Urban Environmental Planning
"Eco-City"

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What is an Eco-City?

- Ecological cities enable their residents to live a **good quality of life** & environment while **using minimal natural resources**; and to **incorporate the environment into the city.**

- To ensure applying the concept of the Eco-City, specific criteria should be available in Micro & Macro level.

Criteria on Macro-Level

- Availability of Natural Resources.
- Proximity of Biodiversity.
- Available of Agricultural Lands.
- Level of protection (Land Sensitivity).

Criteria on Micro-Level

Component	Criteria
Form	• Applicability the Concept of Compact City (Density) • Availability of open spaces
Natural Elements	• Availability of Natural Elements • Accessibility to biodiversity for recreation • High sensitivity of pollution
Economy	• Availability of agricultural lands • Existing potential for Agro-industry
Transportation	• Acceptable slope of streets • Applicability of walkability

Principles of “Eco-City”

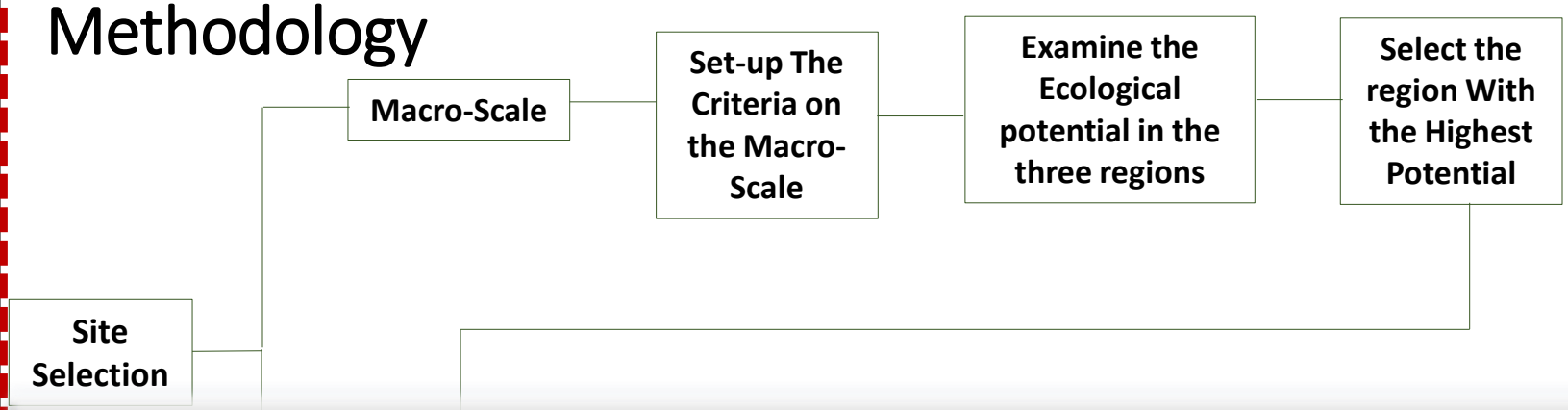
- In order to reach the concept of the “Eco-City”, **T**en **P**rinciples should be achieved and applied.

- Applying these **P**rinciples can ensure a safe move towards the “**Eco-city**”.

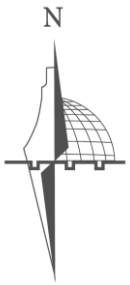
Ten Principles of the Eco-City

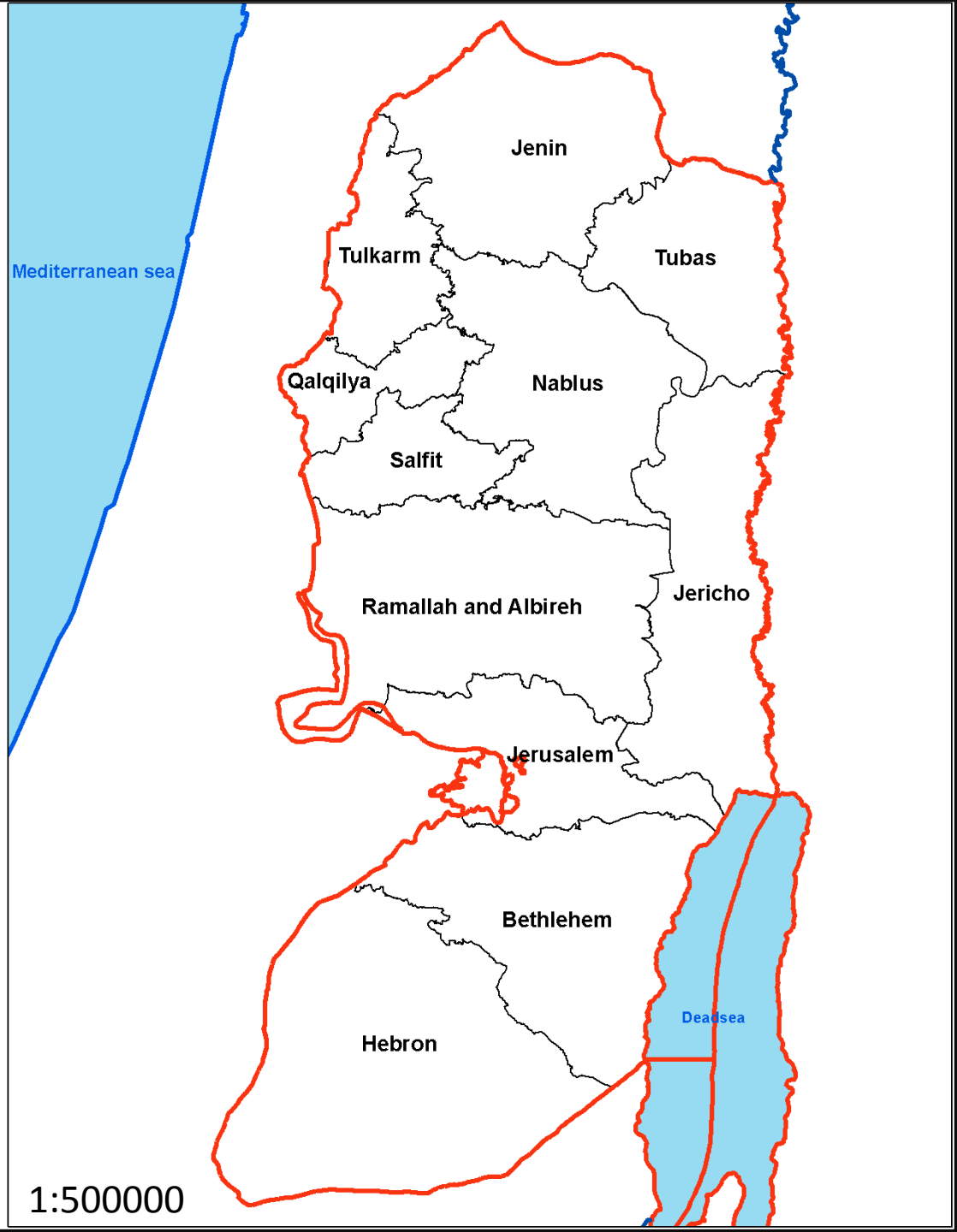
1. **R**estore Degraded Land.
2. **F**it the Bioregion.
3. **B**alance Development.
4. **C**reate Compact Cities.
5. **O**ptimize Energy Performance.
6. **C**ontribute to the Economy.
7. **P**rovide Health and Security.
8. **E**ncourage Community.
9. **P**romote Social Justice and Equity.
10. **E**nrich History and Culture.

Methodology



WestBank Governates



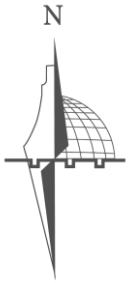


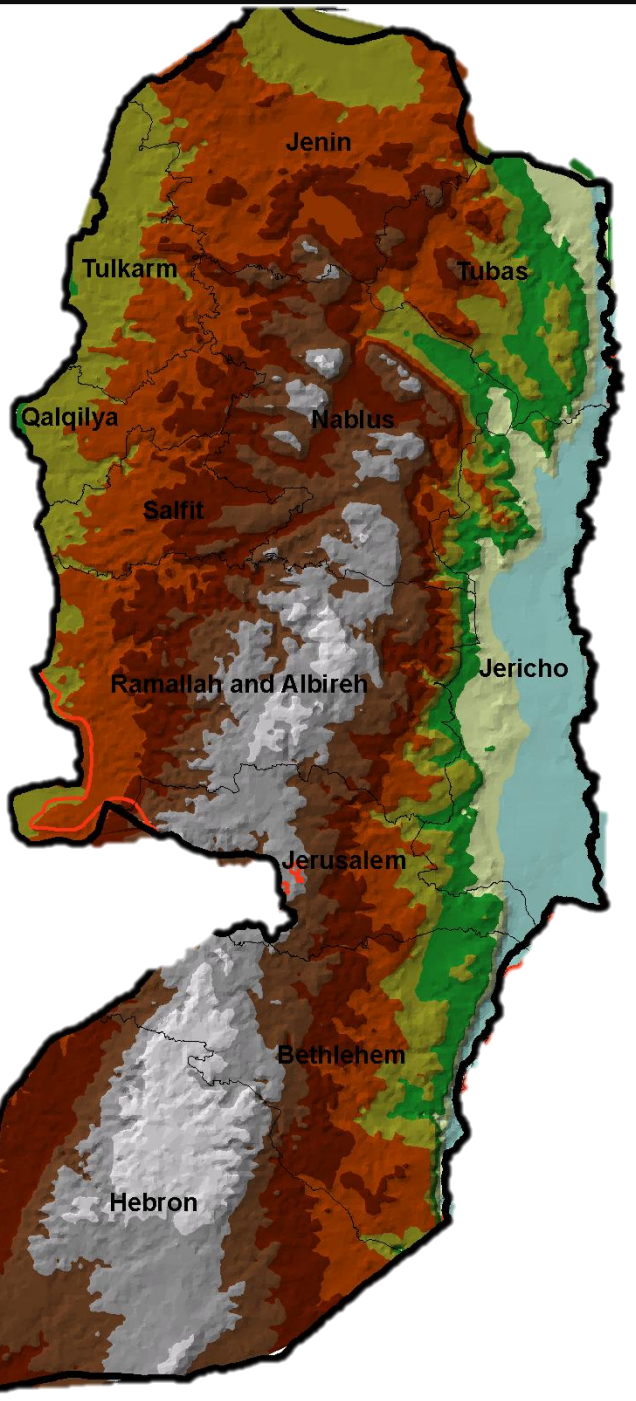
Legend

WestBank Boundaries

Governorates Boundaries

Topography
“WestBank”





Legend

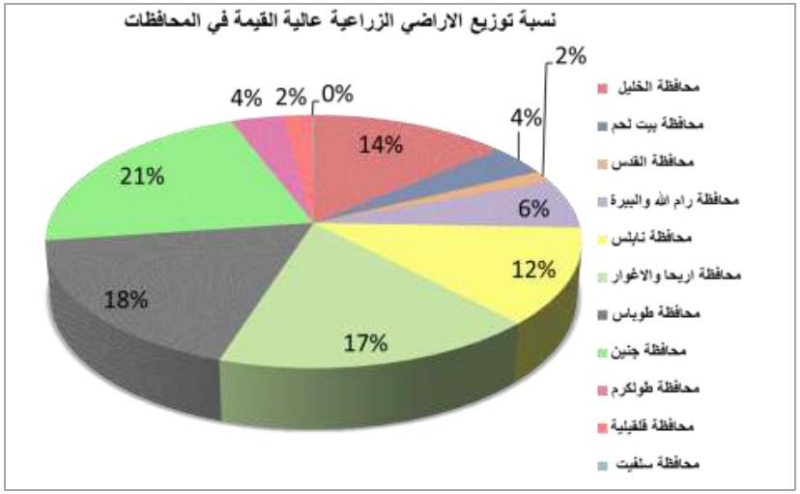
Elevation

- 844.444 - 1000
- 688.889 - 844.444
- 533.333 - 688.889
- 377.778 - 533.333
- 222.222 - 377.778
- 66.667 - 222.222
- -88.889 - 66.667
- -244.444 - -88.889
- -400 - -244.444

1:500000

Agricultural Land Value "West Bank"

Available of Agricultural Lands.



Legend

- Westbank Boundaries
- Governorates Boundaries
- High Agricultural land value
- Medium Agricultural land value
- Low Agricultural land value
- Forests

1:500000

Soil Type
“West Bank”

Availability of Natural Resources.

Legend

Governorates Boundaries

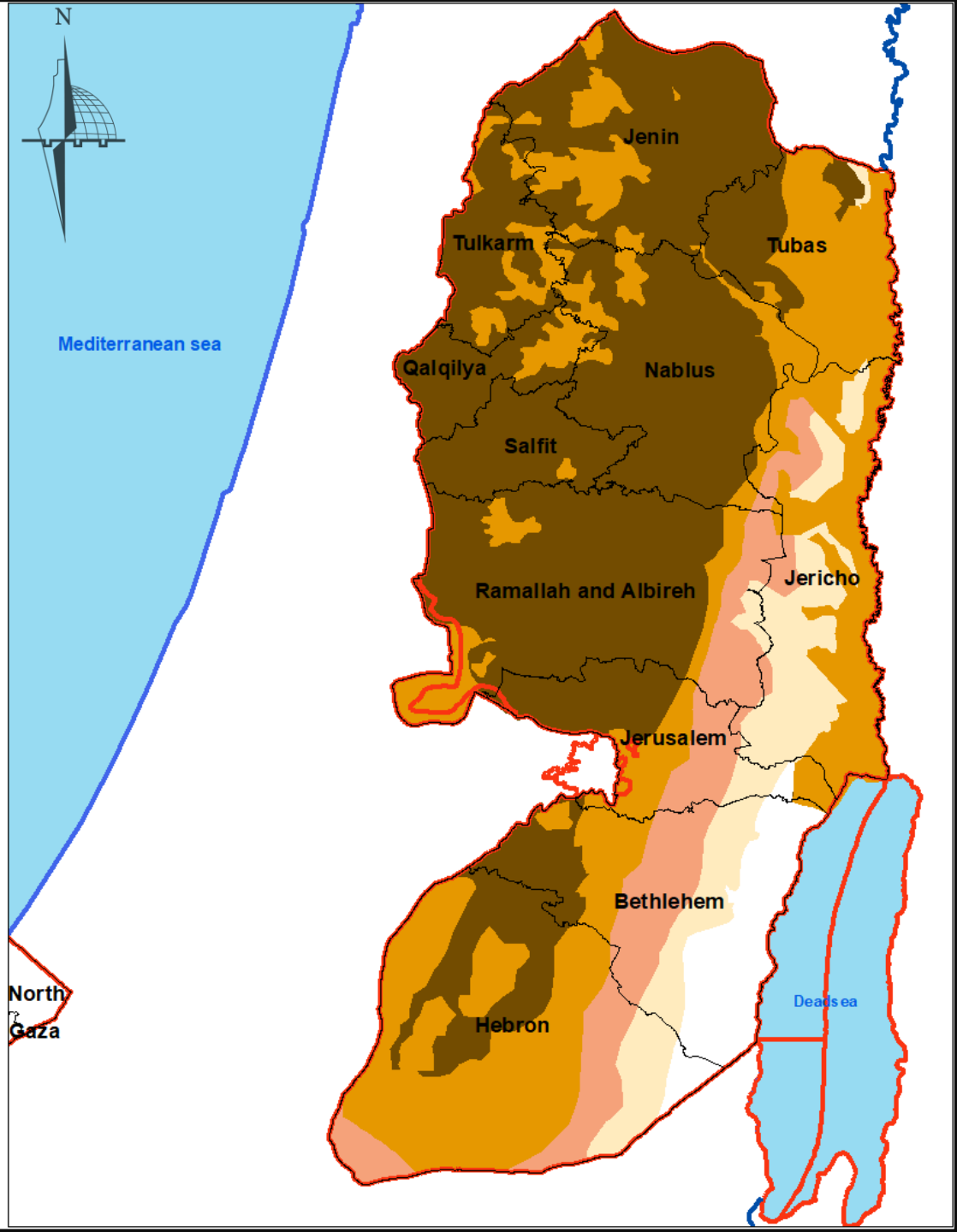
Soil Type

Clay

Clay loam

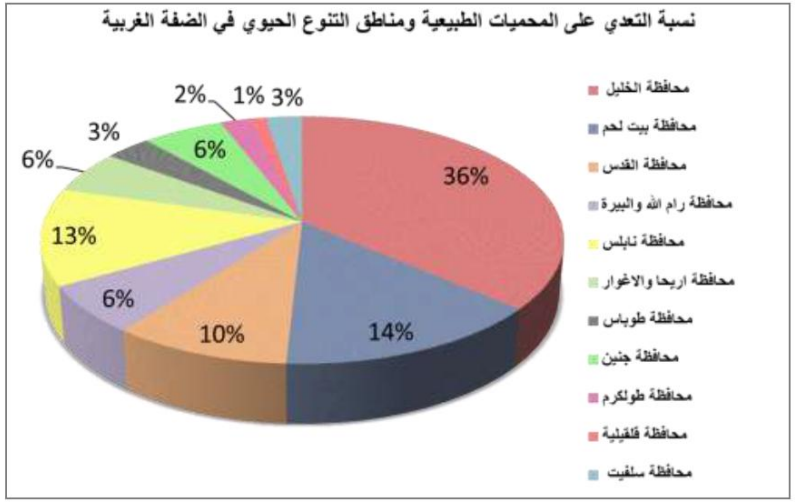
Loamy

Sandy loam



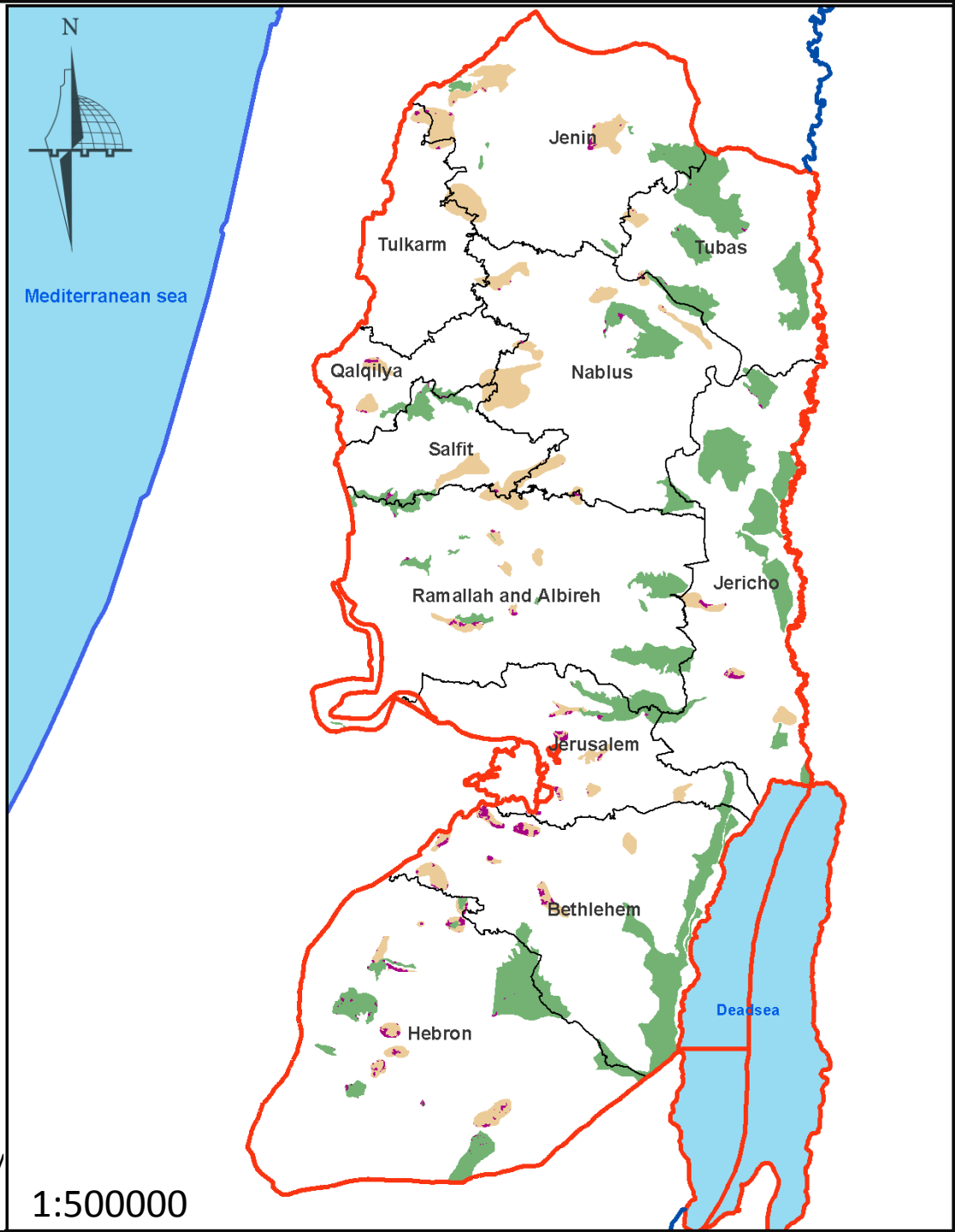
Infringement on Natural Reserve & Biodiversity "West Bank"

Availability of Natural Resources



Legend

- WestBank Boundaries
- **Governorates Boundaries**
- NaturalReserve
- Biodiversity
- Infringement on Nature Reserves & Biodiversity
- Wells



Rainfall Average "West Bank"

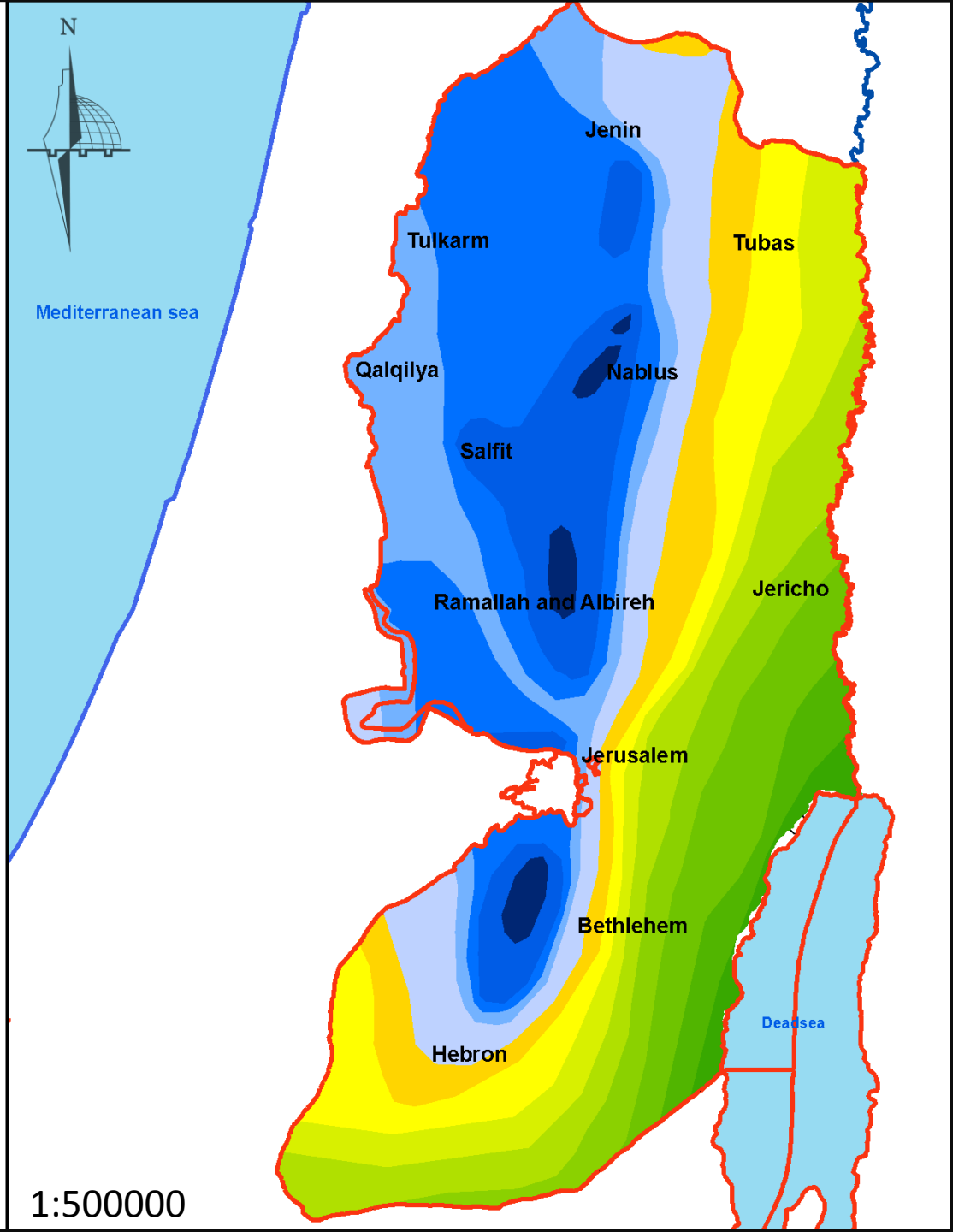
Availability of Natural Resources.

Legend

WestBank Boundaries

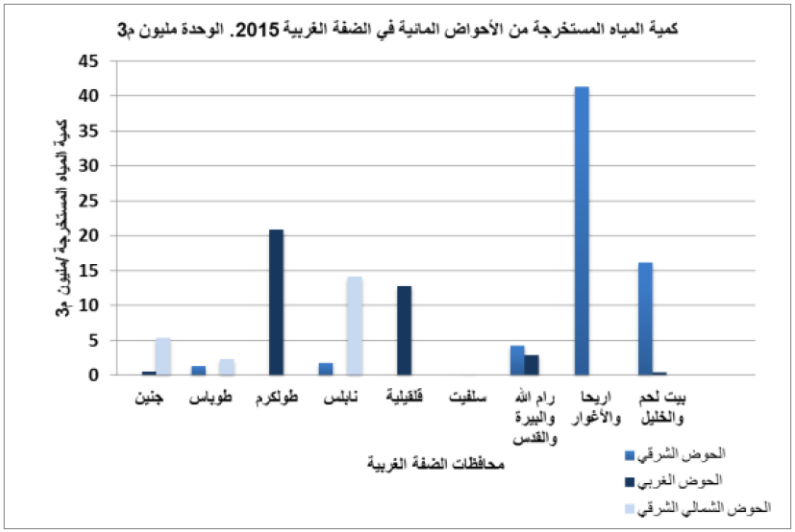
RAINFALL

- 0-100
- 100-150
- 150-200
- 200-250
- 250-300
- 300-350
- 350-400
- 400-450
- 450-500
- 500-550
- 550-600
- 600-700
- 700-1000



Groundwater Inventory in West Bank Basins

Availability of Natural Resources.

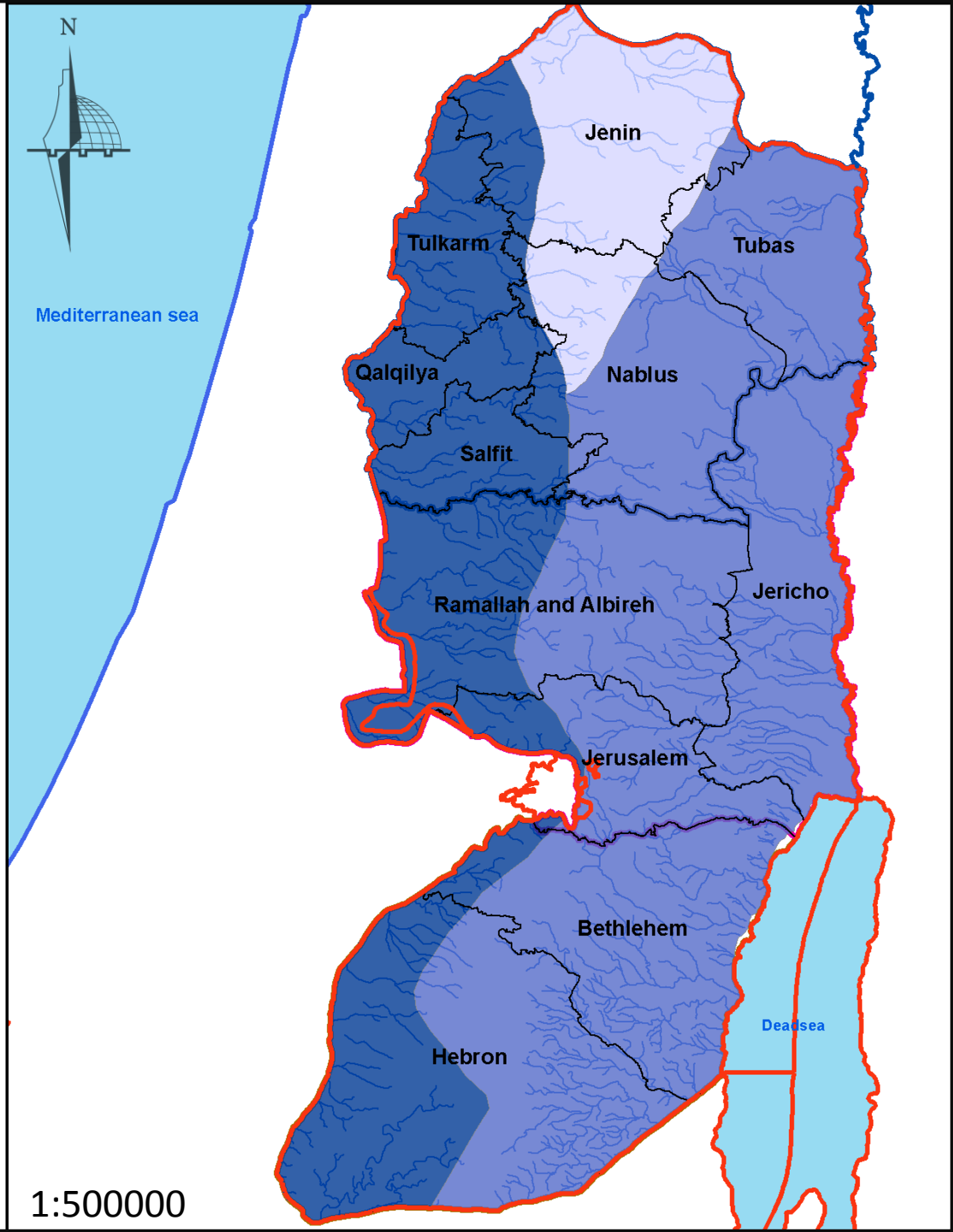


Legend

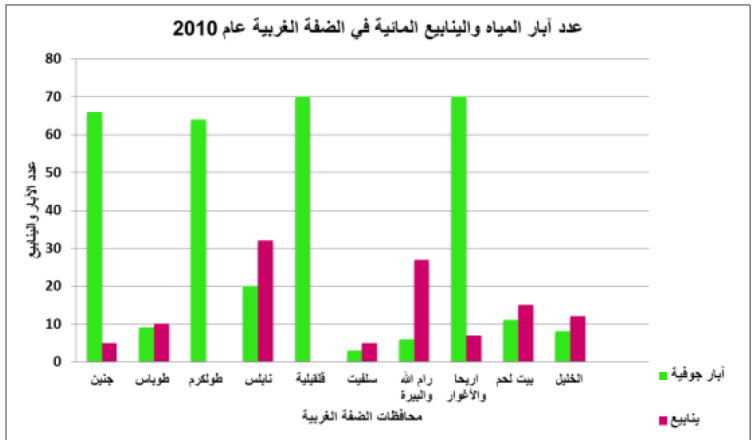
- Boundaries
- Governorates Boundaries
- Wadis

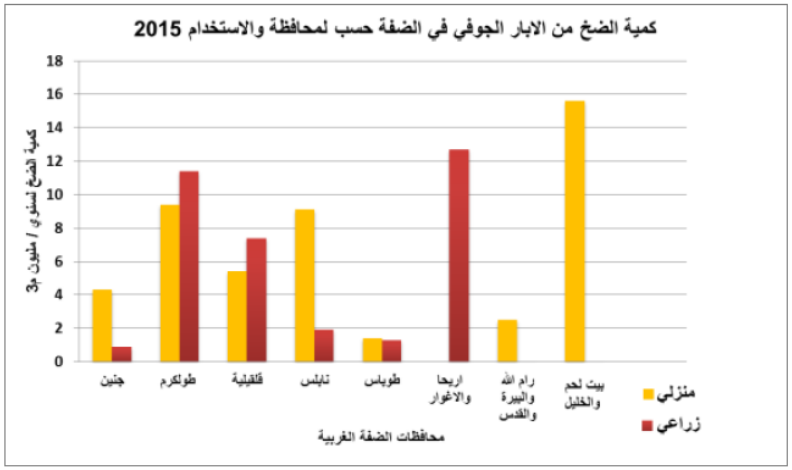
Groundwater Inventory

- 112.2865 (Northeast Basin)
- 350.3986 (Eastern Basin)
- 352.777312 (Western Basin)



Wells Use
“West Bank”





Legend

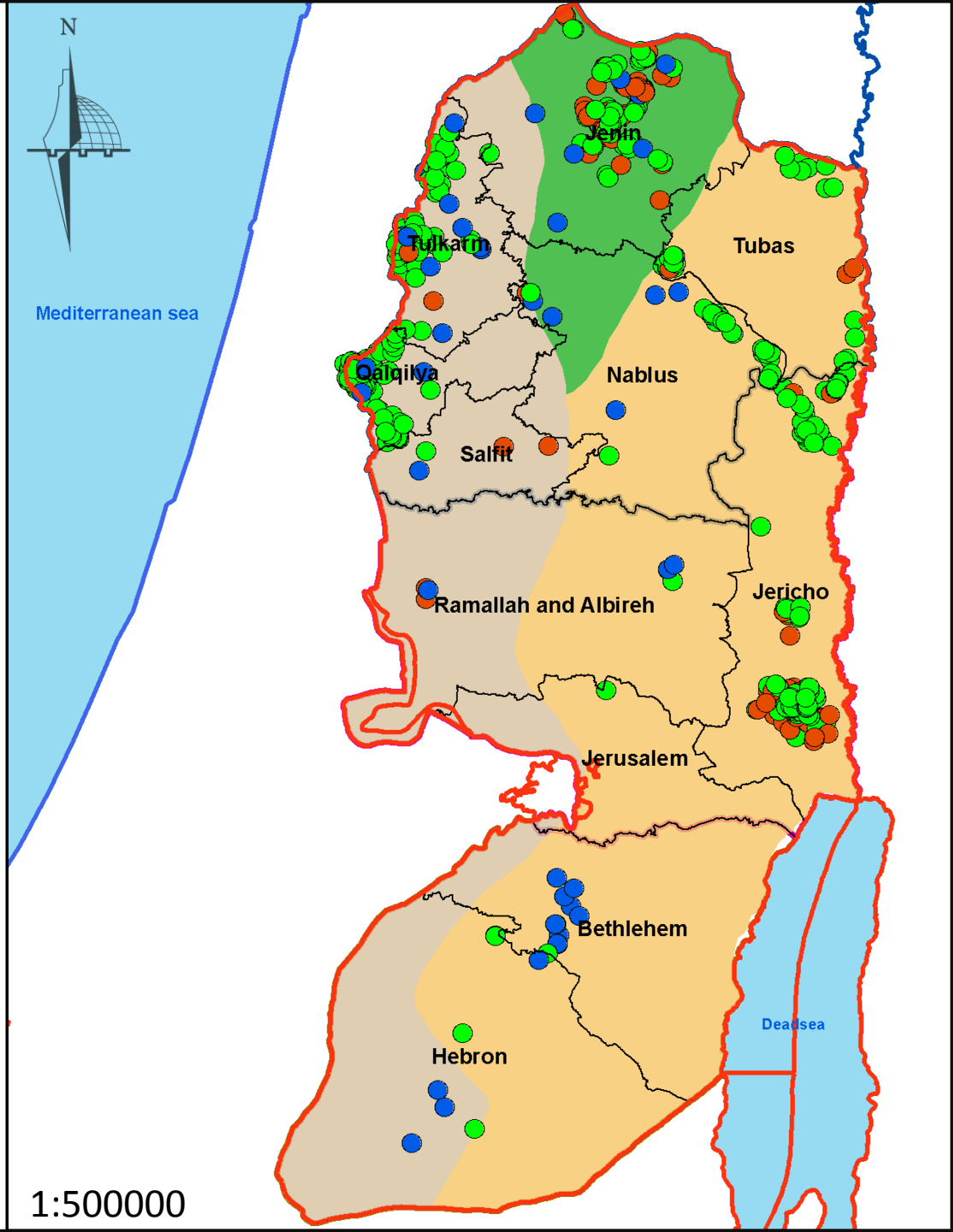
- WestBank Boundaries
- Governorates Boundaries

Basins

- Eastern
- Northeastern
- Western

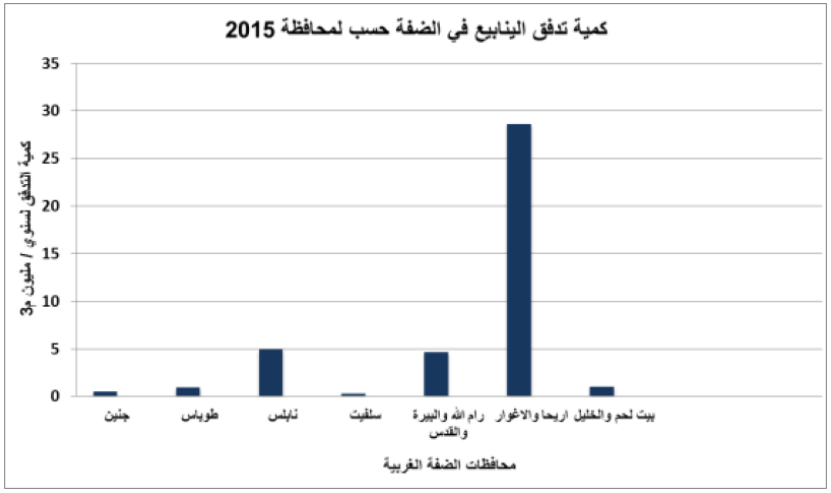
Wells' Classification

- Israeli
- Agricultural
- Domestic



Wells & Springs Production
“West Bank”

Availability of Natural Resources.



