervised clearance activities. A rapid assessment of the heritage value of these residual buildings is being undertaken by State Board of Antiquities and Heritage (SBAH). A secondary examination is needed to establish the heritage value of individual surviving buildings in greater detail. A directive, e.g. by the Provincial Council, should be issued to protect selected areas from further destruction by imposing a ban on the clearing of residual structures until monitoring teams can be put in place.

Sensitive reconstruction areas
Completely destroyed areas that have already been cleared, should be protected from uncoordinated reconstruction. This could be achieved by issuing a directive (e.g. by the Provincial Council) for the temporary freezing of reconstruction activities, pending the finalisation of detailed plans and guidelines. In these areas, an urban re-design should supplement reconstruction guidelines. The guidelines will recommend, among other things, the use of materials, building typologies, windows and door types, as well as detailed guidelines for the reconstruction of religious buildings, such as mosques or shrines.

Additional procedures to protect heritage
Blocks that have a significant number of traditional houses (Figure 87) require additional supervision for their restoration. In some areas, SBAH has already completed its assessment of important historic buildings. However, it is likely that not all buildings with historic value have been recorded thus far. Furthermore, it is likely that low-cost reconstruction approaches carried out by unskilled laborers will damage historic structures in these areas. UN-Habitat and UNESCO recommend that the initial housing rehabilitation activities focus on areas with fewer historic buildings, if no specialized heritage teams or consultants are available for the assessment process.

FIGURE 85. Built-up area of the Old City before the conflict - 2017
(UN-Habitat, adept from field survey by Studio Galli International, 2008)

FIGURE 86. Built-up area of the Old City after the conflict - 2018
Buildings that are severely damaged or completely destroyed are marked as open space as it is likely that these structures need to be cleared (UNOSAT/ UN-Habitat/ UNESCO/ Iconem, 7cm drone imagery 2018).

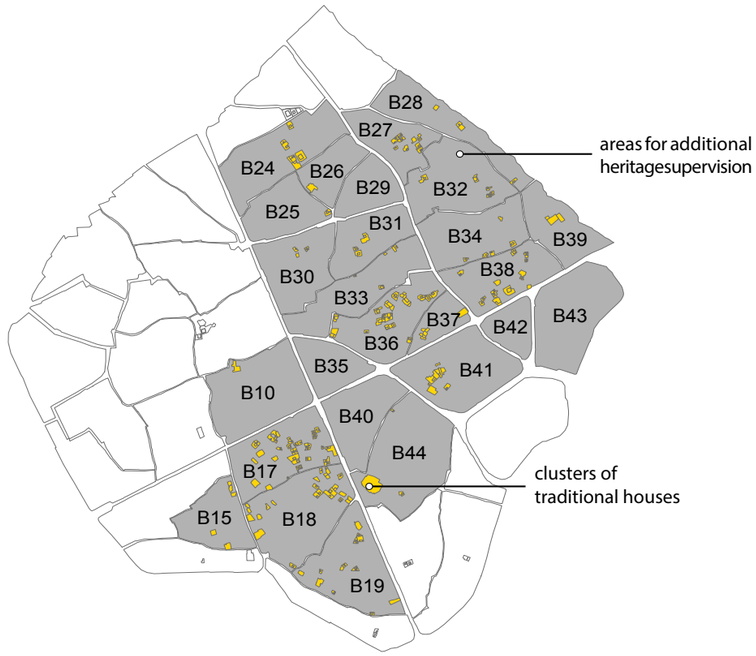


FIGURE 87. Areas with listed traditional houses
There are at least 335 listed heritage buildings, making up only 2% of the 15,000 houses in the Old City. The clusters follow the organization of the 'super block' approach (UN-Habitat/ UNESCO/ SBAH, 2018).

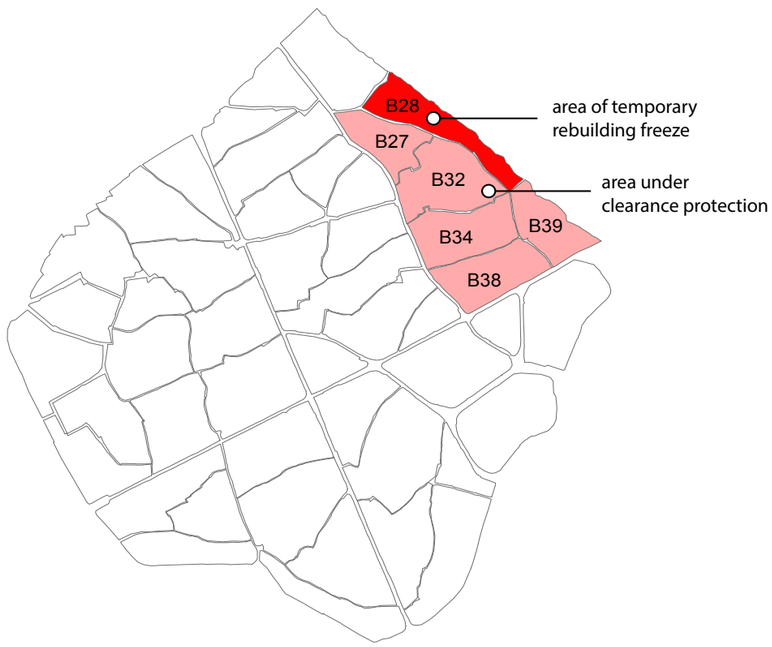


FIGURE 88. Priority areas for immediate protection
(UNOSAT/ UN-Habitat/ UNESCO/ Iconem, 7cm drone imagery 2018)

UN-HABITAT FOR A BETTER URBAN FUTURE
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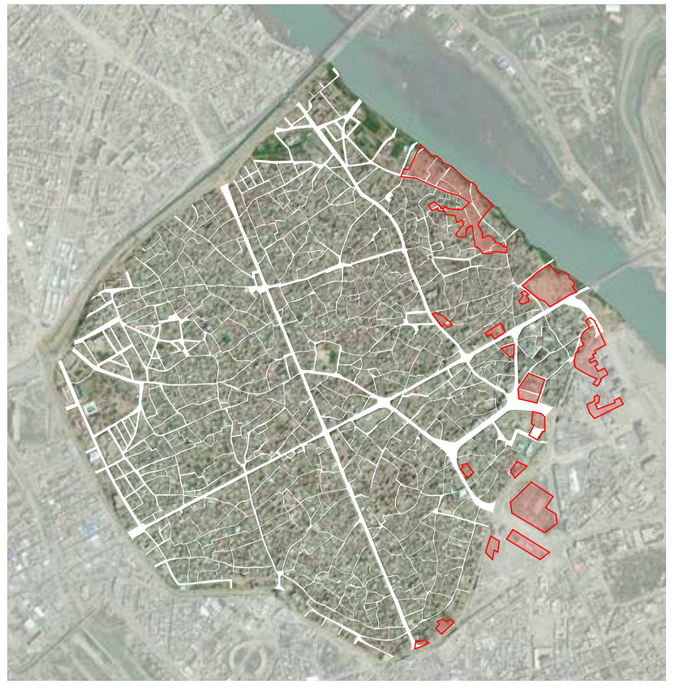

FIGURE 89. Riverfront
Left: Satellite imagery of the riverfront area of the Old City before the conflict (UN-Habitat, satellite imagery, 2014).

FIGURE 90. Bulldozed areas
Center: Image of the riverfront area of the Old City after the conflict. An area of 3.66 ha has been cleared since the liberation of Mosul (UN-Habitat, satellite imagery, 2017).

FIGURE 91. Unregulated clearance
Right: An area of approximately 18 football fields (11.66 ha) has been cleared since the liberation. Large scale demolition came to a halt by October 2018. Further precautions are required to prevent the destruction of valuable structures characteristic of the historic urban fabric of the Old City (UN-Habitat, satellite imagery, 2017).

FIGURE 92. Riverfront
The Al Maidan area was largely destroyed during the ousting of ISIL from this stronghold. The area was subsequently cleared by the military and local authorities to allow easier access. A substantial part of the ERW conteminated debris has been pushed onto the riverbank or into the Tigris River. Parts of the Al Maidan should be protected from any further development pending the provision of clear reconstruction guidelines (UN-Habitat, Jan Willem Petersen, August 2018).

PROTECT HERITAGE FROM FURTHER DESTRUCTION
SAFEGUARD VULNERABLE LANDMARKS

#	Heritage landmarks	Status
1	Elisa Dadah shrine	Destroyed
2	Imam Abdulrahman shrine	Destroyed
3	Shekh Al Shat tomb	Destroyed
4	Al Umawi mosque	Destroyed
5	Omawi mosque minarat	Destroyed
6	Primary house of Iraqi	Minor Damage
7	Emam Ibrahim mosque	Destroyed
8	Hammo Al Qaddo mosque	Destroyed
9	Catholic church	Minor Damage
10	Al Aghawat mosque	Minor Damage
11	Al Sawwaf khan	Minor Damage
12	Nabi Jarjis mosque	Destroyed
13	Al Basha mosque	Minor Damage
14	Al Hadbaa minarat	Minor Damage
15	Al Mufti khan	Minor Damage
16	Hammo Al Qaddu khan	Minor Damage
17	Al Nuri mosque	Minor Damage
18	Saida Nifisa shrine	Destroyed
19	Shah Zanan shrine and tomb	Destroyed
20	Al Hagiyat Khan	Minor Damage
21	Al Najafi street	Minor Damage
22	Khangar Khashab mosque	Minor Damage
23	General old police station	Destroyed
24	Al Totonch house museum	Destroyed
25	Al Hatra hawks square	Destroyed
26	Al Saah church	Minor Damage
27	Dominican fathers monastery	Minor Damage
28	Monastery of Dominican nuns	Minor Damage
29	Khuzam mosque	Minor Damage
30	Ancient Nineveh wall	Destroyed
31	Al Rabiaa mosque	Minor Damage
32	Imam Awn Aldin shrins	Destroyed
33	Obeid Aga bath	Minor Damage
34	Omar Alaswad mosque	Minor Damage
35	Al Omariyya mosque	Minor Damage
36	Al Abaroqi mosque	Destroyed

FIGURE 93. Heritage houses and proposed depot locations
Many historic buildings in the Old City are currently unprotected from weathering and potential looters. To prevent large-scale theft of historic artefacts, these sites, e.g. Al Nuri mosque, require protection by regulating access and closing off specific areas. Furthermore, other international examples show that it is essential to protect fragile interiors from weathering by using waterproof covering, for their preservation. Proposed locations for heritage depots (blue) are located in close proximity to important areas of the Old City. Here, homeowners can temporarily store historic architectural elements to be reused for the restoration and reconstruction process (SBAH/ UNESCO/ UN-Habitat).

FIGURE 94. Example showing proposed protection against potential looting

FIGURE 95. Example showing proposed regulation of access

FIGURE 96. Example showing proposed environmental protection

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PROTECT HERITAGE FROM FURTHER DESTRUCTION
SAFEGUARD VULNERABLE LANDMARKS

The unsupervised disposal of debris jeopardizes the recovery of important landmarks. Valuable historic items, such as pillars, window frames and other decorative elements in Mosulian marble (Alfarsh) or limestone (Aal Hillan) are likely to be lost as it is being included with ordinary residential rubble. The introduction of debris clearance guidelines, assistance, recycling centres and debris transfer stations in the Old City should help residents organize their self-reconstruction initiatives in a way that preserves historic elements as much as possible.

FIGURE 97. Public landmarks
Due to a lack of debris collection sites, public landmarks, such as churches and mosques, are being used as rubble dumps. This often inflicts further damage on heritage sites and forms a potential safety hazard, as the relocation of debris makes it difficult to determine which areas have or have not been cleared of ERW (UN-Habitat, Jan Willem Petersen, August 2018).

FIGURE 98. View on Ninewa Street, one of the main central axis and commercial corridors of the Old City
(UNESCO/ Iconem, drone imagery 2018)

PROTECT HERITAGE FROM FURTHER DESTRUCTION
REBUILD THE PRE-CONFLICT HISTORIC URBAN LAYOUT

The total area of the Old City is approximately 250 ha. The eradication of the physical footprint of the original urban fabric and plot boundaries in parts of the Old City may give rise to new reconstruction scenarios, especially in the Al Maidan area along the riverfront.

Although it is often thought that the Old City has been completely destroyed, less than 3% of the urban street layout has been destroyed to the extent that the plot and street outlines are no longer discernable. Furthermore, the historic pre-conflict layout of the Old City is a key constituent element of the identity of Mosul and should be retained where possible. Rebuilding according to the pre-conflict layout of roads, streets and alleyways respects the current ownership boundaries and helps to avoid major legal ownership challenges, including housing, land and property rights issues as well as changes in land use designations that could prevent a delay in the reconstruction process and lead to complex compensation procedures.

FIGURE 99. Organic growth of urban fabric of the Old City
The layout of roads, streets and alleyways forms an integral part of the identity typical of historic middle-eastern cities (UNESCO/ Iconem, drone imagery 2018).

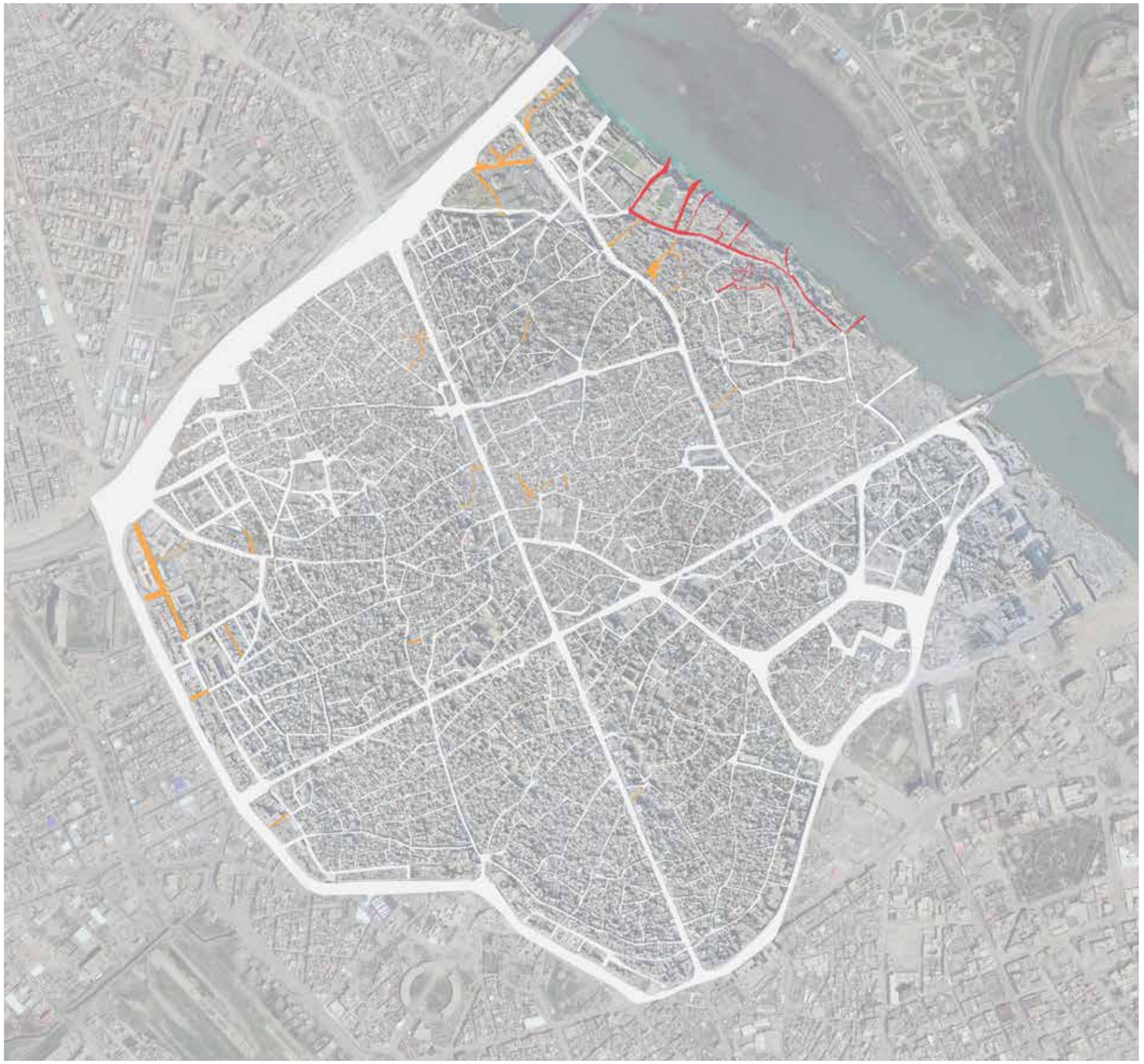


FIGURE 100. Historic pre-conflict urban layout of the Old City
Demarcation of the primary, secondary and tertiary roads, streets, and alleyways that define the overall identity of the Old City are depicted in white. Streets that are no longer discernable are depicted in red (UN-Habitat/ UNESCO).

THE NECESSITY OF A MULTI-SECTORAL, AREA BASED RECONSTRUCTION APPROACH

Area-based approaches have recently been advocated within the humanitarian and development community as a promising tool for recovery of complex urban areas. For example, the Global Alliance for Urban Crises (GAUC) advocated the need to 'adopt area-based approaches to programming and coordination' in recognition of the scale, nature and complexity of urban crises (GAUC, 2016). A 'block-by-block' approach as advocated by UN-Habitat and UNESCO would be a practical implementation model of an area-based approach in the context of the Old City.

Many actors have envisioned a 'phasing and zoning' approach for the reconstruction of the Old City. The reality, however, is that citizens are returning to their homes in a way that is difficult to 'phase' in a structured or rational way. Rather than aligned to a 'zoning', their reconstruction activities depend largely on the physical conditions of their property, their financial capacity to repair or rebuild their homes, the ability to access donor support, and/or the availability of urban services. UN-Habitat and UNESCO suggest delineating 48 areas, the so-called 'super blocks', to allow for a better alignment of existing self-reconstruction activities and prospective assistance.

For the city as a whole, returns depend on the ability of the city to offer accessibility through primary and secondary road networks, the availability of vital services and utilities like schools and electricity hubs, clearance of private property from ERWs, and the capacity of citizens to start self-reconstruction. The safe return of inhabitants to their area of origin is hence dependent on a multi-sectoral recovery.

IMMEDIATE IMPLEMENTATION (<1 YEAR)

2 RECOVER THE CITY THROUGH A 'SUPER BLOCK' APPROACH

Currently, numerous recovery efforts by residents and international actors are unfolding simultaneously in all parts of the Old City. In a large number of areas however, virtually no returns have taken place, as basic services, education or livelihood opportunities are not available. The area based block-by-block recovery approach – tailored to the context of the Old City – could provide a useful coordination tool for the sustainable recovery of the Old City. The community based block recovery plan builds on the initial 'zoning' studies that have been conducted by various stakeholders and provides additional depth to their initial analysis and recommendations. The outlined 48 'super blocks' reduce the recovery challenges of the Old City to more manageable proportions and add a level of detail to the previously recommended zones by the Engineering Consulting Bureau.

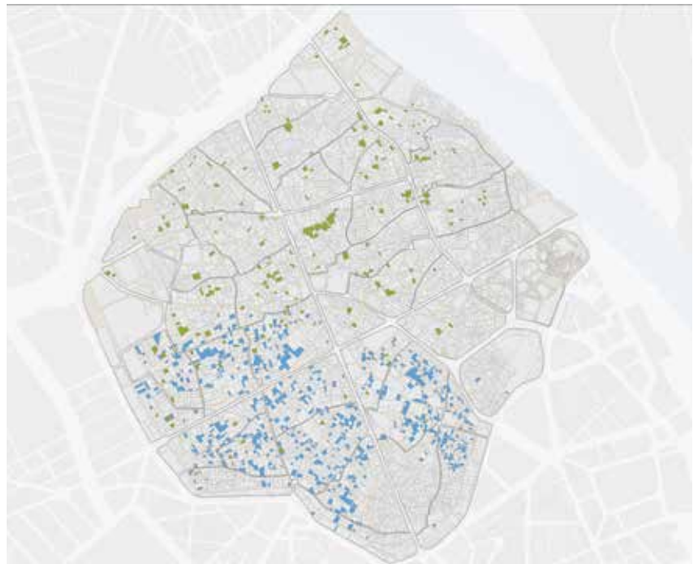


FIGURE 101. Planned and expected project in the Old City
Reconstruction and rehabilitation projects by various actors – 772 UNDP projects (blue) and 308 UNHCR ongoing projects (green) – that are currently undertaken without a comprehensive recovery plan in place for the Old City. Even though these combined activities cover approximately 15% of residential buildings in the Old City, they currently exclude severely damaged historic buildings. The super block recovery plan provides the framework for a systematic and coordinated approach to reconstruction (UNDP/ UNHCR/ UN-Habitat).

Priority Action(s)

» Development and implementation of the 'super block' based reconstruction and recovery plan for the Old City

» Coordinate reconstruction and recovery activities of government and international agencies in the Old City at the level of the 'super block'

» After piloting a super block, assess the potential to scale up the approach to other blocks, allowing for local initiatives and a number of actors to engage with the reconstruction

Possible Actor(s)

Old City Task Force, Local Government, UN agencies, Mosul Self Rebuilding Facility (MSRF)

Possible Implementation/ Funding Options

» Initiate the reconstruction of two super blocks, based on urban profiles and in collaboration with local actors. Conduct multi-sector assessment of the selected blocks with a coalition of actors from multiple sectors, e.g. Cash for Work, Water, Sanitation and Hygiene (WASH), housing rehabilitation, education, heritage. Based on the assessment, develop a 'block Bill of Quantities (BOQ)', which details the minimum interventions required to facilitate the safe and voluntary return of IDPs. Create a Community-Based Organisation (CBO) with representatives of residents to give feedback on the 'block BOQ'. Build a coalition of local actors, local NGOs, and UN agencies around the 'block BOQ' each of which will adopt a section of the BOQ. It is recommended that National actors also commit to part of the 'block BOQ' relating to completely destroyed houses

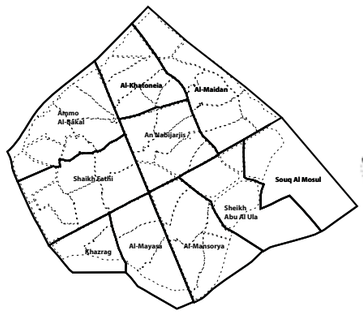
» A CBO consists of approximately 150-350 plot-owners, depending on the size of the block. The donor, e.g. REFAATO will give a conditional grant to the CBO which will be disbursed in tranches provided that owners adhere to building guidelines. After disbursement of the initial tranche, site inspection will confirm the adherence to agreed principles for release of subsequent tranches. Home owners will contribute with a down payment for receiving the grant, based on their level of income. A damage assessment of the block, and the number of parcels within the block, determines the size of the grant. Funds will be transferred to a trust, managed by the block. The block participants must use the money for building materials, construction services, and clearing services for all participants. All expenditures should be cleared by representatives of the super block with 75% agreement. A cost-sharing scheme should be devised which gives preference to people who have their residence as their only property. Overseeing of the construction work is done by the selected owners of the block, who may be compensated for the task. It may also be outsourced if agreed upon. A time frame for the release of grant tranches should be established. When the super block approach is established, it should also be communicated clearly so as to inform absentee owners. If absentee owners do not present themselves before a cut off time, the grant will be forfeited

Indicator

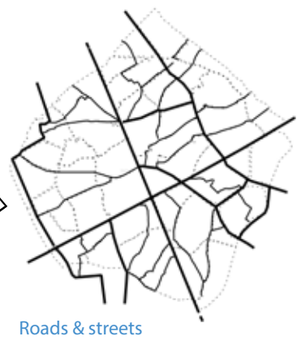
A shared, systematic and comprehensive reconstruction plan for the Old City

RECOVER THE CITY THROUGH A SUPER BLOCK APPROACH
DEVELOP AND IMPLEMENT AN AREA BASED RECOVERY PLAN

The block-by-block approach proposed by UN-Habitat and UNESCO allows for activities of local authorities, service providers, humanitarian agencies and development actors to be coordinated around the unit of the 'super block' for the Old City. These super blocks are defined by a cluster of regular housing blocks, which are an official legislative entity. The criteria that define the outline of a super block include a limit of maximum housing units, the existing road layout, and alignment to existing legal boundaries. A total of 48 super blocks have been defined, each containing between 150-450 plots, with a maximum of 3,500 inhabitants per block.



Neighbourhoods



Roads & streets

Old City blocks

Zoning Study
(Engineering Consulting Bureau of University of Mosul)

FIGURE 103. 'Super block' organization
The primary criteria for the block divisions include existing neighbourhood boundaries, primary and secondary road network, housing blocks and previous zoning studies for reconstruction in the Old City (UN-Habitat).

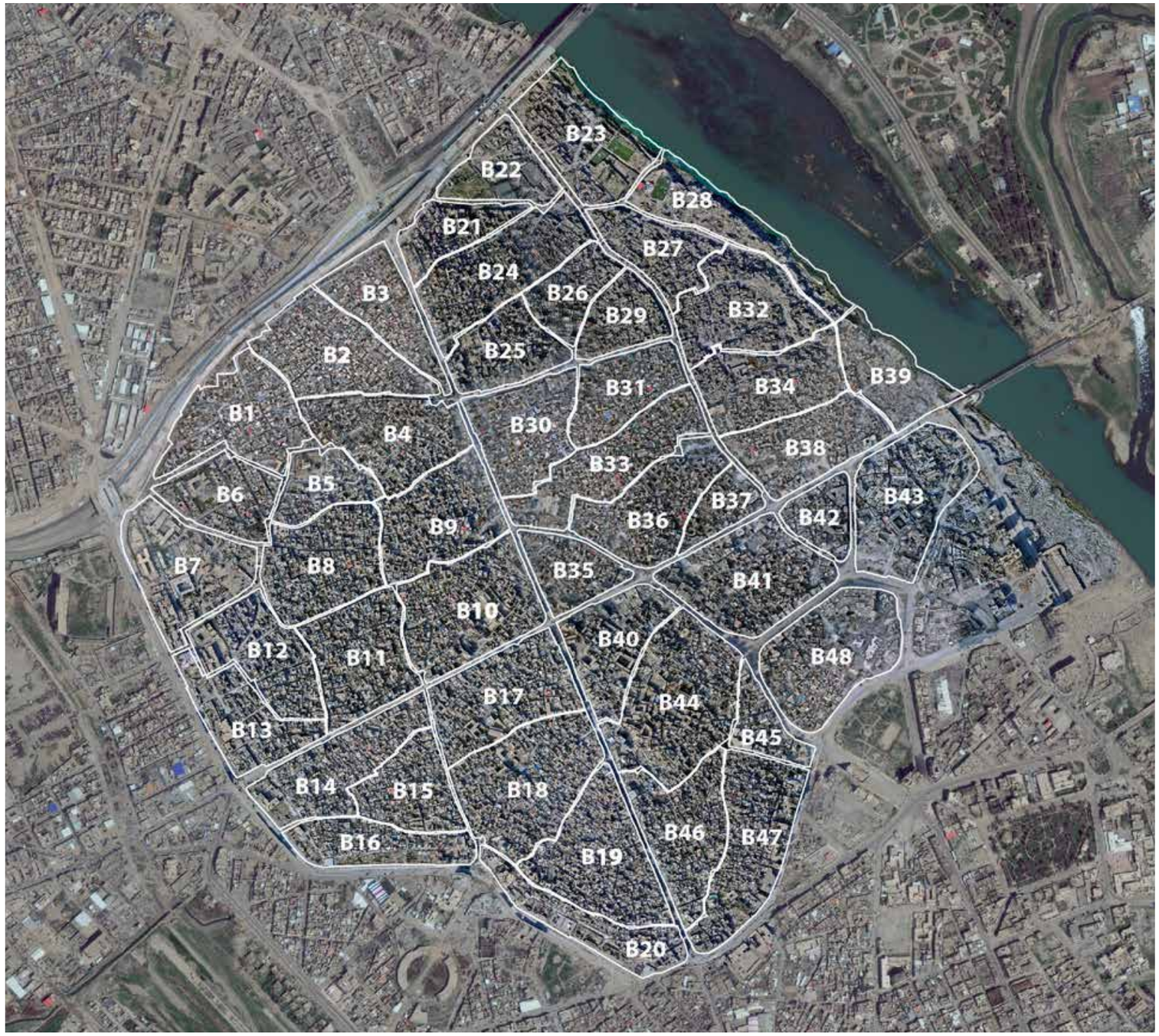


FIGURE 102. 'Super block' of the Old City
Satellite imagery of the Old City as of March 2018 with the defined outlines of the 48 'super blocks' for a community and area based recovery plan (UN-Habitat/ UNESCO/ Iconem, 7cm drone imagery 2018).

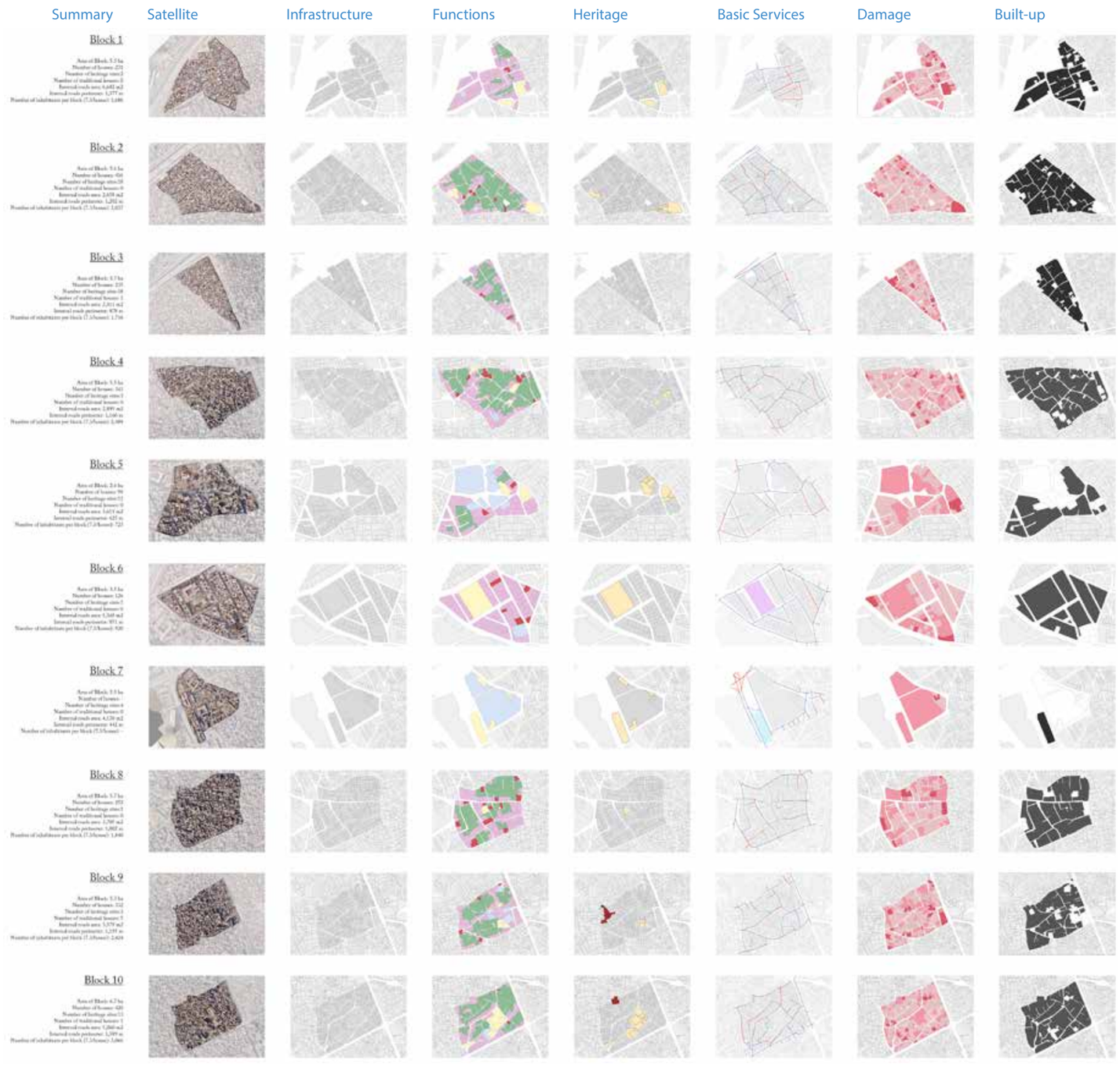


FIGURE 104. Analytical matrix of blocks
Fromrom the analysis of super blocks. Components include proximity to the nearest school, public transport, and health care center, number of households, and density, among others (SGI/ SBAH/ UNOSAT/ UN-Habitat/ UNESCO/ Iconem, 7cm drone imagery).

RECOVER THE CITY THROUGH A SUPER BLOCK APPROACH
DEVELOP AND IMPLEMENT AN AREA BASED RECOVERY PLAN

The super block approach offers considerable benefits.
Firstly, a synchronized block rehabilitation provides the opportunity for systematic clearing of debris and ERW, it permits homeowners to form community based organizations and collectively pool resources. It offers opportunities for the 'block' system to be 'adopted' by international donors (i.e. UNESCO due to significant heritage value). It encourages specific organizational models (i.e. due to full ownership of a block by a Waqf) or defines conditions for grant distribution. By making use of an analytical matrix, insights in the precise reconstruction needs per super block allow for specifically tailored projects and targeted reconstruction and development assistance.

Summary
Each block lists key characteristics, such as the quantity of houses that need rehabilitation and the number of inhabitants affected, as well as the block's proximity to the nearest school, public transport, and healthcare centre.

Satellite
A high-resolution 7cm drone image outlines the location of each block, its context, and post-conflict condition.

Infrastructure
The primary, secondary and tertiary roads, streets, and paths are mapped to delineate the level of damage to the urban network. In addition, potential points for extending or introducing new basic services can be distilled.

Functions
All functions are coded to help determine the intervention needed. The rehabilitation of commercial enterprises, public utilities, social or private housing, or mixed use program, each require a different course of action, i.e. the provision of small business loans, incentives packages for self-reconstruction or direct technical assistance.

Heritage
All heritage buildings, traditional houses and key landmarks are being identified. Special attention is reserved for these locations. The presence of these buildings can generate economic opportunities for the local community in its vicinity, i.e. by Cash-for-Work renovation activities.

Basic Services
Many parts of the Old City are underserviced even prior to the conflict. The destruction of the urban fabric offers a unique opportunity to introduce and upgrade water, electricity, sewage systems, and public services.

Damage Assesment
The damage inflicted is divided into five categories; negligible, minor, major, severe, and destroyed. Outlining the quantity of the categories per block defines the potential actors that need to be involved (i.e. private sector, NGO, International organisations or central government) and their modes of assistance.

Built-up area
The post-conflict build-up area – and subsequent clearing of other parts – is outlined. It highlights potential locations for land-use conversion, for instance to allow for public services to be introduced in greatly underserviced areas by means of financial compensation.

Next steps
After the selection of a block, field surveys will be needed to take stock of the fast-changing situation on the ground. Some blocks may need additional area planning such as the waterfront area.

FIGURE 105. Legend
Description matrix components.

RESPECT HISTORICAL CHARACTERISTICS

There are approximately 15,000 houses in the Old City, with an average of 6,6 people per house. During the pre-crisis the population of the Old City was circa 100,000 inhabitants.