Basins

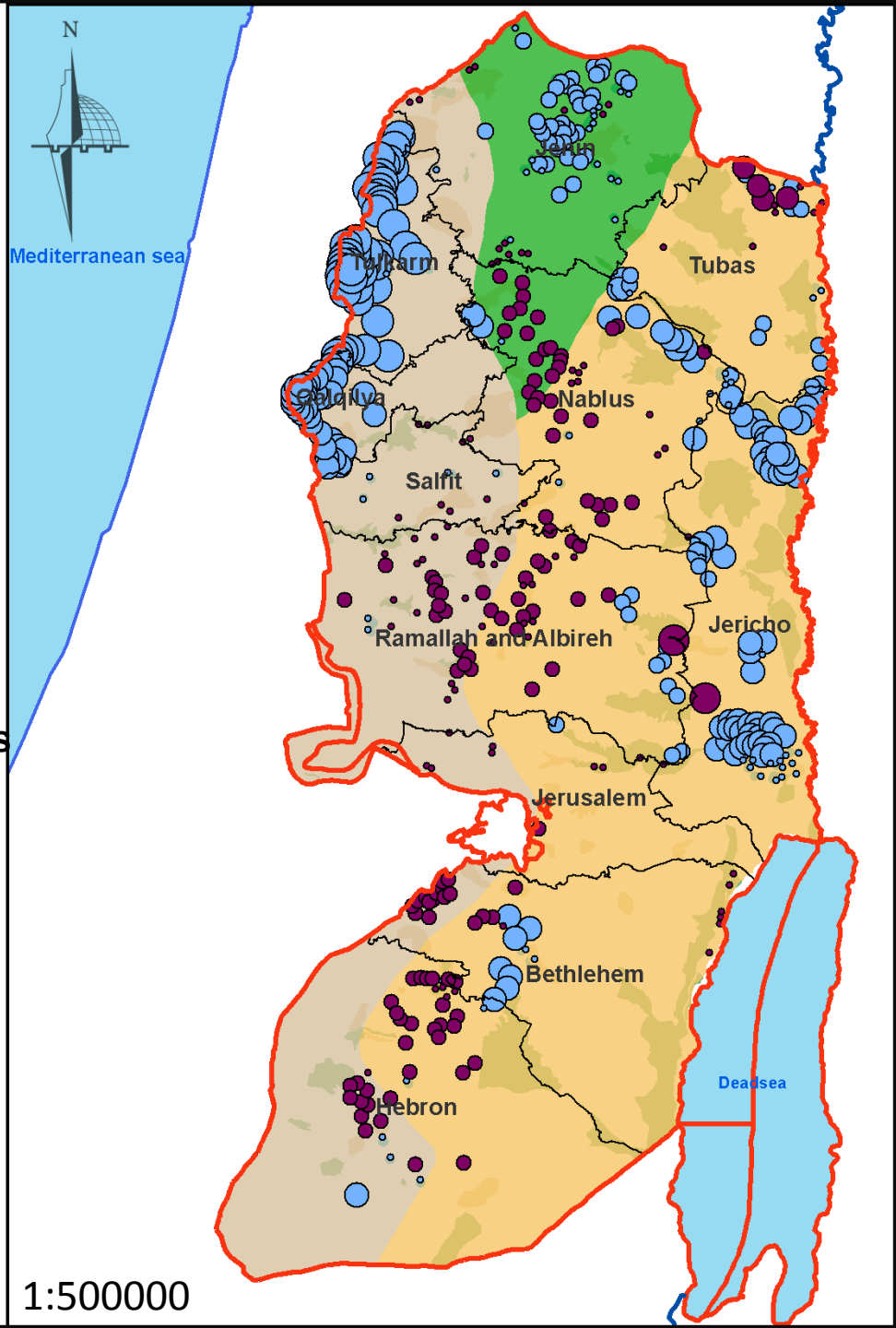
- Eastern
- Northeastern
- Western

Average Production of Springs

- 0. - 0.5
- 0.5 - 4.9
- 4.9 - 12.7
- 12.7 - 28.6

Average Production of Wells

- 0.00
- 1 - 5.200000
- 5.20 - 15.60
- 15.60 - 20.80



Average Temperature
“WestBank”

Availability of Natural Resources.

Legend

WestBank Boundaries

Governorates Boundaries

Average Temperature

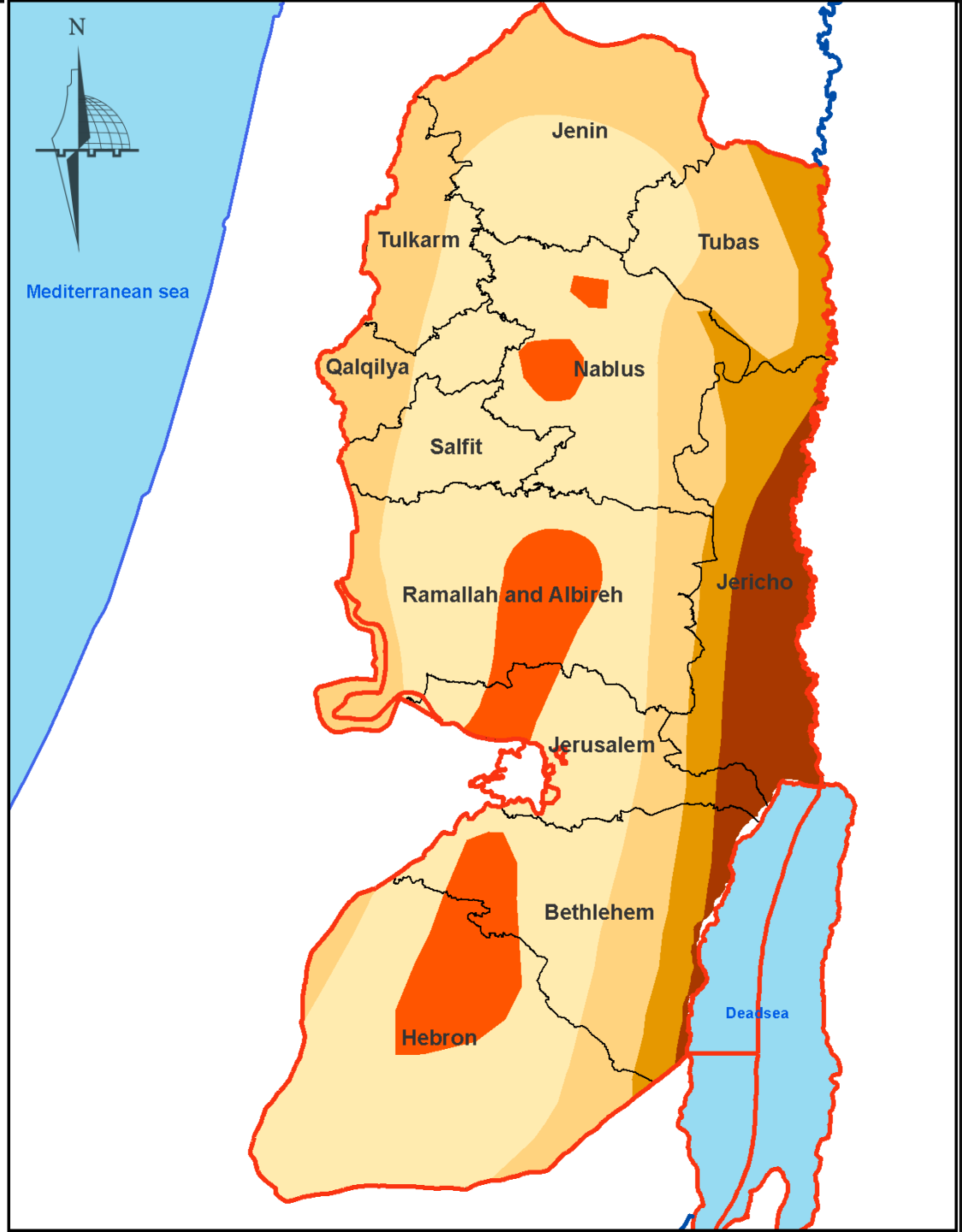
17 - 19

19 - 21

21 - 23

<17

>23



Water Evaporation
“West Bank”

Availability of Natural Resources.

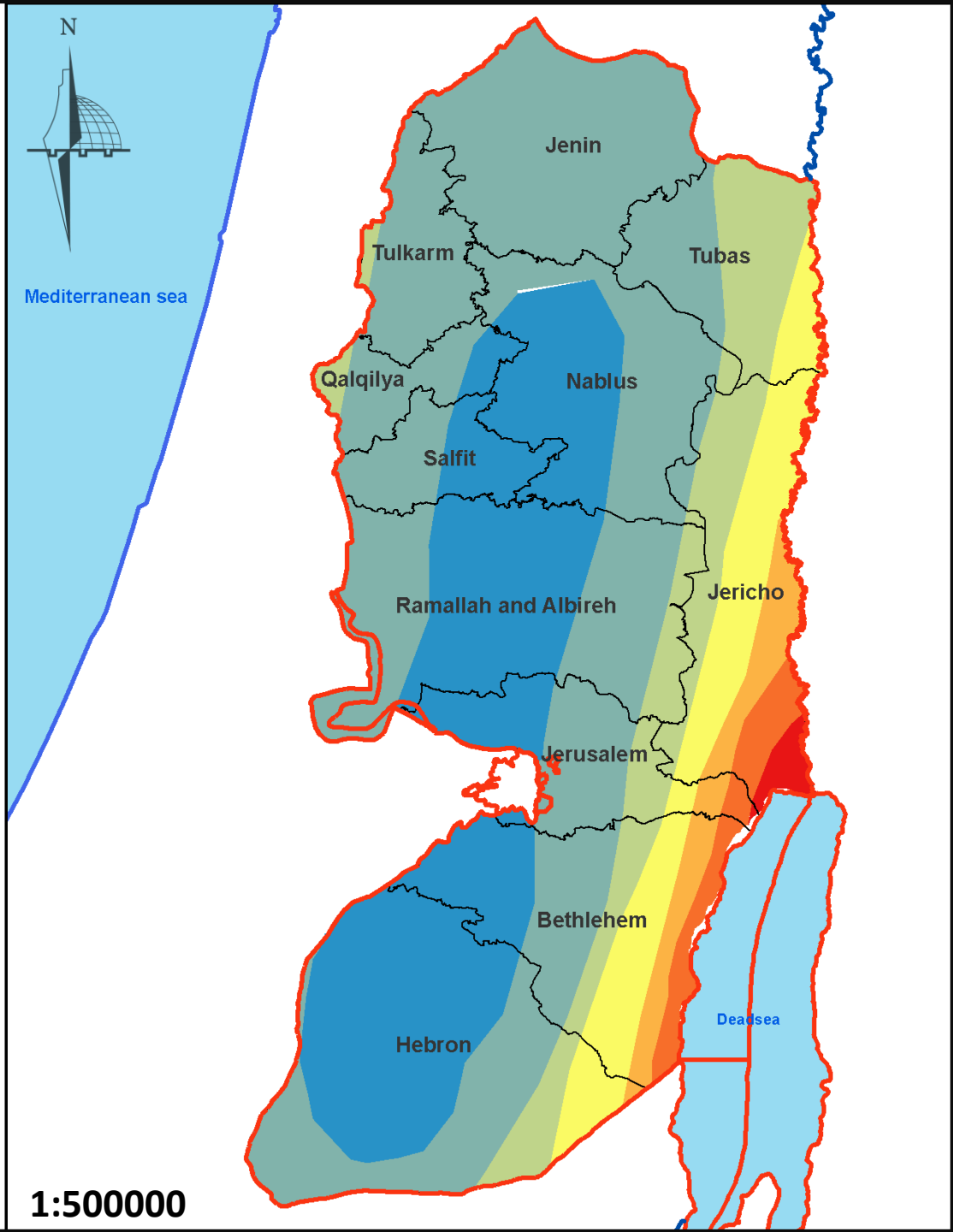
Legend

WestBank Boundaries

Governorates Boundaries

Water Evaporation Rates (Millimeter)

- 1550
- 1650
- 1750
- 1850
- 1950
- 2050
- 2150



Sensitive Areas
“West Bank”

Level of protection (Land Sensitivity).

N

Legend

- WestBank Boundaries
- Governorates Boundaries

Sensitive Areas

- Extreme
- High- Moderate
- Moderate
- Low
- Not Sensetive

Seismic Factor "WestBank"

Level of Protection

Legend

WestBank Boundaries

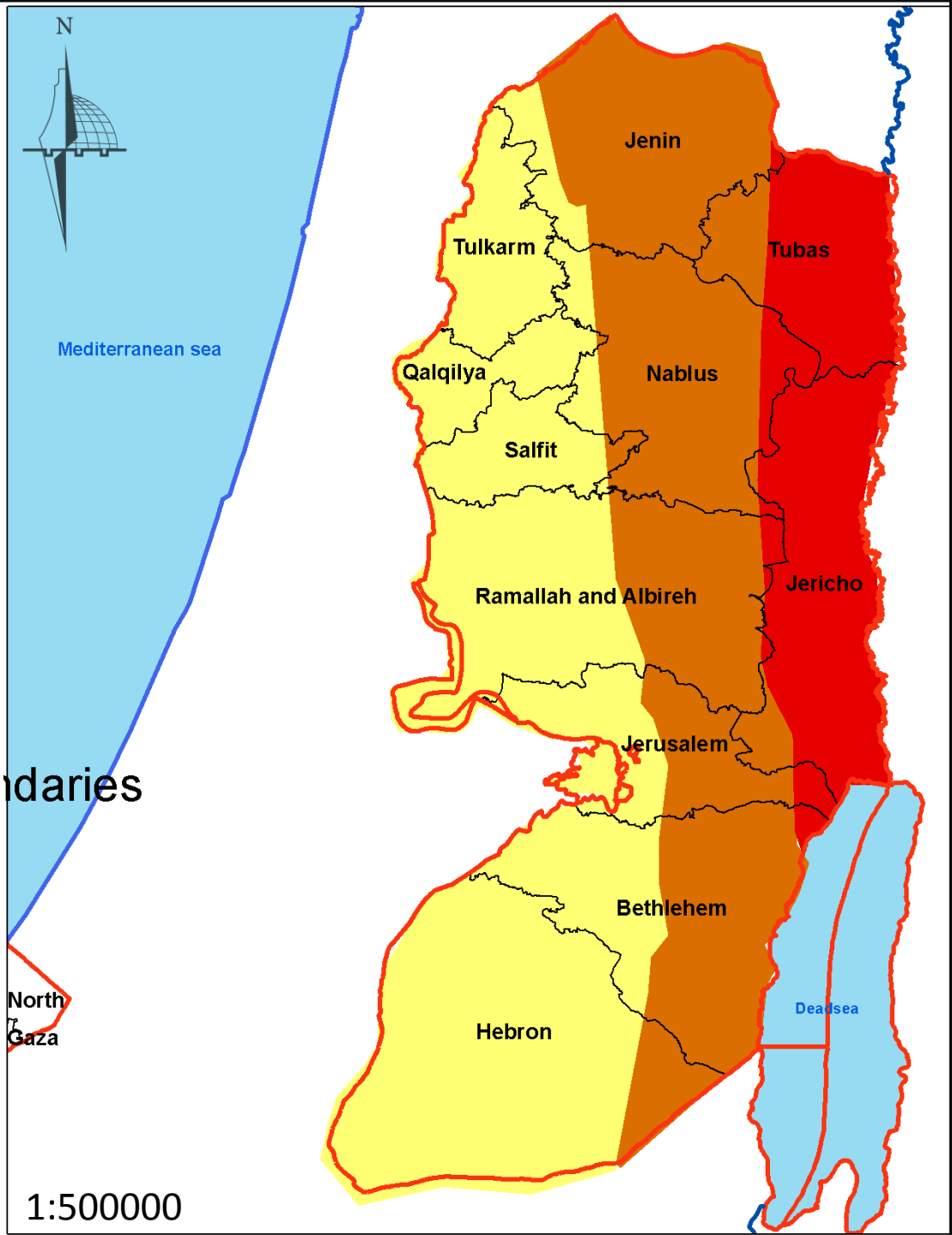
Governorates Boundaries

Seismic Factor

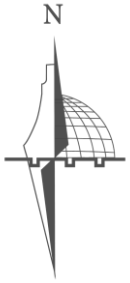
2A=0.15

2B=0.2

3=0.3



Land Evaluation "Northern Region "



The Highest Ecological Potential is in the Northern Region

Legend

WestBank Boundaries

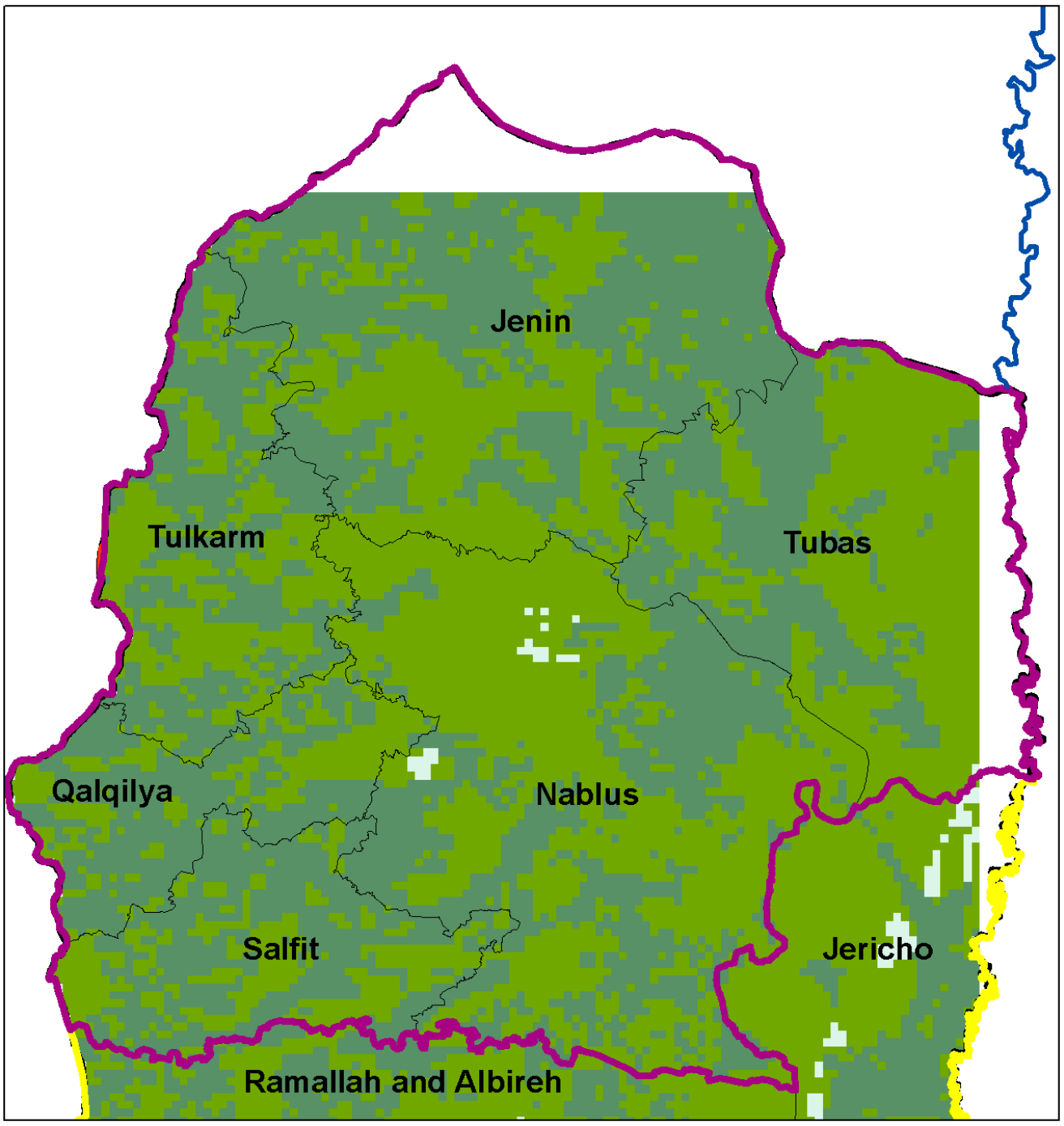
Land Evaluation

Value

1= Low Land Suitability

2= Medium Land Suitability

3= High Land Suitability



Land Evaluation
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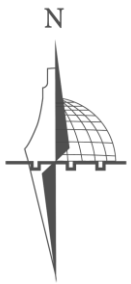


The Highest Potential is in Jenin, Tubas & Selfit

Legend

WestBank Boundaries

Administrative Boundaries

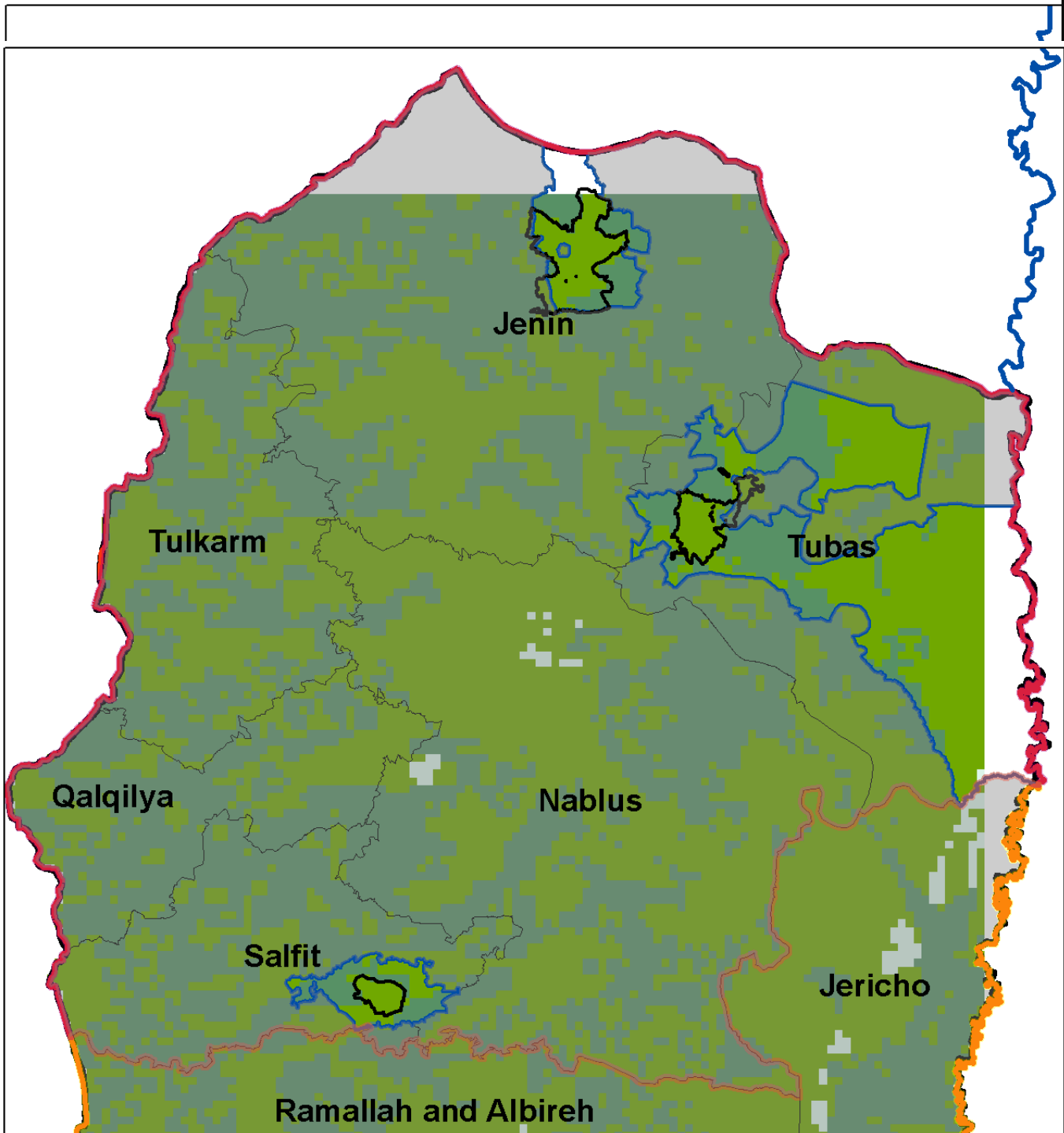
Land Evaluation

Value

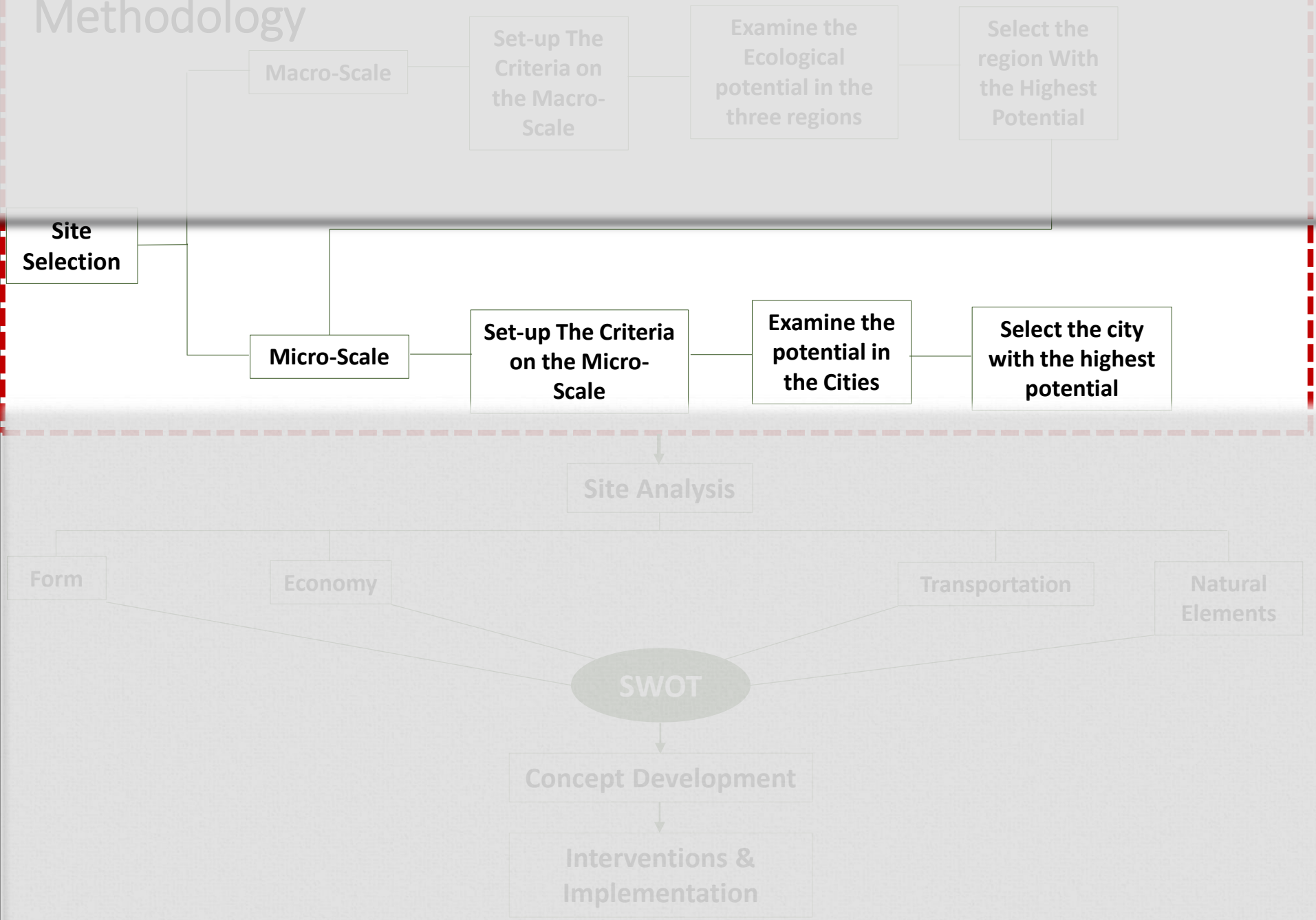
1= Low Land Suitability

2= Medium Land Suitability

3= High Land Suitability



Methodology

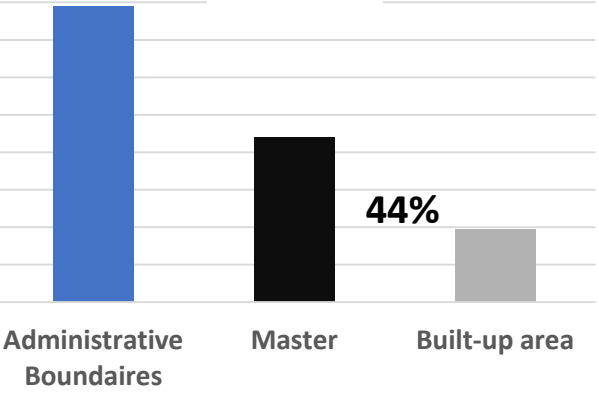


Criteria on Micro-Level

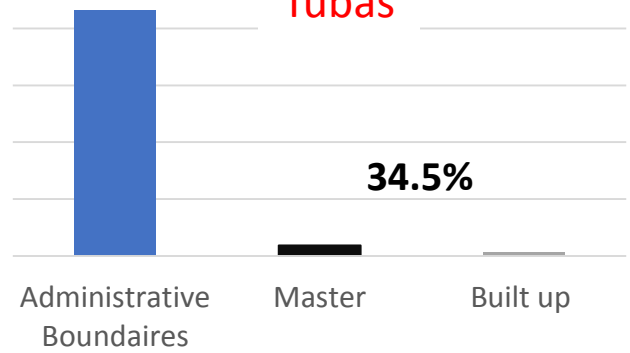
Component	Criteria
Form	• Applicability the Concept of Compact City (Density) • Availability of open spaces
Natural Elements	• Availability of Natural Elements • Accessibility to biodiversity for recreation • High sensitivity of pollution
Economy	• Availability of agricultural lands • Existing potential for Agro-industry
Transportation	• Acceptable slope of streets • Applicability of walkability

Urban Form
"Built-up Area"

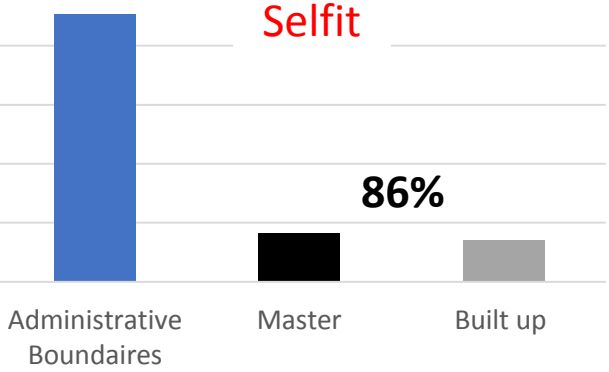
Jenin

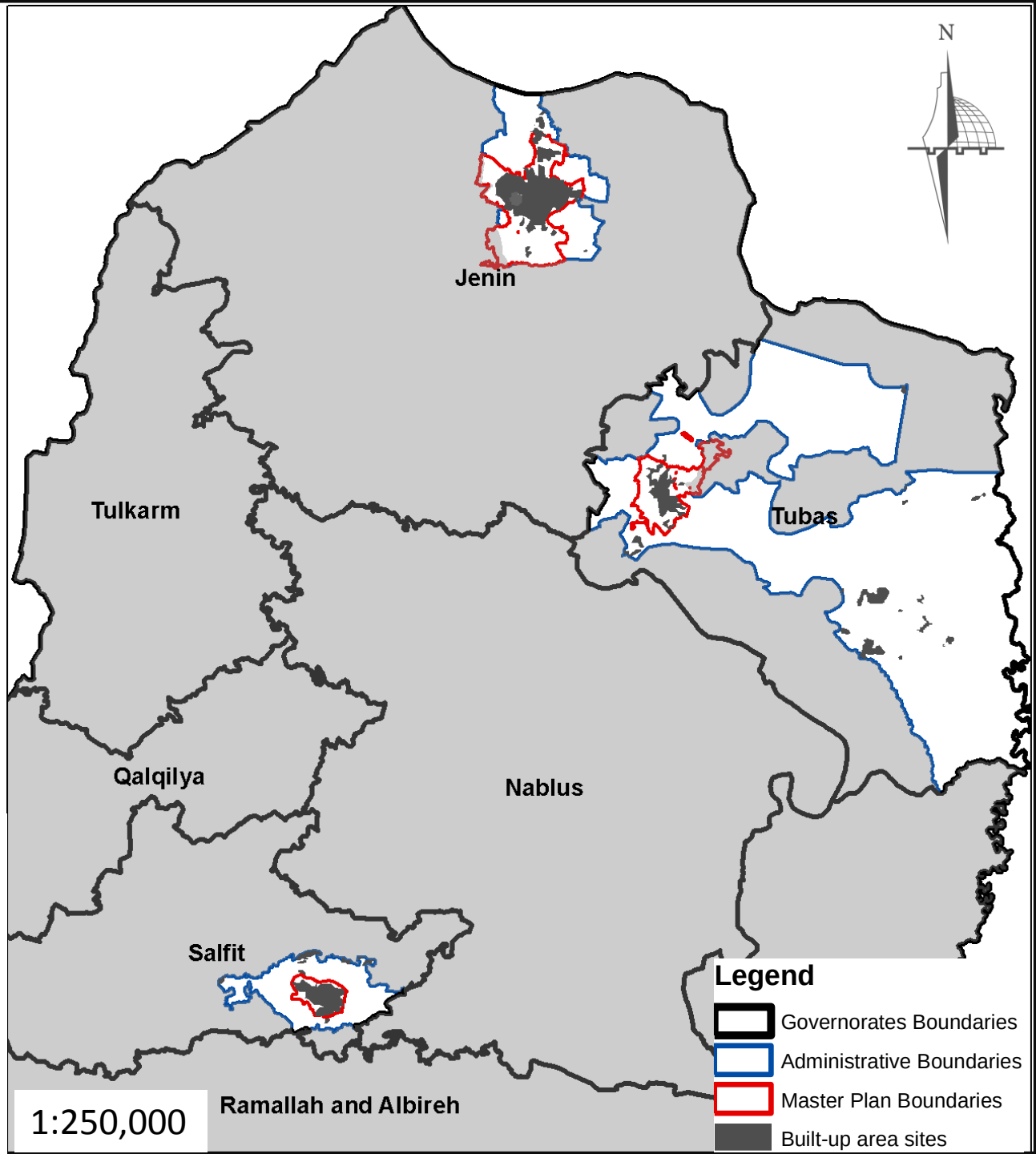


Tubas

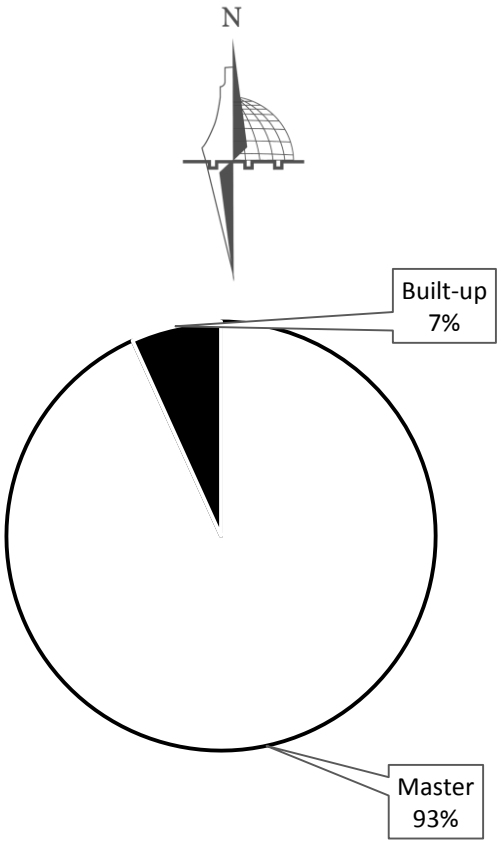


Selfit



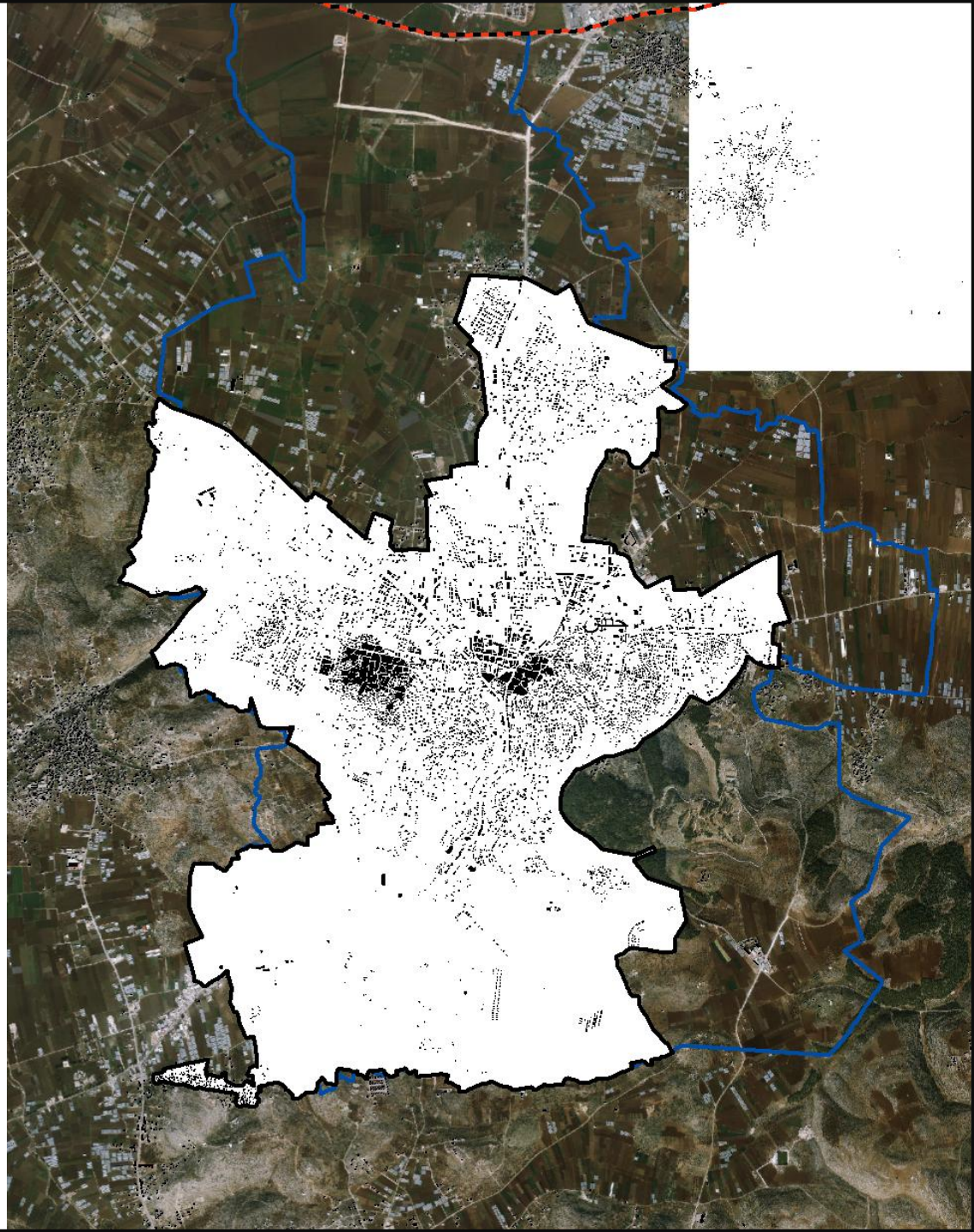


Urban Form
” Figure Ground Plan”

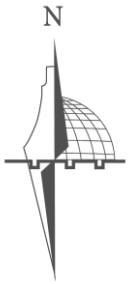


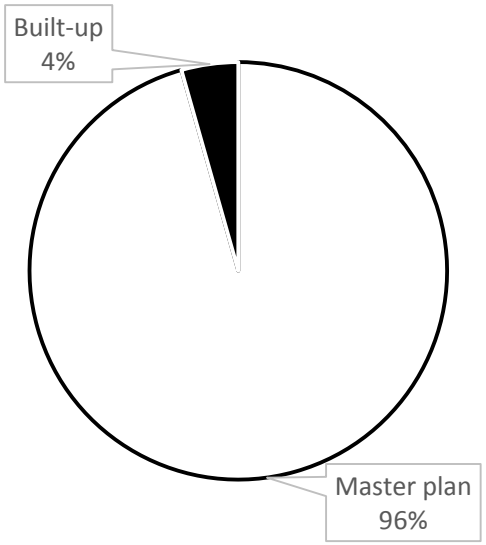
Open Space

Built-up



Urban Form
” Figure Ground Plan”

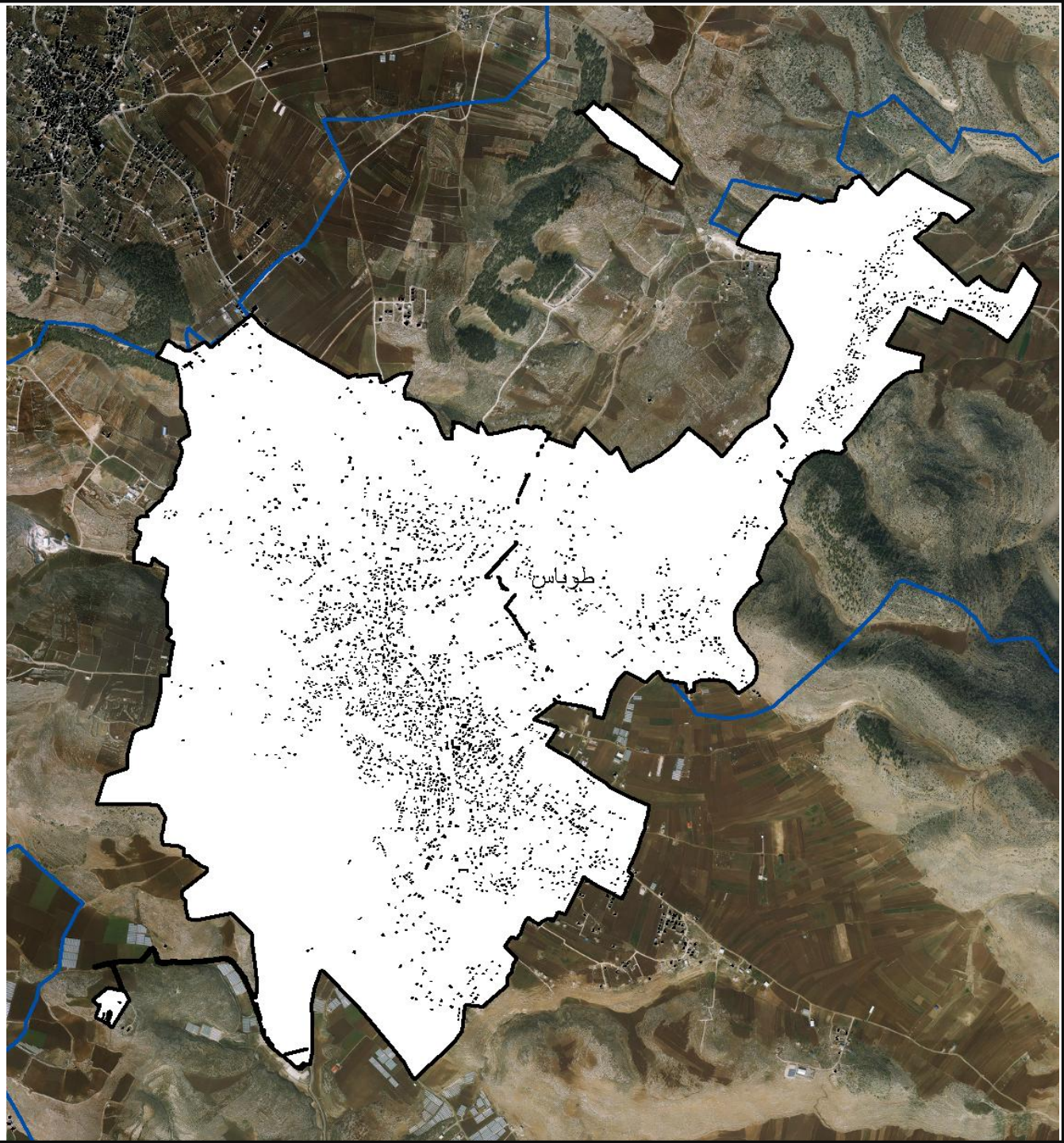




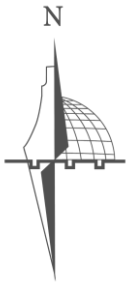
☐ Master plan ■ Built-up

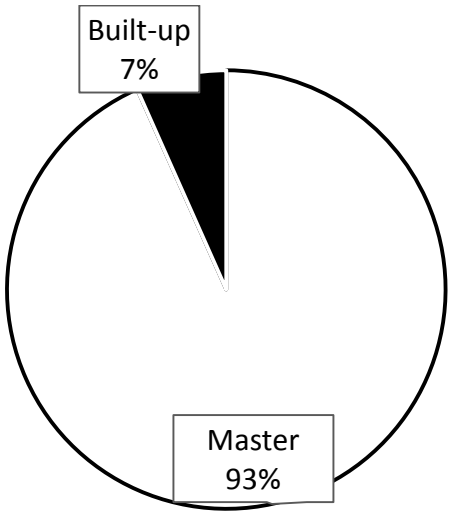
Open Space

Built-up



Urban Form
” Figure Ground Plan”

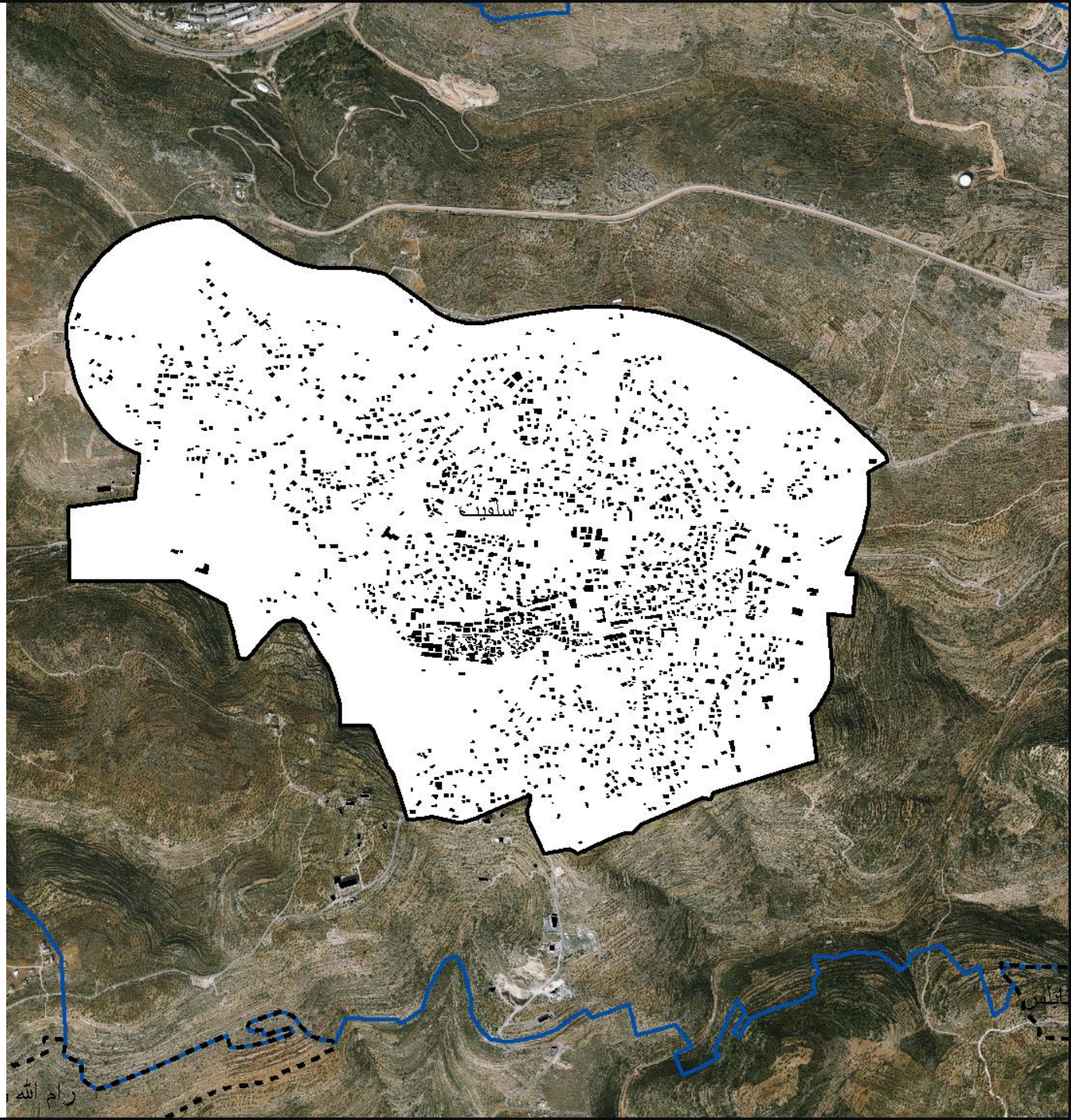




Master Built-up

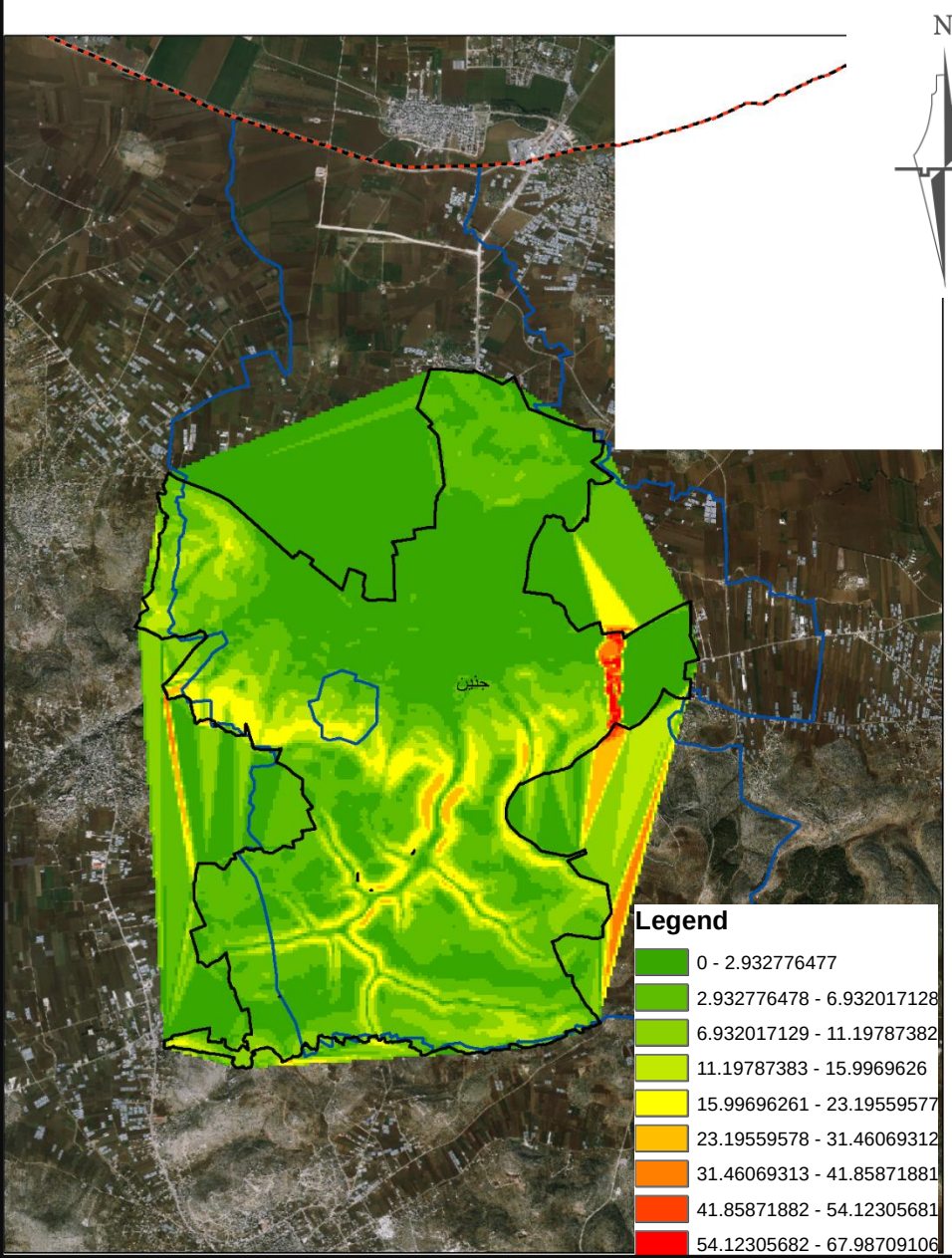
Open Space

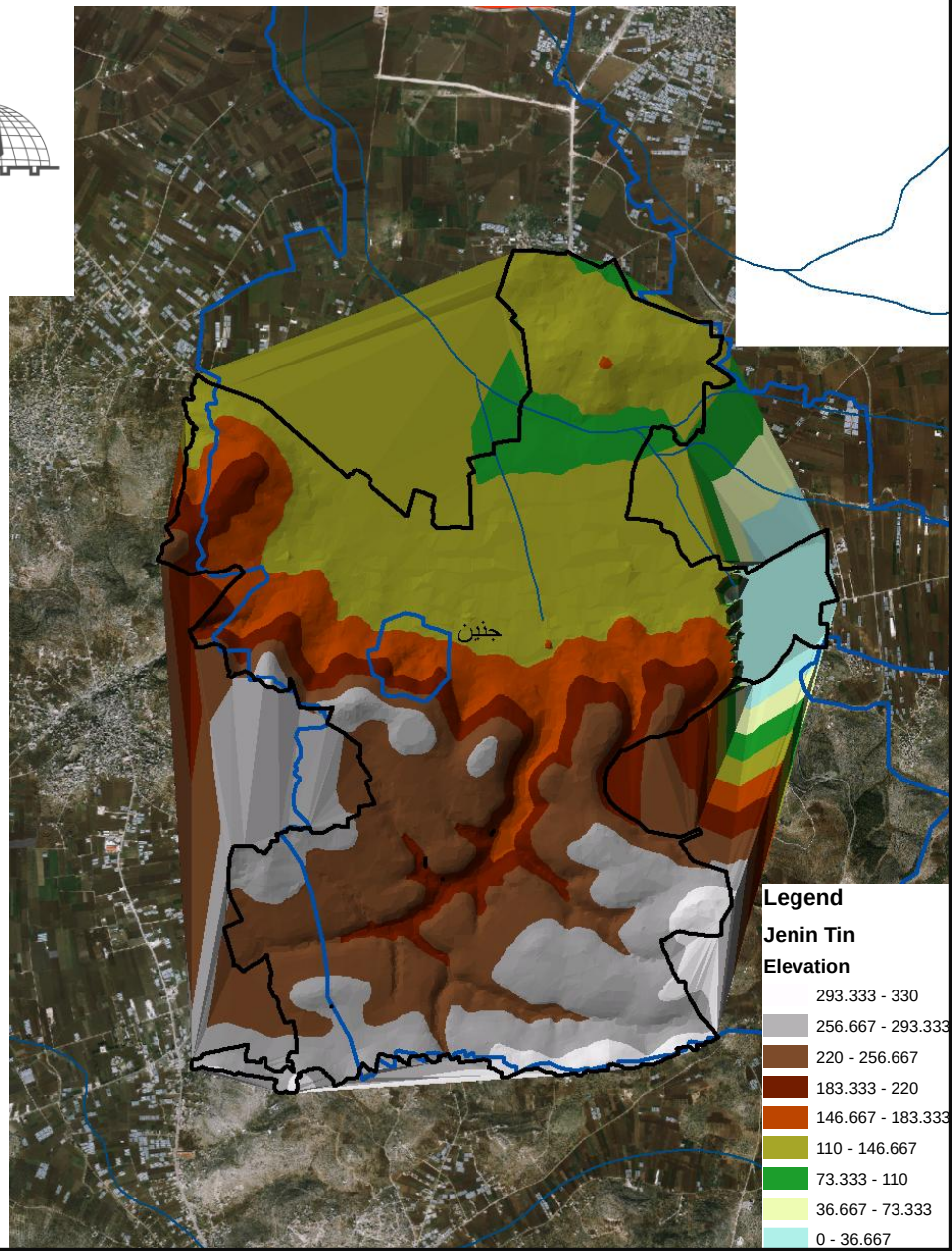
Built-up



Natural Elements

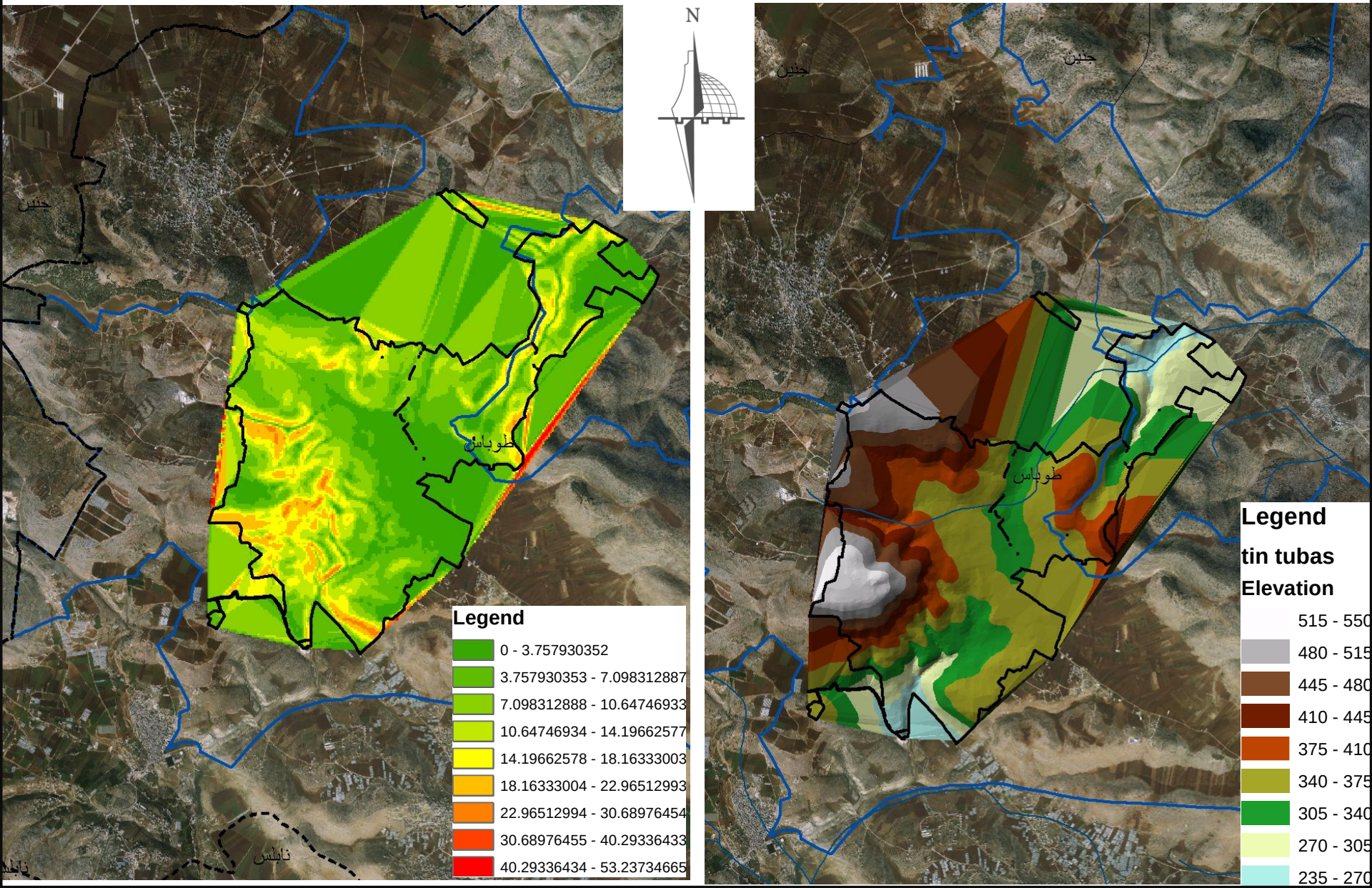
“Topography & Slope”





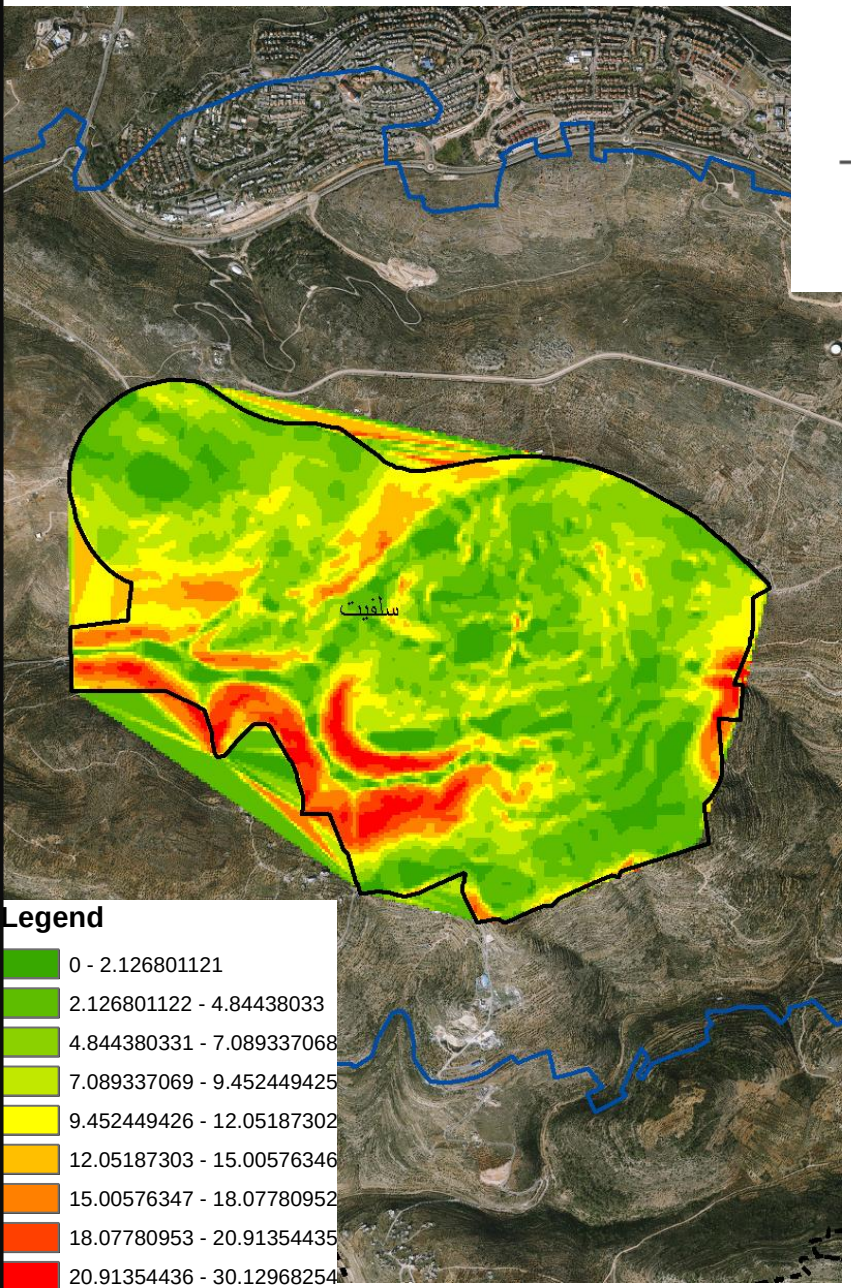
Natural Elements

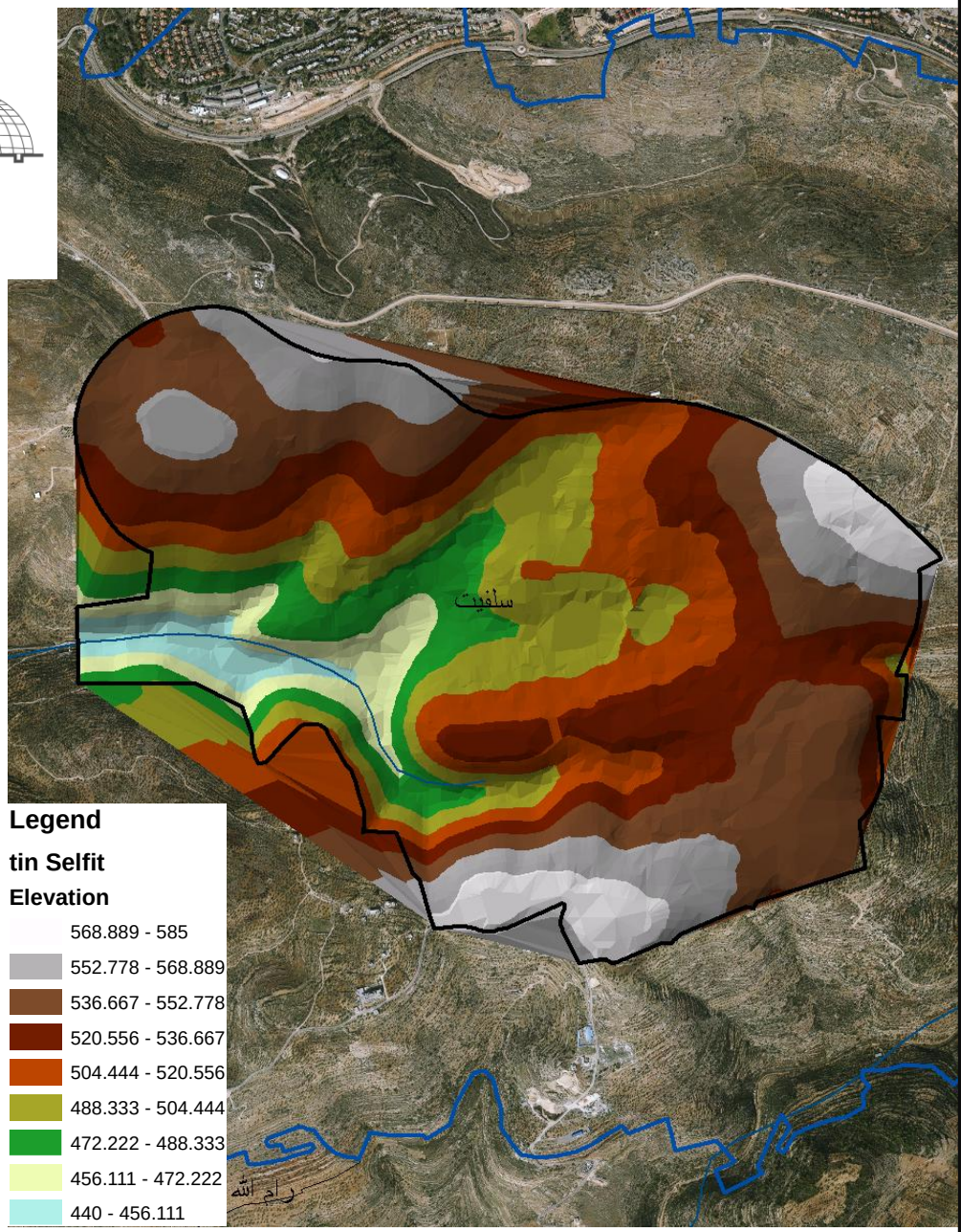
“Topography & Slope”



Natural Elements

“Topography & Slope”





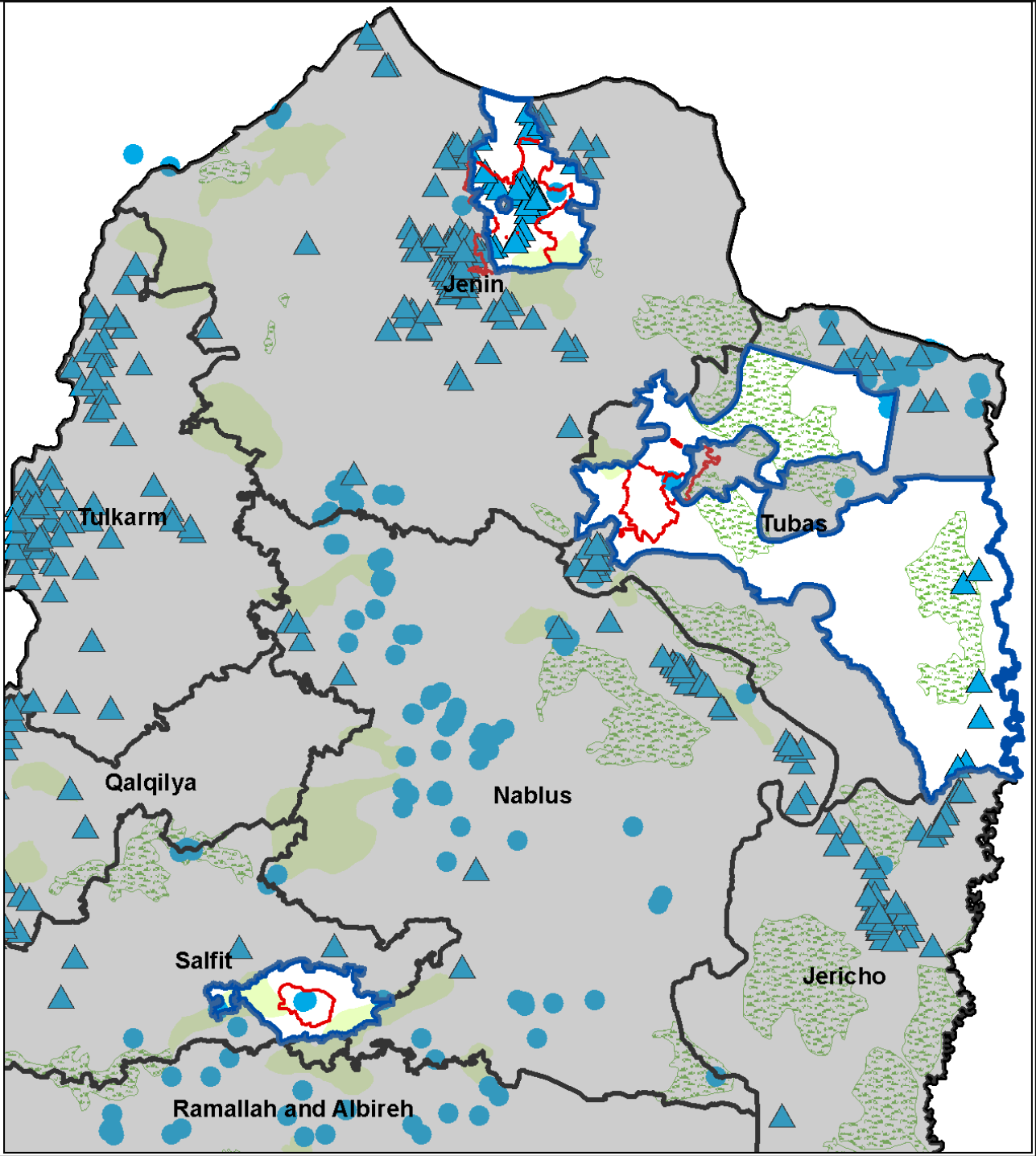
Natural Elements

"Wells, Springs, Biodiversity, Natural Reserves"

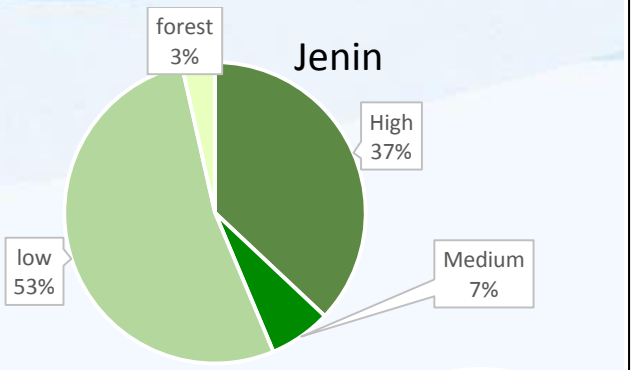
N

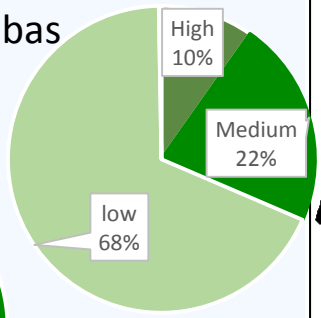
Legend

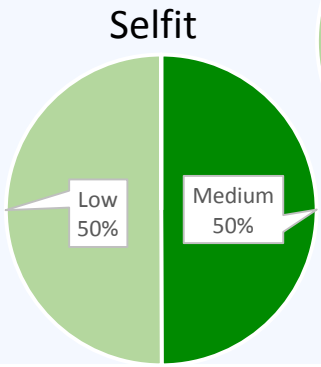
- Governorates Boundaries
- Administrative Boundaries
- Master Plan Boundaries
- Biodiversity
- NaturalReserve
- Wells
- Springs