Legend level of damage

- Destroyed - 1,690 buildings
- Severe damage - 3,241 buildings
- Negligible, Minor, Major damage - 9,455 buildings

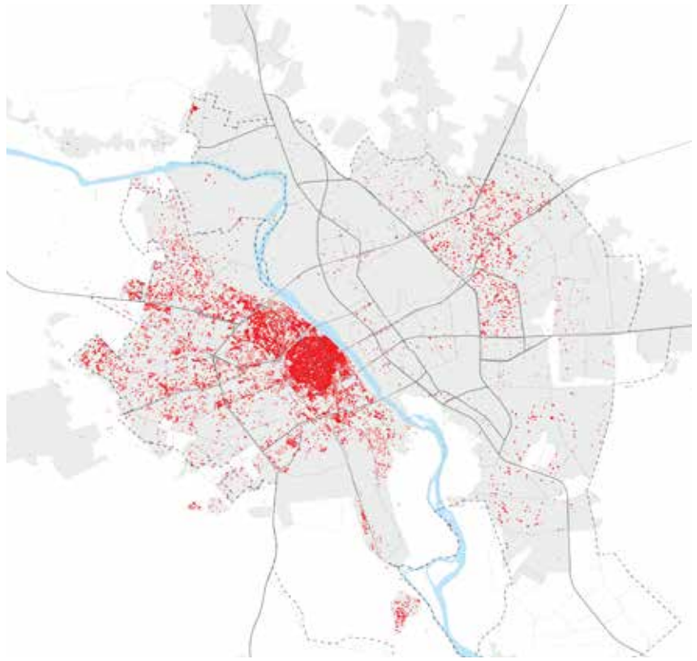


FIGURE 107. Damage assessment of Mosul
Overview of approximately 31,000 damaged residential buildings based (Satellite assessments UNOSAT/ UN-Habitat/ Ministry of Planning).

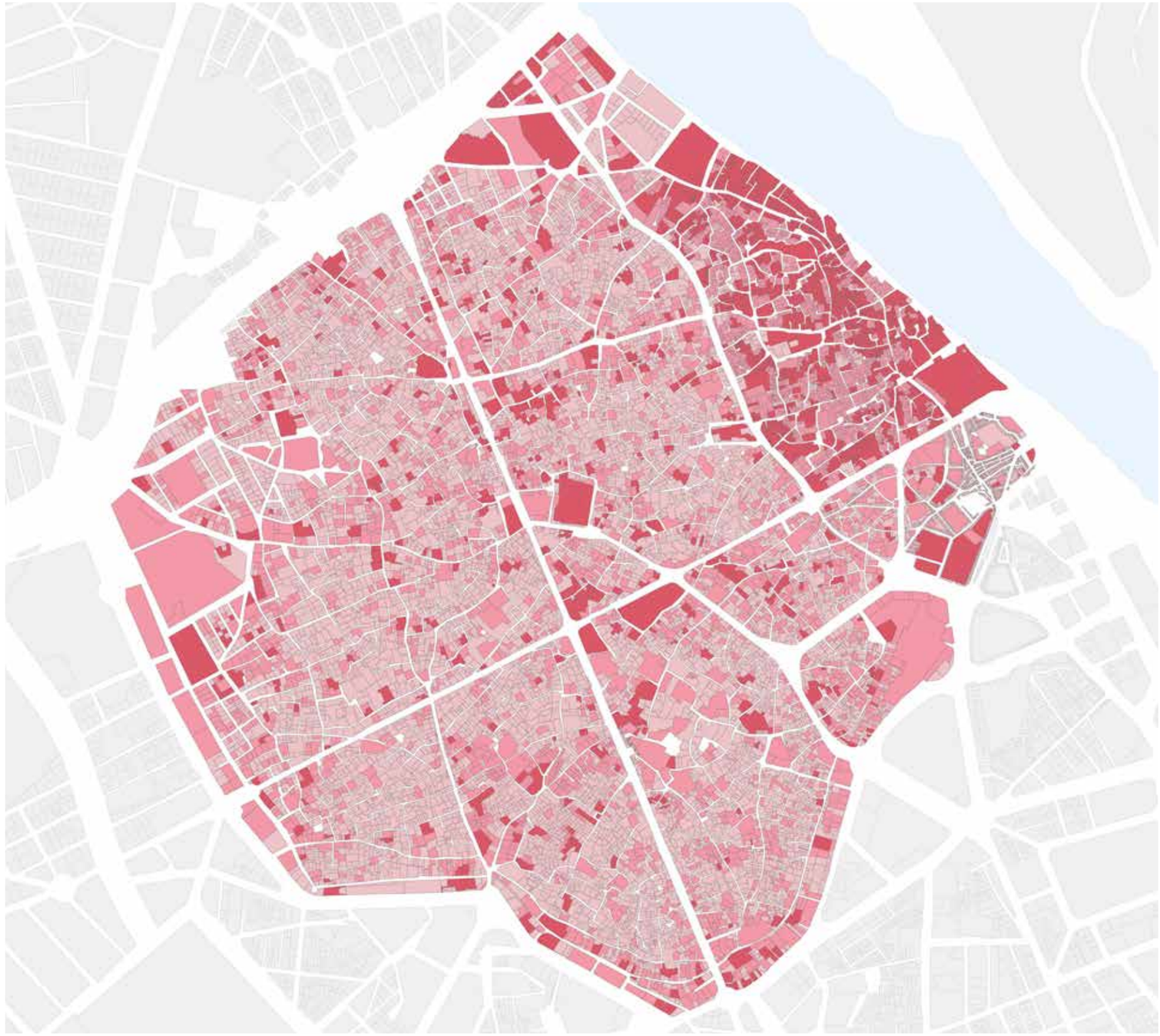


FIGURE 106. Damage assessment of the Old City
(UNOSAT/ UN-Habitat/ UNESCO/ Iconem, 7cm drone imagery 2018)

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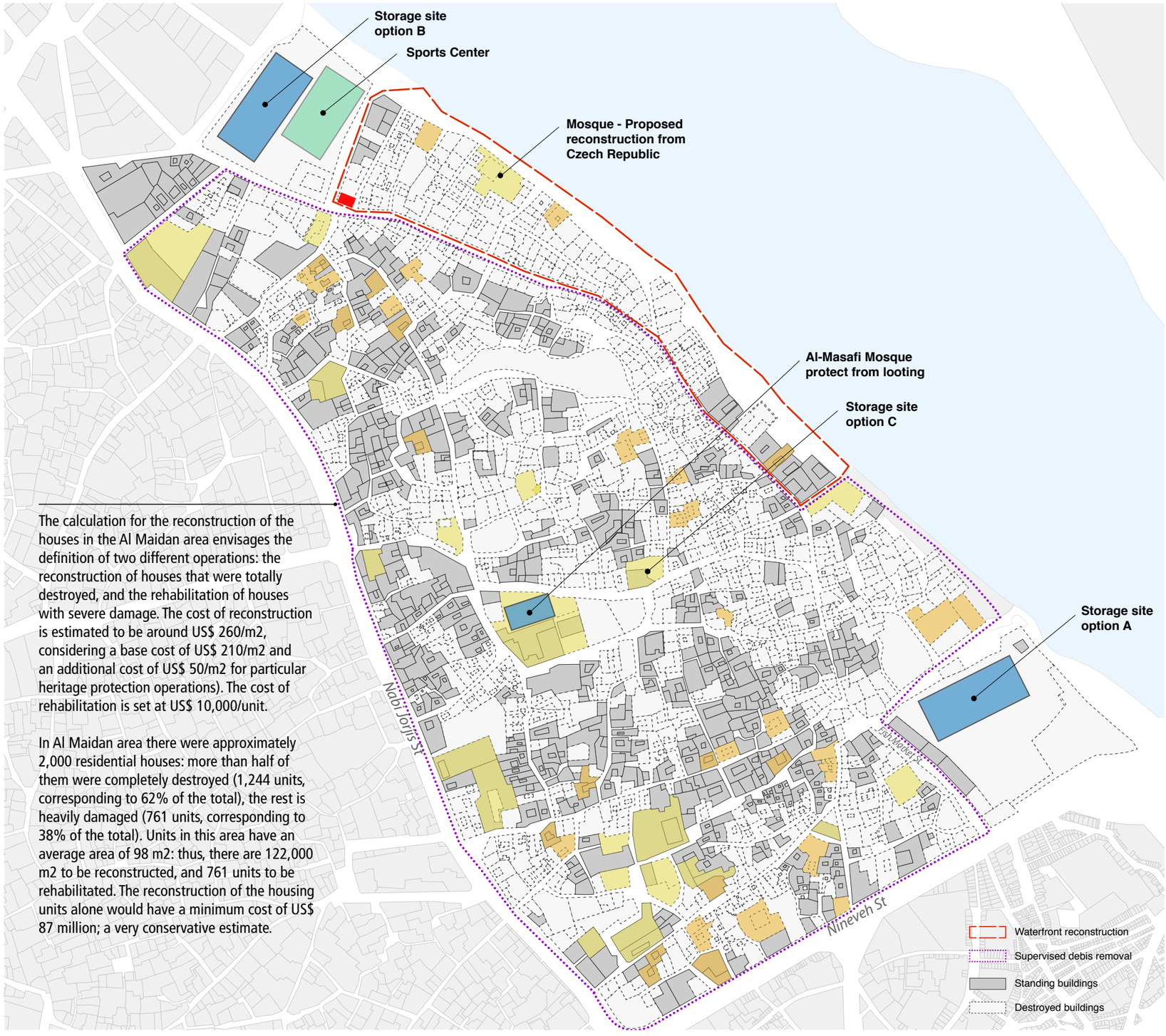
RECOVER THE CITY THROUGH A BLOCK APPROACH
INITIATE A PILOT SUPER BLOCK

Intervention strategies and options include:

Land-readjustment schemes
In heavily destroyed blocks, development agencies and private sector developers can assist landlords of single or multiple properties (e.g. religious endowments) for the purpose of improving access, availability of services and public facilities.

Transfer of Development Rights (TDR)
MOCHMPW, in consultation with Urban Planning Directorate, to consider offering TDRs to landlords in selected locations to discourage them from demolishing their heritage houses because they cannot afford their restoration and are willing to relocate. Landlords eligible for TDR will be assigned alternative serviced sites within the city for self-help construction of houses. A package of incentives needs to be developed. The property deed would be transferred to the government of Iraq and the old property could then be reused for public purposes. TDRs should be executed only on a voluntary basis, and should respect the rights of citizens.

Integrated rehabilitation
Depending on their specialization, national and international development agencies, and NGOs can intervene directly or join a partnership effort focusing on a single block. Depending on the level of physical damage to the building and infrastructure, intersected with the architectural or historic value of each building some blocks are more suitable for self-help or Cash-for-Work repairs, e.g. as implemented by the United Nations High Commissioner for Refugees (UNHCR) and International Organization for Migration (IOM), assisted rehabilitation through contractors (e.g UNDP Funding Facility for Stabilization, UN-Habitat and NGOs), or conservation interventions by specialised agencies (such as UNESCO) and heritage trusts in close consultation with a CBO of representatives of residents. The approach can be replicated and scaled-up to other blocks, based upon priority.



RECOVER THE CITY THROUGH A BLOCK APPROACH
COORDINATE RECOVERY ON LEVEL OF SUPER BLOCK

The 'super block approach' provides a mechanism for reconstruction implementation and coordination. The following pages list advantages, opportunities and challenges of different reconstruction approaches:

- Reconstruction by individual building-by-building and self-help recovery

- Reconstruction by sectoral design-based development

- Reconstruction by area based super block recovery and reconstruction

MAIN ASPECTS	RECONSTRUCTION BY INDIVIDUAL BUILDING-BY-BUILDING RECOVERY AND SELF-HELP	RECONSTRUCTION BY SECTOR DESIGN-BASED REDEVELOPMENT
Overall recovery	▪ **More susceptible to "piece-meal" and uncoordinated development**. ▪ **Slower process of reconstruction**. ▪ **Lost 'multiplier effect' of larger-scale investments.** ▪ **Only wealthier citizens will be able to rebuild their properties.** The poor will mostly depend on the timely payments of the War Compensation and/or the support of single development agencies.	▪ **May create problems of integration with the rest of the Old City** in terms of land uses, socio-economic assimilation, street patterns etc. ▪ **The rest of the old city would be more susceptible to "piece-meal" and uncoordinated developmen**t. ▪ **Risk of a "two-tier development process"** with higher services standards in the newly designed areas and patched up work elsewhere.
ERW clearance	▪ **Piece-meal ERW clearance is difficult to coordinate and is more expensive** (no-economy of proximity). ▪ **Slow house-by-house clearance process.**	▪ **ERW clearance action would be easily prioritised and executed** but would be mostly focused on the selected areas.
Housing, land & property (HLP) issues	▪ **Individual citizens will have to mostly fend for themselves,** with the assistance of specialised HLP actors. ▪ **Will apply to the War Compensation Scheme**,	▪ **High risk of HLP rights infringements and involuntary resettlement, with the burden of property acquisition and expropriations leaning mostly on the Governorate** rather than the developers or buyers (i.e. they "offset" the problem on the State). ▪ **Typically, residents mistrust** the authorities' ability to compensate for their damaged/destroyed property. ▪ **Complicated land acquisition process** with disputes that might take years, if not decades, to solve particularly where expropriation is not conducted in the public interest (e.g. new roads, services etc). *Such approach has been successfully adopted in Beirut, with Solidére, but it has been heavily criticized for favouring real estate developers over the interests of poor landlords. It requires very strong leadership and managerial setup.*
Community engagement	▪ **SBAH to monitor the status of all key landmarks, historical houses and religious buildings, and actively engage landlords to prevent destruction or insensitive redevelopment**, whilst creating a detailed list of protected historical religious buildings, even if no funds are currently available for their specific reconstruction.	▪ **Unless very sensitively designed in terms of heights, mixture of land uses and ratio devoted to public spaces, the introduction of entirely new blocks will disrupt the socio-economic and physical integrity of the Old City**, increased rents and costs of living, ultimately alienating the remaining residents who may decide to leave. Nothing is worse, also from a tourism perspective, than an historic town with no residents (also known as "*museification*" or "*disneysation*" process).
Private sector	▪ **Limited economy of scale possible on the purchase and transport of equipment and construction materials**.	▪ The spear-heading of the recovery process through the implementation of large new development schemes would attract and instil the much-needed confidence of real estate developers, yet **private-sector-led operations will only focus on the most profitable areas from a real estate point of view** (e.g. the opportunities along the river or along the commercial streets), and not necessarily being able to create a positive "ripple effect" benefiting the Old City as a whole. ▪ **Opportunity for developers and contractors to maximise the economy of scale** on the purchase and transport of equipment and materials which would lower the costs of works.
Coordination between local authorities, agencies and donors	▪ **More difficult to convince donors and specialised agencies to take an integrated approach** that can also benefit non-heritage houses or non-vulnerable households.	- No comment
Type of intervention	▪ **As people see best fitting their needs, aspirations, financial capacity** – whereby the landlord's compliance with basic building standards and any recommended heritage conservation action is up to their own sense of responsibility, law abidance and conscientiousness. ▪ **More expensive contractual works** because of the limited economy of scale possible (contractors would work only on 1 house in that area and building material cannot be bought in bulk).	▪ **Top-down approach** that often does not take into account needs and aspirations of single landlords. ▪ **Heavily dependent on the ability to secure sufficient budget** for construction and implementation of infrastructure. **Intervention options include:** - **Redevelopment through wholesale property acquisition.** - **Land-readjustment schemes: in heavily destroyed blocks, private sector developers can assist** landlords of single or multiple properties (e.g. religious endowments) to improve access, layout of properties, real estate value, ventilation, lighting etc. while introducing mixed land uses.

MAIN ASPECTS	RECONSTRUCTION BY AN AREA BASED SUPER BLOCK RECOVERY AND RECONSTRUCTION
Overall recovery	▪ **The complex urban fabric of the Old City is broken down ("unpacked") into sizeable units** to facilitates surveys, analysis and interventions undertaken by different actors. ▪ **Facilitates the synchronization of interventions** between local authorities, utility departments, SBAH, NGOs and development actors. ▪ **Activities of local authorities, service providers, humanitarian agencies and development actors are coordinated around the unit of the urban block**, allowing for a better integration of actions.
ERW clearance	▪ **ERW clearance action would be easier to plan and execute** -particularly in blocks that are planned to be rehabilitated by development agencies.
Housing, land & property (HLP) issues	▪ **HLP actors will find it easier to apply a community-based verification approach** that will rely on neighbours' testimonies to guarantee for landlords that have lost their property deeds, but also benefit absentee owners. ▪ **Religious Endowment could benefit from the War Compensation Scheme and integrate the rest through the commercial reuse of property** (for example for low-rise hotels and restaurants). ▪ **Municipality and Sunni Waqf to reach out to non-returning landlords that might want to consider donating their destroyed or damaged property either to GOI or Waqf, to be rebuilt as a public facility** (e.g. school, community centre) or reused as affordable rental housing.
Community engagement	▪ **Allows for stronger community action and mutual solidarity within each cluster or single block**, whereby CBOs of landlords and religious endowments can self-organise themselves to approach agencies/donors with proposals. ▪ **CBOs of landlords and religious endowments can conduct self-enumeration** to speed up assessments and interventions. ▪ **The engagement and consultation of landlords/community members by SBAH and concerned agencies becomes easier.**
Private sector	▪ **Private sector contractors of all sizes – including community builders – would have a better chance to work in the Old City**. ▪ **Opportunity for contractors to maximise the economy of scale** on the purchase and transport of equipment and construction materials which would lower the costs of works.
Coordination between local authorities, agencies and donors	▪ **SBAH and local authorities will be able to orientate and guide interested donors, agencies and developers to particular blocks that require urgent attention.** ▪ **On the basis of finer grade analysis of damage to infrastructure and degree of IDP return, utility departments can more appropriate plan.**
Type of intervention	**Intervention strategies and options include:** - **<u>Land-readjustment schemes</u>: in heavily destroyed blocks, development agencies and private sector developers can assist** landlords of single or multiple properties (e.g. religious endowments) for the purpose of improving access, availability of services and public facilities). - **<u>Transfer of Development Rights (TDR)</u>: MOCH, in consultation with Urban Planning Directorate, to consider offering Transfer Development Rights to landlords in selected locations to discourage them from demolishing their heritage houses because they cannot afford (or wish) their restoration and are willing to relocate.** Landlords eligible for TDR will be assigned alternative serviced sites within the city for self-help construction of houses (package of incentives to be developed). The property deed would be transferred to the State and the old property could then be reused for public purposes. - **<u>Integrated rehabilitation</u>: Depending on their specialization, national and international development agencies, NGOs and Trusts can intervene directly or join a partnership effort focusing on a single block or an entire 'block cluster'**. Depending on the level of physical damage to the building and infrastructure, observed in conjunction with the architectural/historic value of each building (see Matrix) some blocks are more suitable either for self-help/cash-for-work repairs (e.g. UNHCR and IOM), assisted rehabilitation through contractors (e.g UNDP/FFS, UN-Habitat and NGOs), or conservation interventions by specialised agencies (such as UNESCO) and heritage trusts, in close consultation with a CBO of representatives of residents. The approach can be replicated and scaled-up to the other blocks, based upon priority.