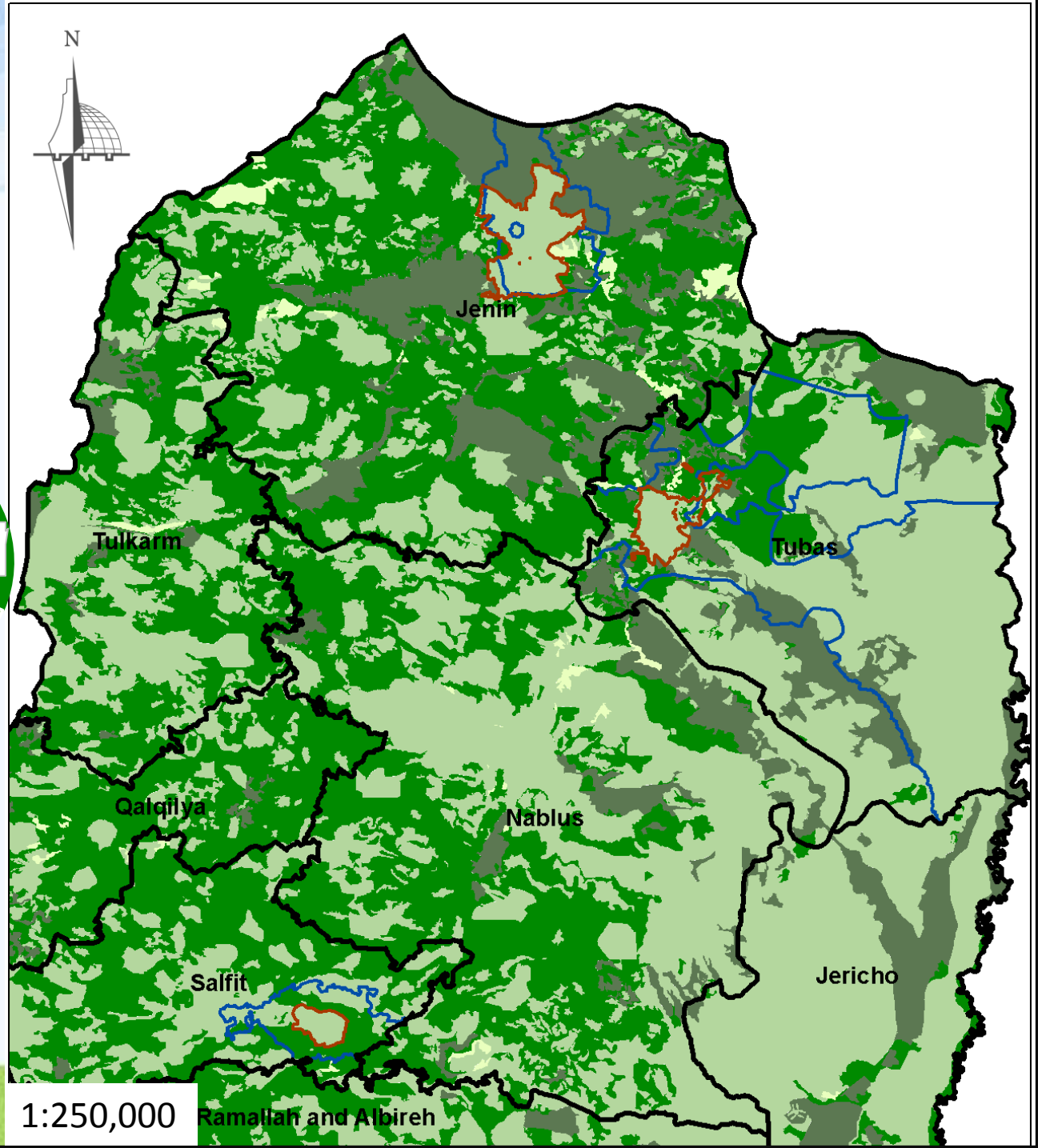


Economy
"Agricultural Land Value"





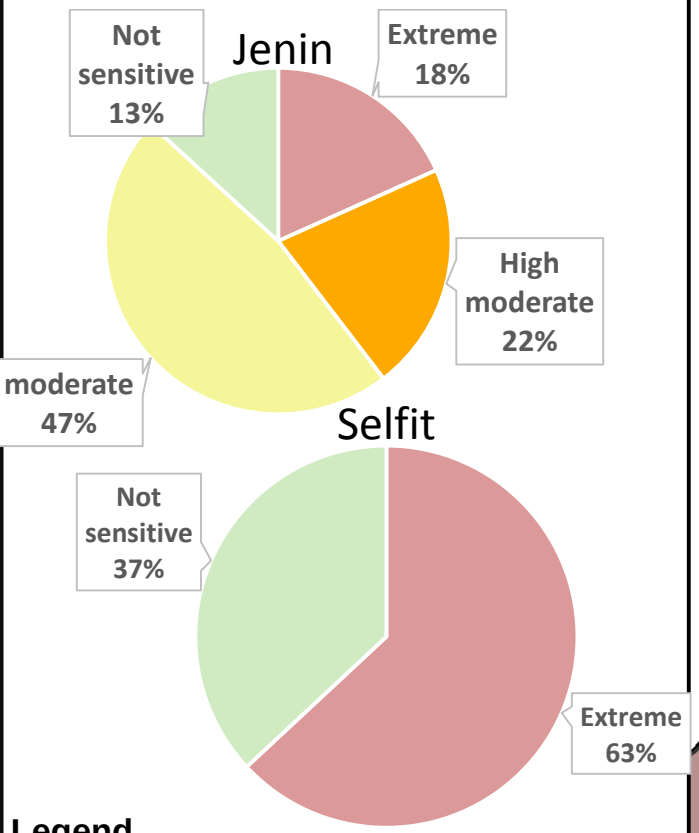


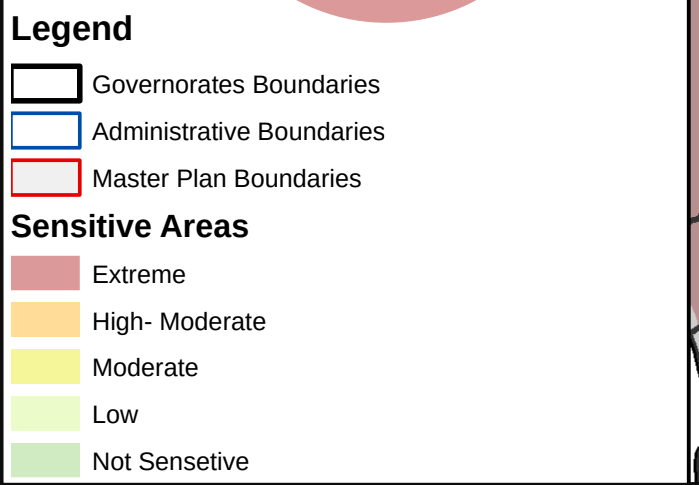


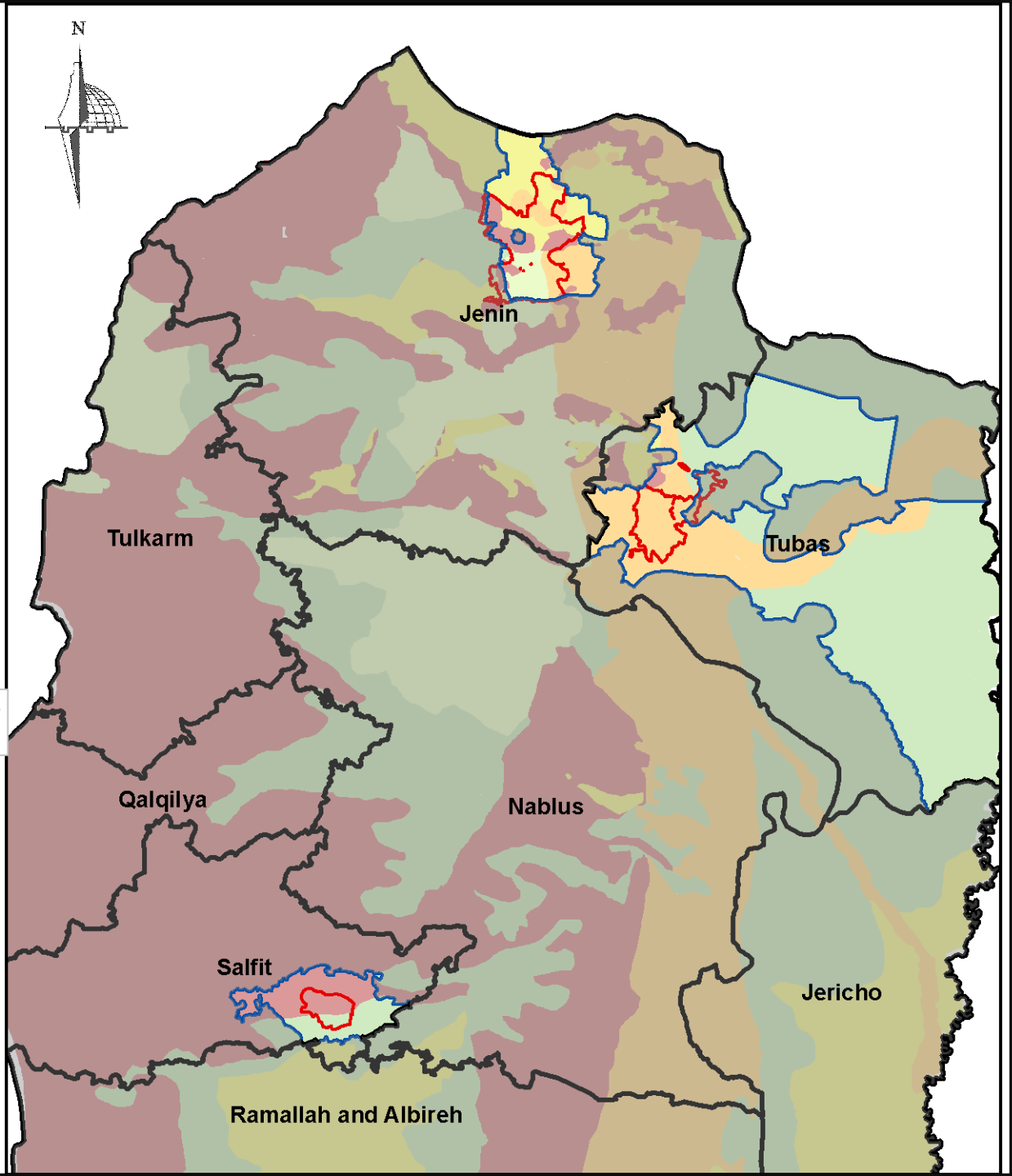
Legend

- Governorates Boundaries
- Administrative Boundaries
- Master Plan Boundaries
- High Agricultural land value
- Medium Agricultural land value
- Low Agricultural land value
- Forests

Natural Elements
"Sensitive Areas"



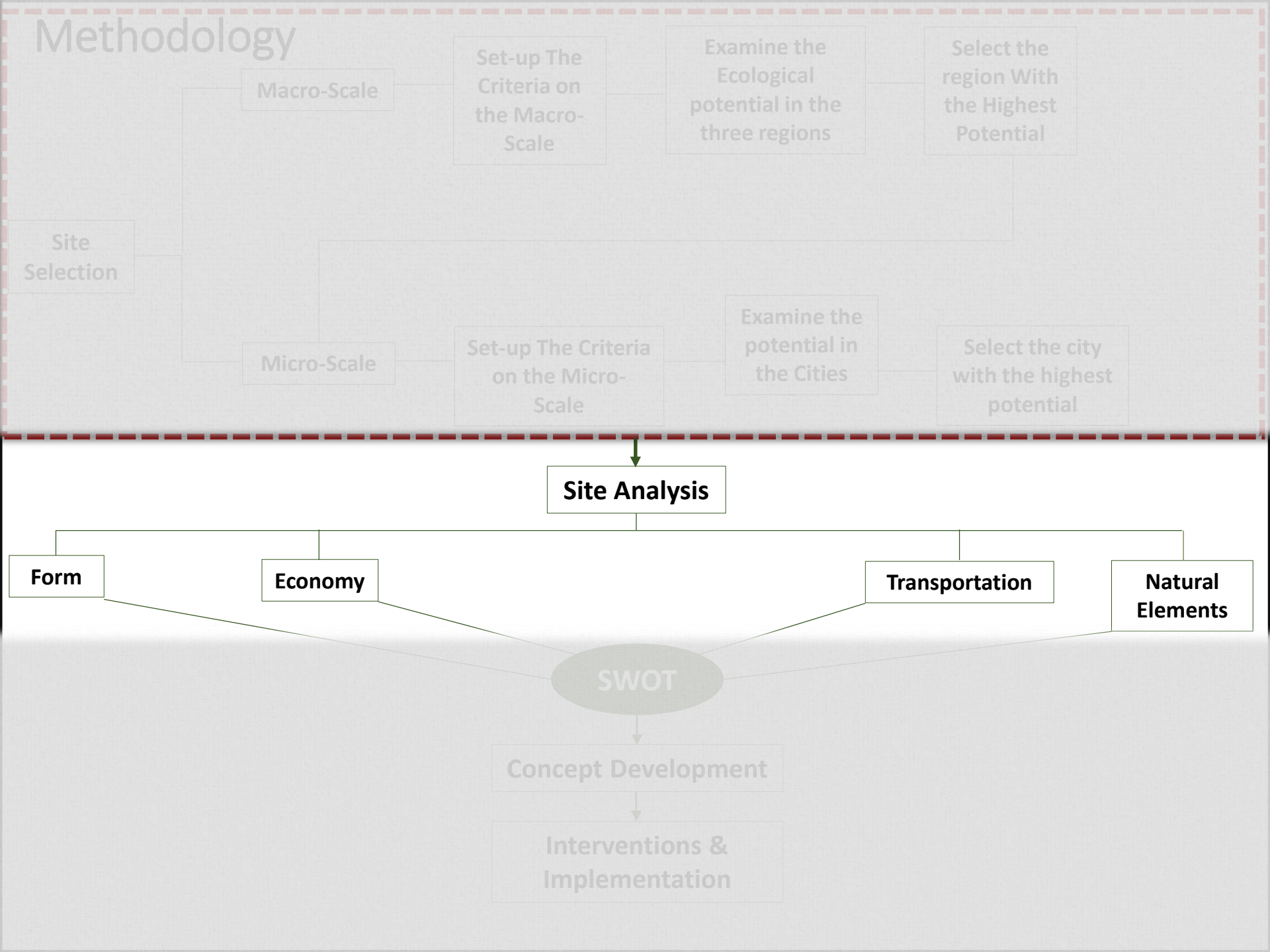


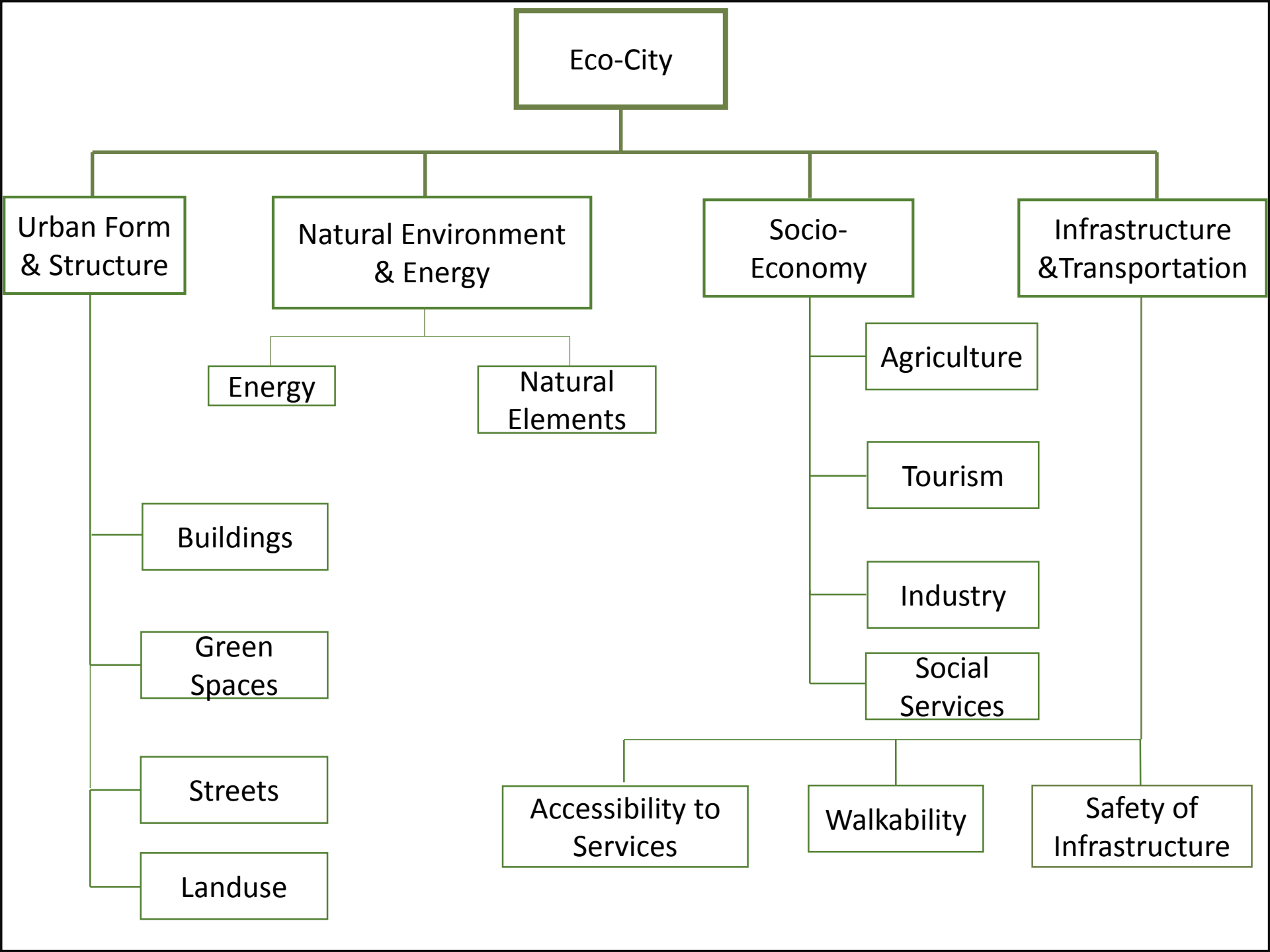


Criteria	Weight	Mark	Weight	Mark	Weight	Mark
	Jenin		Tubas		Selfit	
Agricultural lands	1	4	1	2	1	3
Sensitive areas (Soil sealing)	1	2	1	3	1	4
Low Density	3	3	3	4	3	2
Open Spaces	2	2	2	3	2	5
Natural Resources	1	4	1	2	1	2
Biodiversity	1	1	1	2	1	3
Topography & Slope	2	4	2	2	2	3
Total		20		18		23

The Highest Ecological Potential is in "Selfit City"

Methodology




Eco-City
Urban Form & Structure
Natural Environment & Energy
Socio-Economy
Infrastructure &Transportation
Energy
Natural Elements
Agriculture
Tourism
Industry
Social Services
Buildings
Green Spaces
Streets
Landuse
Accessibility to Services
Walkability
Safety of Infrastructure

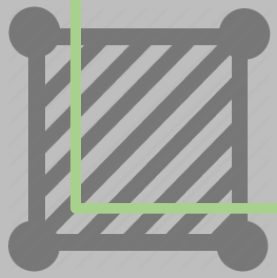
Principle	Component
Restore Degraded Land.	▪ Open & Green Spaces ▪ Landuse
Fit the Bioregion.	▪ Water ▪ Industry ▪ Buildings ▪ Waste Water
Balance Development.	▪ Urban Form & structure
Create Compact Cities.	▪ Urban Form & structure ▪ Transportation
Optimize Energy Performance.	▪ Natural Elements ▪ Buildings ▪ Transportation
Contribute to the Economy.	▪ Economy ▪ Landuse
Provide Health and Security.	▪ Services & Infrastructure
Encourage Community.	▪ Social (Community)
Promote Social Justice and Equity.	▪ Social Aspect (Activities)
Enrich History and Culture.	▪ Socio-Economy

Urban Form & Structure

Urban Form

"Density"

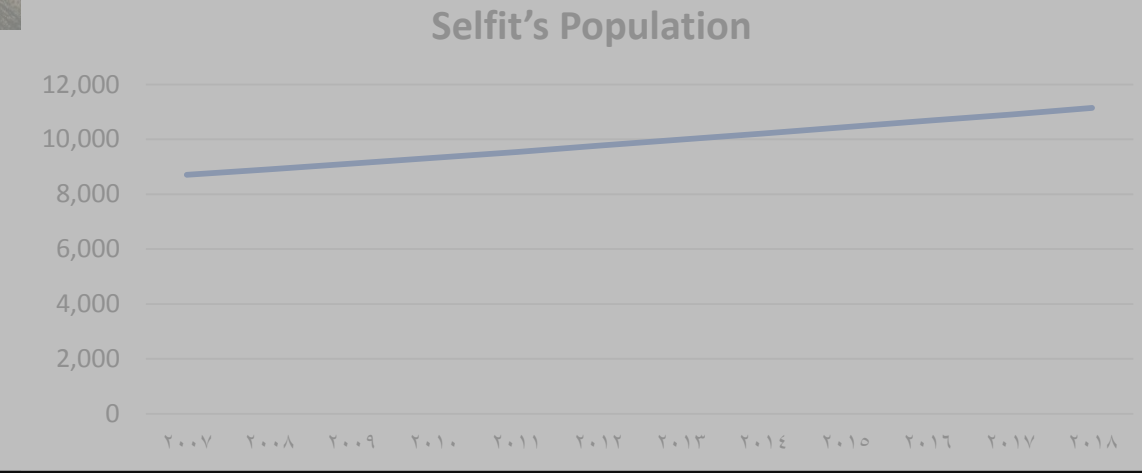
10911
Persons



391[illegible]7
Donum

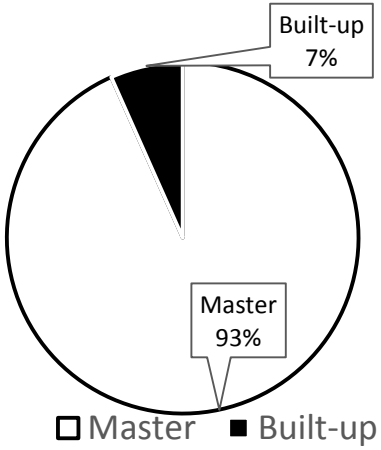
- Balance Development
- Create Compact Cities

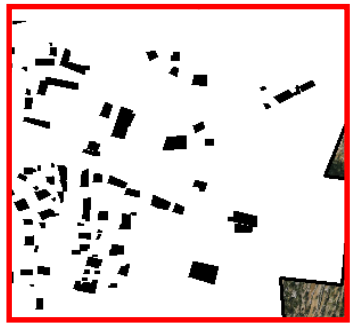
2.8
Person/Donum



Urban Form

"Figure Ground"

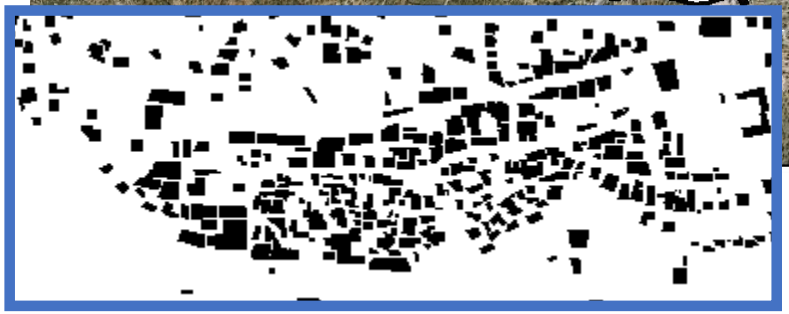




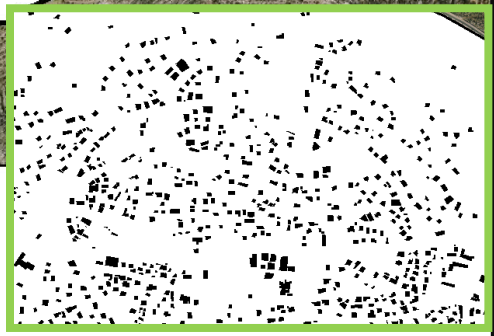
Large Buildings

Open Space

Built-up



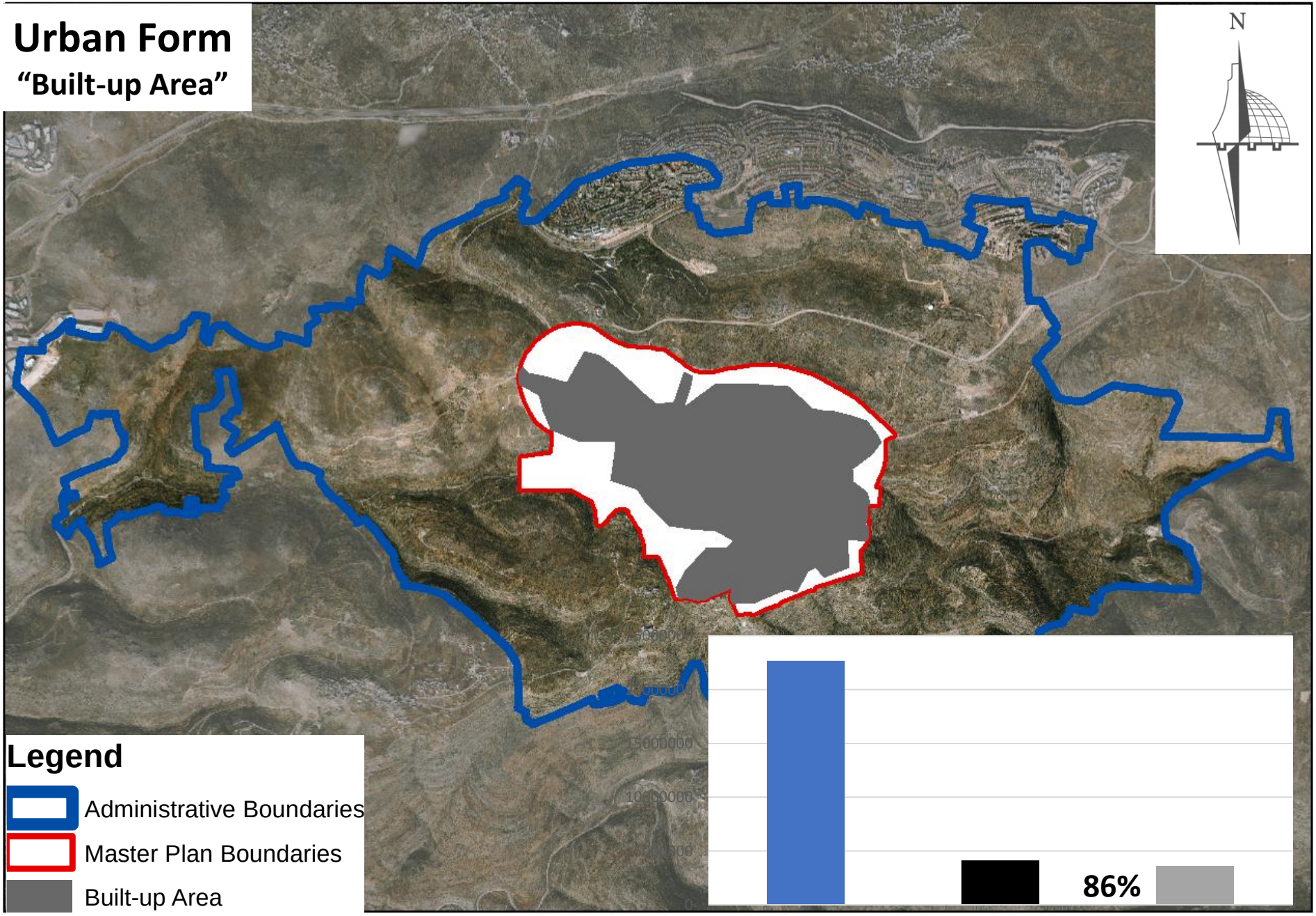
Clustered



Dispersed

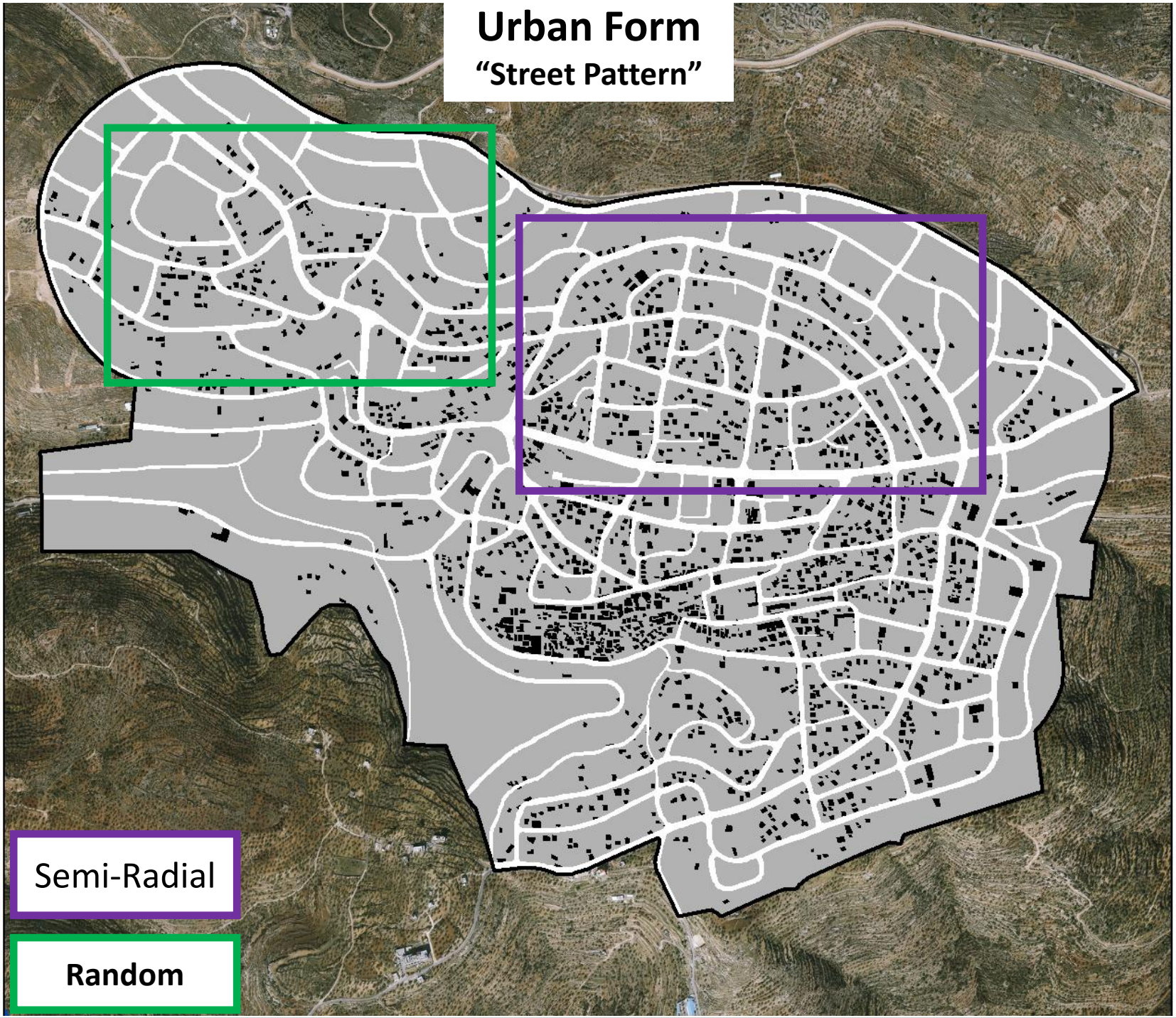
Urban Form

"Built-up Area"



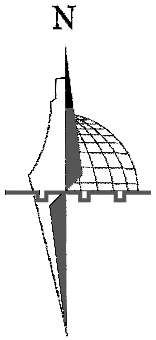
Urban Form

"Street Pattern"



Urban Form

"Internal Landscape"

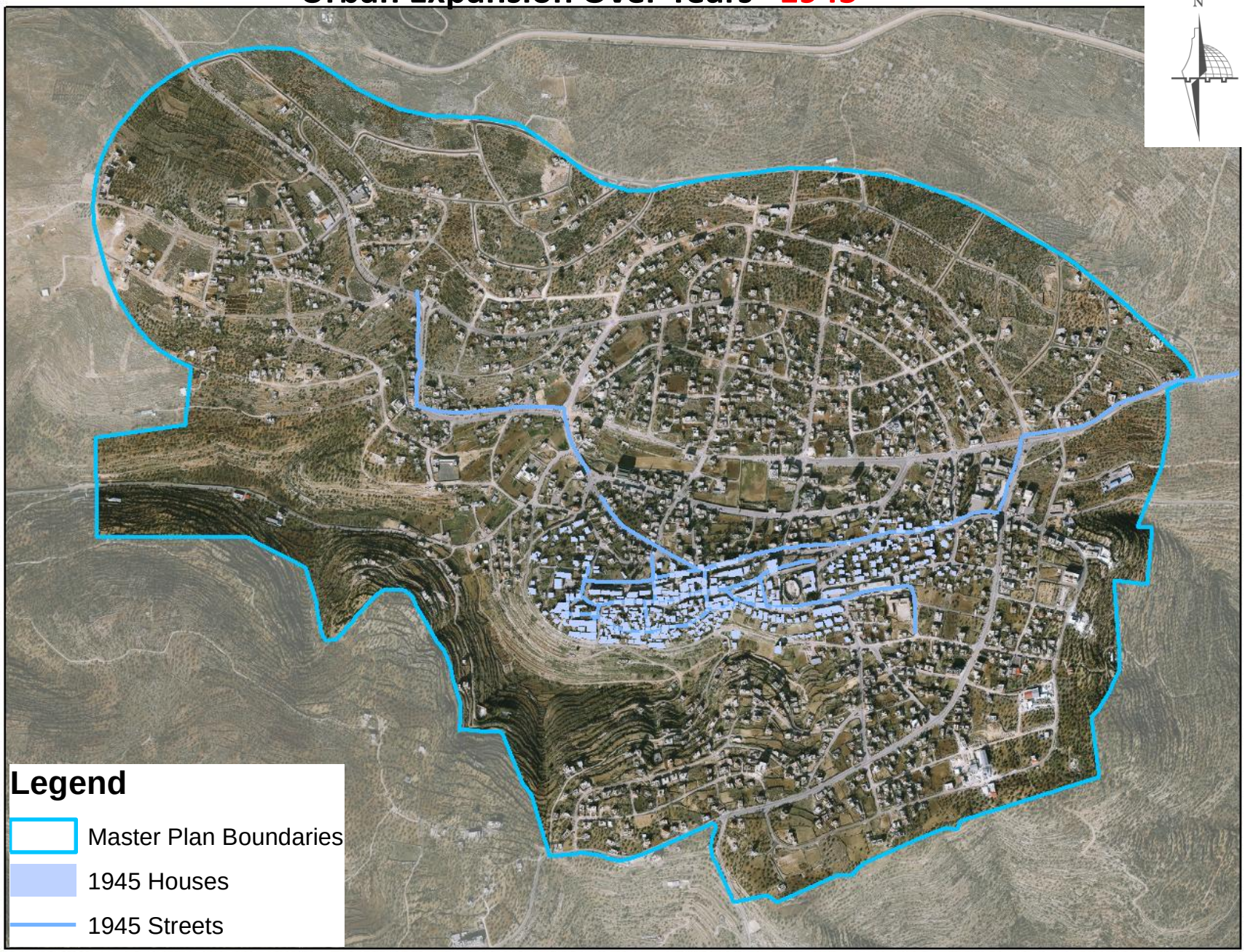


Legend

Selfit Parcels

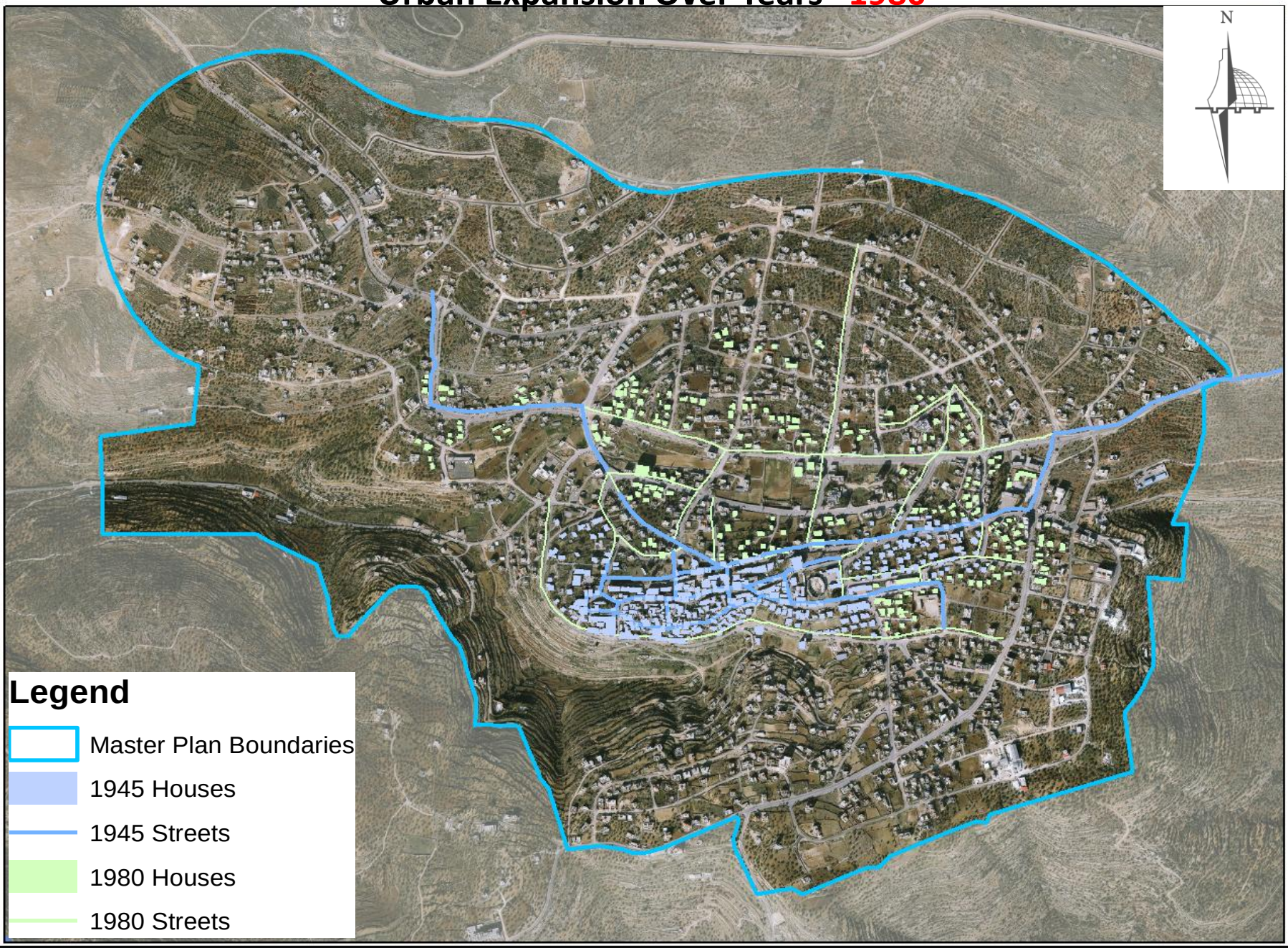
Urban Form

Urban Expansion Over Years "1945"



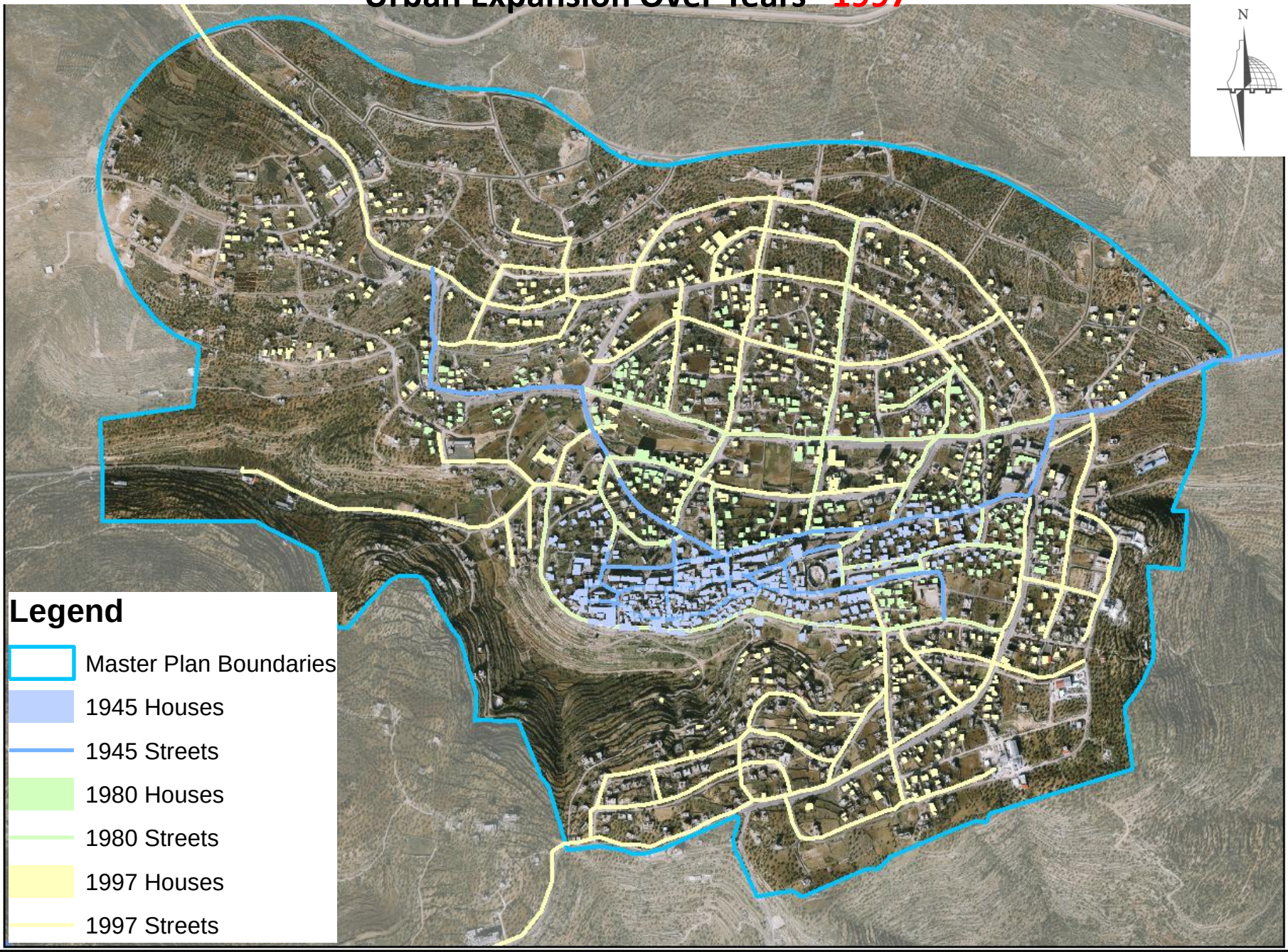
Urban Form

Urban Expansion Over Years "1980"



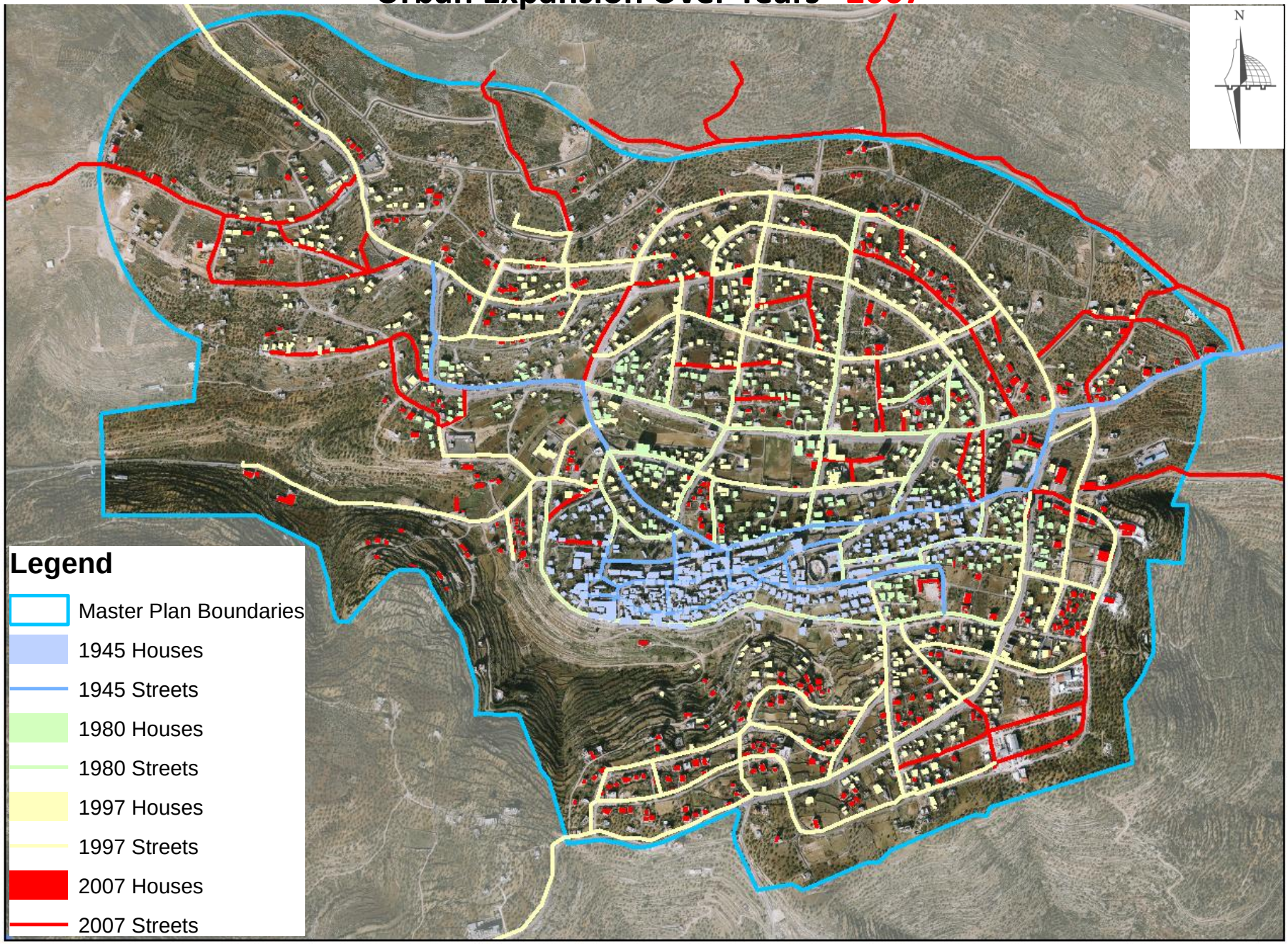
Urban Form

Urban Expansion Over Years "1997"



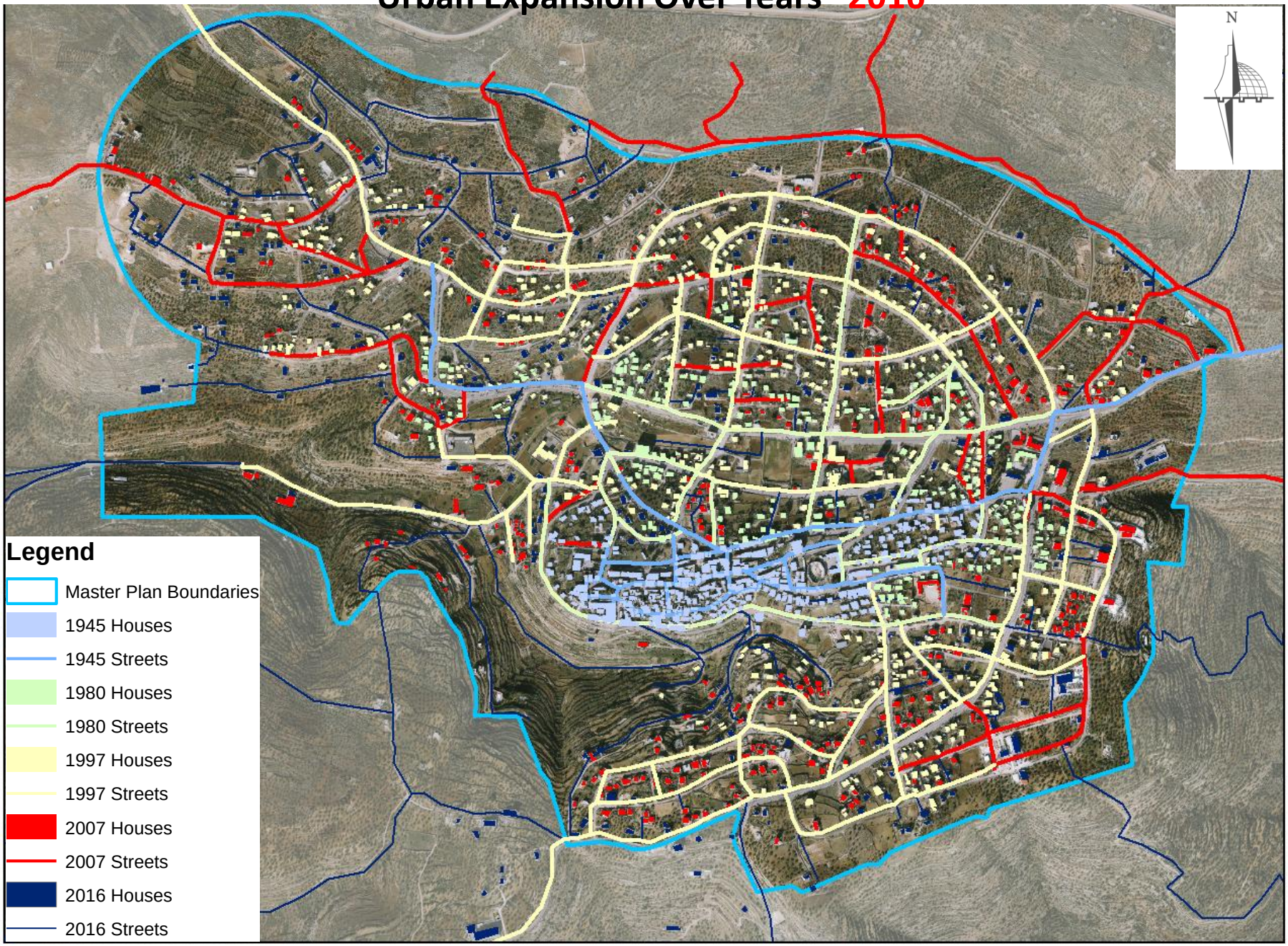
Urban Form

Urban Expansion Over Years "2007"



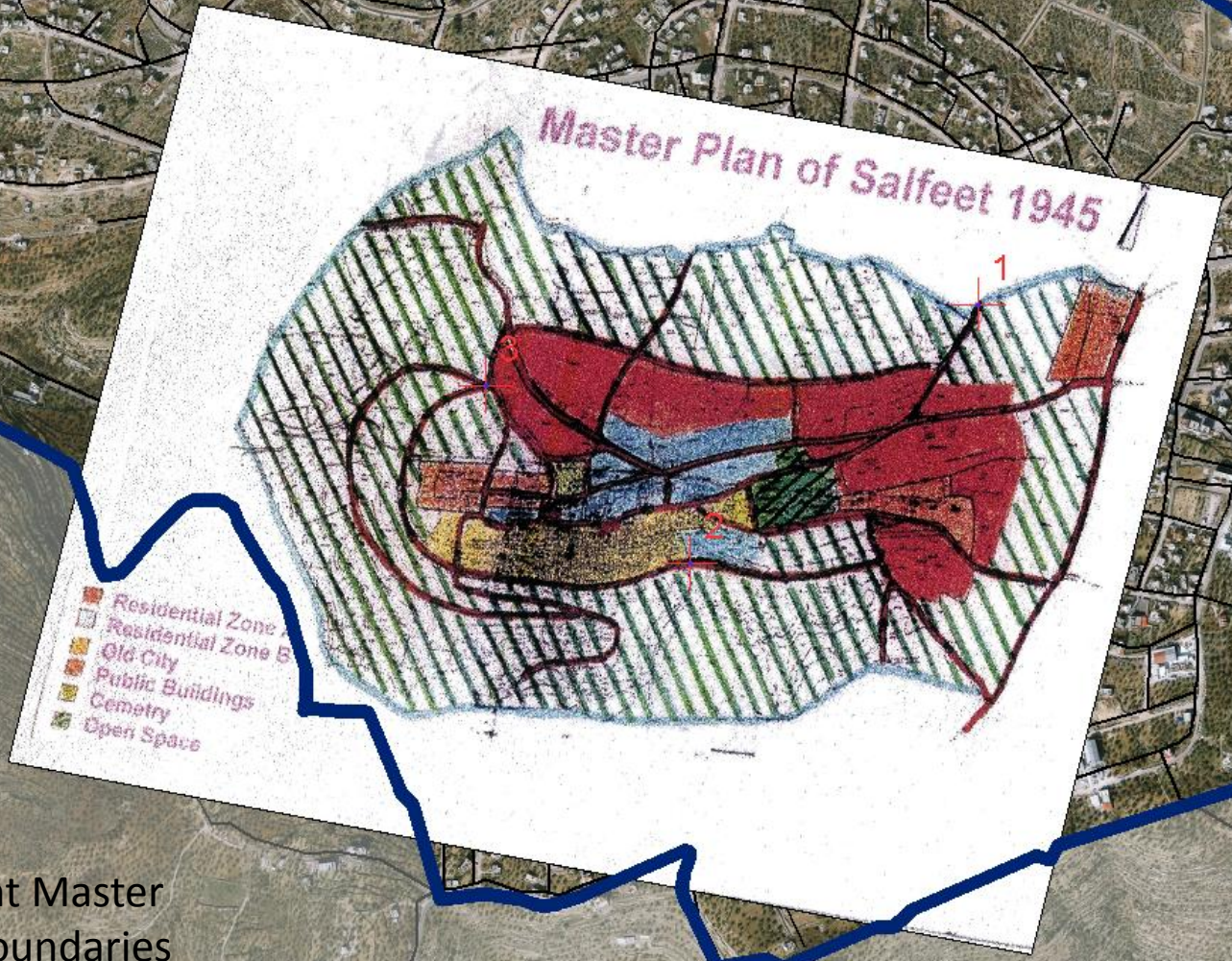
Urban Form

Urban Expansion Over Years "2016"



Urban Form

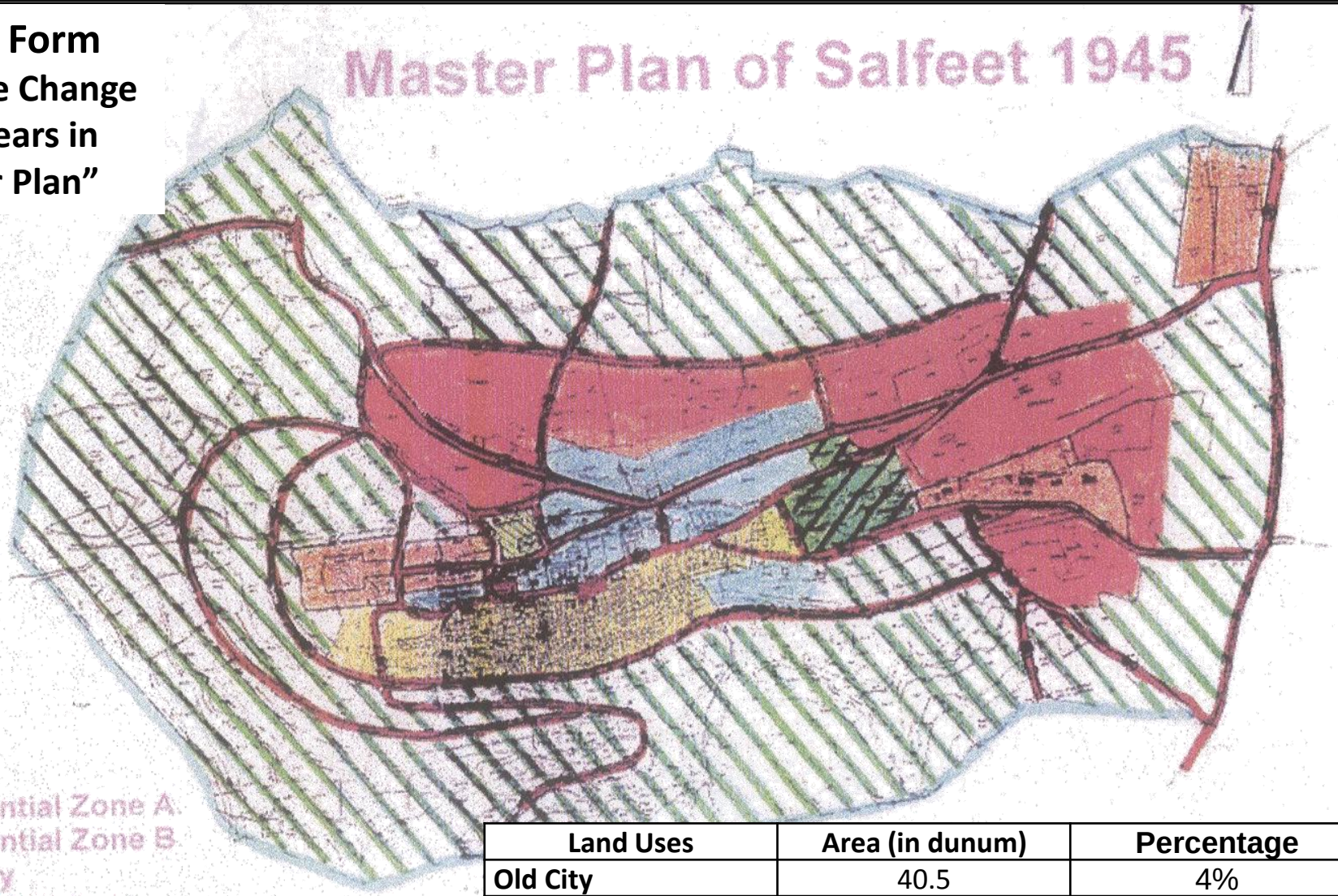
"Landuse Change Over Years in Master Plan"



Current Master Plan Boundaries

Urban Form

"Landuse Change Over Years in Master Plan"



Land Uses	Area (in dunum)	Percentage
Old City	40.5	4%
Agricultural Area	665.7	70%
Residential Area (B)	46.0	5%
Residential Area (A)	130.5	14%
Schools	31.8	5%
Public Buildings	17.3	
Open Areas	14.9	2%
Total	**946.7**	**100%**

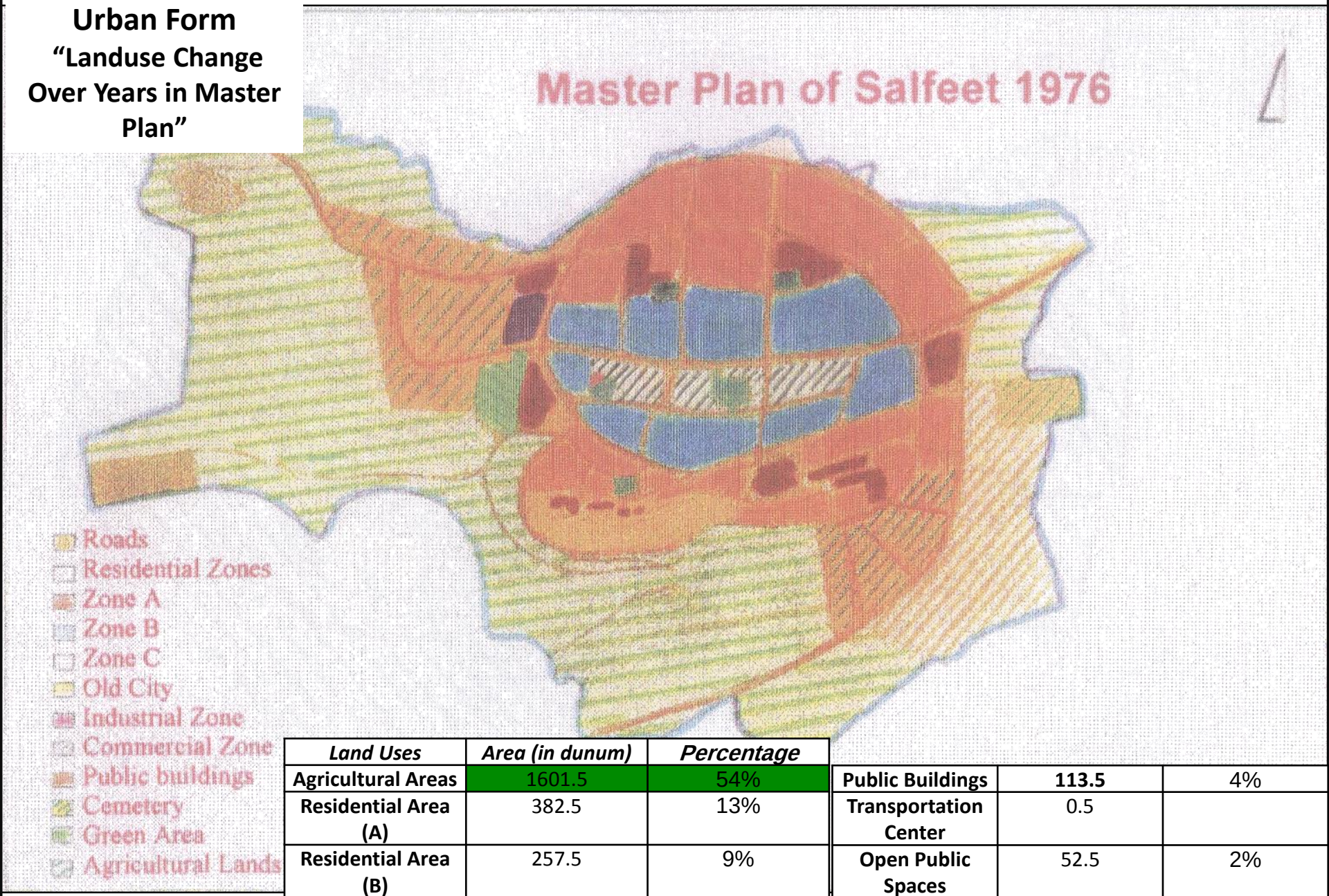
Urban Form

"Landuse Change Over Years in Master Plan"

Current Master Plan Boundaries

Urban Form

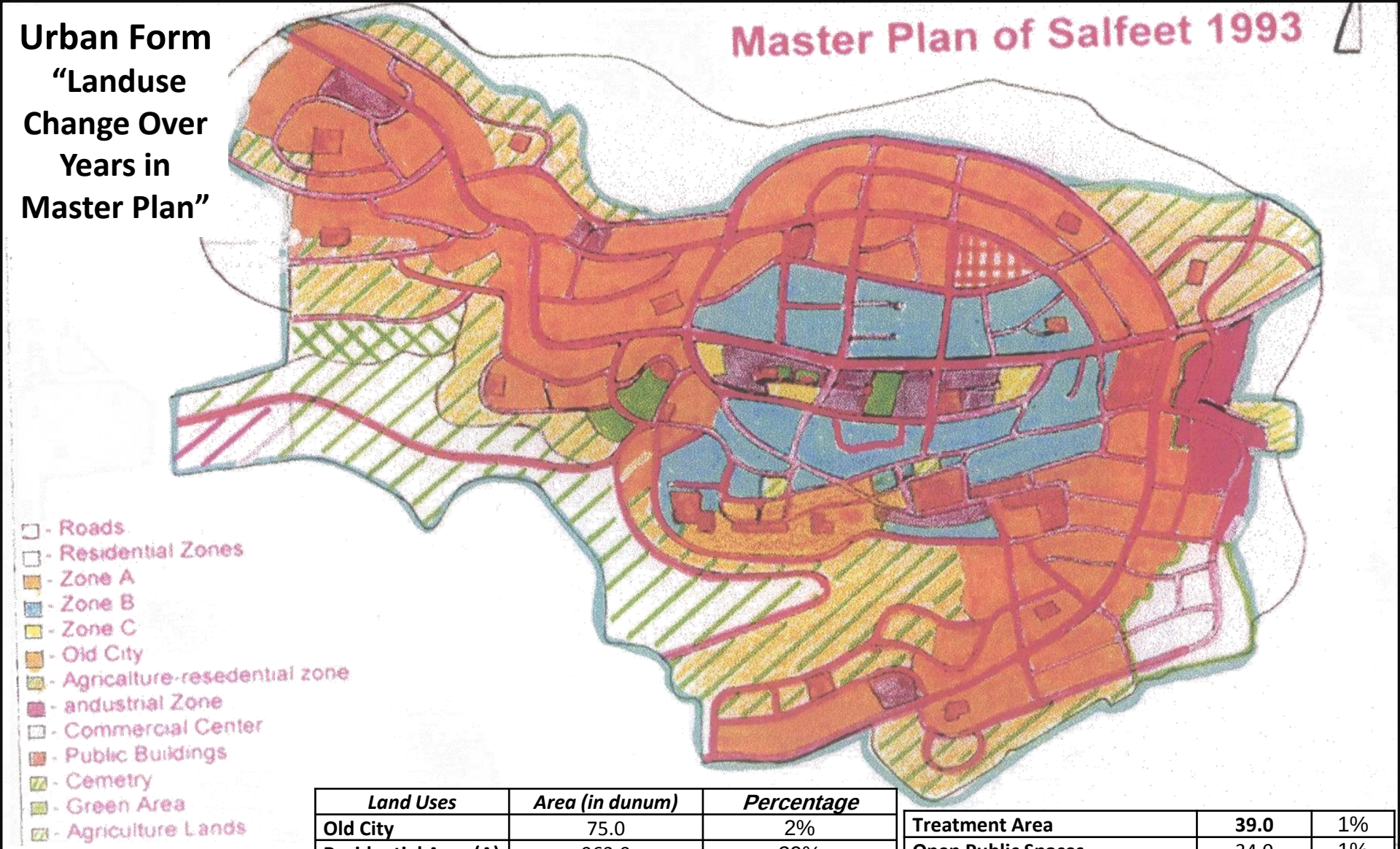
"Landuse Change Over Years in Master Plan"



Land Uses	*Area (in dunum)*	*Percentage*
Agricultural Areas	1601.5	54%
Residential Area (A)	382.5	13%
Residential Area (B)	257.5	9%
Conservation Area	50.0	2%
Commercial Areas	85.0	3%

Public Buildings	**113.5**	4%
Transportation Center	0.5	
Open Public Spaces	52.5	2%
Cemeteries	30.0	1%
Roads	341.5	11%
Total	**3211**	100%

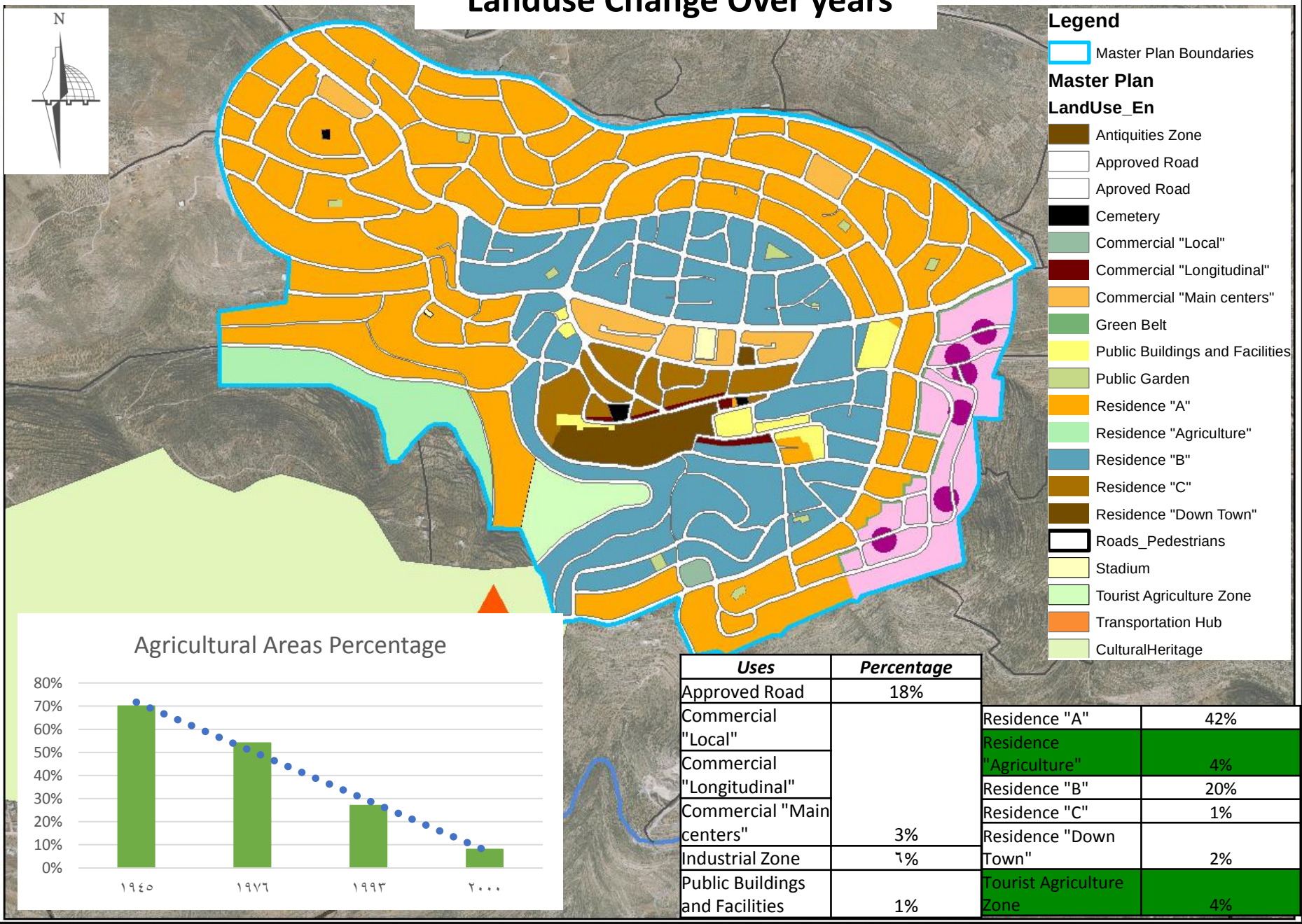
Urban Form "Landuse Change Over Years in Master Plan"



Land Uses	*Area (in dunum)*	*Percentage*
Old City	75.0	2%
Residential Area (A)	963.0	29%
Residential Area (B)	340.0	10%
Residential Area (C)	15.0	0.1%
Agricultural Residence	579.0	17%
Commercial Areas	106.0	3%
Manufacturing	150.0	5%
Public Buildings	116.0	3%

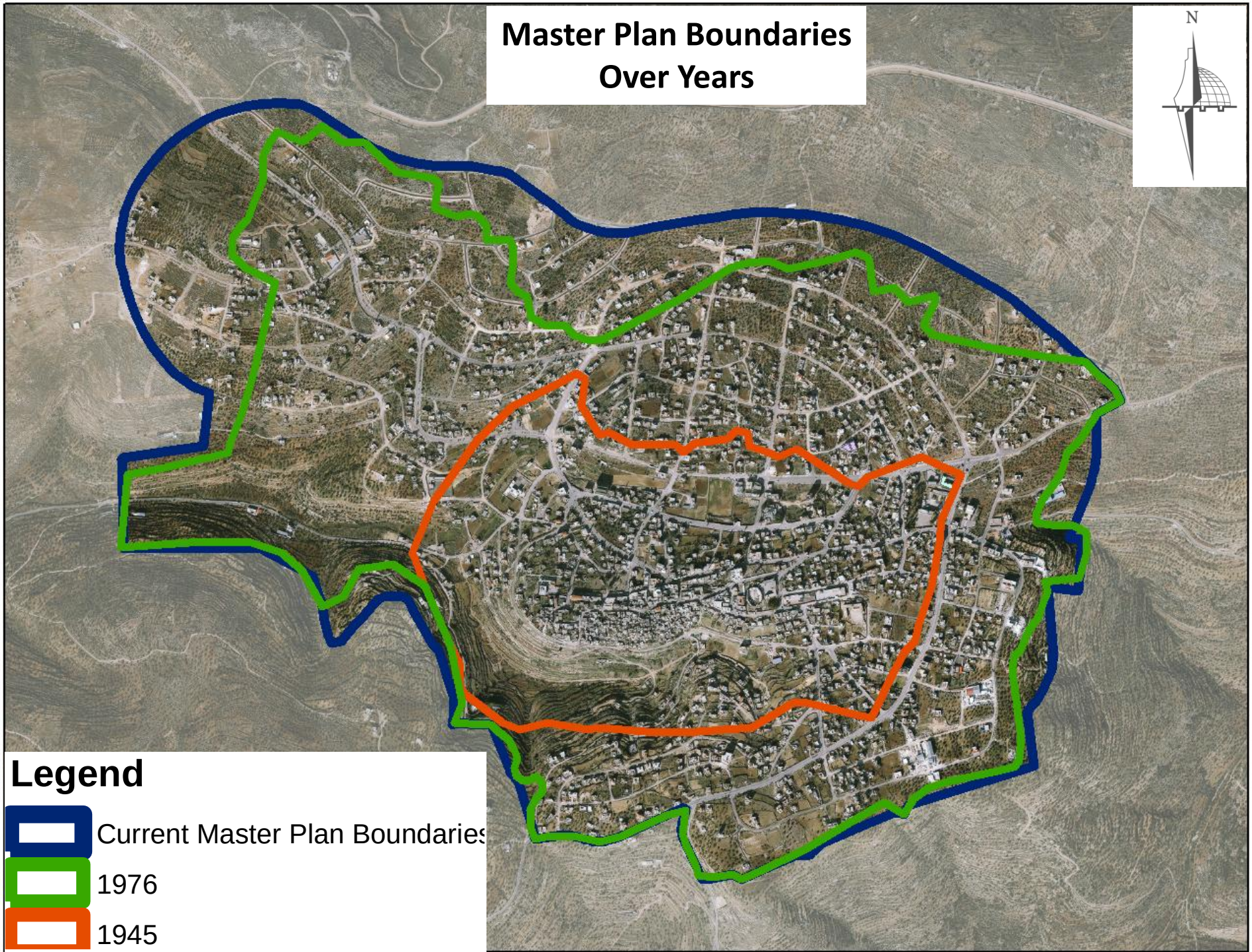
Treatment Area	**39.0**	1%
Open Public Spaces	34.0	1%
Cemeteries	19.0	1%
Roads	554.0	17%
Agricultural Area Prohibited from Building	44.0	1%
Cultivated Agricultural Area	290.0	9%
Total	**3324**	100%

Urban Form
“Landuse Change Over years”

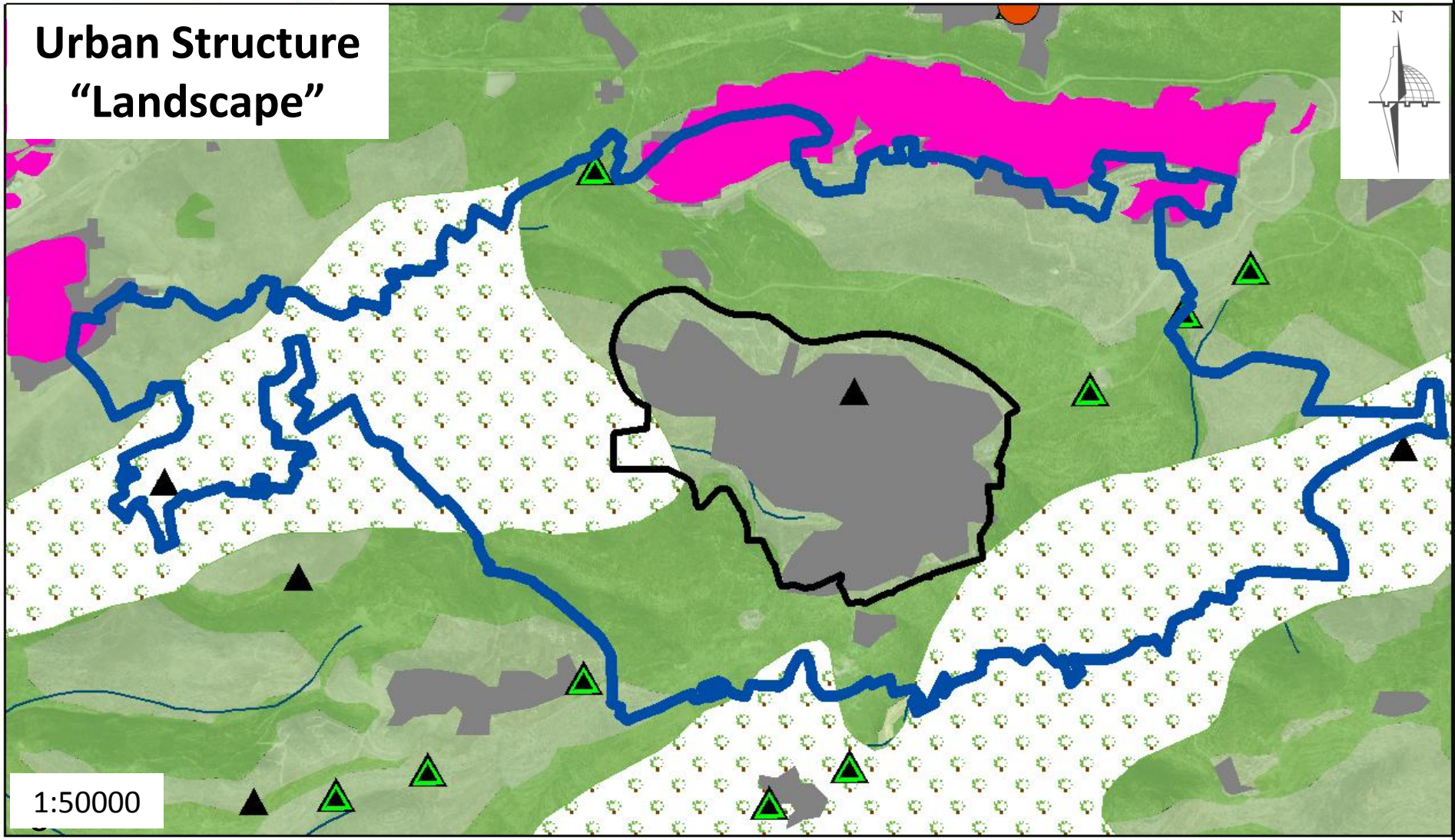


Uses	*Percentage*
Approved Road	18%
Commercial "Local"	
Commercial "Longitudinal"	
Commercial "Main centers"	3%
Industrial Zone	٦%
Public Buildings and Facilities	1%