FIGURE 108. Example super block
The built-up area of super block B8, related to the mechanisms and implementation strategies of the area based block recovery plan.

FIGURE 109. Extensive destruction of the Al Maidan area. For the Old City, debris and ERW clearance are intrinsically linked
(UN-Habitat, Jan Willem Petersen, August 2018)

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IMMEDIATE IMPLEMENTATION (<1 YEAR)

3 CLEAR THE CITY FROM DEBRIS AND ERW EXPLOSIVE REMNANTS OF WAR

With hundreds of buildings destroyed and thousands of structures severely damaged, the recovery of Mosul and its historic city center is a formidable task. The millions of tons of debris still define the urban landscape of the Old City one year after the liberation of Mosul, and forms a significant reconstruction obstacle. Not only does the vast amount of debris amassed prevent the return of the former residents to the Old City, there are multiple instances of deliberate acts of sabotage by ISIS to hamper and prevent a swift recovery of the area. It is estimated that two-thirds of the explosive hazards are thought to still be buried under the rubble, along with decomposed bodies of civilian casualties and ISIL fighters that will need to be carefully removed. Additionally, a lack of accessible information leads to public uncertainty, sustaining speculation over the extent and nature of contamination. The ignorance of the dangers of ERWs remains a real threat and no course of action is readily available to inhabitants.

FIGURE 110. Immediate assistance for former residents
The clearing of the huge number of unexploded ordnance, as seen on the foreground, still present in the city and the gradual return of people increases the need for coordination between disposal teams and inhabitants (UN-Habitat, Jan Willem Petersen, August 2018).

Priority Action(s)	Possible Actor(s)
» Launch of city wide awareness campaign which informs the public on the current situation in the Old City and instructs residents on how to act when encountering potential explosive hazards	Old City Task Force, UNMAS, UNEP, UNDP
» Provide a legal 'blanket' protection for all ERW operations in residential properties. Despite current efforts to conduct house clearance by making use of third-party liabilities coverage, this dramatically increases the cost of de-mining and reduces the amount of houses that can be cleared at current funding levels	Old City Task Force, MOJ
» Clear the Old City from debris and ERW	UNMAS

Possible Implementation/ Funding Options	Indicator
» Implement a debris management plan which provides substantial economic and social benefits to the local population, integrating ERW management and recycling works	# of returnees to damaged and destroyed areas # of self-reconstruction activities # of cleared ERW # of inhabitants informed # of houses cleared
» Implement and enforce debris regulation, requiring debris to be taken to recycling centres. Allocate official debris transfer stations in the Old City at spaces that are vacant due to the destruction of the property. Such plots can temporarily 'leased' from the plot owner by the municipalities to allow the use as debris disposal site	
» Engage actors conducting mine clearance to prepare a de-mining phasing plan based on the block-by block approach. Appeal to donors to fund further demining; involve local authorities to train local NGOs to continue and scale-up the work conducted so far by UNMAS	
» Involve returnees as first observers, as they are likely to be first to spot ERW's. Set up a de-mining hot-line for communication between residents and professional teams to clear ERWs allowing for the scarce demining resources to be more effectively deployed	

CLEAR THE CITY OF DEBRIS AND ERW
IMPLEMENT A DEBRIS MANAGEMENT PLAN

The decision on the location and method of the disposal of rubble is likely to have the most significant impact on the overall cost and timescale for the entire debris operation. The United Nations Environment Programme (UNEP) technical report titled *Mosul Debris Management Assessment* (May 2018) lists an estimated 7.65 tonnes of debris for the whole of Mosul, of which approximately 75% is located in West Mosul and the remaining in the eastern part of the city. Within the confines of the Old City (250 ha) there is a minimum of 1,875 million ton of debris (>7,500 tonnes/ hectare), a figure that is likely to rise as the reconstruction generates more rubble.

The time needed to complete the debris removal under the current conditions is conservatively estimated to be over 7 years by UNEP. When considering the area based 'super block' recovery plan by UN-Habitat, this would account to an average of 1.75 months per 'super block'. Several scenarios for alternative debris management plans are put forward by UNEP with varying costs, time frames, or additional beneficial impacts. From a sustainable urban planning and recovery perspective, the social-economic benefits – the implementation of debris recycling and large scale employment opportunities in reconstruction works – is integral to Mosul's rehabilitation process. Establishing and implementing a comprehensive debris management plan with special attention for the Old City is critical. Including the integration of ERW management into the debris removal and recycling works is key to the actual safe return of inhabitants to their properties.

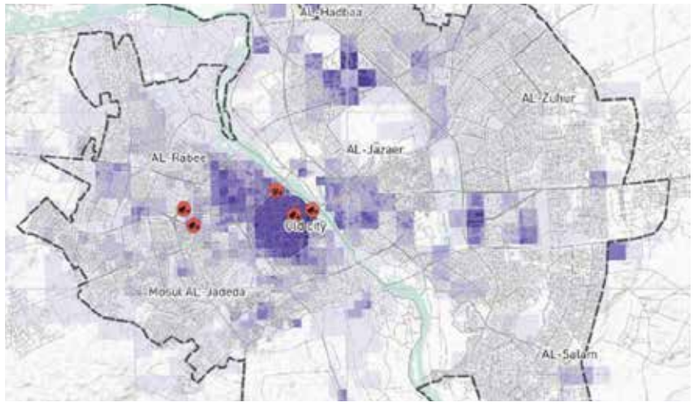

FIGURE 111. Scenario with fixed debris crushing locations
(Mosul debris management assessment - UNEP/URP/UN-Habitat).

Scale		Floors	Occupants	m2	Debris generation (tonnes/ 100 m2)
Small single family	10%	2	4	100	80
Common house	20%	2	6	200	100
Large villa	5%	2	9	500	120
Apartment complex	0%	3	40	400	140
Commercial buildings	15%	4	20	400	80
Old single family house	50%	1	8	100	120

TABLE 113. Debris quantities
Table with model of average debris calculation for the Old City (UNEP).

FIGURE 114. Debris recycle centres
The location of the debris recycling site (white) is being finalized. It has been fitted out to receive debris, sort it, crush and screen the recycled debris materials and then transfer it to the Mosul Municipality for use in reconstruction and rehabilitation. In parallel a possible set of recycled debris materials testing programmes to identify potential end uses is being explored (UN Environment /UNDP, Sattelite Imagery/ Google Earth).

Scenario: Mobile Debris Crushing		Scenario: Increased Trucking Capacity		Scenario: Fixed Debris Crushing	
Total working years	6,20	Total working years	2,40	Total working years	7,20
Total clearing cost (USD)	35,030,500	Total clearing cost (USD)	53,471,000	Total clearing cost (USD)	49,915,000
Reprocessing job creation (fte)	38,680	Reprocessing job creation (fte)	-	Reprocessing job creation (fte)	134,800
Total fuel consumption (USD)	5,077,500	Total fuel consumption (USD)	6,961,300	Total fuel consumption (USD)	7,101,200
Trucking distance (km)	13,705,500	Trucking distance (km)	26,303,200	Trucking distance (km)	15,964,000
Material recovered for construction (tonnes)	(re) 4,770,200	Material recovered for (re)construction (tonnes)	-	Material recovered for (re)construction (tonnes)	3,973,700

FIGURE 112. Debris clearing scenarios
UNEP has devised possible scenarios for the debris removal for the Old City, differing in duration, cost, and social and economic benefits for local inhabitants (Mosul debris management assessment UNEP/ URP/ UN-Habitat)

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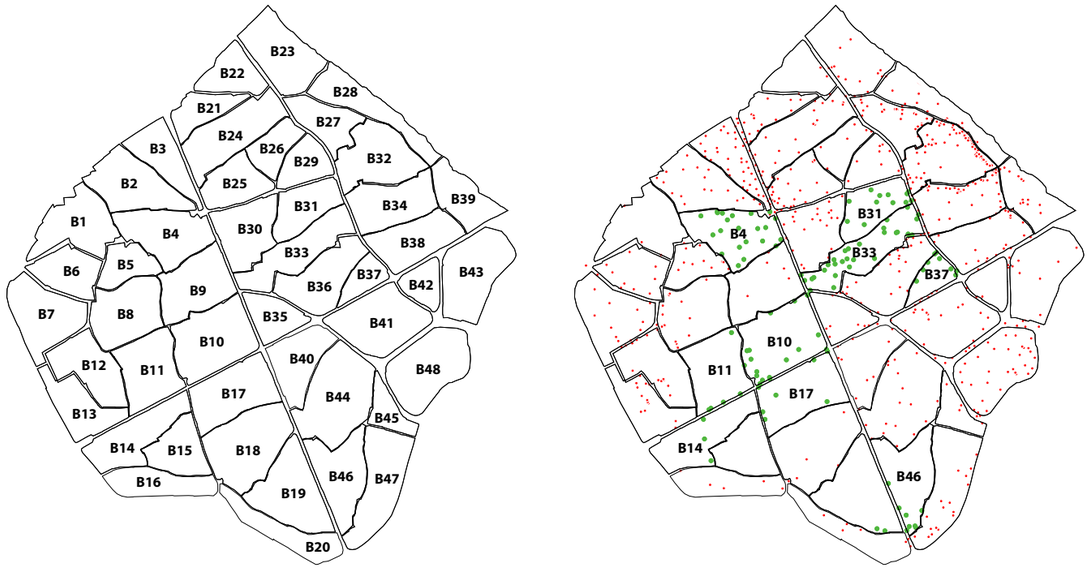

FIGURE 115. Systematic clearance plan
Overall ERW operations are hampered by that fact that ordnance is often displaced by residents to areas that have previously been cleared. No systematic ERW clearance methodology is currently in place, with specialised teams responding to ad-hoc requests on a daily basis. The block based recovery plan can potentially expedite clearing by addressing one 'super block' at a time. Shown in green above, an example of potential of initial block clearance areas based on the levels of damage.

CLEAR THE CITY OF DEBRIS AND ERW
INTEGRATE ERW OPERATIONS WITH RECYCLING WORKS

Not only has the massive quantity of debris caused by extended conflict prevented the return of residents to the heart of the city, it is clear that ISIL deliberately acted to hinder the recovery by placing booby traps in many structures. The high density of ERW contamination, including locally manufactured ammunition and improvised explosive devices produced on an industrial scale, and the variety and complexity of these devices is unprecedented in recent history. UNMAS indicated that only 0.4% of the Old City has been cleared of ERW.

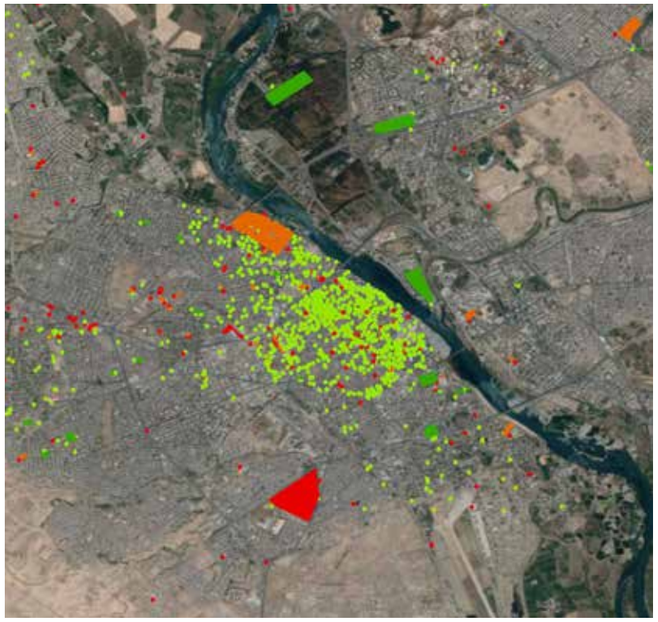

FIGURE 116. Clearance activities October 2016 - May 2018
Areas cleared (dark green), ongoing (orange) and identified (red) hazards. The explosive hazards (light green) are predominantly cleared locations (UNMAS, Sattelite Imagery/ Google Earth).

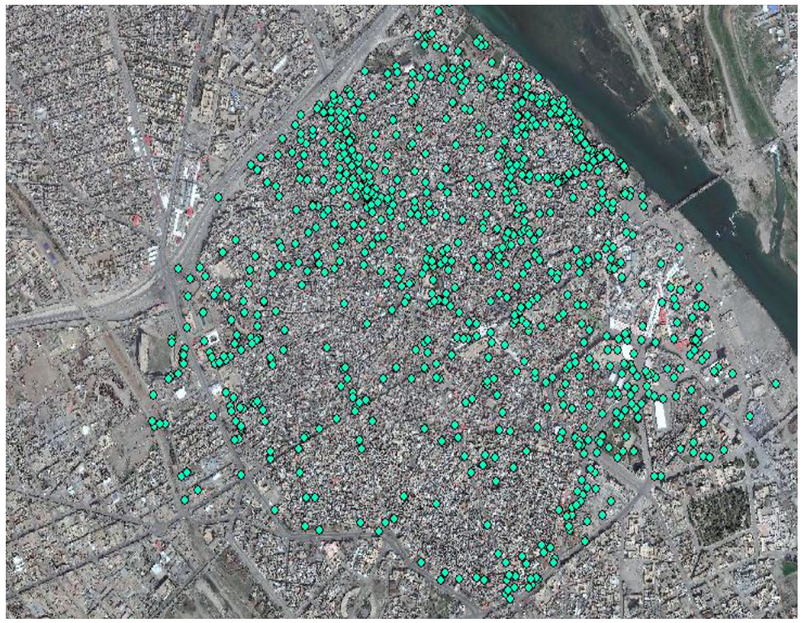

FIGURE 117. Sites cleared from ERW contamination in the Old City
(UNMAS, October 2018, Sattelite Imagery/ DigitalGlobe, February 2017: US Department of State, NextView License)

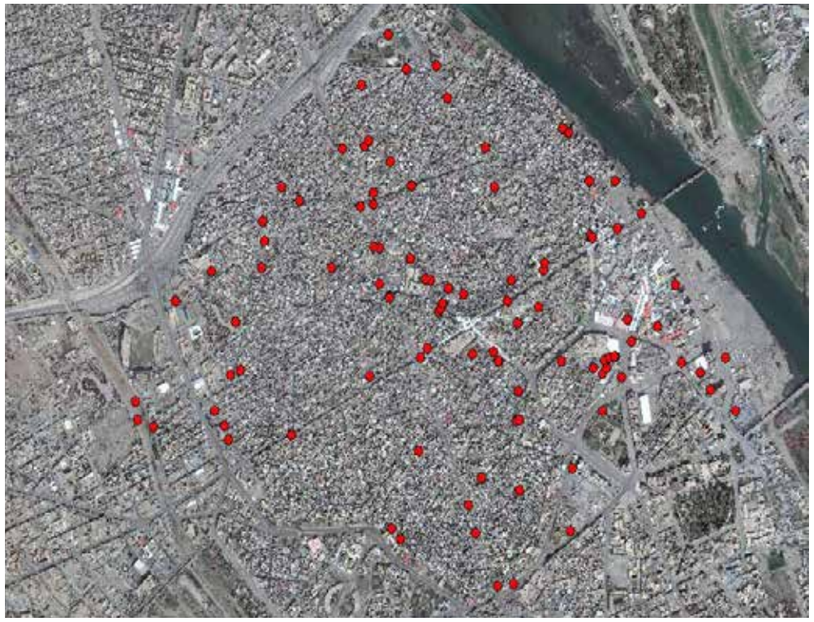

FIGURE 118. High risk contamination locations in the Old City.
(UNMAS, October 2018, Sattelite Imagery/ DigitalGlobe, February 2017: US Department of State, NextView License)

FIGURE 119. Assessment of the extent of destruction after the liberation at the entrance of the Al Nuri mosque
(UN-Habitat, Ivan Thung, November 2017)

IMMEDIATE IMPLEMENTATION (<1 YEAR)

4 ENSURE RECONSTRUCTION THAT RESPECTS HISTORICAL CHARACTERISTICS

The 'Spirit of Mosul' was no more clearly apparent than in the winding backstreets, elegant courtyard houses and towering minarets of the Old City. While much of this unique architectural heritage has been lost, the historic and cultural soul of the City is still very much present. It is therefore imperative that the reconstruction, restoration and conservation process respects not only the tangible surviving elements of the historic urban fabric but the traditions and techniques used in their original construction. With this in mind, key intervention in the Old City should adhere not only to specific re-building guidelines developed by UN-Habitat and UNESCO in conjunction with government stakeholders, but also to appropriate international standards and conventions for such processes. Not only should adequate research and documentation retrieval be undertaken to ensure the authenticity of re-built or restored structures, but also a corpus of data on surviving building types, architectural elements and material used should be collated for reference during this process. The use of appropriate materials and designs, where practically feasible, is essential to the success of this endeavor and the revitalization of the Old City. Traditional building techniques must be fully understood and employed throughout the process, wherever practical. It is only on the basis of adhering to the above that the surviving structures within the Old City can hope to offer a glimpse of the former architectural and cultural glory of the Old City.

FIGURE 120. Early recovery attempt
Image of a house in the Old City that has been plastered over and redecorated (UNESCO, Giovanni Fontana Antonelli, August 2018).