Residence "A"	42%
Residence "Agriculture"	4%
Residence "B"	20%
Residence "C"	1%
Residence "Down Town"	2%
Tourist Agriculture Zone	4%


Master Plan Boundaries
Over Years
N
Legend
Current Master Plan Boundaries
1976
1945

Urban Structure "Landscape"



Administrative Boundaries
Governorates Boundaries
Master Plan Boundaries

Springs use

Agricultural
No-Use

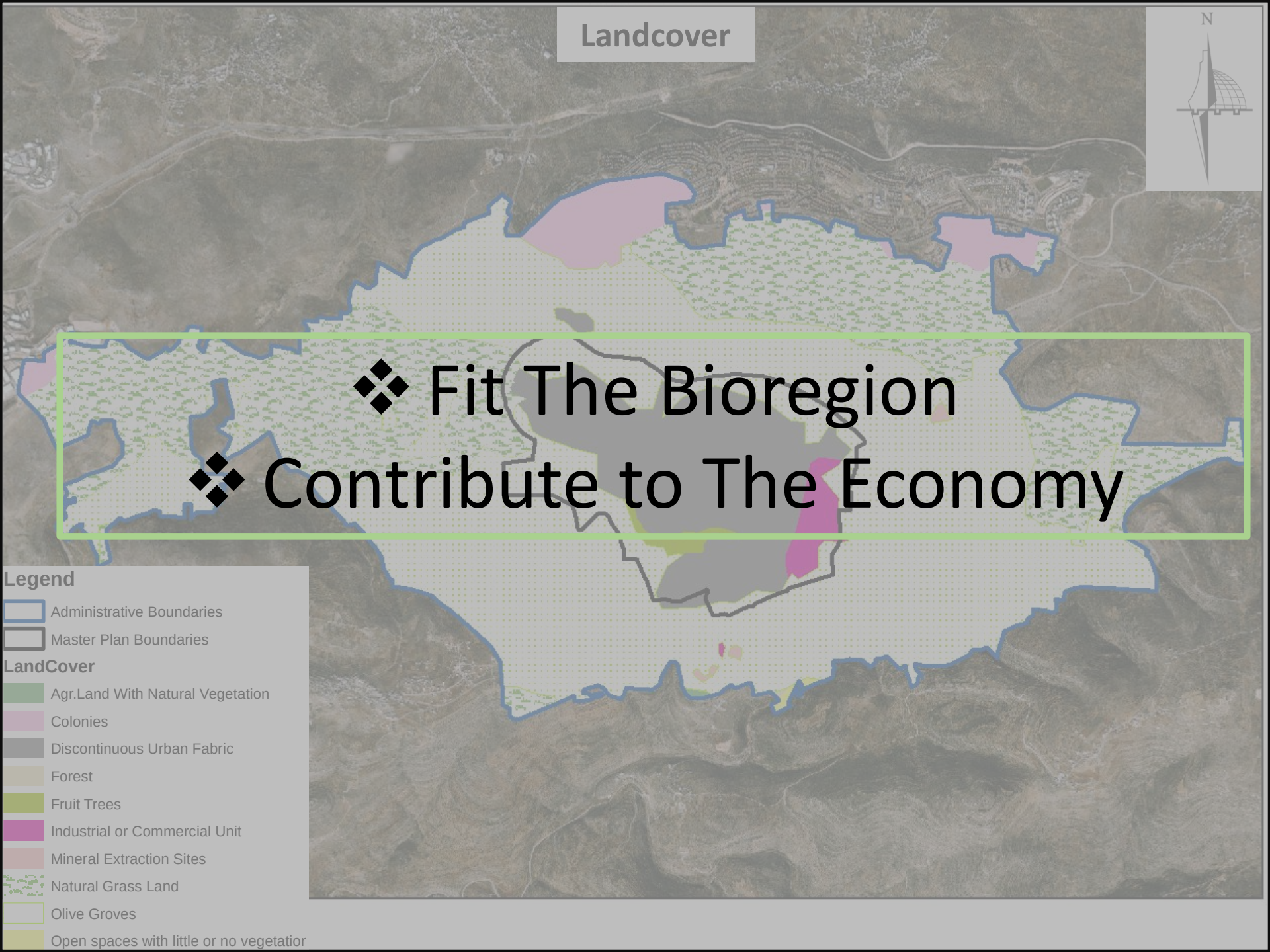
Wells' Classification

Israeli
Agricultural
Domestic
Culverts

Colonies
Built-up Areas
Biodiversity
NaturalReserve
Wadis

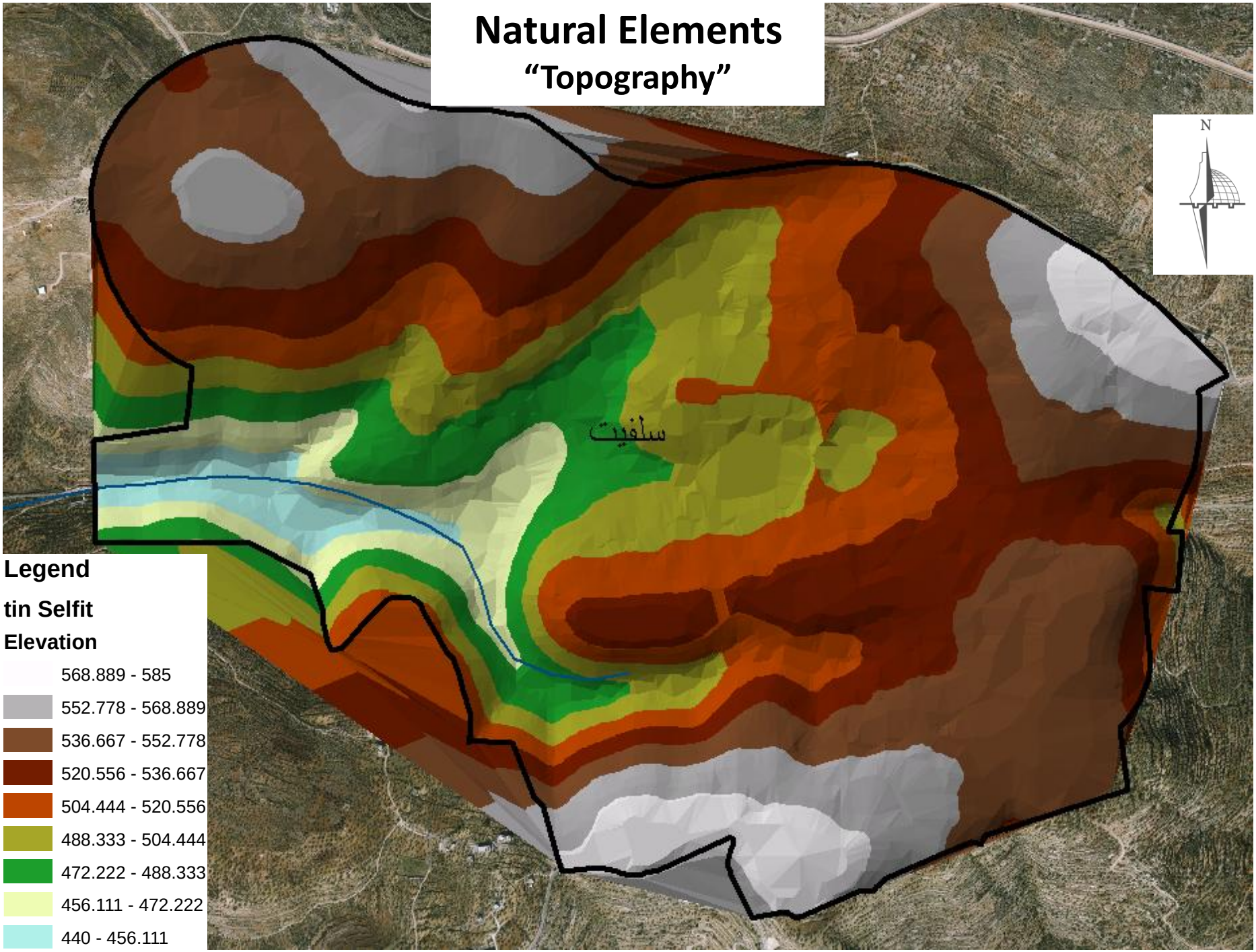
Agricultural Classification

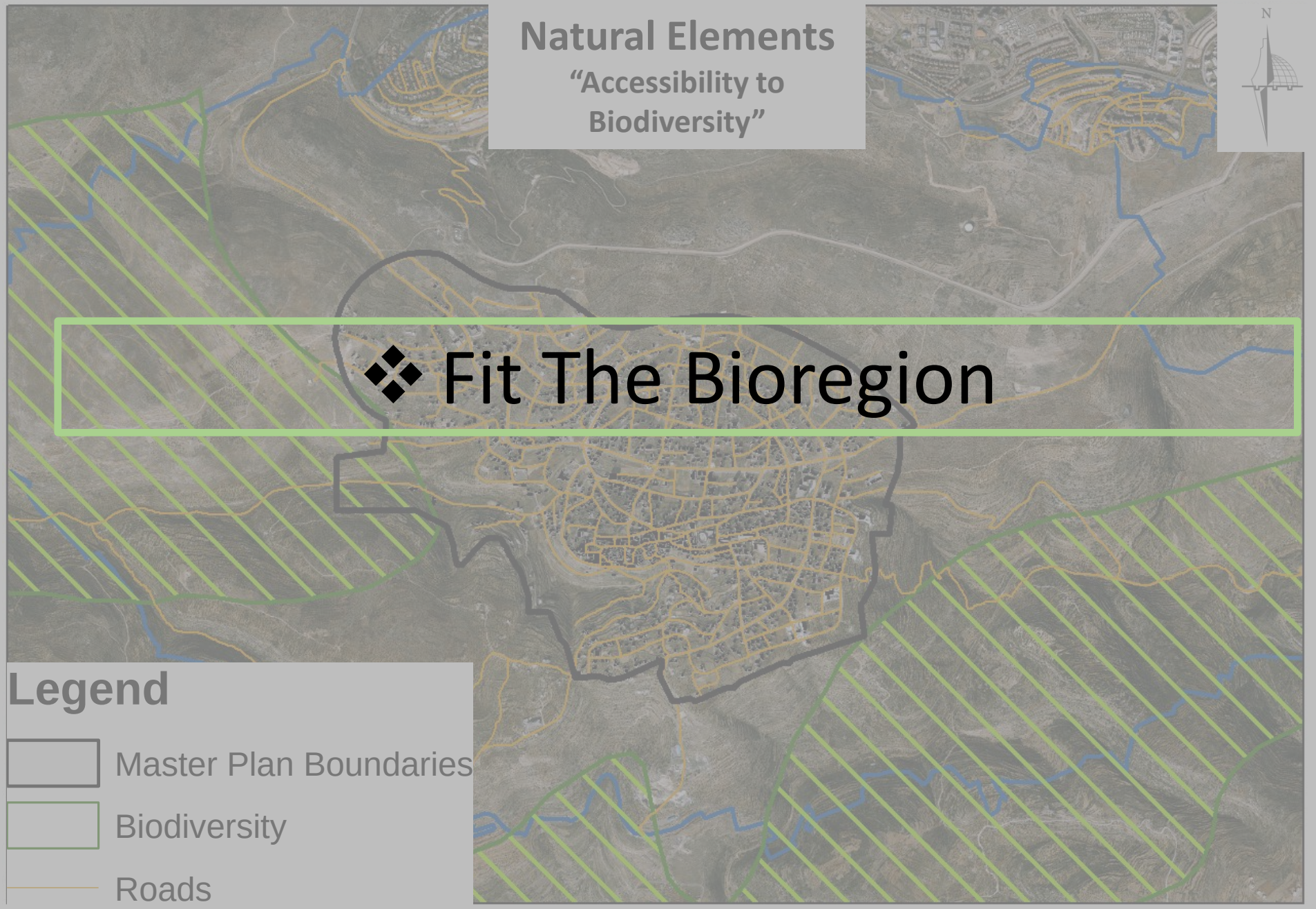
High Agricultural land value
Medium Agricultural land value
Low Agricultural land value
Forests


Landcover
N
❖ Fit The Bioregion
❖ Contribute to The Economy
Legend
Administrative Boundaries
Master Plan Boundaries
LandCover
Agr.Land With Natural Vegetation
Colonies
Discontinuous Urban Fabric
Forest
Fruit Trees
Industrial or Commercial Unit
Mineral Extraction Sites
Natural Grass Land
Olive Groves
Open spaces with little or no vegetatior

Natural Elements & Energy

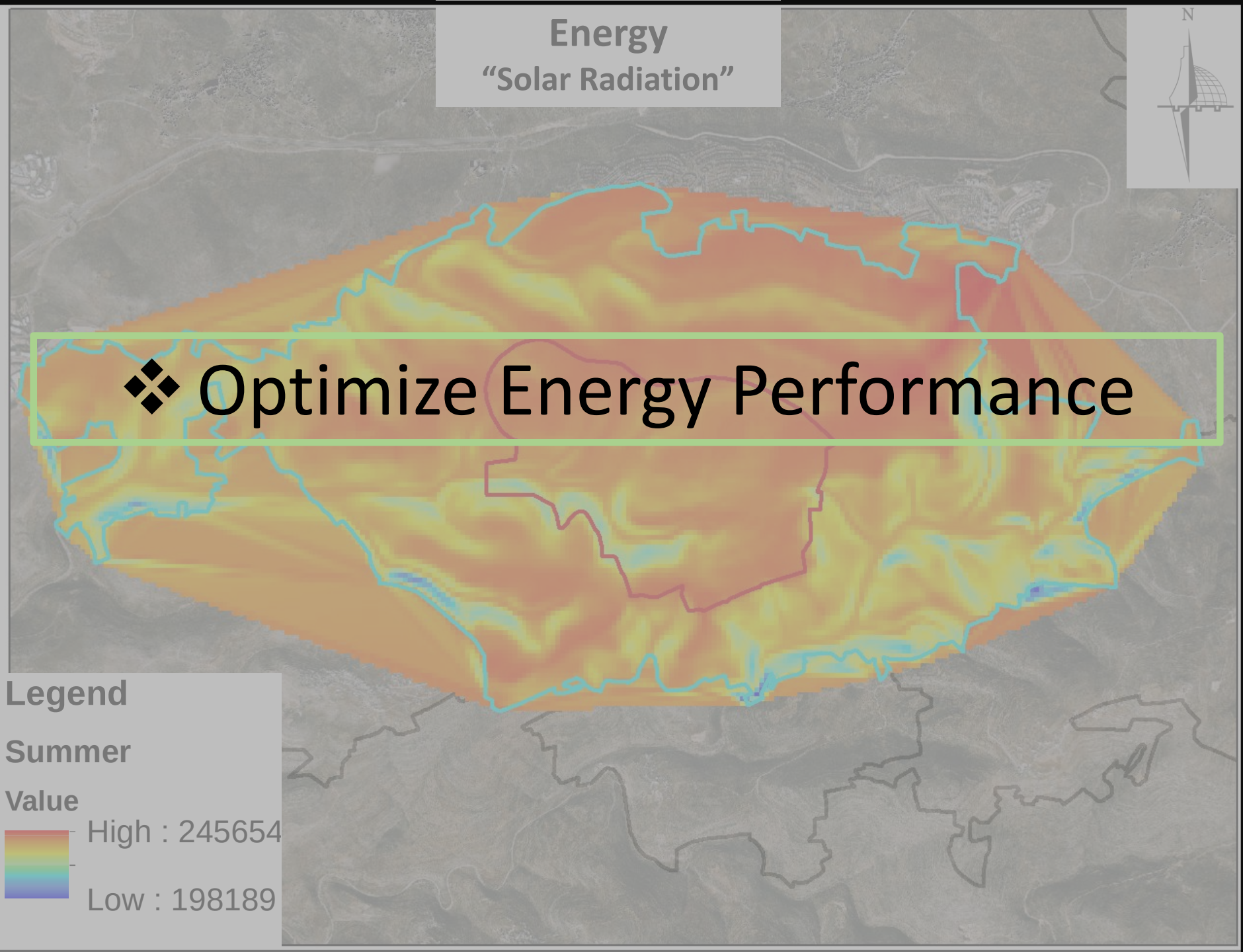
Natural Elements
“Topography”

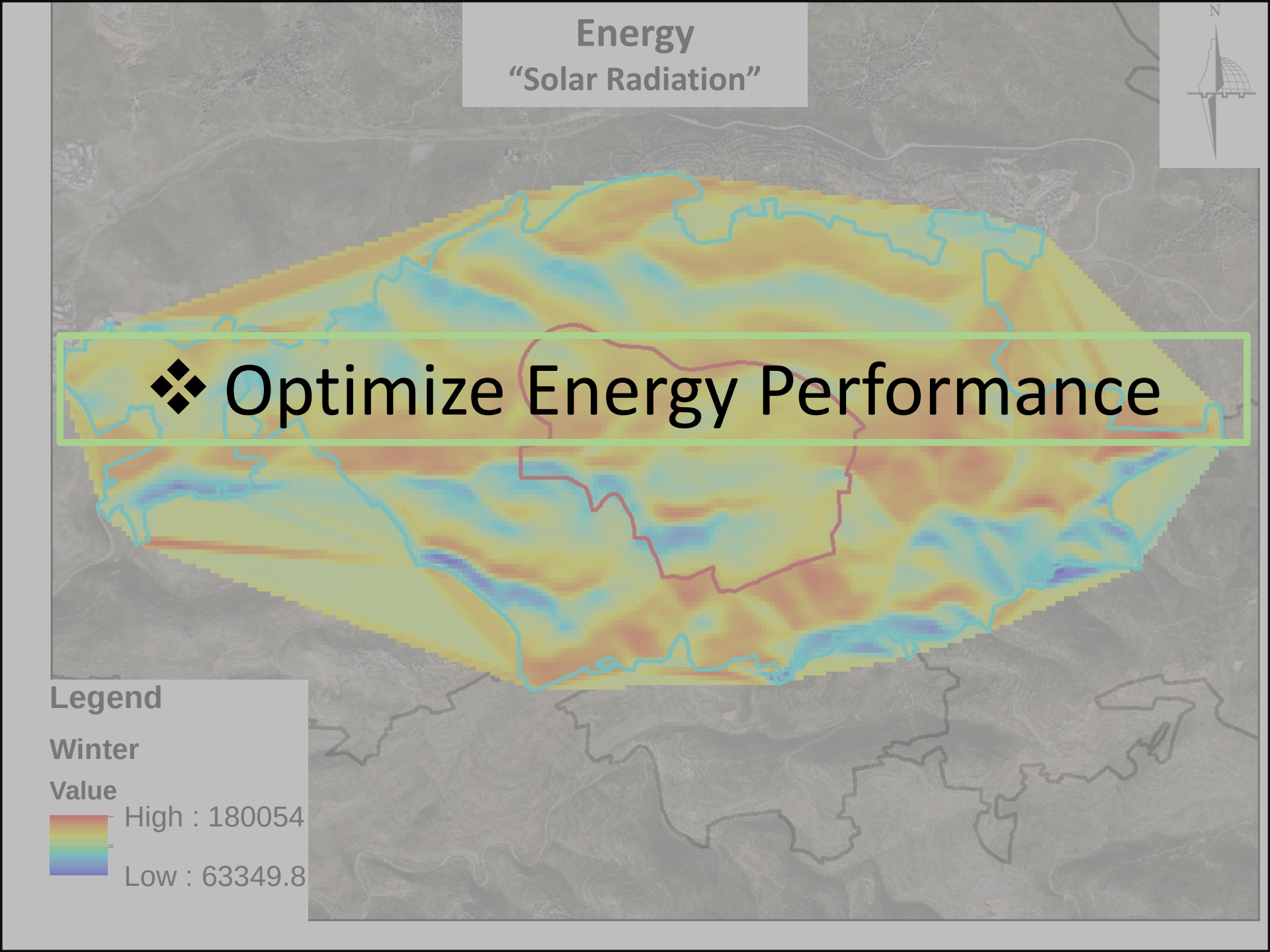



Natural Elements
"Accessibility to Biodiversity"
N
❖ Fit The Bioregion
Legend
Master Plan Boundaries
Biodiversity
Roads

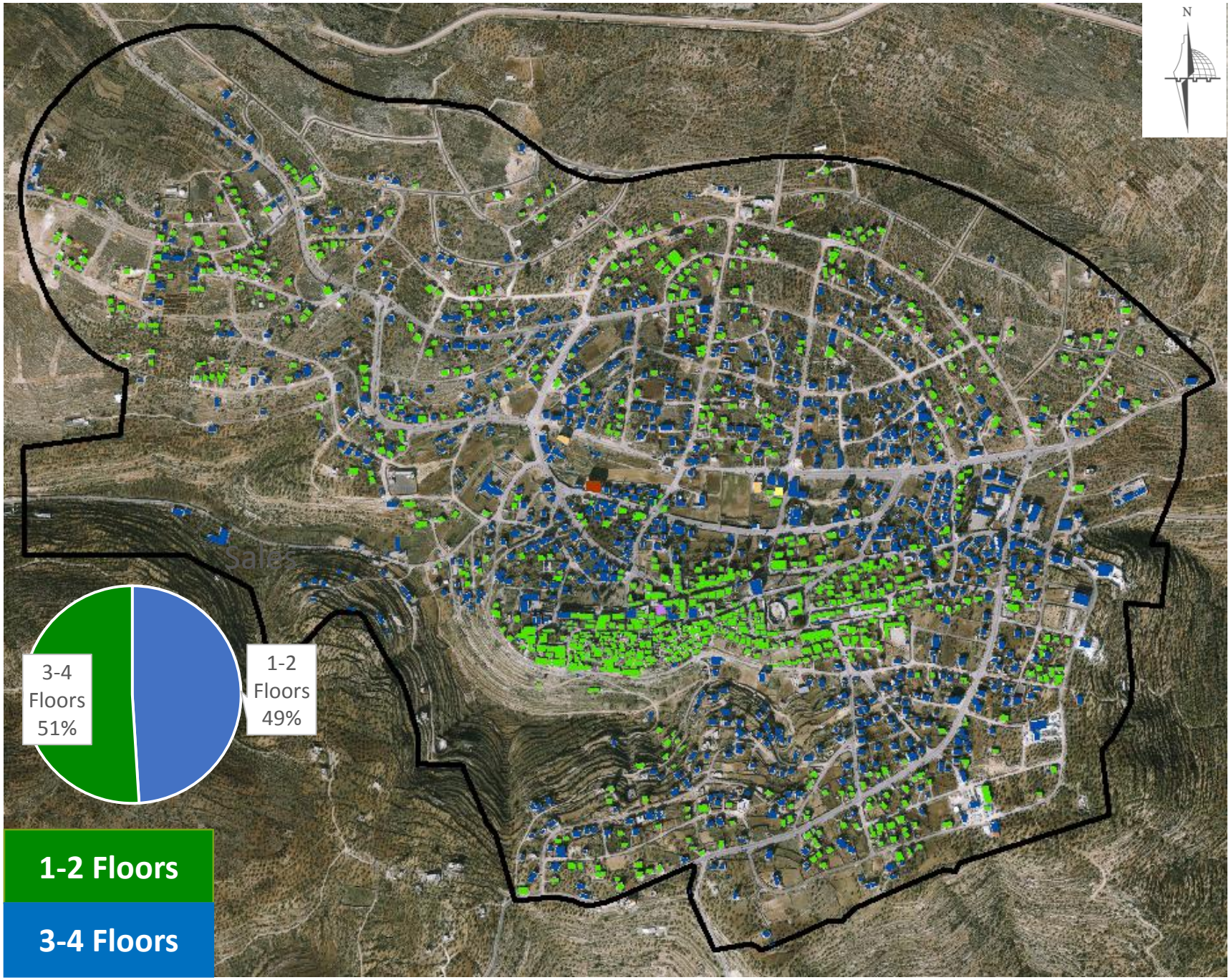
Energy

“Solar Radiation”



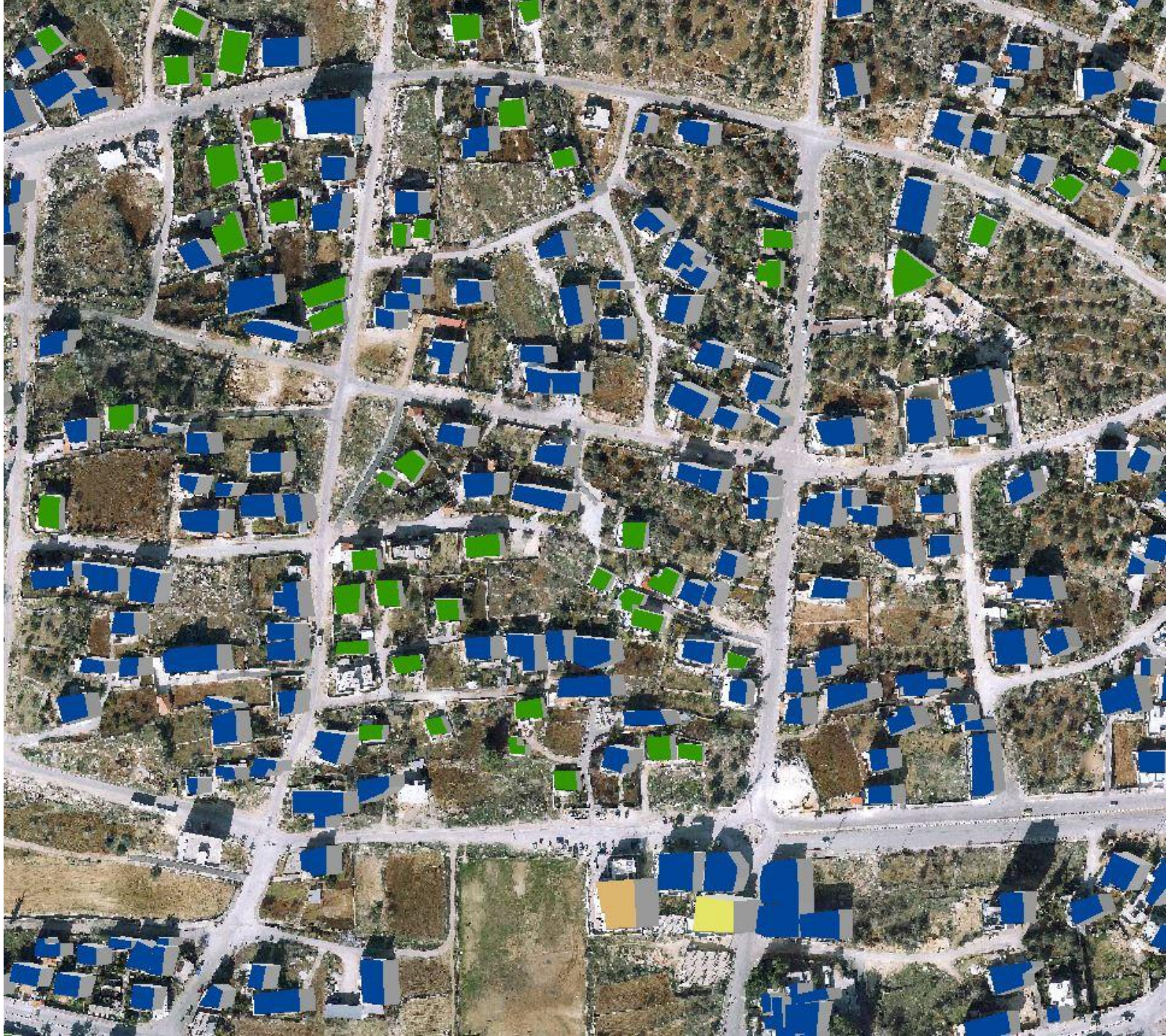

Energy
“Solar Radiation”
N
❖ Optimize Energy Performance
Legend
Winter
Value
High : 180054
Low : 63349.8

Number of Floors



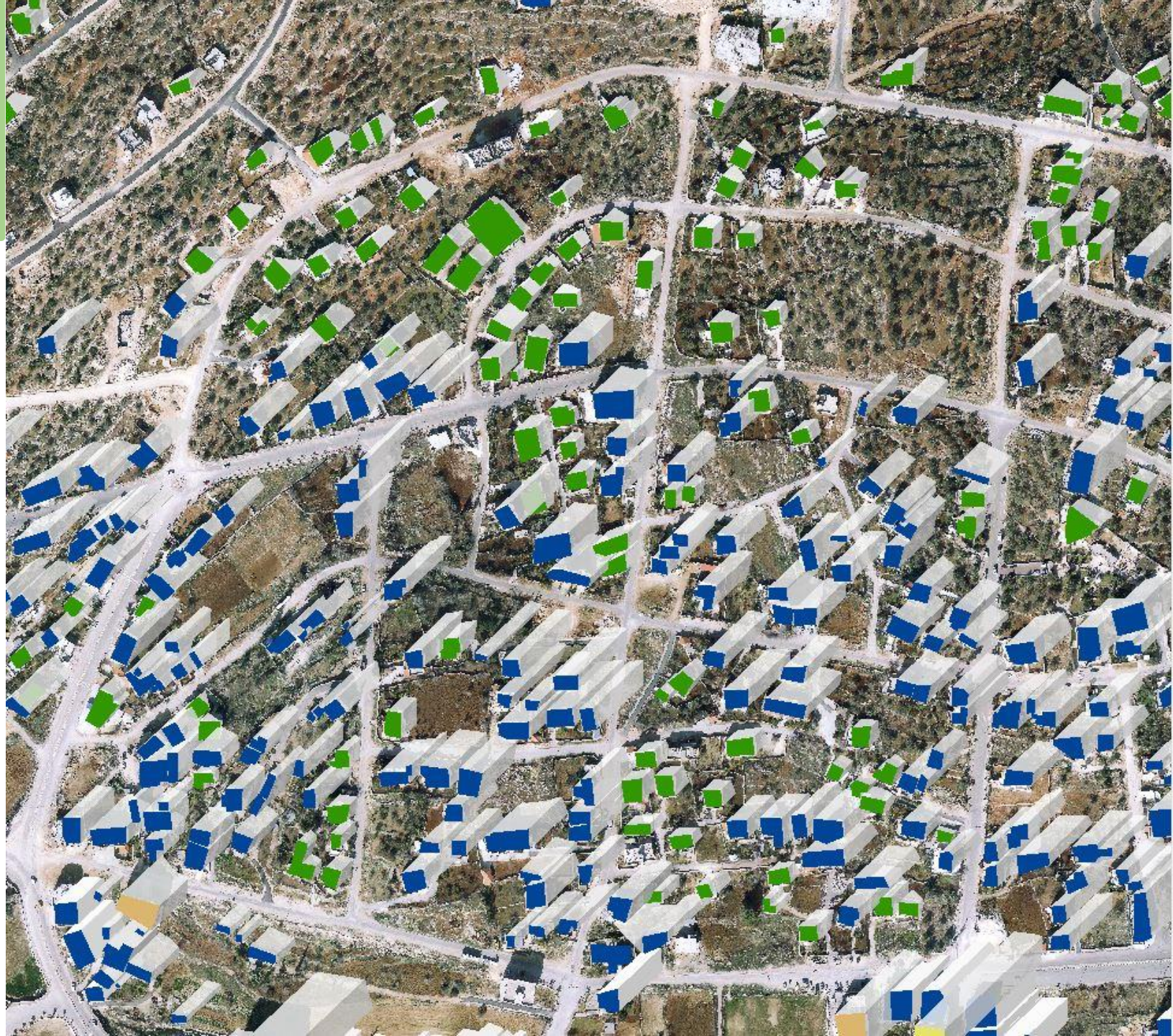
Summer
1/6
at 9:30
AM

Summer
1/6
at 3:30
PM



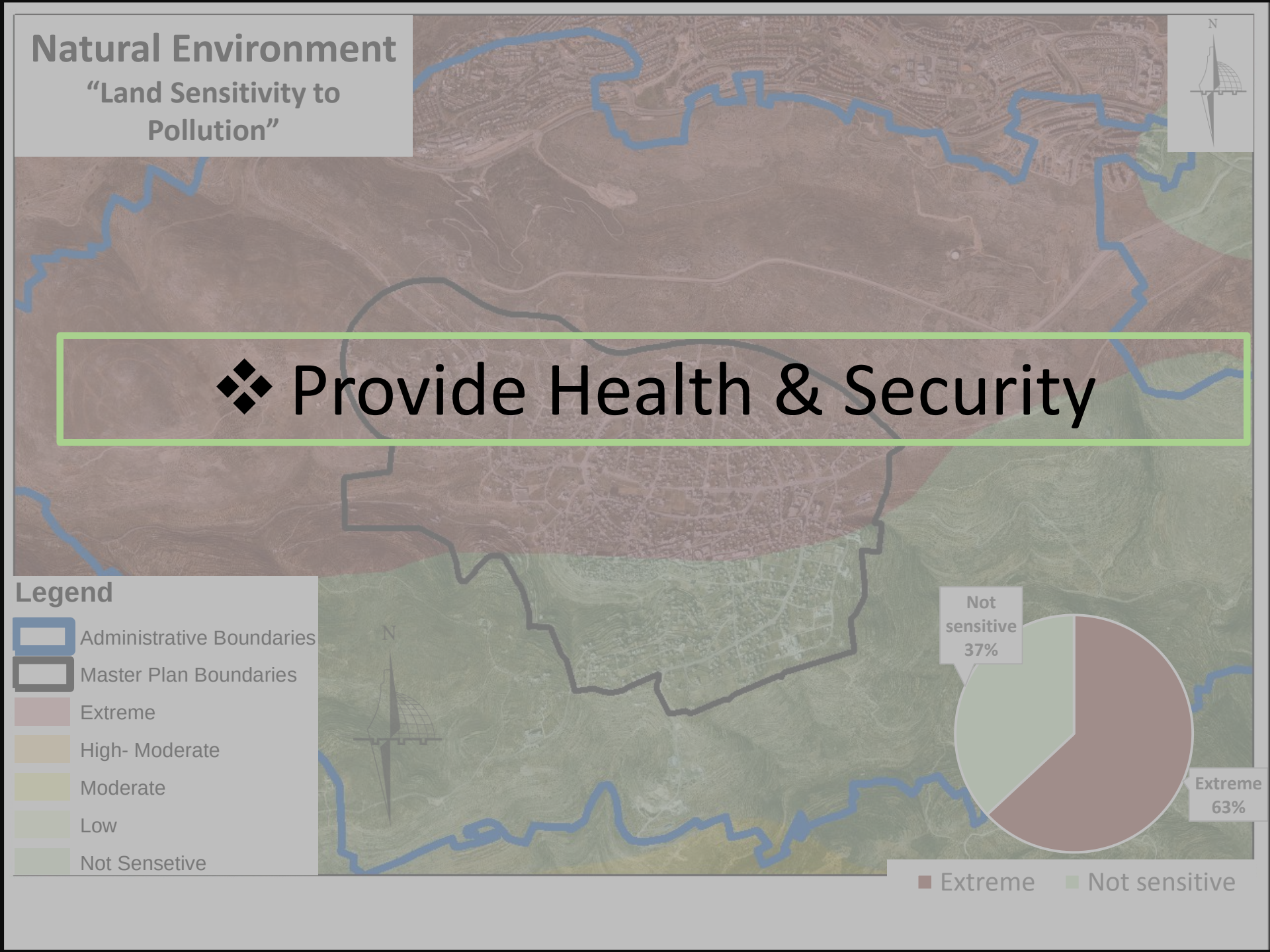
Winter
1/1
Early at
9:30 AM

Winter
1/1
Early at
3:30 PM



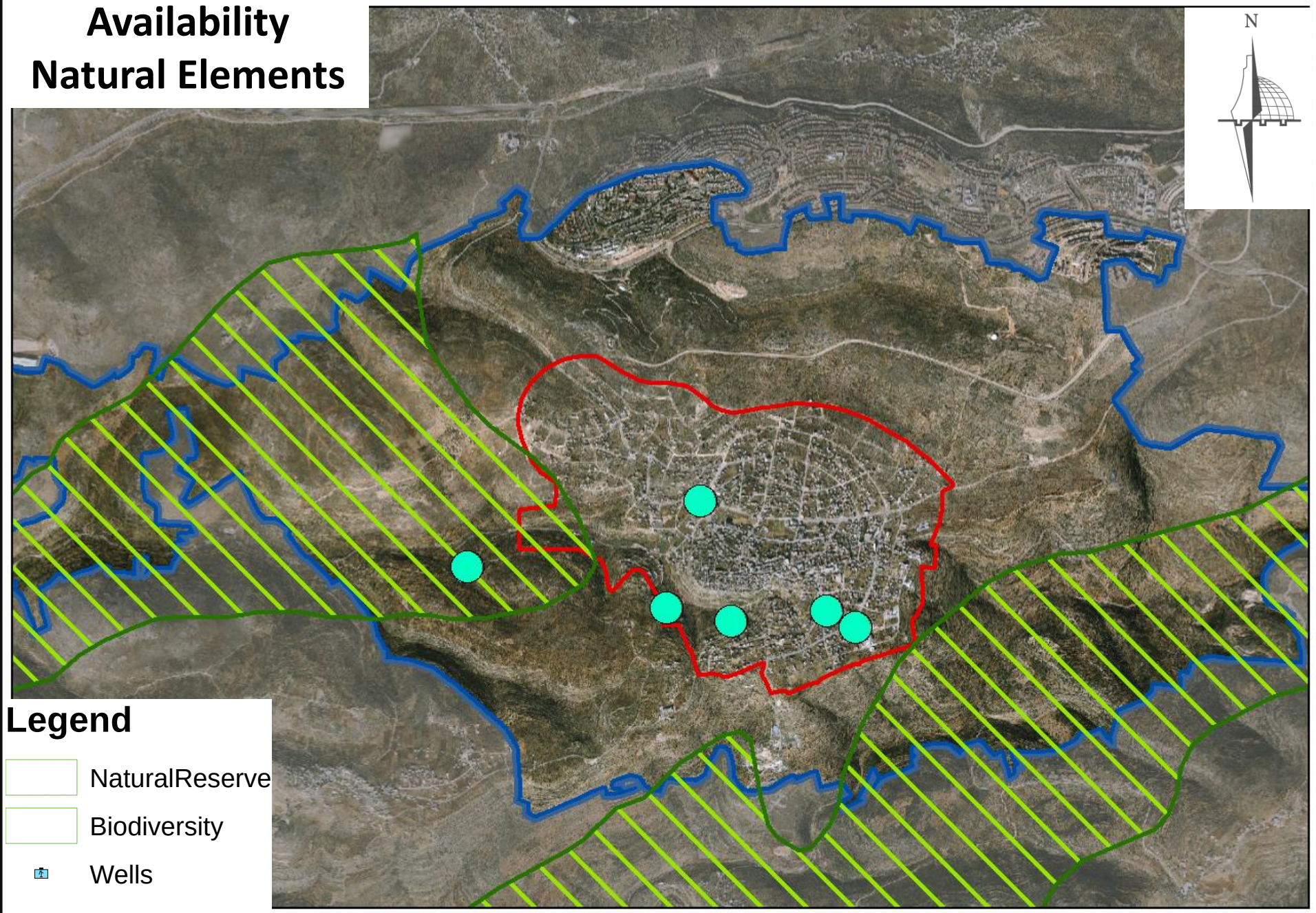
Natural Environment

"Land Sensitivity to Pollution"