Priority Action(s)	Possible Actor(s)
» Establish the Mosul Old City Self-Rebuilding Facility (MSRF)	Old City Task Force, UNESCO, UN-Habitat
» Continue the city-wide awareness campaign concerning the importance of the historic heritage and the long-term economic benefits for owners when maintaining the unique characteristics of historic buildings	Old City Task Force, Local Government, MSRF
» Draft and disseminate Building Design Guidelines for the reconstruction of properties located in the Old City that all development actors, including UN agencies, (I)NGOs, and religious endowments must abide by	Sunni Waqf, MSRF
» Adopt a special licensing process for buildings comprised within the Old City boundary, linking to building design guidelines and a three-tier process for building permits	Old City Task Force, UNESCO
» Rehabilitate selected pilot demonstration houses in the Old City that demonstrate the value of restoring or reconstructing residential properties according to building guidelines, providing contractors and residents alike with tangible hands-on guidance, e.g. the use of specific materials or traditional construction techniques	Old City Task Force, UNESCO
» Develop and deliver a comprehensive capacity-development programme fostering appropriate skills, followed by an aid apprenticeship programme	

Possible Implementation/ Funding Options	Indicator
» Issue a local order that makes adherence to the guidelines mandatory for all reconstruction within the Old City	# of rebuild and rehabilitated properties conforming Building Design Guidelines for the Old City
» Encourage conservation activities through Heritage Sponsorship Schemes funded by private donations and donor support to national and international Heritage Trusts and Foundations	
» Devise a financial mechanism that addresses the restoration of valuable historic buildings and enables wider community benefits. One way is to follow international standards on decent jobs, whereby the Old City's citizens are offered minimum wage packages of 20 USD/day (25% higher than current wages). A certain percentage of the salary is withheld and released retroactively upon verified reconstruction reinvestment, allowing for 'indirect' reconstruction assistance	

RESPECT HISTORICAL CHARACTERISTICS
DEVISE BUILDING GUIDELINES

The development of building guidelines provides direction and general principles for the recovery and reconstruction of the Old City. The guidelines focus primarily on residential buildings. Their goal is to identify the most important elements, techniques, and materials that characterize Mosul's architecture. Two features define the guideline intervention chart; the heritage value viewed in conjunction with the degree of damage sustained. A building survey should classify the historical significance of every building. Damage assessment is defined in five grades, through the identification of primary features of the building. This classification is agreed upon by development actors working under the Shelter Cluster; an inter-agency coordination mechanism that supports humanitarian shelter.

0 - NEGLIGIBLE

Walls and loadbearing elements: No damage caused by conflict or damage limited to external finishes or boundary walls

Roof slab and roof covering: Slight cosmetic/external conflict traces to roof or parapets (bullet holes, superficial shell damage)

External Windows and doors: Slight cosmetic/external conflict traces to roof or parapets (bullet holes, superficial shell damage)

Finishes, water and electricity: Slight cosmetic/external conflict traces to roof or parapets (bullet holes, superficial shell damage)

1 - MINOR

Walls and loadbearing elements: Slight/superficial cracking with no observable deformation of structural elements or limited mortar and shell perforations to walls

Roof slab and roof covering: Limited mortar and shell perforations to roof or parapets

External Windows and doors: Minor damage to windows and frames. External doors missing, or damaged

Finishes, water and electricity: Slight internal damage due to overuse/overcrowding or limited war damage to internal floors and walls

2 - MAJOR

Walls and loadbearing elements: Extensive shell perforation, no observable deformation of structural elements

Roof slab and roof covering: Minor damage by shells penetrate roof, but roof structure is otherwise intact, not buckling

External Windows and doors: Damage to window frames, external doors missing or damaged

Finishes, water and electricity: Internal spaces damaged by shells, Damage across multiple floors. Fire damage can be repaired

3 - SEVERE

Walls and loadbearing elements: Structural damage involving several loadbearing members, significant cracking with observable permanent deformations of the structural elements

Roof slab and roof covering: Damage by large shells penetrating roof. Engineering solutions required to conduct structural repairs of roof

External Windows and doors: Damage irrelevant if structure is compromised

Finishes, water and electricity: Severe fire damage that can be repaired but so widespread that renders the house inhabitable

4 - DESTROYED

Walls and loadbearing elements: Reduced to rubble, complete failure of two or more major structural components, Extensive cracking or loss of material with gross local or overall deformations

Roof slab and roof covering: Partial or complete collapse of roof, excessively deflected roof, weakened structure at risk of collapse

External Windows and doors: Damage irrelevant if structure is compromised

Finishes, water and electricity: Non-repairable fire damage, affecting structural members

CRITERIA GUIDING INTERVENTIONS IN OLD MOSUL		ARCHITECTURAL/HISTORICAL VALUE			
		A HIGH (LISTED)	B MEDIUM (HISTORIC - VERNACULAR)	C LOW (TRADITIONAL)	D NONE (MODERN)
DAMAGE LEVEL	4 DESTROYED	A4	B4	C4	D4
	3 SEVERE	A3	B3	C3	D3
	2 MAJOR	A2	B2	C2	D2
	1 MINOR	A1	B1	C1	D1
	0 NEGLIGIBLE	A0	B0	C0	D0

FIGURE 121. Intervention chart
A matrix is developed that merges damage assessment and heritage value. Each value relates to a specific code and type of intervention (UNESCO/ UN-Habitat).

Grade **A**
High Heritage Value:

The buildings represent example of significant historical, cultural or architectural importance. They have played a central role in local, regional and national identity. These buildings have a documented historical role in the Old City that has been recorded from their initial construction through to the present day. They are characterized by a unique aesthetic significance, and they constitute iconic cultural landmarks within the historic fabric of the Old City area.

Grade **B**
Medium Heritage Value:

Buildings characterized predominantly by their age: Construction took place in an early historical context and are representative (architecturally and culturally) from a specific period of the regions history. They may have a specific relevance to historical events or people. These buildings usually show aesthetically significant architectural elements, and they represent a notable part of the historic urban fabric but do not embrace any significant communal interest.

Grade **C**
Low Heritage Value:

Buildings constructed in the recent past: They exemplify architectural design and construction practices or activities from more recent history and do not have a connection with any specific event or person. These buildings are characterized by aesthetic and structural features that are related to local and regional traditional building techniques and represent the most common element of the historic urban fabric.

Grade **D**
No Heritage Value:

Buildings that have been recently constructed (circa 20th century or later): They are not related to any specific practice or activity within a historical context. They may only exhibit signs of the recent conflict and associated damage.. These buildings do not posses any aesthetically significant or important elements.

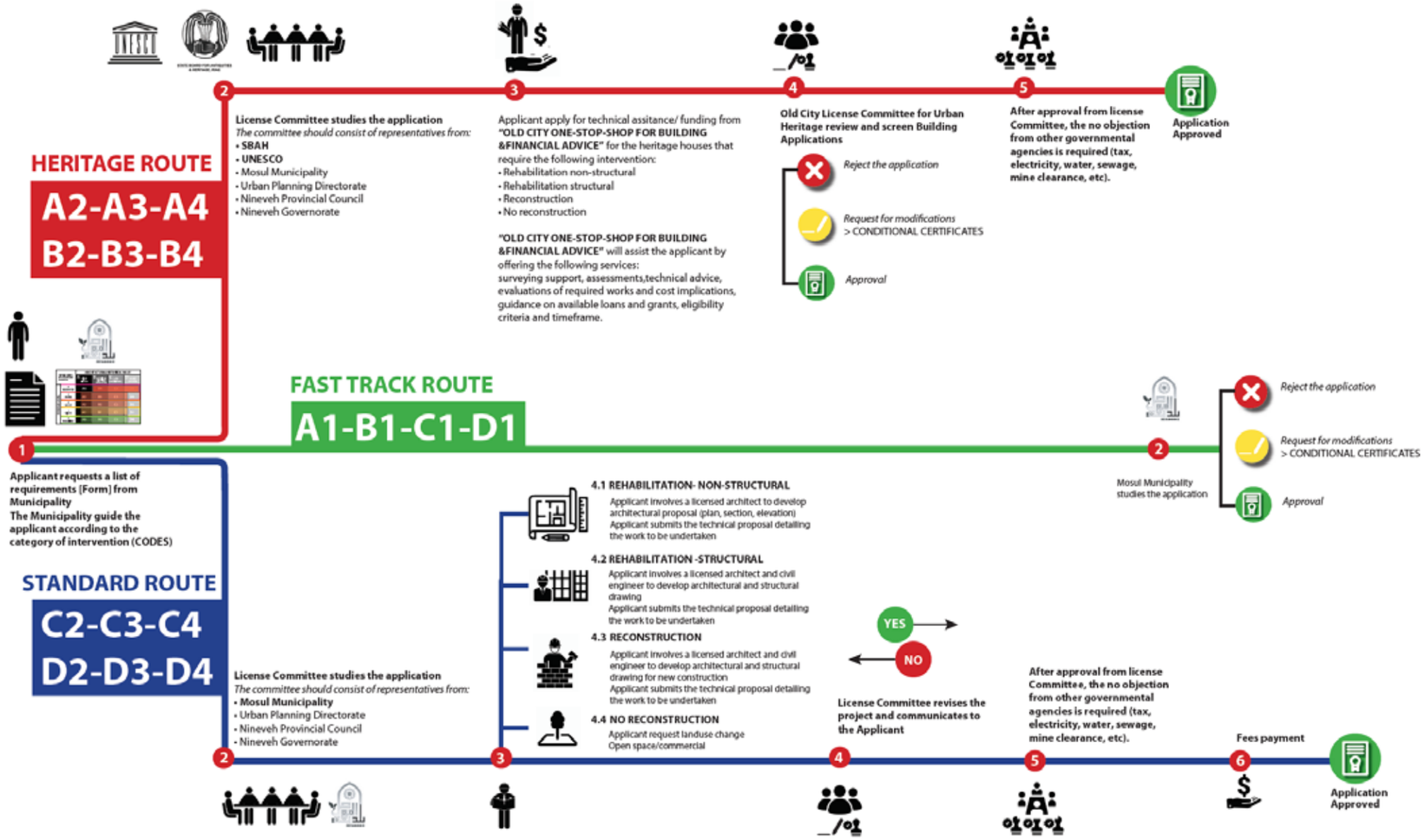

FIGURE 122. Three building permit trajectories
A fast, standard, and heritage track for the reconstruction of residential buildings (Directorate of Urban Planning/ UNESCO/ UN-Habitat).

RESPECT HISTORICAL CHARACTERISTICS ADOPT A SPECIAL LICENSING PROCESS

The matrix also provides a useful tool for administrating control over the different reconstruction activities planned in the Old City. There are three building permit tracks envisioned to assist the inhabitants in the recovery process.

The **Standard Rout**e is a conventional procedure to be followed for buildings with low or no heritage value and major, severe damage or complete destruction. The building application is evaluated by a committee that includes representatives from Mosul Municipality, Urban Planning Directorate, Ninewa Provincial Council and Ninewa Governorate.

For the buildings with minor damage, there is the possibility of taking advantage of a **Fast Track Route**. The owner is called on to submit a simple application followed directly by an approval or rejection from the Municipality.

For the rehabilitation of buildings listed as highly valuable in terms of architecture and heritage, it will be necessary to follow a **Heritage Route**. This envisages the application being approved by a committee similar to the one called to address the Standard Route applications, but including representatives from UNESCO and SBAH.

The 'negligible' row of the chart is not considered in the building application process as it envisages works qualified as maintenance, which would not need official approval.

RESPECT HISTORICAL CHARACTERISTICS
DEVICE BUILDING GUIDELINES

SPECIAL HERITAGE INTERVENTION

PRESERVATION

Preservation is defined as measures carried out to maintain a cultural property in its existing situation and prevent further deterioration. It aims to protect and preserve Cultural Heritage properties as close as possible to their original condition, and for as long a period of time as possible. Preservation is implemented where indicators show that the general stability and condition of a cultural property is endangered, and/or immediate intervention is required to mitigate this threat. Research, documentation, and recording are fundamental components of the preservation process and practice. Documentation should be implemented before, during and after any conservation work undertaken, and it should also accompany any subsequent monitoring of the cultural property. Any physical intervention or change to the fabric must be kept to a minimum.

SPECIAL HERITAGE INTERVENTION

STABILIZIATION AND RESTORATION

Restoration, as a process, aims to retain and/or maintain the original setting and fabric of a cultural property whilst also preventing any further deterioration. Interventions may include the substitution, renewal or reposition of decorative, non-structural and structural elements, in order to bring back the buildings former or original state. The process also seeks to ensure structural and material stability. Restoration includes two categories: partial restoration and comprehensive restoration. Partial restoration is implemented where indicators show that a cultural property is in relatively good condition, but some elements are deteriorating and require interventions. Comprehensive restoration is implemented where indicators show the setting and fabric of a cultural property is exhibiting severe physical deterioration and requires more extensive, appropriate intervention .

URBAN SCALE DESTRUCTION

URBAN REHABILITATION

Urban rehabilitation is a complex process that should involve all sectors in society living within an historic urban area. All urban rehabilitation programmes in historic areas should be based on a integrated conservation approach. Urban rehabilitation can involve modification of a cultural property to contemporary functional standards which may include adaptation for new uses. These interventions will take into consideration one or more blocks or groups of blocks, focusing on their rehabilitation as a whole. Any interventions will respect the pre-existing street pattern and the curtain of buildings defining its boundary. Volume, accessibility/permeability and appearance of the facades will be defined by the urban rehabilitation guidelines.

URBAN SCALE DESTRUCTION

URBAN REGENERATION

Urban regeneration is aimed at the recovery of large parts of the city where destruction has reached such proportions that the physical environment is also effected (meaning the built fabric and the ecological system), hence affecting both economic and social dynamics. Operations cover both public and private properties, they require a cross-cutting strategy that can address the phenomenon of under used land resources, liveability, and productivity. The process envisages changes in future urban growth and productivity patterns.

NEGLIGIBLE DAMAGE

MAINTENANCE

Maintenance indicates activities carried out regularly, according to a pre-determined schedule; maintenance aims to protect the physical fabric and setting of a cultural property from the effects of time and use, through both preventive and scheduled actions. Maintenance is implemented where indicators show that the cultural property is generally in good condition and only minor interventions are required.

MINOR DAMAGE

REPAIR

Repair concerns interventions that aim to replace or correct broken, damaged or faulty components or elements of a building, either inside or outside, or to make minor alterations or renovations to it in order to maintain its operating efficiency. It includes the substitution of doors, windows, and finishing, as well as the replacement or completion of electrical and mechanical systems.

MAJOR DAMAGE

BUILDING REHABILITATION - NON STRUCTURAL

Rehabilitation is usually carried out in order to extend a building's life and/or its economic viability. Rehabilitation aim at the refurbishment of a damaged building that is not able to fullfil its performance. This category of rehabilitation does not involve structural works or retrofitting. It envisages opening or closing of rooms, or the recovery of courtyards and facades that not imply structural works.

SEVERE DAMAGE

BUILDING REHABILITATION - STRUCTURAL

Structural rehabilitation interventions are aimed at at the recovery of the main functions of a building that suffered major structural damage. The operations envisage the stabilization or completion of the structural works, and include the refurbishment of partitions, facades and stairs.

DESTRUCTION

NO RECONSTRUCTION

This category of intervention aims at a de-densification of the historic urban fabric while providing social and community services and public spaces. After the removal of rubble and debris, severely damaged or fully destroyed buildings will not be rebuilt, leaving urban voids.

DESTRUCTION

RECONSTRUCTION

This category of intervention is aimed at the reconstruction of buildings that are severely damaged or totally destroyed. Reconstruction in situ involves the re-creation of a non-existent building on its original site. Based upon historical, literary, graphic and pictorial as well as archaeological evidence, a replica of the original is built using both modern and/or traditional methods of construction. Any relocation of a cultural property should be documented and dismantled parts should be rebuilt or reassembled. Reconstruction entails new foundations and structural works, the building of rooms around a courtyard (if pre-existing), as well as partitions, facades and staircases.

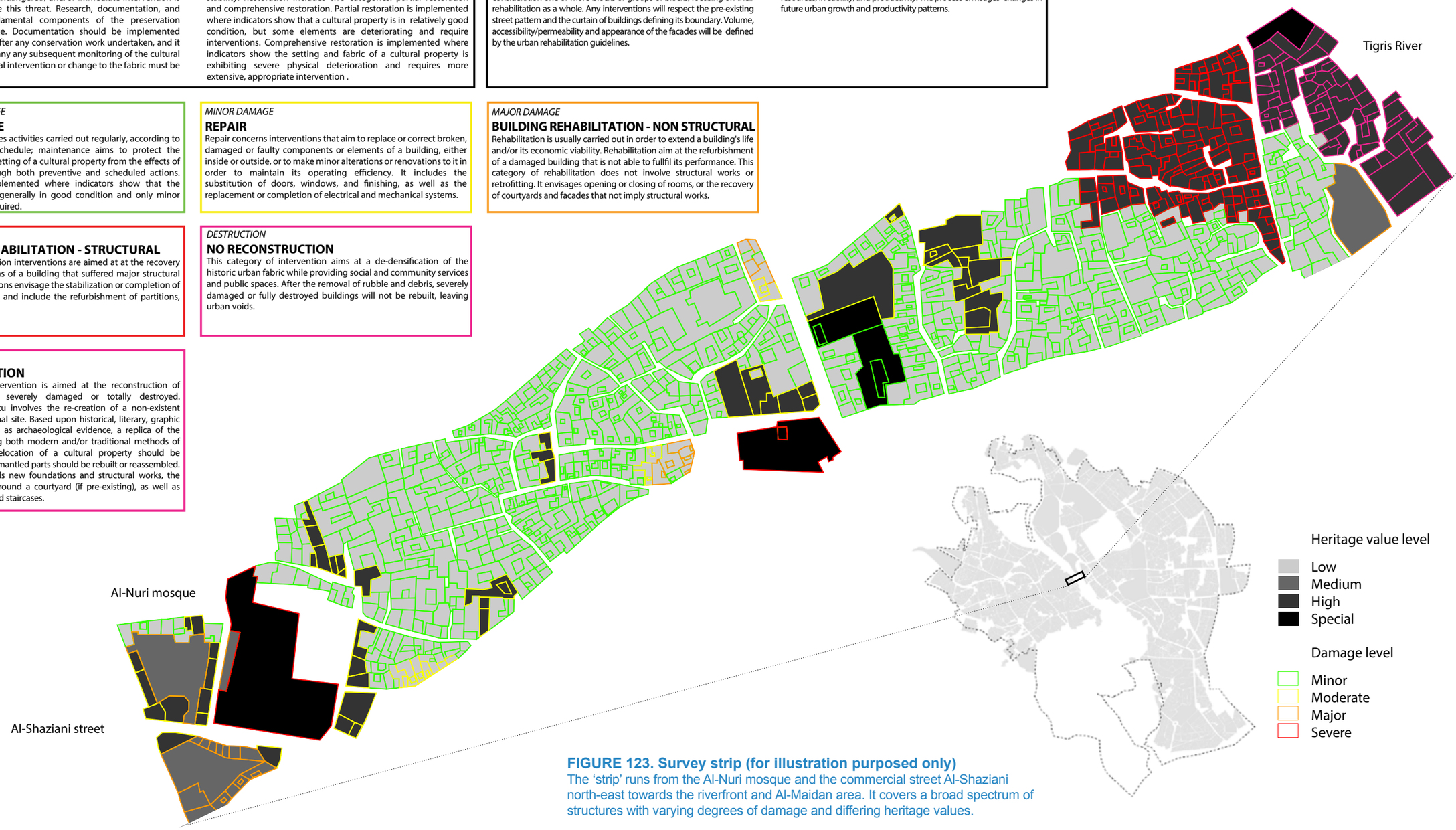

FIGURE 123. Survey strip (for illustration purposed only)
The 'strip' runs from the Al-Nuri mosque and the commercial street Al-Shaziani north-east towards the riverfront and Al-Maidan area. It covers a broad spectrum of structures with varying degrees of damage and differing heritage values.