❖ Provide Health & Security

Availability Natural Elements



Energy & Material Flows

"Wastewater"

❖ Provide Health & Security

Transportation & Infrastructure

Transportation

"Roads Width"

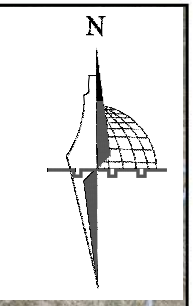
N

Street Width

- Master Plan Boundaries
- 25m
- 18-20m
- 10-14m
- 6-8m

Transportation

"Roads Classification"



Legend

Master Plan Boundaries

Roads Classification

Main

Local

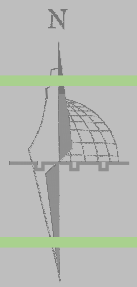
Internal

Transportation

"Walkability

Streets

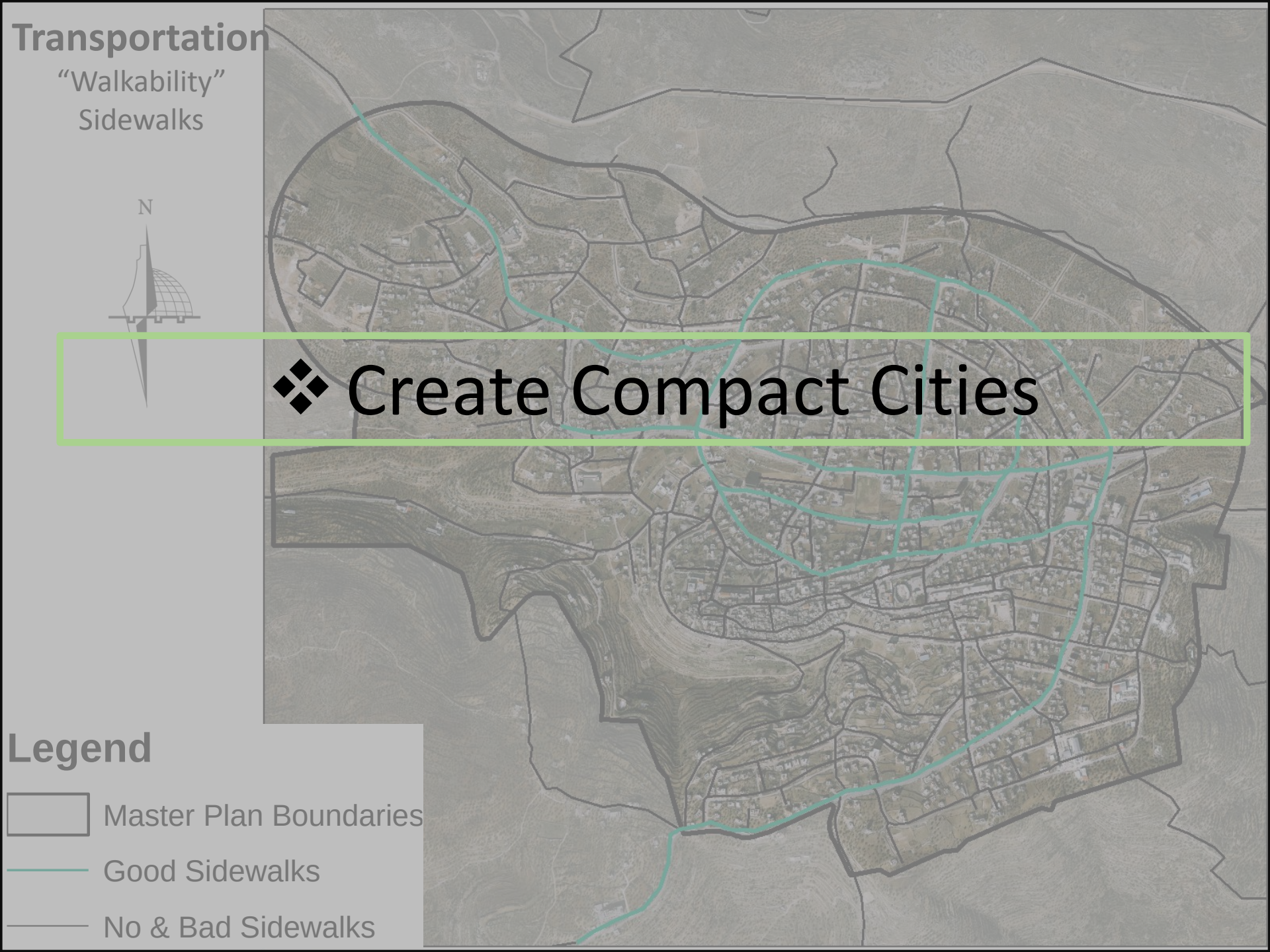
Plantation"



❖ Create Compact Cities

Legend

- Master Plan Boundaries
- Good Plantation
- Shortage in Plantation
- No Plantation


Transportation
"Walkability"
Sidewalks
N
❖ Create Compact Cities
Legend
Master Plan Boundaries
Good Sidewalks
No & Bad Sidewalks

Infrastructure "Waste"

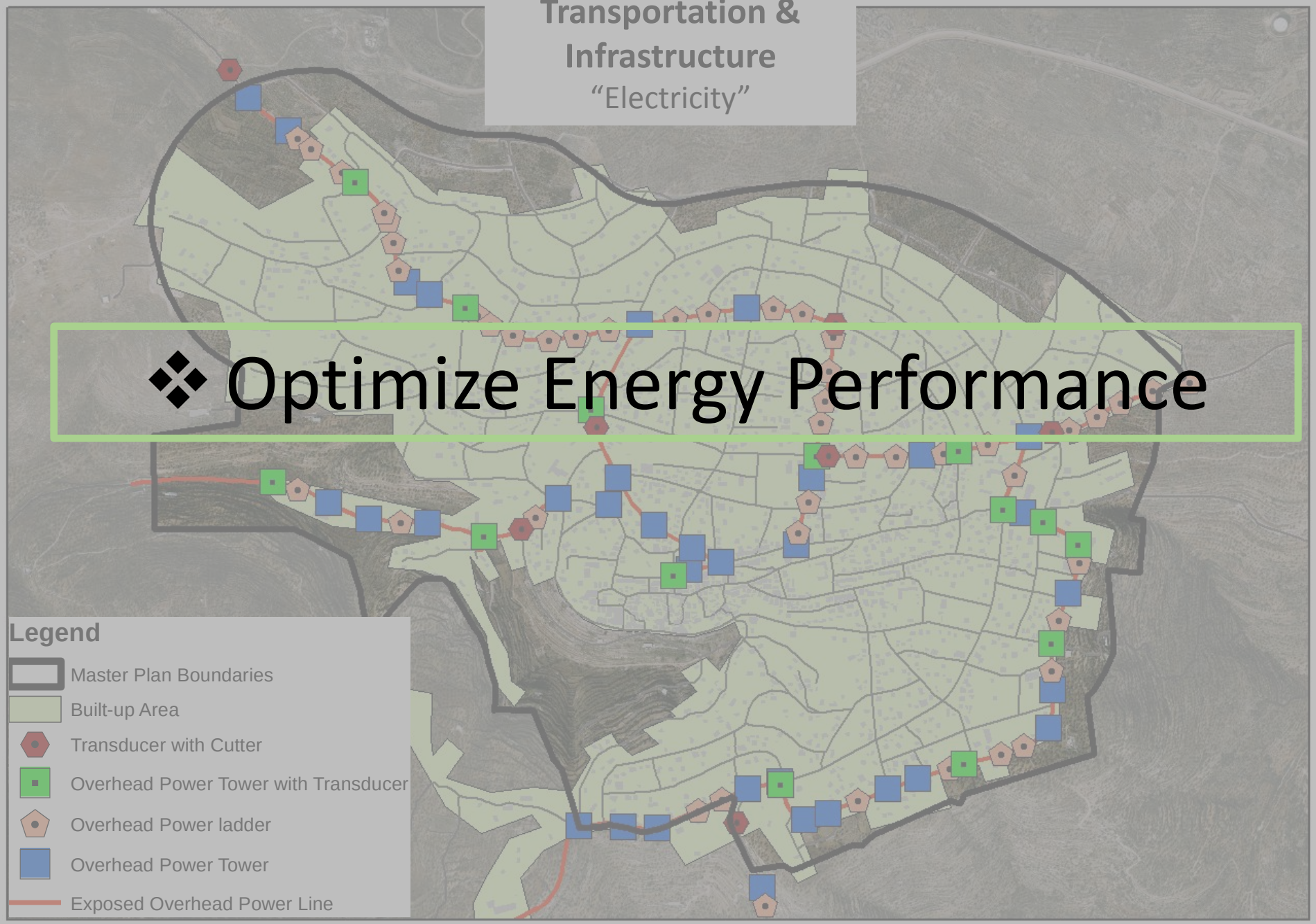
❖ Provide Health & Security

Legend

- Administrative Boundaries
- Master Plan Boundaries
- Existing dumping site
- Colonies
- Built-up Area
- Garbage Container

Transportation & Infrastructure

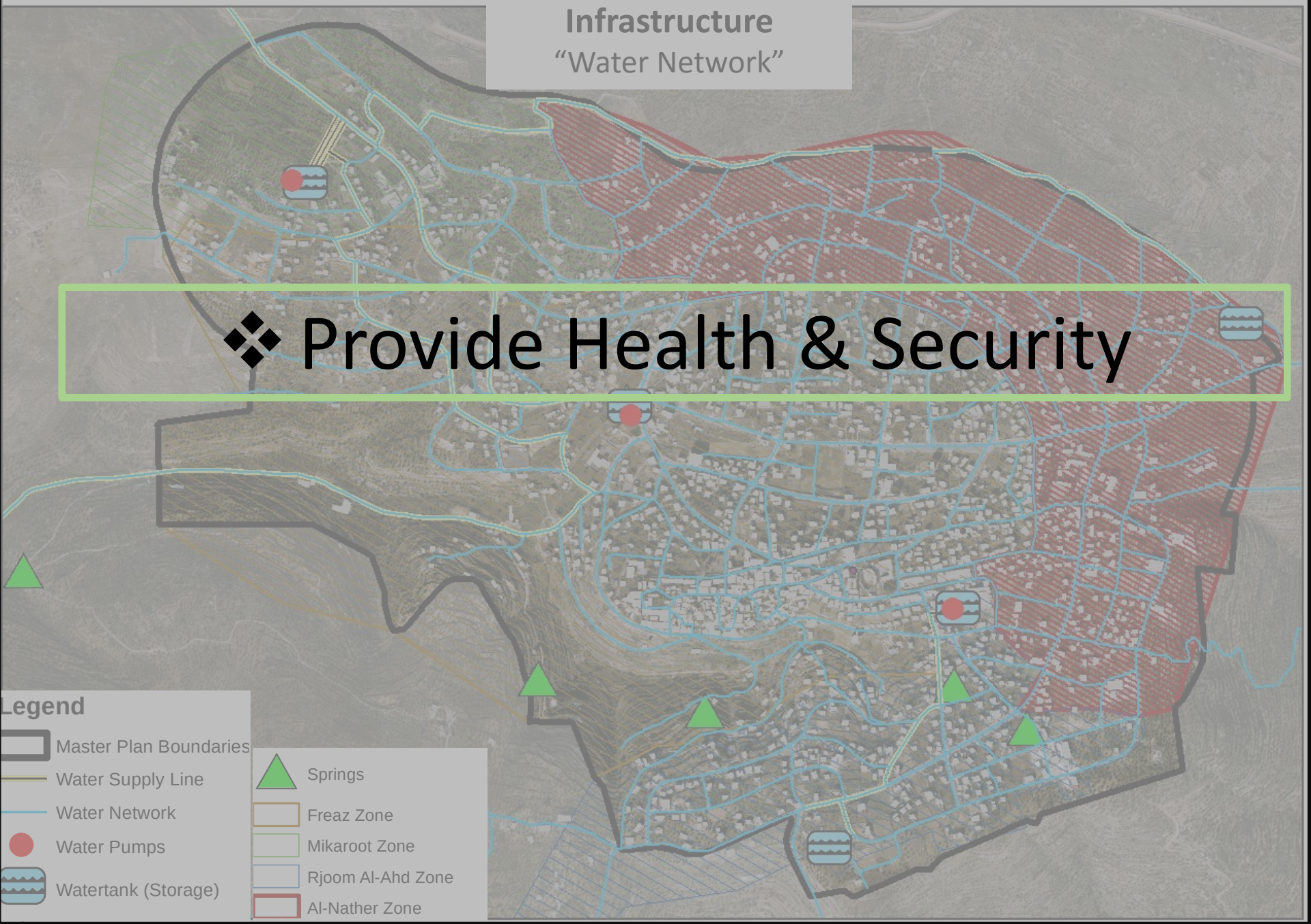
"Electricity"



❖ Optimize Energy Performance

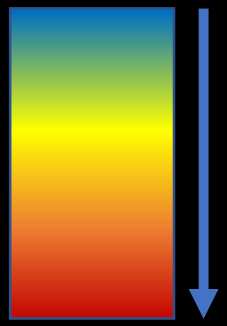
Transportation & Infrastructure

"Water Network"



❖ Provide Health & Security

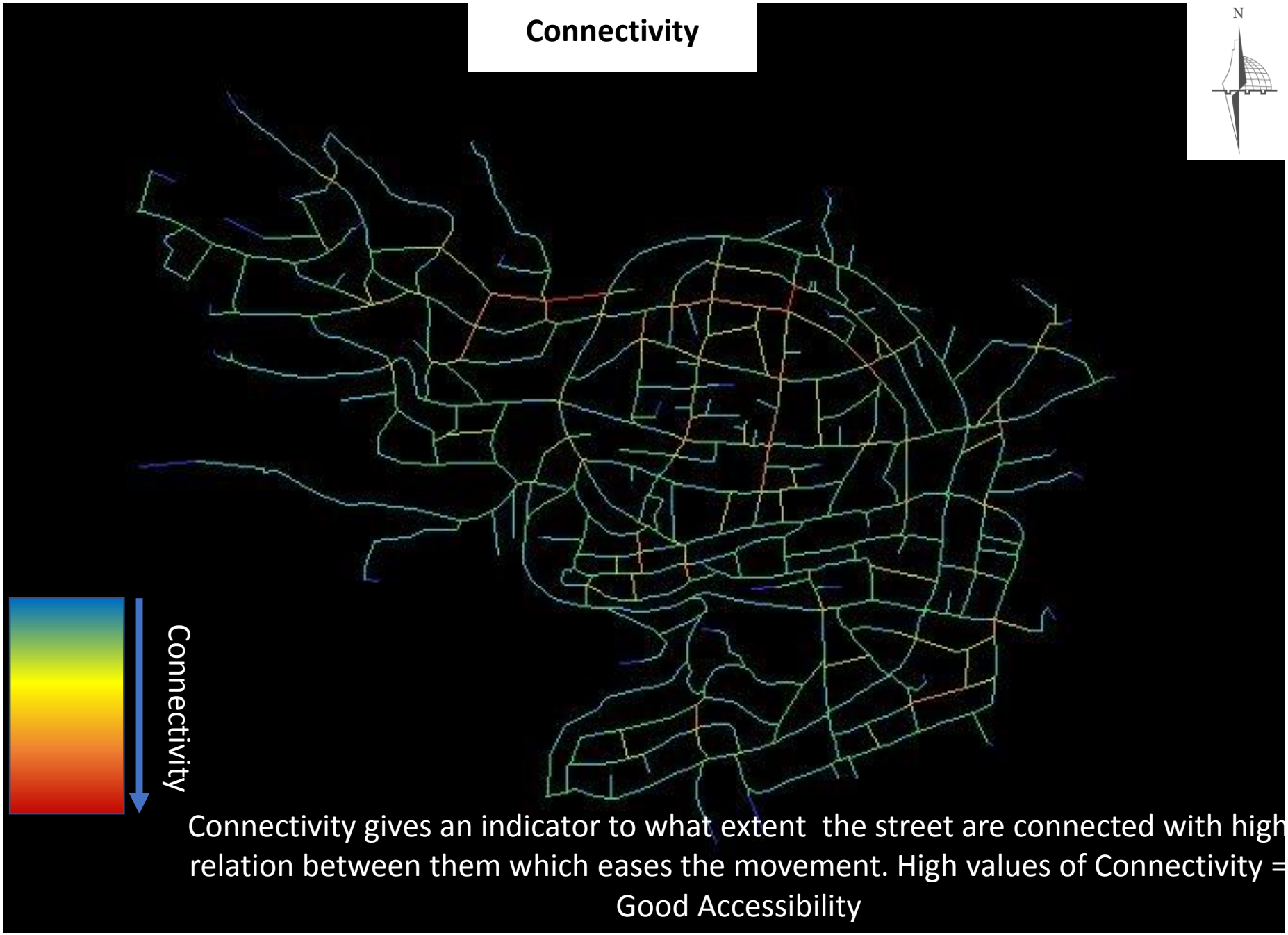
Integration



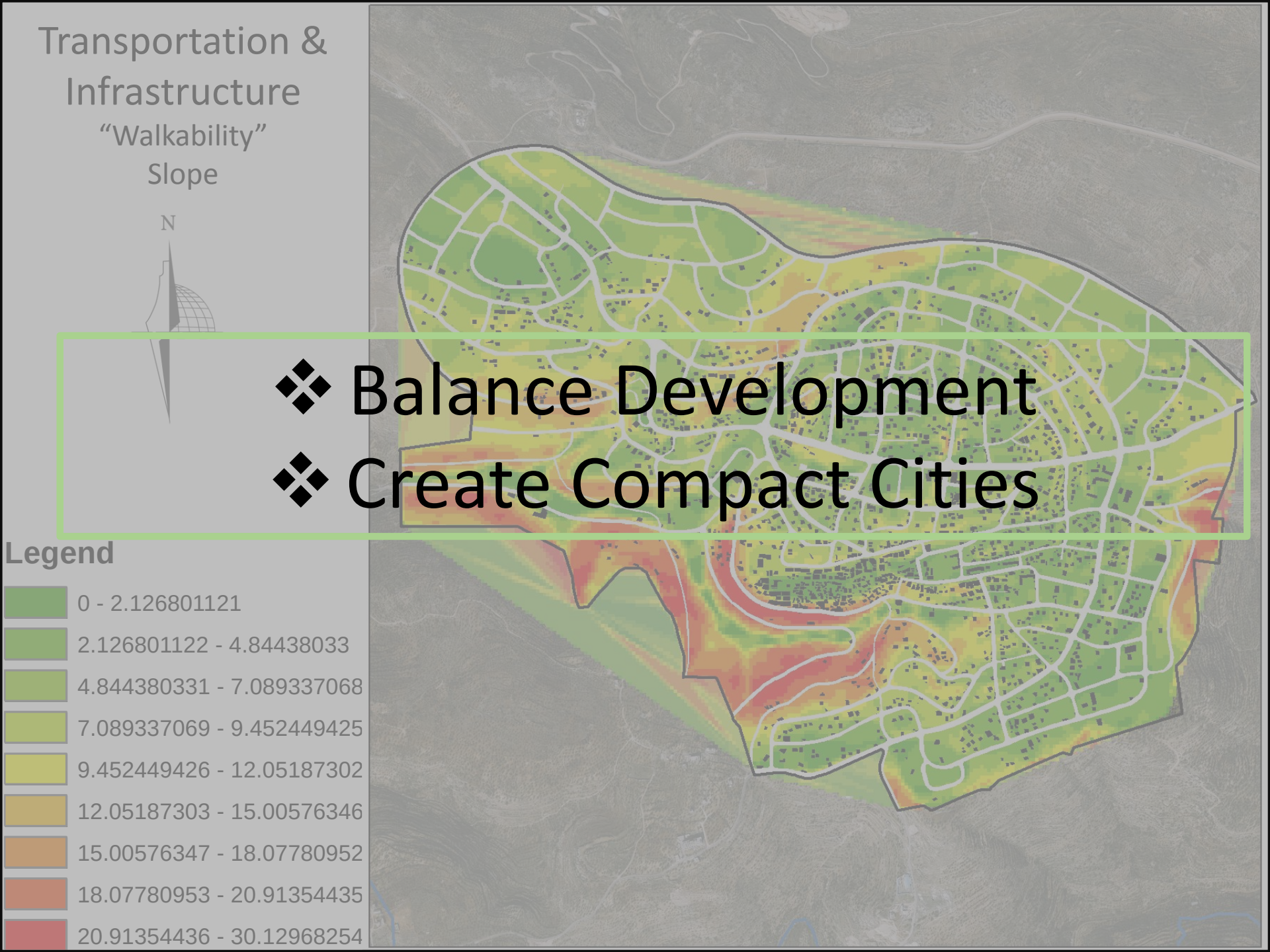
Integration

Streets with high Integration give an indication about their potential for Commercial uses for example

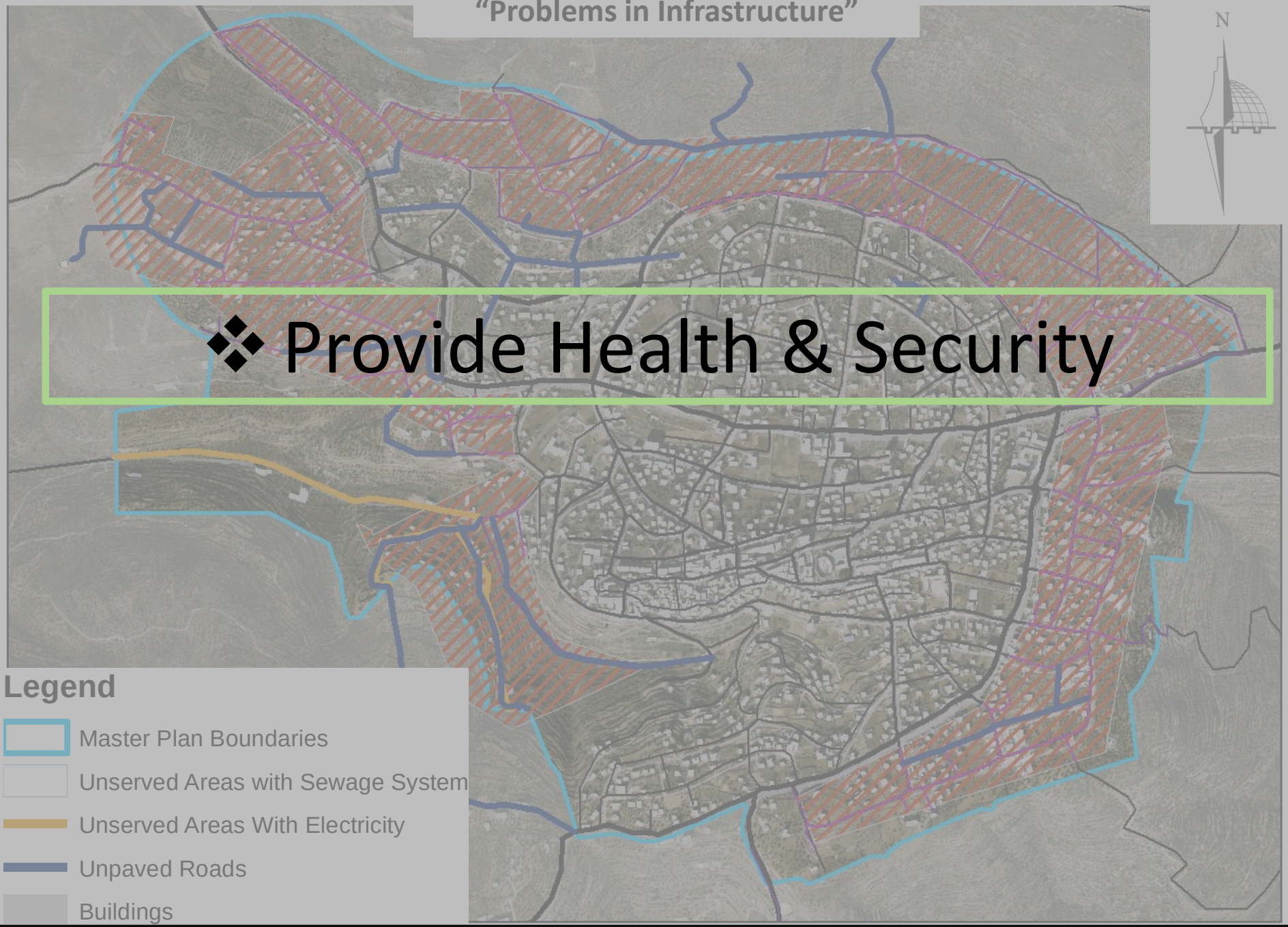
Connectivity

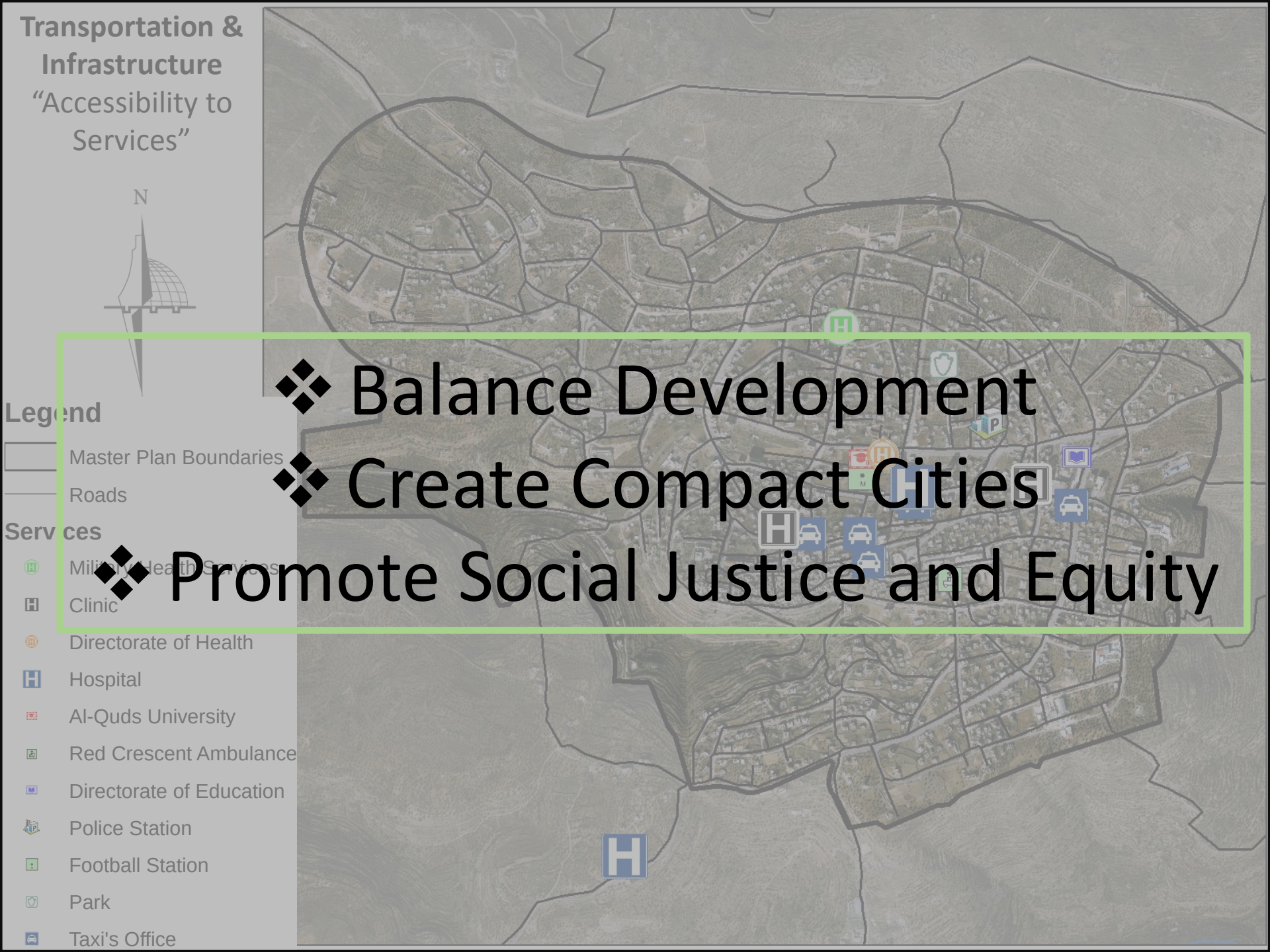


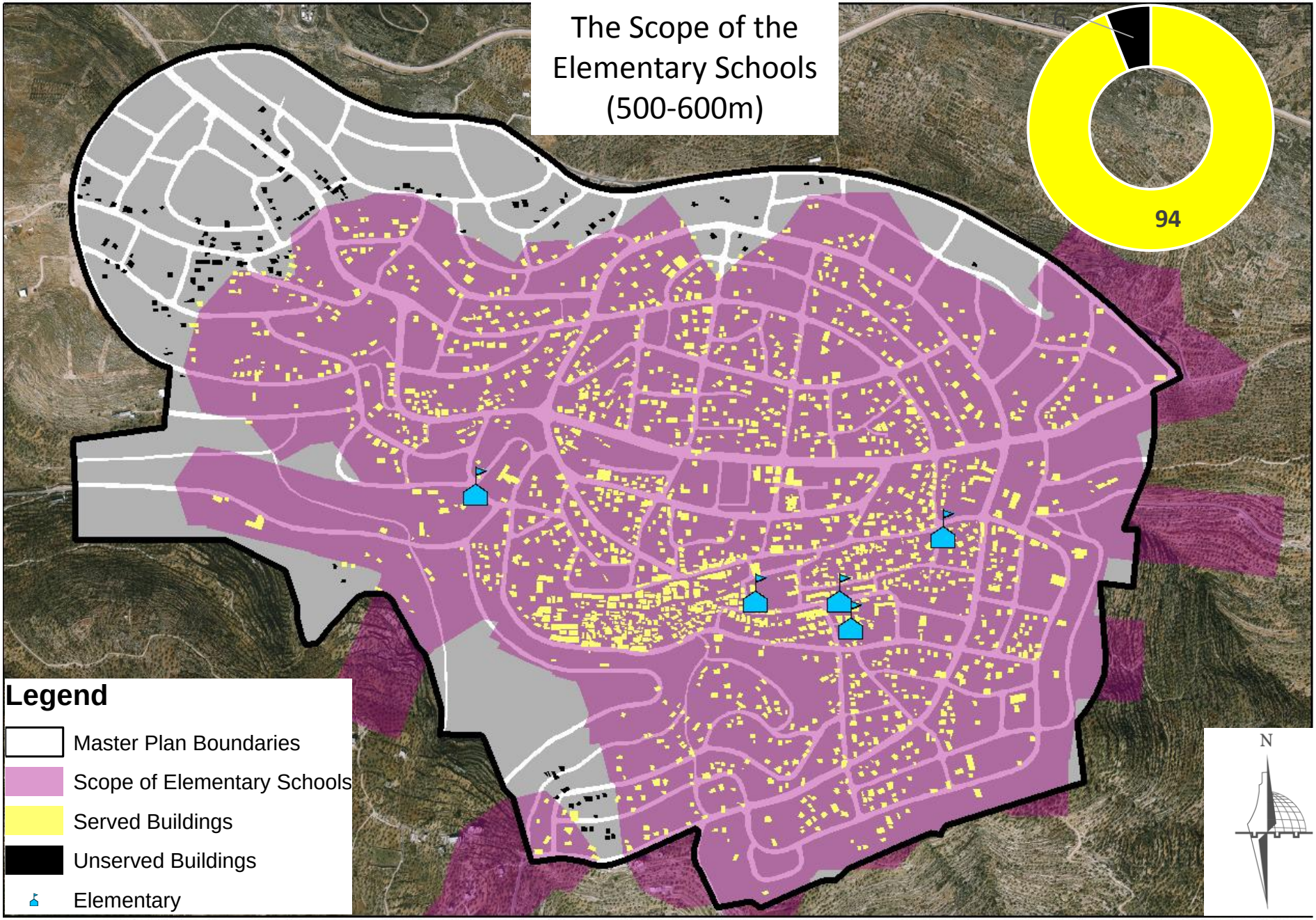
Connectivity gives an indicator to what extent the street are connected with high relation between them which eases the movement. High values of Connectivity = Good Accessibility

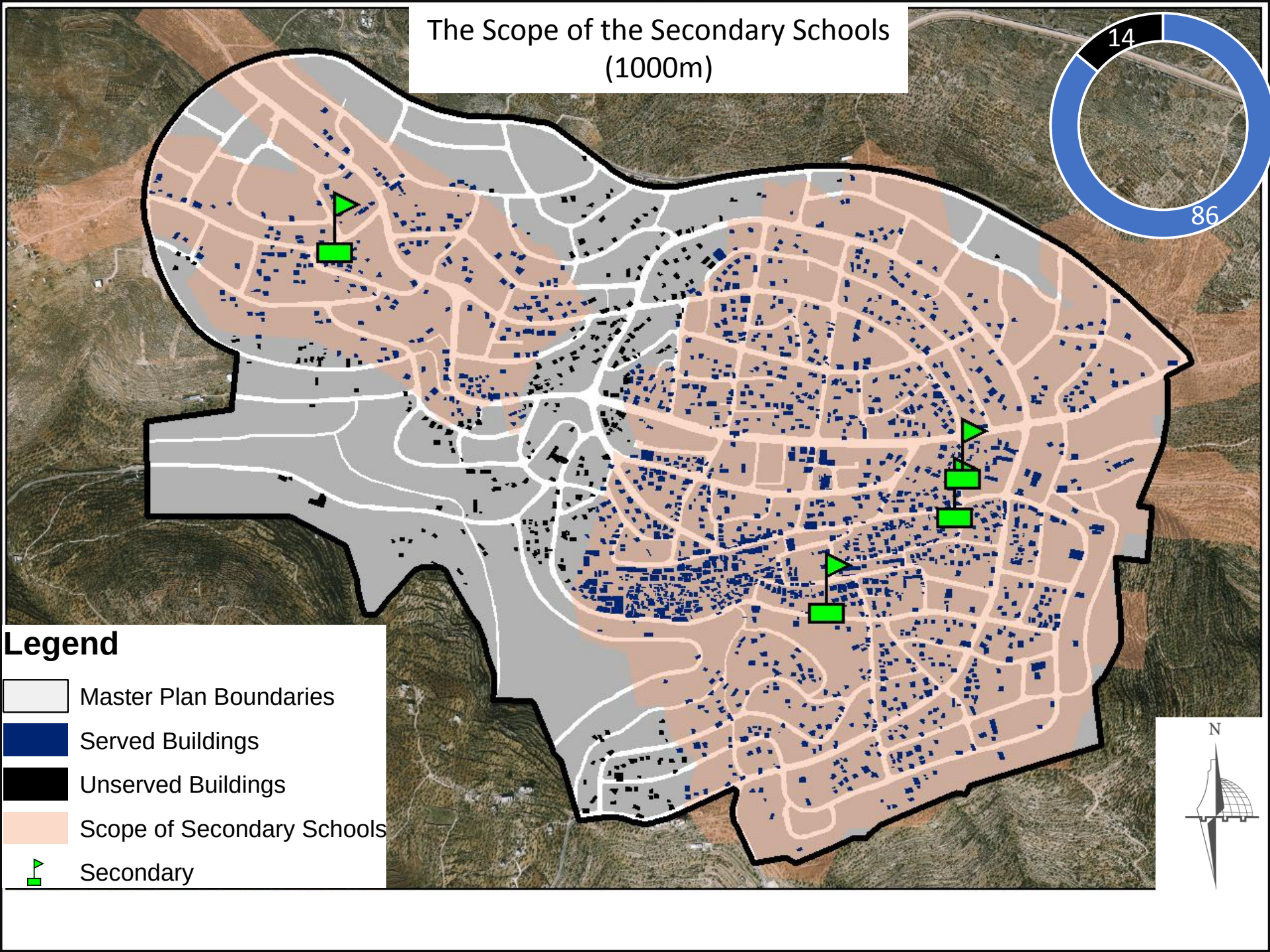

Transportation & Infrastructure
"Walkability"
Slope
N
❖ Balance Development
❖ Create Compact Cities
Legend
0 - 2.126801121
2.126801122 - 4.84438033
4.844380331 - 7.089337068
7.089337069 - 9.452449425
9.452449426 - 12.05187302
12.05187303 - 15.00576346
15.00576347 - 18.07780952
18.07780953 - 20.91354435
20.91354436 - 30.12968254