UN-HABITAT FOR A BETTER URBAN FUTURE

United Nations Educational, Scientific and Cultural Organization

#ReviveTheSpiritOfMosul

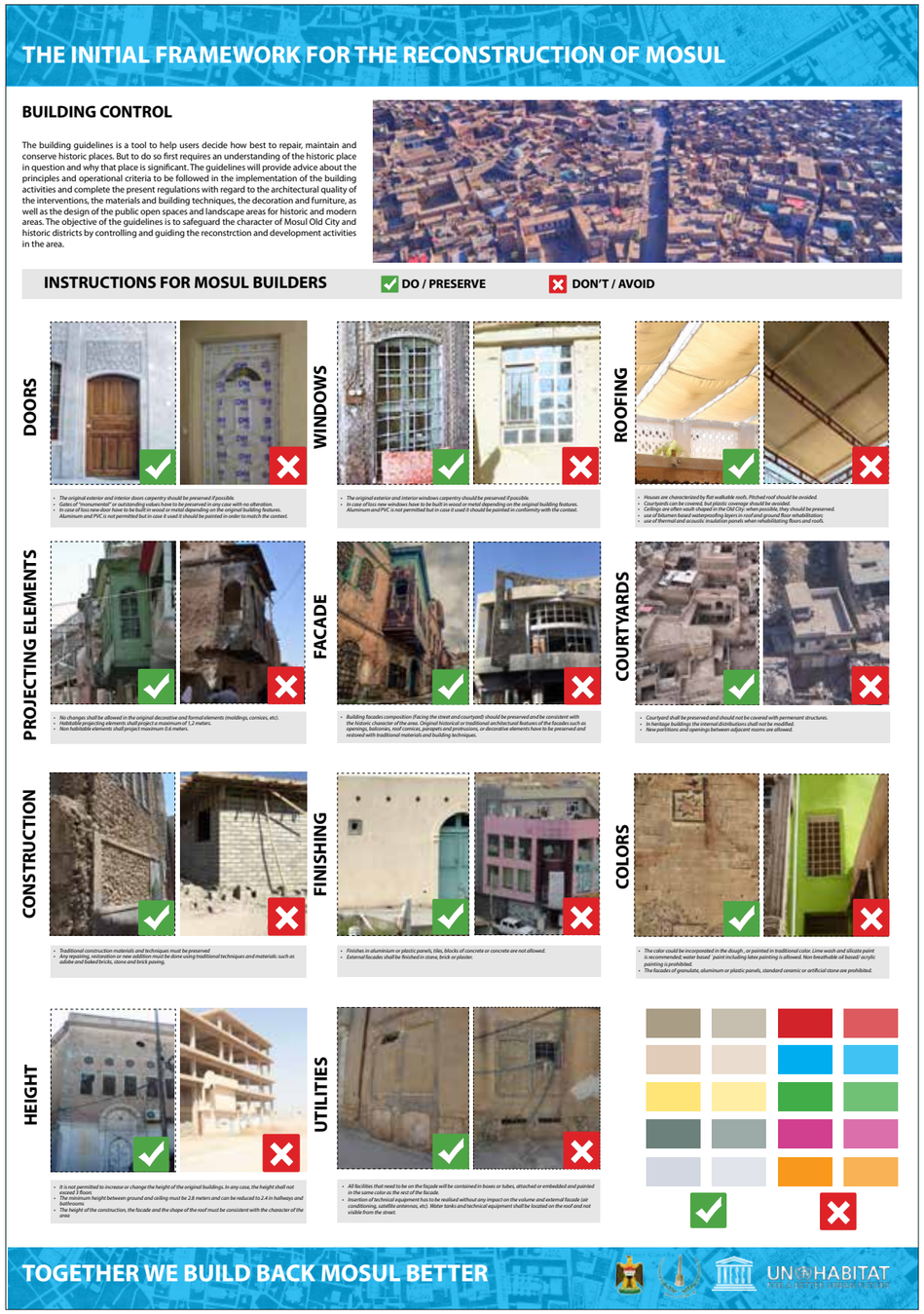

FIGURE 124. Poster of dos and don'ts for reconstruction
Such a poster could be displayed in the Municipality as a visual reference for citizens and development actors. Even though many people will not be able to immediately afford the cost of repair of historic buildings and elements, it is important to raise awareness of the value of these buildings to prevent irreparable damage to historic elements during reconstruction. In case of compensation for reconstruction, additional support for historic buildings should be considered (UNESCO/ UN-Habitat).

FIGURE 125. Mosul Old City Forum held on 22 October 2018 in Al Chalabi House (UNESCO/ UN-Habitat)

RESPECT HISTORICAL CHARACTERISTICS CONTINUE THE CITY-WIDE AWARENESS CAMPAIGN

A lack of public awareness in relation to the ongoing reconstruction efforts and the options available – for example financial compensation options for self-reconstruction of private properties – demonstrate the need for a city-wide public campaign on the value of historical buildings. Poorly-guided and hasty reconstruction activities are presently underway, without an appropriate understanding of the urban context or adhering to any building guidelines. As a result, the historic and heritage identity of the Old City is at risk.

On 22 October 2018, UN-Habitat in partnership with UNESCO launched the first 'Mosul Old City Forum' where it shared the work carried out so far on the 'Initial Planning Framework for the Reconstruction of Mosul'. The Forum event – focusing on the Old City heritage – was held in the Al Chalabi house, one of the finest surviving examples of a historic building in the Old City, in the wake of the destruction caused by the recent conflict with ISIL. The presence of local residents provided an appropriate opportunity to directly engage the citizens of the historic quarters, as part of efforts to raise awareness of the unique but endangered cultural values of traditional architecture in Mosul. Local government representatives, heritage experts, academia, civil society, and local media were invited to learn about and contribute to the development of the analytical tools and essential planning instruments that are being developed in support of the reconstruction efforts conducted by local authorities.

FIGURE 126. Some residents of the Old City spiritedly re-occupy their properties and re-paint their shop fronts, regardless of the extent of destruction and relics of war surrounding them
(UN-Habitat, Jan Willem Petersen, August 2018)

IMMEDIATE IMPLEMENTATION (<1 YEAR)

5 SUPPORT THE ONGOING SELF-RECONSTRUCTION PROCESS

The implementation of a rapid and targeted self-reconstruction process for the returning residents of the Old City is of paramount importance. Self-Build reconstruction aims to develop an active framework for rapid reconstruction with the participation of the local community. The process that is currently being developed is an urgent response to the needs of the displaced communities to re-construct their homes, religious, educational and public spaces. Setting up a self-reconstruction system for the Old City represents an attempt to overcome issues like the lack of availability of appropriate construction materials and expert help. There is a growing feeling that there should be more immediate long and short term action taken to create the conditions for the community to re-build their own properties.

Wherever possible, proposed designs for self-build construction techniques should be independent of any external materials or workforces outside of the Old City. Such programme relies on utilizing recycled materials from damaged buildings, local materials, labour and techniques. These materials are either the result of post-conflict demolition or are easily available in the locality, and could be utilized, recycled, or developed to be used for construction purposes. As part of the project, one large or multiple self-rebuilding facilities will be established within the Old City, appropriately located in districts that are in close proximity to the areas that will require the centre's facilities most, and to reduce the extent of movement required between the centres and people's homes. The facilities will represent a hub for modern and traditional construction skills training, information, practical workshop facilities and equipment, materials storage and provide a community environment in which residents can learn from and support each other in their self-reconstruction endeavours.

Priority Action(s)	Possible Actor(s)
» Create a building materials depot with traditional building bricks and other materials for people who have obtained a valid building license*	MSRF, UNESCO
» Set-up Mosul Self-Rebuilding Facility that can give technical support, advice and expedite the licensing process	Old City Task Force, MSRF, UNESCO, UN-Habitat
» Development and delivery of on-the-job training modules in self-construction techniques with a view to rehabilitation and reconstruction in historical contexts for semi-skilled and unskilled youth labourers	MSRF, UNESCO
» Establishment of Intensive Employment Schemes in self-construction techniques in historical contexts for semi-skilled and unskilled youth labourers	MSRF, UNESCO
**Consider increasing incentives for landlords of buildings with heritage features that have adhered to the proposed design guidelines*	

Possible Implementation/ Funding Options	Indicator
» Establish a temporary brick production site within or near the Old City that can produce key traditional and/or innovative construction materials, for example artificial stone	# of trained local workers in restoration # of applications for assistance # of sound rehabilitated and rebuild houses
» Disburse "Special Assistance Packages" comprising specialized craftsmanship man-hours and direct support in the form of traditional bricks, limestones, marble and equipment	

FIGURE 127. Ongoing reconstruction in the Old City
Example of the result of residents not having access to traditional building material (UN-Habitat, Ivan Thung, August 2018).

FIGURE 128. Ongoing reconstruction in the Old City
Currently, local residents engage in the reconstruction of private houses (UNESCO, Giovanni Fontana Antonelli, May 2018).

FIGURE 129. The commercial areas of the Old City suffered greatly under the onslaught of the conflict with over 1,200 shops being affected
(UN-Habitat, Ivan Thung, November 2017)

IMMEDIATE IMPLEMENTATION (<1 YEAR)

6 SUPPORT SMALL-MEDIUM ENTERPRISES IN COMMERCIAL AREAS

The Old City is the commercial heart of Mosul. In West Mosul there are around 2,300 commercial properties affected by the conflict. More then 1,200 commercial properties in the Old City are damaged. The support and diversification of socio-economic activities in the Old City is key to achieving its revitalization. With a view to supporting individual households, a small grant/start-up scheme should be designed and activated to support handicraft production, compounded with the creation of micro, small and medium enterprises for the rehabilitation and reconstruction of the historic urban fabric. PPPs should be encouraged, to sustain the reviving of the Old City and those services that will contribute to its regeneration, for future support of its socio-economic and socio-cultural fabric. Well designed and thought out PPPs are seen as the key to success and strategic implementation of the rehabilitation and reconstruction of the Old City.

Priority Action(s)	Possible Actor(s)
» Support the Mosul business community located in officially designated commercial and manufacturing areas	Old City Task Force, Chamber of Commerce
» Explore opportunities for the first phase of the rehabilitation of the Old City market of 600 shops for small traders	Old City Task Force, Chamber of Commerce, UN agencies, Waqf

Possible Implementation/ Funding Options	Indicator
» Set-up a Revolving Fund for small business loans that is accessible for privately owned shops and Small and Medium Enterprises (SME)s	# of active commercial enterprises

FIGURE 130. Commercial axis
Commercial Street in the Old City one year after liberation. Where the level of damage permits, inhabitants are rebuilding and re-opening shops and other commercial premises. A greatly diminished customer base is a major concern and challenge (UN-Habitat, Jan Willem Petersen, August 2018).

FIGURE 131. View of Shaziani commercial axis
Several shops sustained relatively minor damage to the ground floor. Shopkeepers have returned and started reconstruction of the structures on their own in order to be able to start selling daily wares, food, and small equipment. Some shops need support to re-stock in order to start operating again (UN-Habitat, Ivan Thung, August 2018).

SUPPORT SMALL-MEDIUM ENTERPRISES
SET-UP A REVOLVING FUND FOR SMALL BUSINESS LOANS

Al Makawi street
Appears more heavily damaged than the main commercial axes. Satellite imagery suggests that at least 84 properties have been damaged.

Al Nuri mosque street
Almost all properties in this street have been severely damaged or completely destroyed. Reconstruction support should be considered and be combined with any project concerning the Al Nuri Mosque.

Al Farouq - Al Shaziani street
Satellite imagery suggests that approximately 152 commercial properties have been severely damaged. It can be assumed that all properties have suffered at least minor damages to doors, windows and wares.

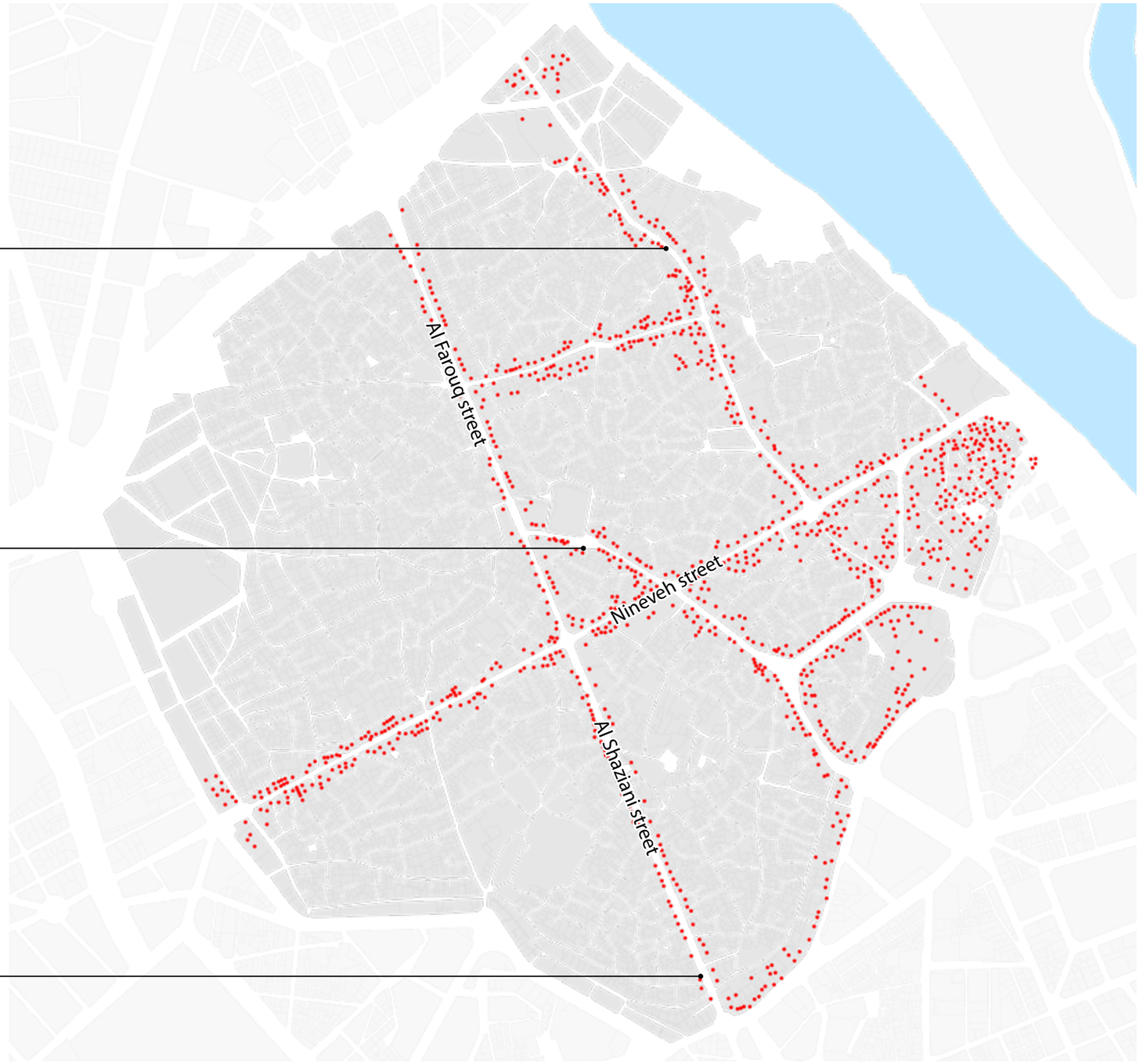

FIGURE 132. Old City commerce
Location and extent of more than1,200 damaged commercial properties in streets that are indicated as commercial by the urban planning department (UN-Habitat, August 2018).

SUPPORT SMALL-MEDIUM ENTERPRISES
REHABILITATE PART OF THE OLD CITY MARKET

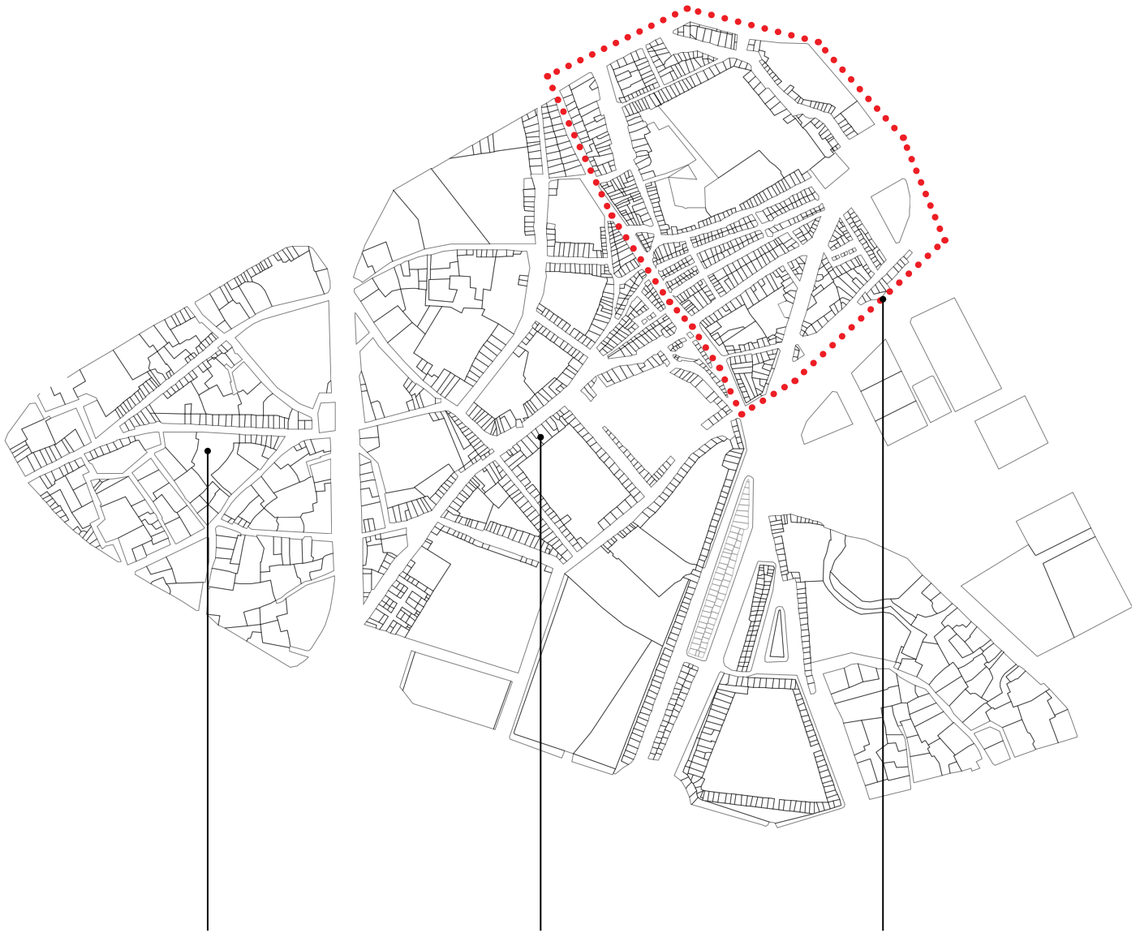

FIGURE 133. Souq Al-Saghah
Contains a variety of smaller shops but few buildings with heritage value, and can be reconstructed through private sector initiatives.

Souq Bab Al Saray
Contains a variety of smaller shops with historic buildings, the Khan and Baths, both of which have architectural plans and documentation.

Reconstruction in these areas should only proceed with the appropriate studies and building design guidelines to prevent further damage to the remaining historic buildings (Reconstruction of the Old City of Mosul Preliminary Study, Engineering Consulting Bureau of Mosul University).

Bab Al Jisr area, the Corniche street and Al Manarah Souq
This area comprises numerous small rectangular plots of approximately 7.5m2 (2.5 m x 3 m) and some larger corner plots ranging in size from 24 m2 (4 m x 6 m) to approximately 50 m2.

To accommodate the return of the maximum number of shops, this should be considered for the first phase for rehabilitation.

Rehabilitating this area would bring back approximately 600 shops for small traders in the Old City (UNESCO/ Iconem, 7 cm drone imagery 2018).

FIGURE 134. Aerial view of the Old City Market
(UNESCO/ Iconem, 7cm drone imagery 2018)

FIGURE 135. Even before the conflict, the Old City, with its dense urban fabric, lacked the space to introduce new facilities
(UNESCO/ Iconem, drone imagery 2018)

IMMEDIATE IMPLEMENTATION (<1 YEAR)

7 INTRODUCE NEW SCHOOLS AND HEALTH FACILITIES TO THE OLD CITY

Most of the schools in East and West Mosul are in the process of being partly recovered, meaning that at least one or two classrooms are functional. For the Old City, there are 9 destroyed and 22 damaged schools. Presently, 6 buildings are being rehabilitated. The educational system was already in crisis before the crisis, with most schools functioning on the basis of 2 to 3 shifts for boys and girls. The system will remain overburdened for the foreseeable future. In several areas of Mosul, residents have insufficient access to educational facilities. In particular sites on the fringes of Mosul as well as the Old City are chronically underserved. Rehabilitating and reconstructing the existing 37 schools within the Old City is a prerequisite to expedite the return of inhabitants. Pre-crisis, the average school in the Old City hosted between 360 and 500 students and operated both morning and afternoon shifts.

FIGURE 136. Damage to one of the 37 schools in the Old City
Schools in the Old City suffered from the extensive fighting.

Priority Action(s)	Possible Actor(s)
» Reconstruct and rehabilitate the existing 37 schools located within the Old City*	Old City Task Force, Local Government, MOE
» Consider introducing an additional 8 schools in the Old City. Offer landlords of any large destroyed property of no architectural or historical value the possibility of applying for the Transfer of Development Rights (TDR) to an alternative site in the city (200 m2 plot) where they can relocate so that their plot in the city can be redeveloped as a school	Old City Task Force, Local Government, Waqf
» Reach out to non-returning landlords who might want to consider donating or receive compensation for their destroyed or damaged property either to GoI or Waqf, to be rebuilt as a public facility	Municipality, Waqf, Local Government, GoI
**Allocate space for new school facilities to align with Iraq standard of 0.4 per 1,000 capita, addressing disparities of services between different communities and neighbourhoods*	

Possible Implementation/ Funding Options	Indicator
» Set-up a working group for "The Improvement of Social Services in the Old City" comprised of land-owners, the Waqf, the Directorate of Municipalities, and the Directorate of Education. The working group should identify areas in the Old city suffering the most from lack of public services, and prioritise and explore opportunities to negotiate land-use changes with property owners to allow the insertion of new services and facilities	# of new facilities Improved levels of public services
» Adopt a compensation model for voluntary expropriation of plots, through TDR. In this model, land owners can be offered lucrative development rights elsewhere, outside or near the Old City, in exchange for forfeiting the destroyed house and its associated plot in the Old City* ** The TDR is a zoning technique used to permanently protect natural and cultural resources by redirecting development to areas planned to accommodate growth and development. TDR programs enable landowners within valuable agricultural, natural and cultural resource areas to be financially compensated for choosing not to develop some or all of their lands. They can decide to sell these rights to another landowner or a real estate developer. TDR removes some of the windfalls typically associated with conventional zoning by allowing landowners in areas zoned for 'conservation' to capture some of the same financial rewards available to landowners located in areas zoned for suburban and urban land use.*	

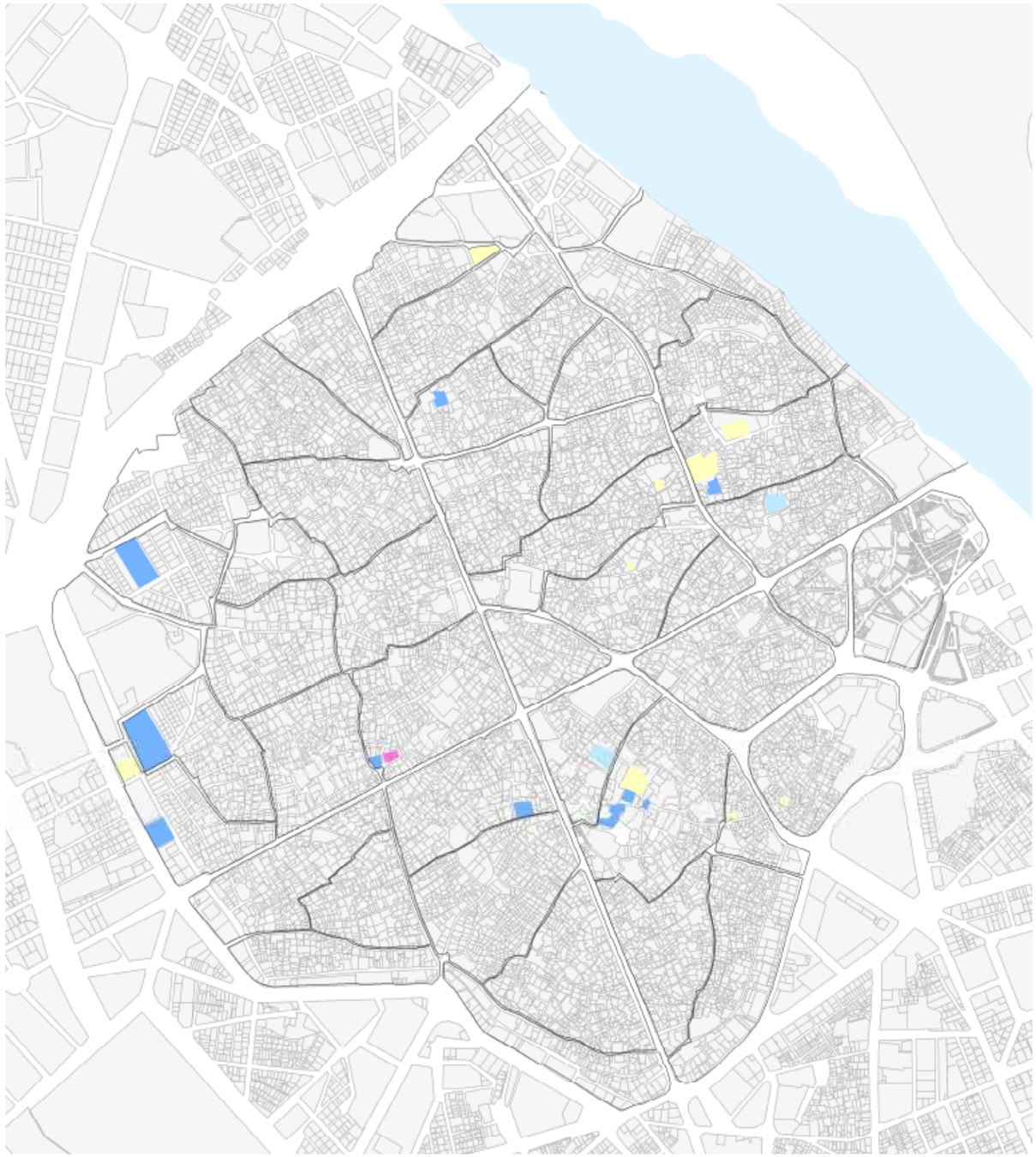

FIGURE 137. Education coverage in the Old City
(Local government/ UN-Habitat)

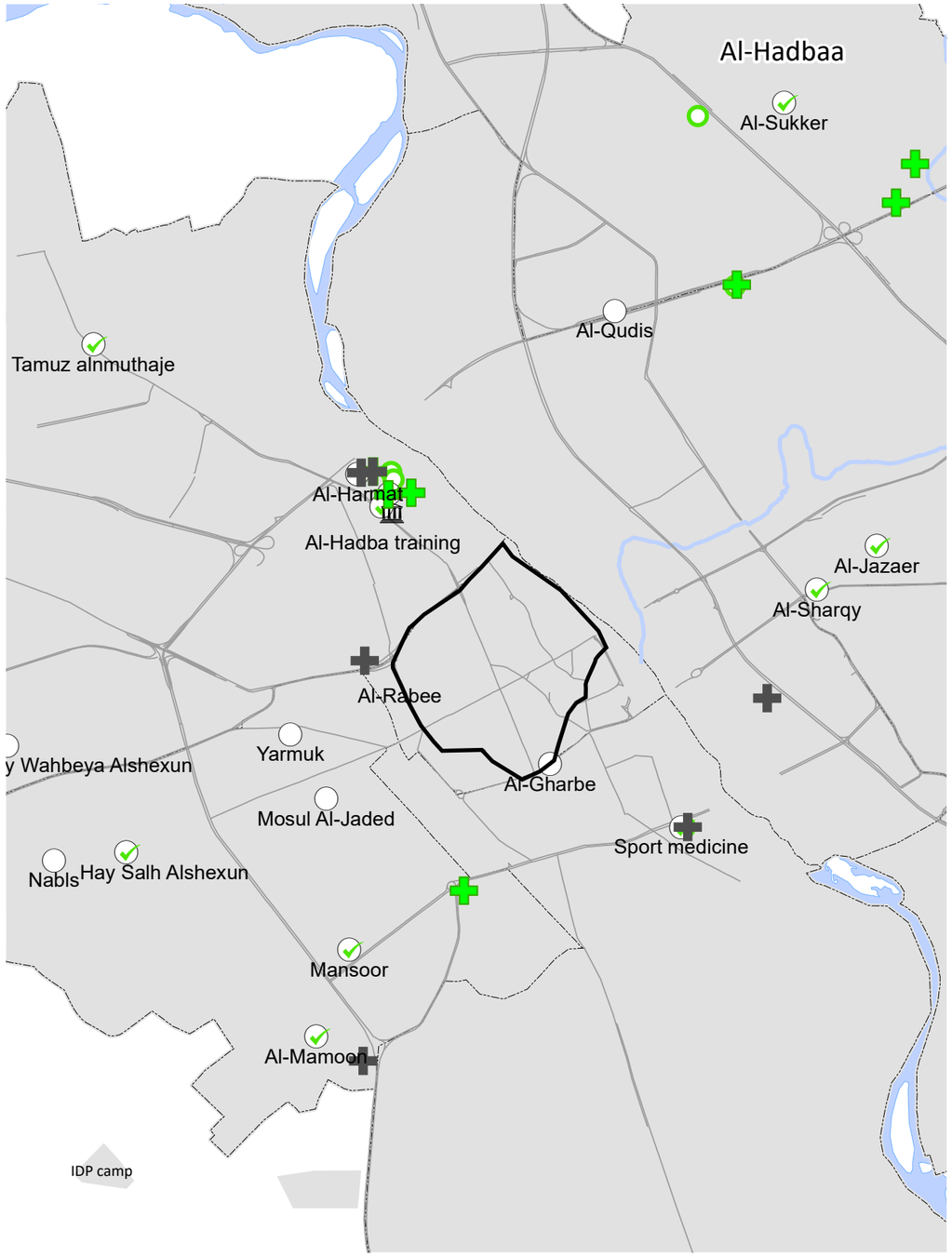

FIGURE 138. Health coverage in proximity of the Old City
(Local government/ UN-Habitat)

RE-INTRODUCE SCHOOLS TO THE OLD CITY
APPLY TRANSFER OF DEVELOPMENT RIGHTS

The lack of space within the Old City previously made it difficult to introduce additional educational facilities. The scale of destruction of parts of the city offers a unique opportunity to address disparities of services between different communities and neighbourhoods. If approximately 1% of the completely destroyed properties could have their land use changed for educational purposes, a significant improvement in the level of services provided, would be achieved.

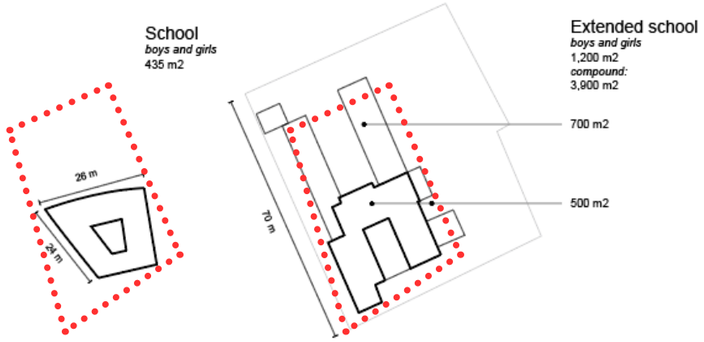

FIGURE 140. Built-up area of block B9
Example of potential location for a new school initiated by land-use change and financial compensation mechanisms. This particular site is approximately 50x30m (Local government/ UN-Habitat).

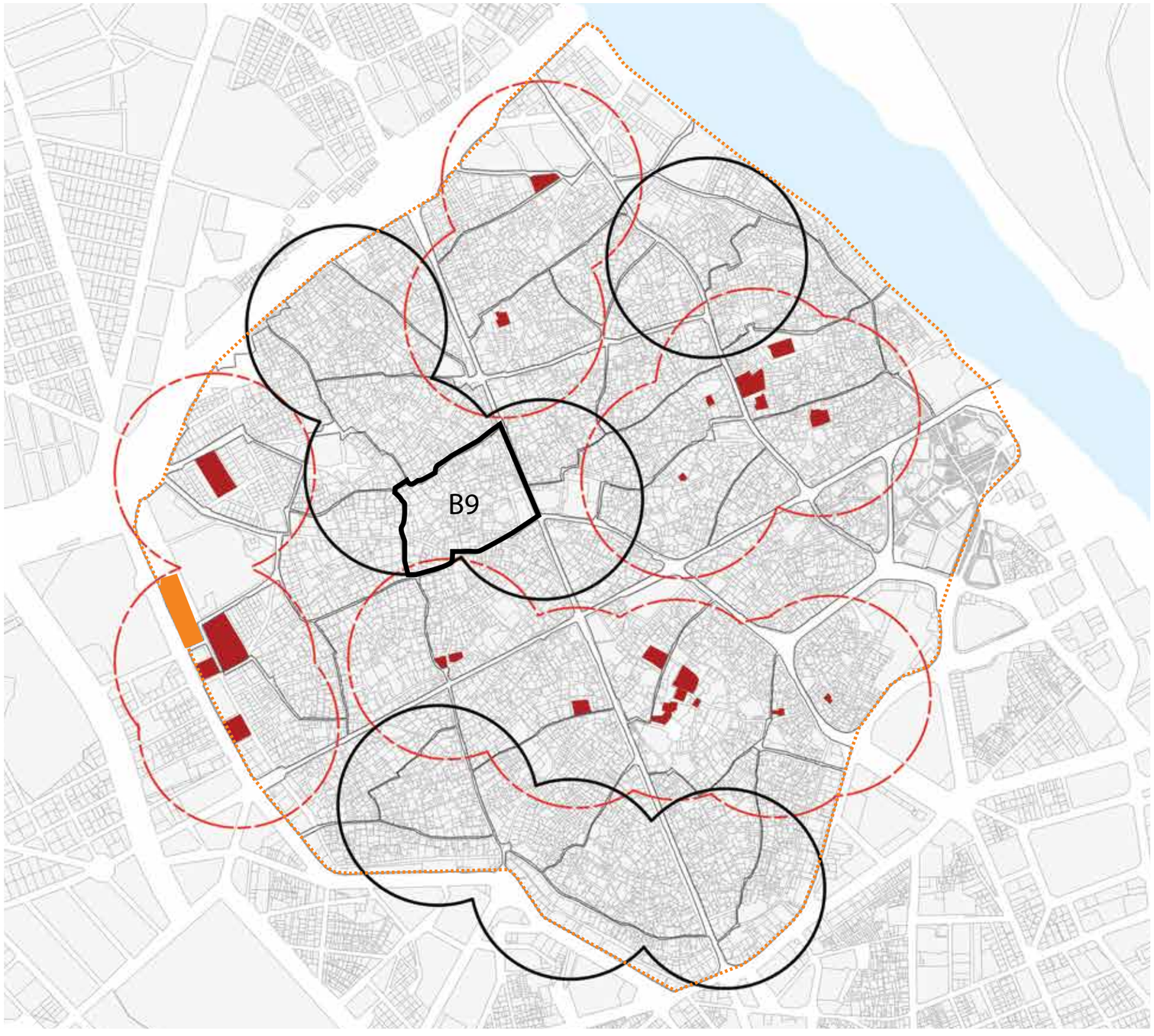

FIGURE 139. Potential areas for new facilities
Existing schools and walking distances are outlined in red. The potential locations for new schools to be incorporated in the Old City are marked in black. This would reduce the number of underserviced neighborhoods. There is currently 1 health centre servicing more than100,000 inhabitants, depicted in orange. Additional locations for clinics are to be allocated within or in close proximity of the Old City (Local government/ UN-Habitat).

FIGURE 141. Damage to the right Bab Al-Tob Terminal in the Old City
(Satellite imagery 2018/ UN-Habitat)

IMMEDIATE IMPLEMENTATION (<1 YEAR)

8 RECONNECT THE OLD CITY TO THE WIDER MOSUL AREA BY PUBLIC TRANSPORT

There are 8 main transportation hubs and one temporary stop in Mosul. They are divided into those with predominantly external connections and those managing transport links within the city. The Old City is served by 3 bus stations: The right Bab Al Tob Terminal and the left Bab Al Tob Terminal connect the Old City to the East Bank and the West Bank respectively. Rehabilitation priority goes to those two bus stations, in order to reconnect the Old City to the public transport network. The Baghdad Bus Station needs considerable investment for it to be appropriately repaired as removing large concrete residual structures increases the clearing costs significantly. The Public Transportation Management Private Company authority will manage the bus/taxi routes and terminals. The land of these terminals is owned by the Ministry of Transportation and all terminals lie within Mosul's city boundaries.

The area west of the Old City potentially has all the elements to again become a transport hub. For this area, a Transit-Oriented Development (TOD) should be considered*.
Within a small area, it hosts:
- The Old City market and other commercial facilities in the vicinity.
- A significant amount of parking spaces that existed before the crisis.
- The high population density.

With improvements of the facilities for pedestrian traffic, well-maintained continuous sidewalks and safe traffic crossings over Khalid bin Al Walid Street and Ninewa Street, approximately two-thirds of the Old City (60,000 people) could be brought to within a 1-km walking distance of the transport hub.

* A TOD is a planning strategy that aims to bring housing, jobs and transport within walking distance. As such, it reduces a dependence on cars and promotes pedestrian traffic. Key elements of a TOD strategy are: high density housing areas, public transport and parking, commercial facilities, and good access for pedestrian traffic.

Priority Action(s)	Possible Actor(s)
» Reconnect the Old City to the rest of the Mosul with public transport	Old City Task Force, Public Transportation Management Company

Possible Implementation/ Funding Options	Indicator
» Rehabilitate the bus terminal Al Bab Al Tob Terminal through a PPP construction	# of inhabitants with access to public transport

Baghdad Bus Station to Baghdad, South Hamam

Left Bab Al Tob Terminal to the West Bank

Right Bab Al Tob Terminal to the East Bank

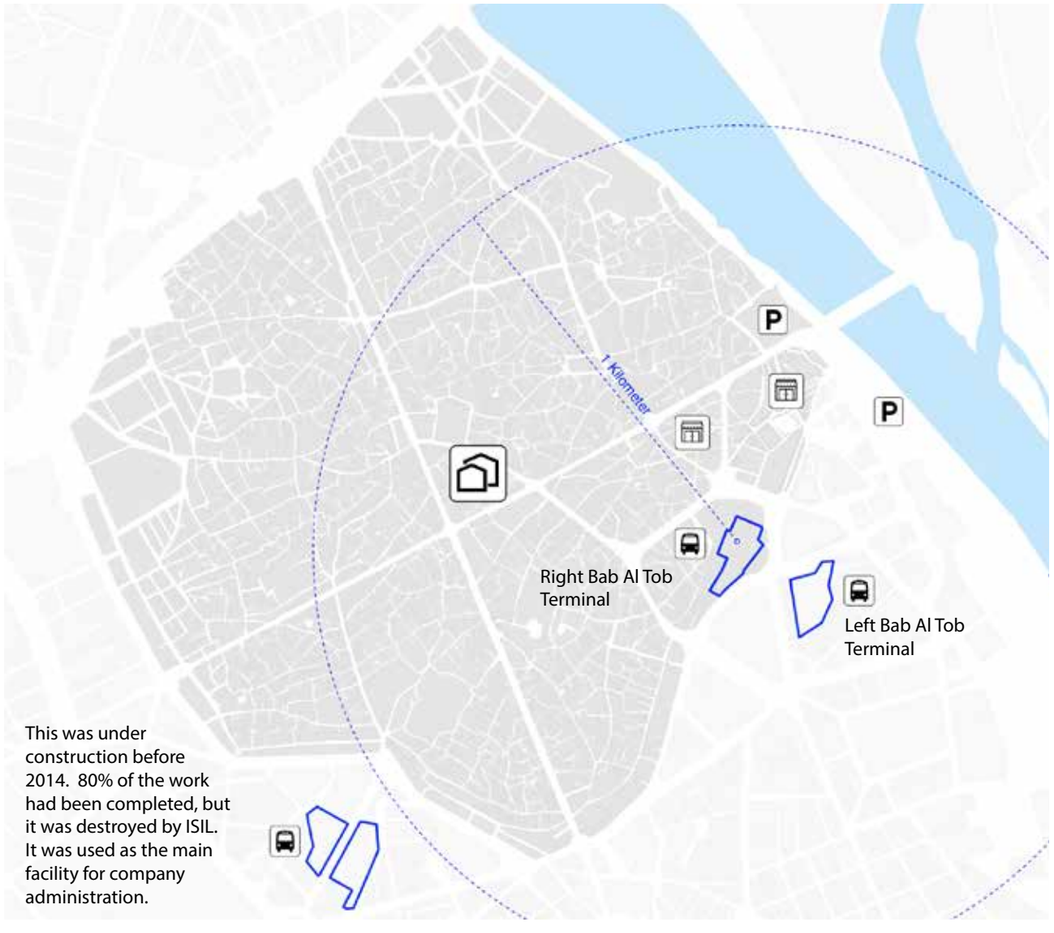

FIGURE 142. Location of the right Bab Al Tob Terminal
Rehabilitation of this bus station could bring 60,000 people within walking distance of the transportation hub (Local government/ UN-Habitat, Sattelite Imagery/ DigitalGlobe, June 2017: US Department of State, NextView License)

IMMEDIATE IMPLEMENTATION (<1 YEAR)

9 SUPPORT OLD CITY RESIDENTS WITH PROPERTY DOCUMENTATION

Housing, land and property (HLP) issues are among the most difficult and pressing challenges preventing refugees and IDPs from returning to their homes. During the occupation, ISIL illegally seized many properties in the Christian neighborhoods and of families who left the city without permission, or who did not return to ISIL-controlled territory. They illegally sold properties or reallocated them to supporters and fighters within their ranks. Other minorities, such as Kurds, Turkmens, Shabakhs and Yazidis also fled the city and left their properties unprotected. Subsequently some were illegally occupied or confiscated.

In the Old City, particularly along the completely destroyed waterfront area, it is difficult to reliably establish pre-crisis plot boundaries. Here, missing property documentation is expected to be a key obstacle in respect of people's HLP rights and fairness of any top-down or uncontrolled reconstruction and development activities. Furthermore, missing documentation will also prove to be a bottleneck for cash assistance for repairs and compensations, as generally, no assistance can be provided without proof of ownership. Difficulties will include: visually determining the property boundaries in heavily damaged areas, inheritance disputes, tenants claiming ownership, and a long process for identifying legitimate interlocutors.

Assistance from HLP actors like NGOs and agencies should be set-up to expedite assistance to these families to obtain documentation necessary for filing compensation claims. A fast-track for the replacement of obtaining the HLP documents through short, effective and efficient processes from the mentioned special body must be incorporated. HLP actors are to conduct awareness raising sessions about the process of filing claims in cases of property disputes and obtaining missing HLP documentation through capacity building of local authorities such as Mukhtars, community leaders, and other relevant actors in the respective areas.

Priority Action(s)	Possible Actor(s)
» Set-up a special quasi-judicial dedicated administrative body tasked to resolve property disputes through mediation, conciliation and negotiation to alleviate the burden on overcrowded courts and help to reduce the current backlog of cases and waiting time – staffed for example with "Peace Judges" (respected community elders)	Old City Task Force, Local Government, MOJ, Land Registry Office

Possible Implementation/ Funding Options	Indicator
1. Coordination and information exchange with the Land Registry Office. The copies of the title deed, inheritance, property transfer and other HLP documents will help to identify the types of properties and categorization of the land, whether it is privately or publicly owned, managed by endowment (Waqf) to facilitate restoring property boundaries, title deeds, inheritance documents, illegal constructions, housing rehabilitation, unregistered owners, informal contracts, and secondary occupations within communities. 2. Cross-referencing property boundaries with the pre-existing survey conducted in 2008. 3. Coordination with Waqf institutions for information exchange on Waqf properties and mobilizing legal specialists to process related documents. 4. Establish and train a core group (e.g. partnering with a local NGO) of people who will carry out the mapping and the questionnaires on the ground, mobilise volunteers from the community. Complete the questionnaires using Kobo Toolbox, with mapping done on printed satellite images in the field. 5. With the above mentioned information obtained, identify missing property documents in project area. 6. Cooperation with respective institutions on verifying ownership documents and consultation with local community leaders, community elders and neighbours on verifying ownership in case of missing, lost, destroyed documents or non-formal transaction of property to ensure that beneficiaries are real owners.. 7. Transfer to a database e.g. Social Tenure Domain Model, a Geographic Information System (GIS)-based tool developed by UN-Habitat, digitise mapped satellite imagery of action 5 mentioned above into geo located polygons of spatial units and record supporting documentation. 8. Community validation: captured data to be displayed for community validation and corrections. Issue Certificates of Occupancy for cases where property documents are destroyed. Certificates provide community endorsed verification and endorsement of local authorities that the plot is occupied by people linked to the spatial unit. 9. Liaise with land registry office and local authorities for recognition.	# of residence receiving assistance (i.e. the 13,000 inhabitants along the riverfront that could face HLP issues)

IMMEDIATE IMPLEMENTATION (<1 YEAR)

10 IMPLEMENT PRE-CRISIS PLANS TO 'BUILD BACK BETTER'

The crisis and destruction of the city provides an unmatched opportunity to 'Build Back Better'. Plans that before the crisis may have been unfeasible because of, for example the high price of expropriation of functioning businesses, can now be prepared for implementation. Even if there is no immediate funding available for the implementation of these plans, actions should be taken to make sure that reconstruction activities do not restrict the future implementation of these plans.

Priority Action(s)	Possible Actor(s)
» Commit to the improvement of water, sewerage and electricity as recommended by the Engineering Consulting Bureau (ECB), College of Engineering, Mosul University	Mosul Directorates, Old City Task Force, Local Government

Possible Implementation/ Funding Options	Indicator
» Initiate and implement the initial study of the Mosul reconstruction by Engineering Consultancy Bureau, Mosul University, including the first phase of the green strip and Mosul Old City wall rehabilitation	# of projects initiated

Improvement of infrastructure of basic services as recommended by Engineering Consultancy Bureau, Mosul University

- Connect the water treatment plans on the Right Bank to improve access to drinking water.
- Renew and extend the water distribution system.
- Introduce an underground electric cabling network
- Install optical fiber lines.
- Improve rainwater catchment channels.
- Introduce a sewerage network in areas where this was not yet present.

All of these interventions compete for the same space under the road infrastructure, which in many areas is currently being rehabilitated. In order to make sure that these services can be introduced at a later stage it is critical to:

- urgently create a shared underground infrastructure network plan with all relevant directorates for the potential future expansion of the basic services network.
- designate reserves in road sections that are expected to accommodate these infrastructures.

Green strip as recommended by Engineering Consultancy Bureau

Pre-crisis, plans and studies had been conducted to implement a green strip around the Old City, consisting of a large linear park. This park could include recreational and service facilities. Before the crisis, expropriation made this proposal too costly. However, the destruction of a significant number of buildings along the strip may make compensation more justifiable. Therefore, not rebuilding some commercial and manufacturing facilities should be considered, in order to make the implementation of proposals more feasible. This process should only be conducted with appropriate compensation in place, and by respecting the rights of citizens according to Iraqi law.

FIGURE 143. Example of 'Building Back Better'
The destruction of the over ground electricity cable network provides the opportunity to improve on the level of services and their incorporation in the urban fabric (UN-Habitat, Ivan Thung, August 2018).

Potential phase one implementation of green strip. Implementation of outlined section of approximately 2.2 ha is most feasible because:
- The section contains mostly severely damaged buildings.
- Existing public functions (such as schools) can be integrated with the green strip.
- The section consists of only 12 plots, circumventing complex TDR issues.

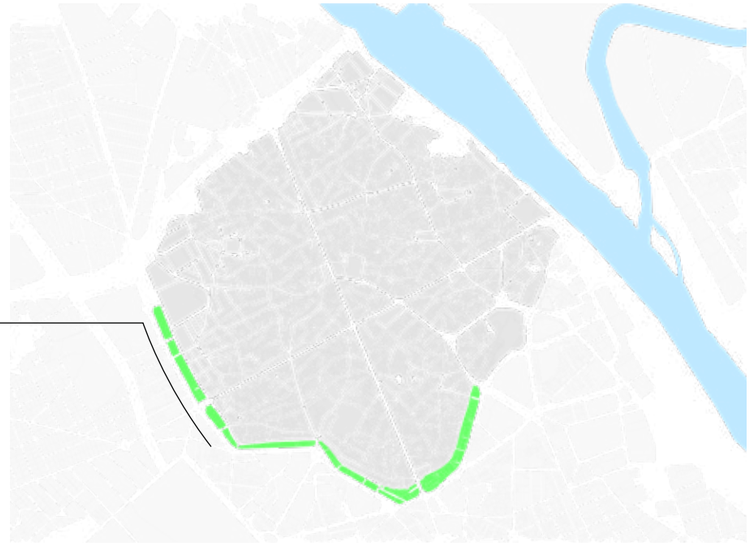

FIGURE 144. Location of the proposed green strip
(Adapted from Engineering Consulting Bureau)

COLOPHON

United Nations Human Settlements Programme (UN-Habitat), www.unhabitat.org

The United Nations Educational, Scientific and Cultural Organization (UNESCO), www.unesco.org.

United Nations Compound

If you require any information, please contact Ivan Thung, UN Habitat.
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Since the liberation of East Mosul in January 2017 and West Mosul in July 2017, humanitarian actors have been providing emergency assistance to rehabilitate infrastructure and public facilities in Mosul. However, several actors, including Ninewa Governorate, and international actors have expressed their concern that reconstruction without a coordinated strategy is inefficient and may complicate the long-term development of the city. Indeed, the recovery and reconstruction of Mosul would greatly benefit from a guiding framework that considers emerging needs and takes into account the fast-changing reality on the ground within greater Mosul.

Furthermore, the damage to Mosul's cultural heritage during military efforts to oust ISIL from Mosul and the surrounding areas is severe. Parts of the Old City have been completely destroyed in the final phase of liberation. Several months of armed conflict in the struggle to retake the city has left behind a devastated urban landscape, characterised by destroyed monuments, demolished houses, damaged buildings, destroyed infrastructure, extensive piles of rubble and areas contaminated by human bodies and unexploded ordnance. In particular, along the Tigris River, the historic urban fabric has been severely affected, with an estimated 5,000 buildings in the Old City destroyed or severely damaged.

A multi-disciplinary team from UN-Habitat and UNESCO has developed an Initial Planning Framework for the Reconstruction of Mosul in order to support Mosul's local government with the reconstruction and recovery of the city. This project is an initiative by UN-Habitat and UNESCO, supported by the Deputy Special Representative of the United Nations Secretary-General/ Resident Coordinator/Humanitarian Coordinator.

The Initial Planning Framework aims to define recovery priorities and deliver a comprehensive reconstruction and planning approach for the greater Mosul area, with special attention to the Old City. It aims to provide concrete actions for the revival of the entire Mosul metropolis, supported by desk research, fieldwork, and data. In addition, the document provides recommendations for the implementation of suggested actions.