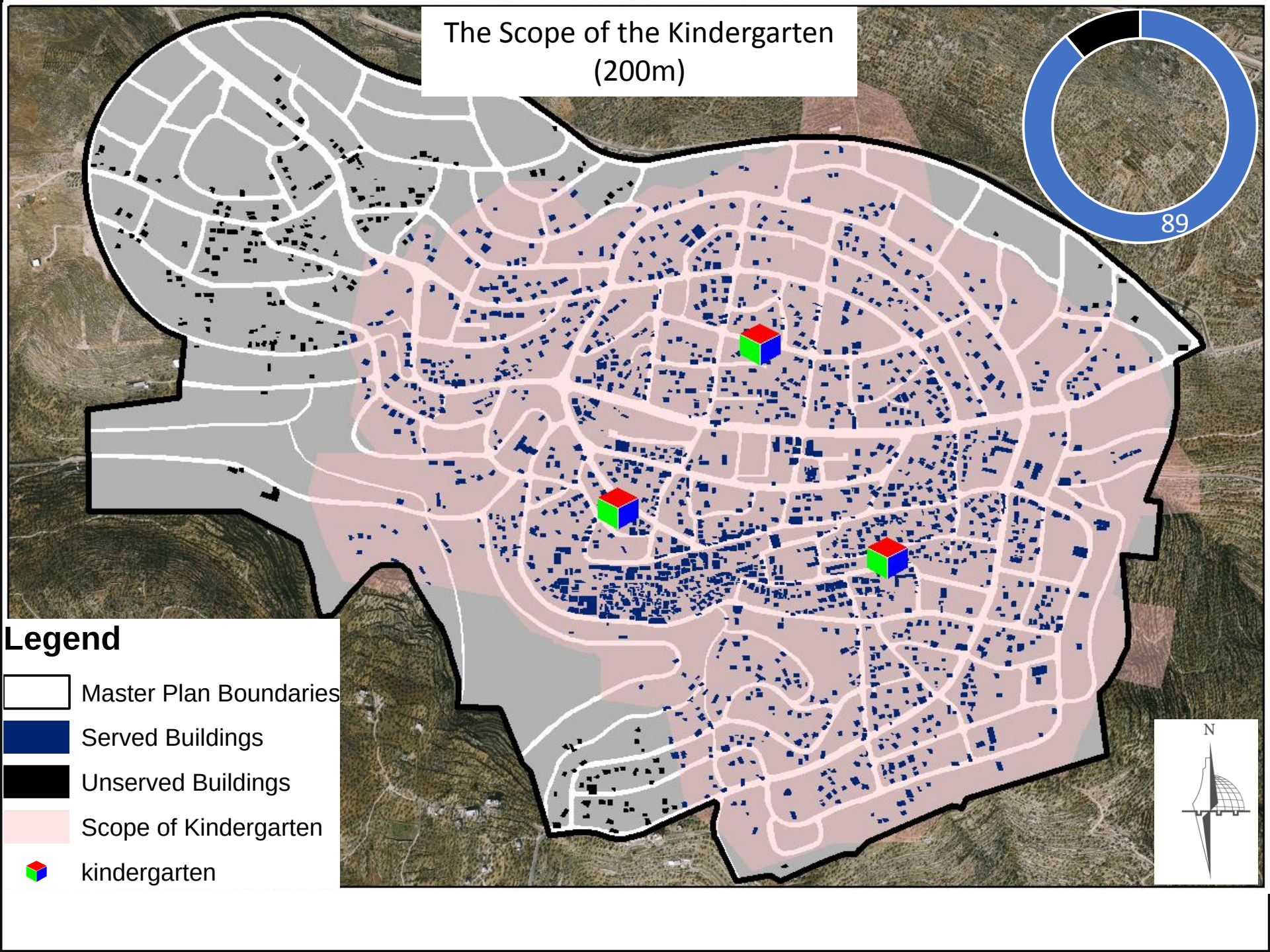
Transportation & Infrastructure
"Problems in Infrastructure"

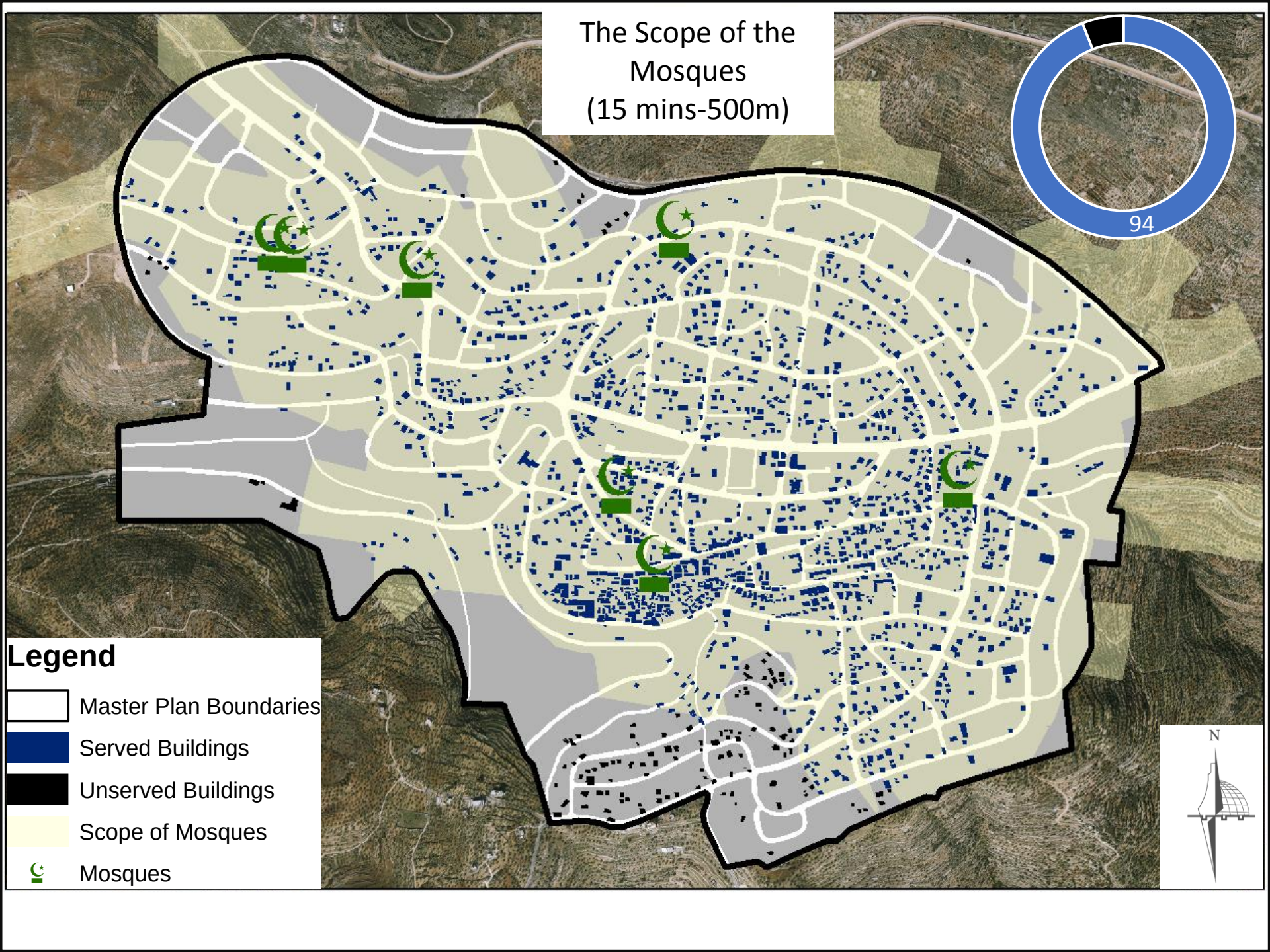


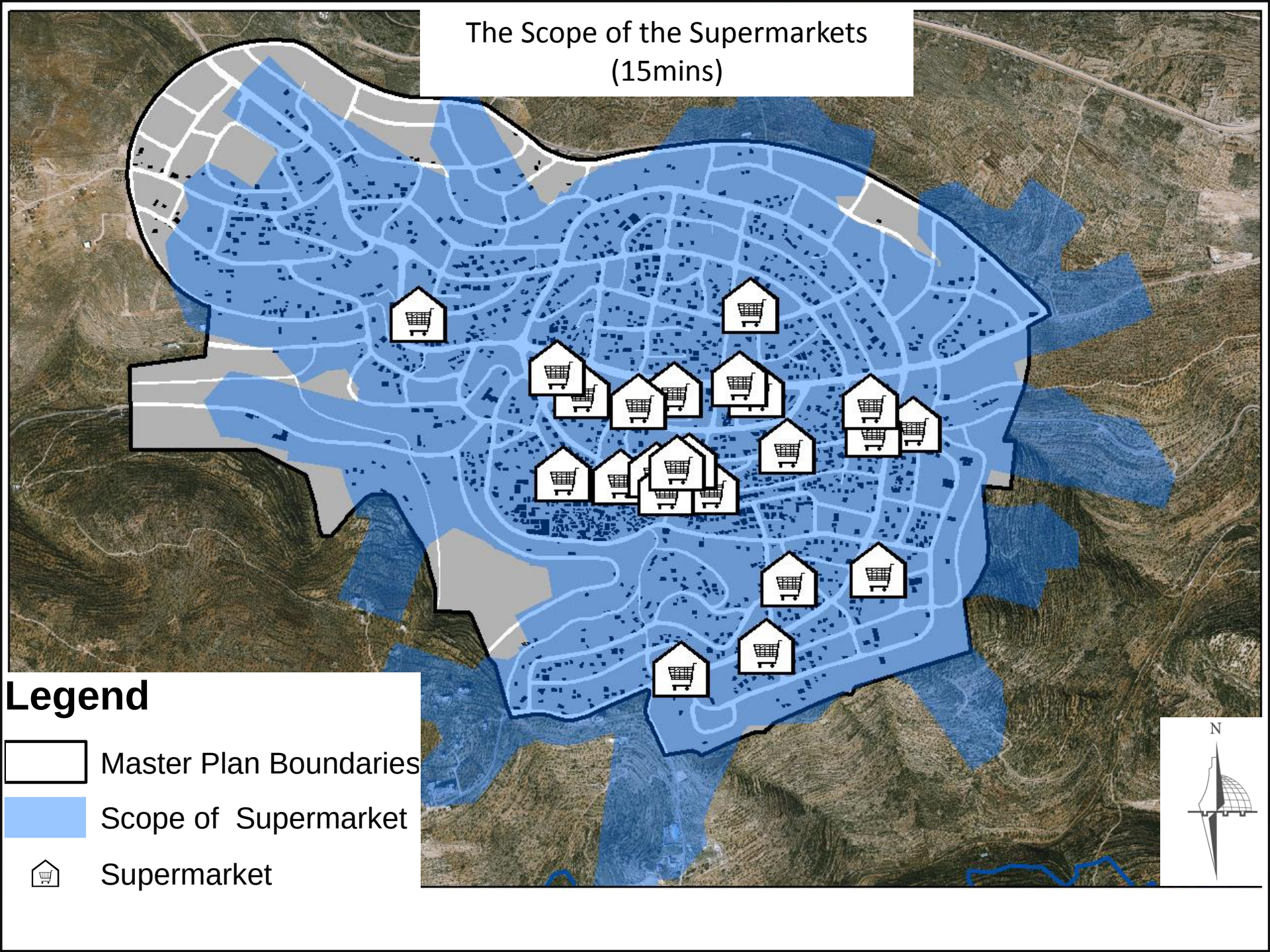

Transportation & Infrastructure
"Accessibility to Services"
N
Legend
Master Plan Boundaries
Roads
Services
Clinic
Directorate of Health
Hospital
Al-Quds University
Red Crescent Ambulance
Directorate of Education
Police Station
Football Station
Park
Taxi's Office
❖ Balance Development
❖ Create Compact Cities
❖ Promote Social Justice and Equity

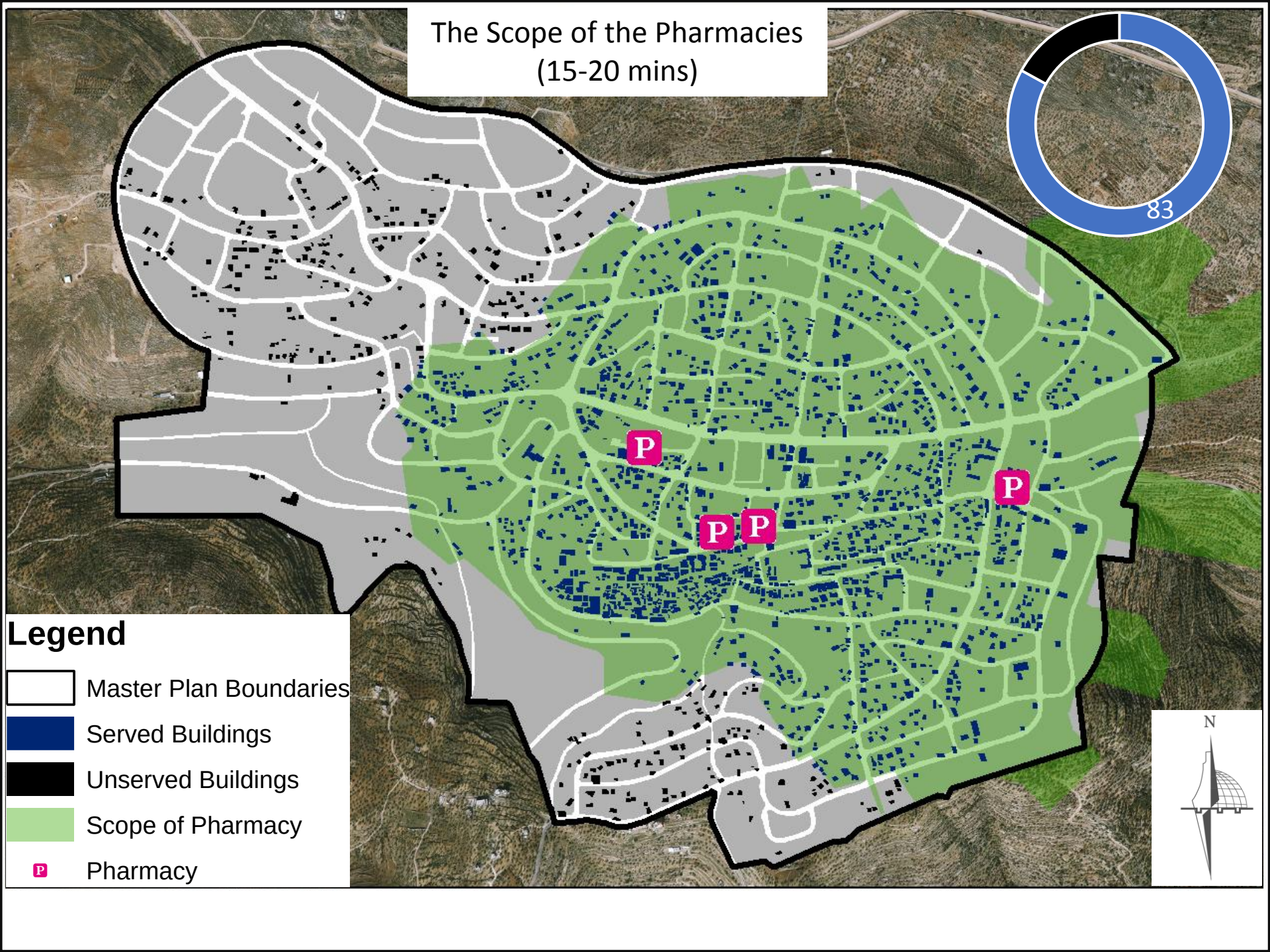

The Scope of the Elementary Schools (500-600m)
94
Legend
Master Plan Boundaries
Scope of Elementary Schools
Served Buildings
Unserved Buildings
Elementary
N

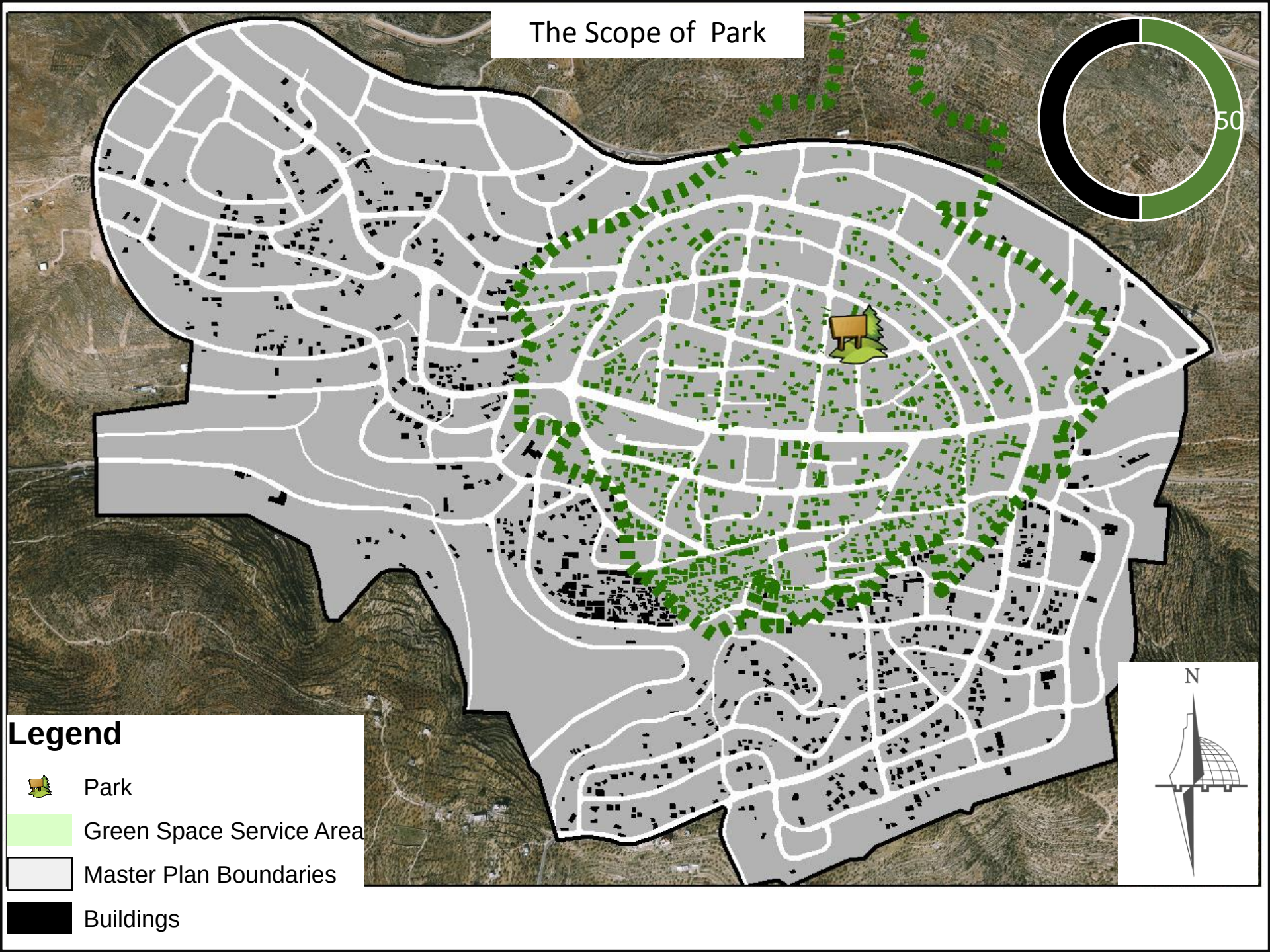

The Scope of the Secondary Schools
(1000m)
14
86
Legend
Master Plan Boundaries
Served Buildings
Unserved Buildings
Scope of Secondary Schools
Secondary
N


The Scope of the Kindergarten (200m)
89
Legend
Master Plan Boundaries
Served Buildings
Unserved Buildings
Scope of Kindergarten
kindergarten
N

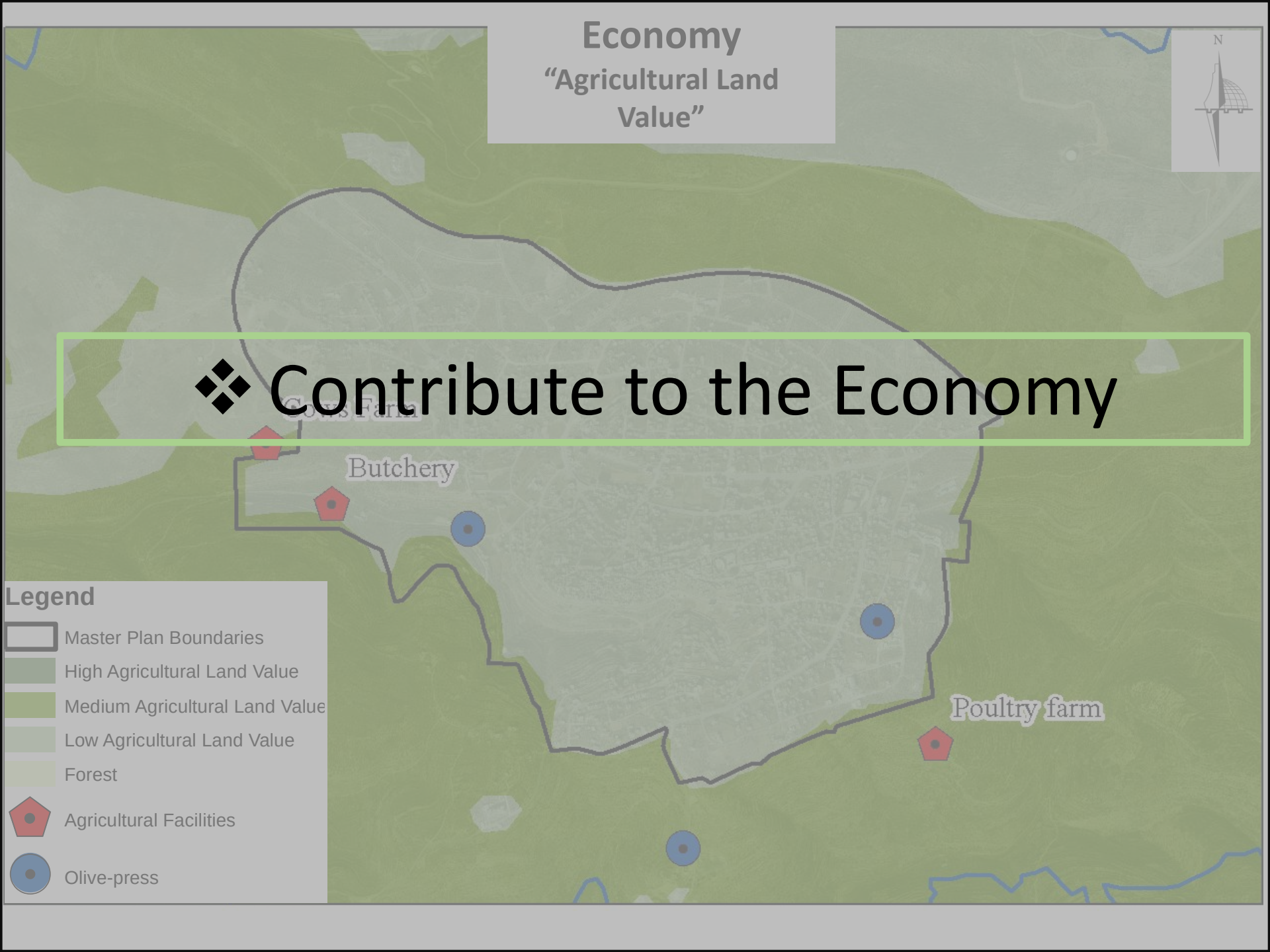

The Scope of the Mosques (15 mins-500m)
94
Legend
Master Plan Boundaries
Served Buildings
Unserved Buildings
Scope of Mosques
Mosques
N


The Scope of the Supermarkets
(15mins)
Legend
Master Plan Boundaries
Scope of Supermarket
Supermarket
N

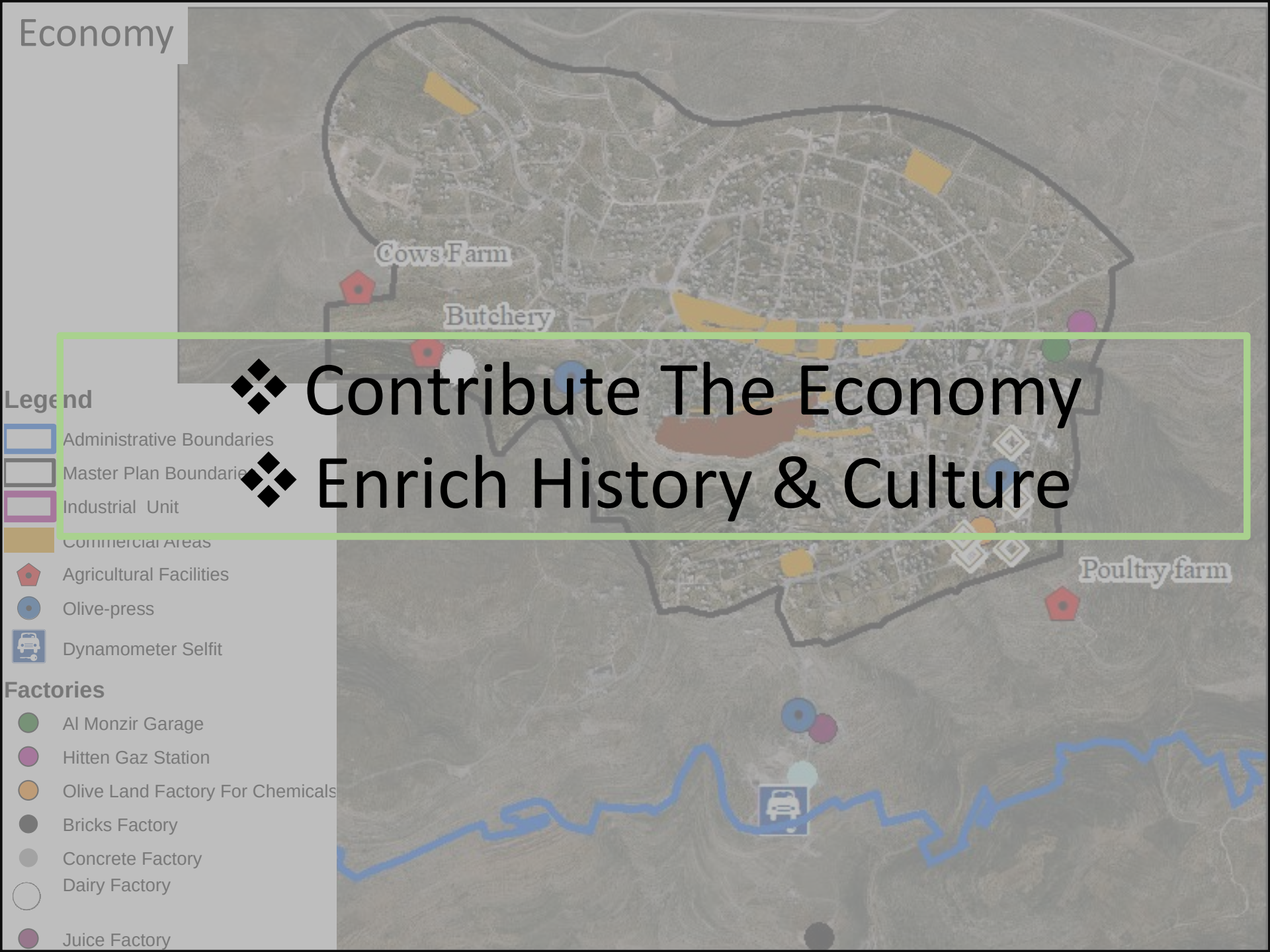

The Scope of the Pharmacies
(15-20 mins)
83
Legend
Master Plan Boundaries
Served Buildings
Unserved Buildings
Scope of Pharmacy
Pharmacy
N


The Scope of Park
50
N
Legend
Park
Green Space Service Area
Master Plan Boundaries
Buildings

Socio-Economy


Economy
"Agricultural Land Value"
N
Contribute to the Economy
Butchery
Poultry farm
Legend
Master Plan Boundaries
High Agricultural Land Value
Medium Agricultural Land Value
Low Agricultural Land Value
Forest
Agricultural Facilities
Olive-press

Economy



- Contribute The Economy
- Enrich History & Culture

Economy

"Agricultural Land Loss"

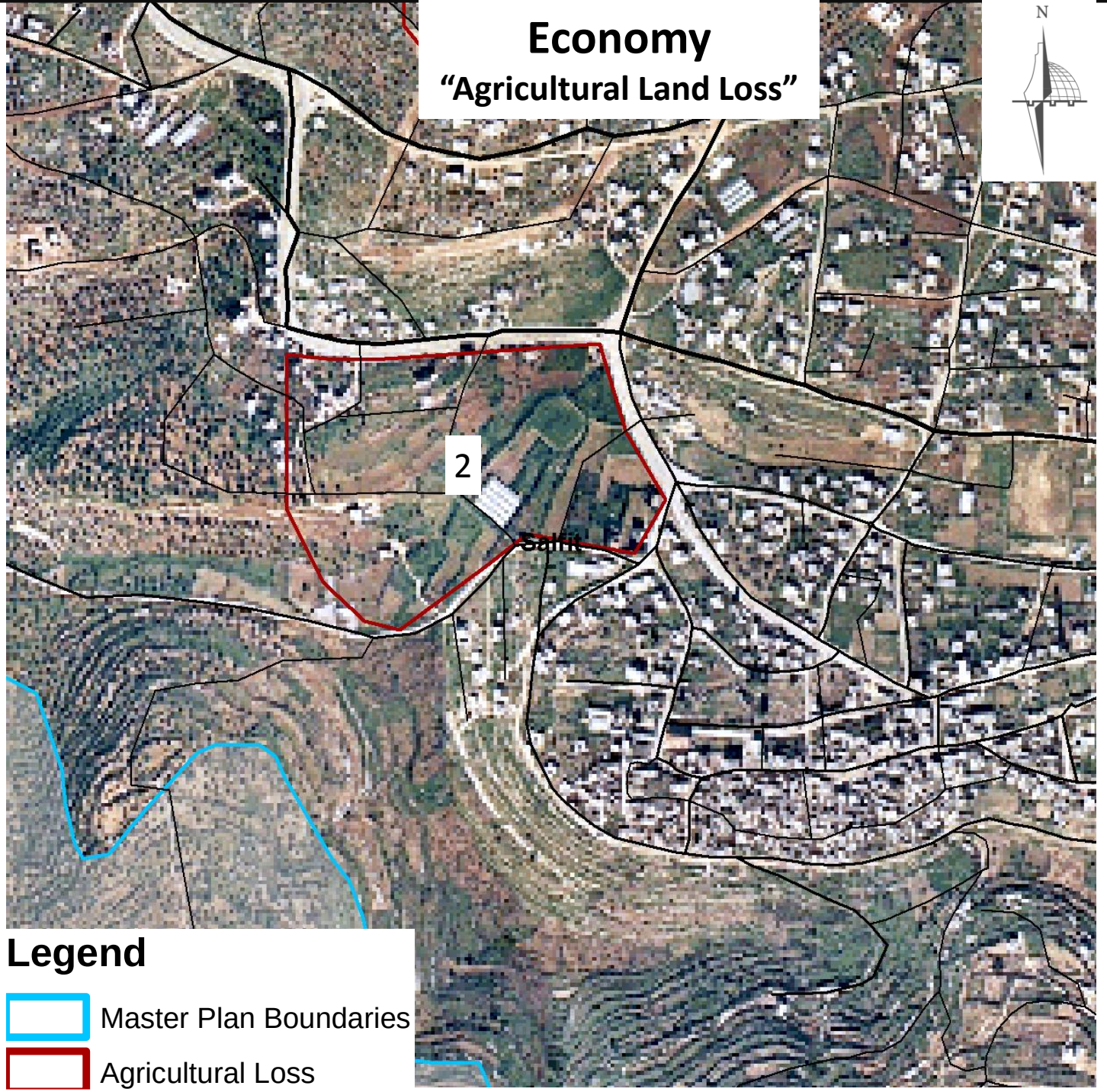
ID	Area (Meters Square)
0	25065
1	2392
2	101773
3	2072
4	27946
5	17977
6	209110
Total	436002

- Contribute to the Economy
- Restore Degraded Land

Economy

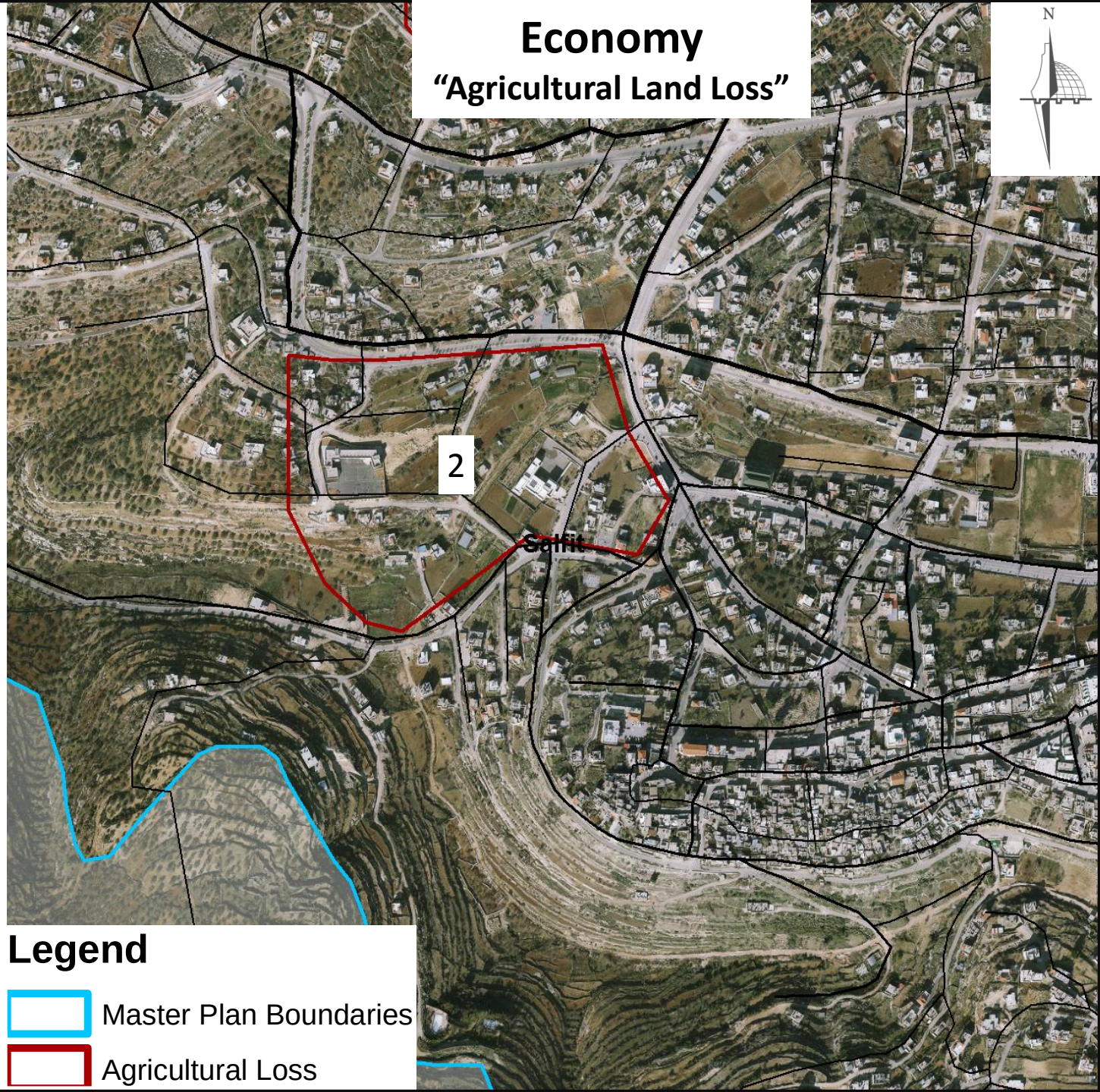
"Agricultural Land Loss"

ID	Area (Meters Square)
2	101773



Economy

"Agricultural Land Loss"

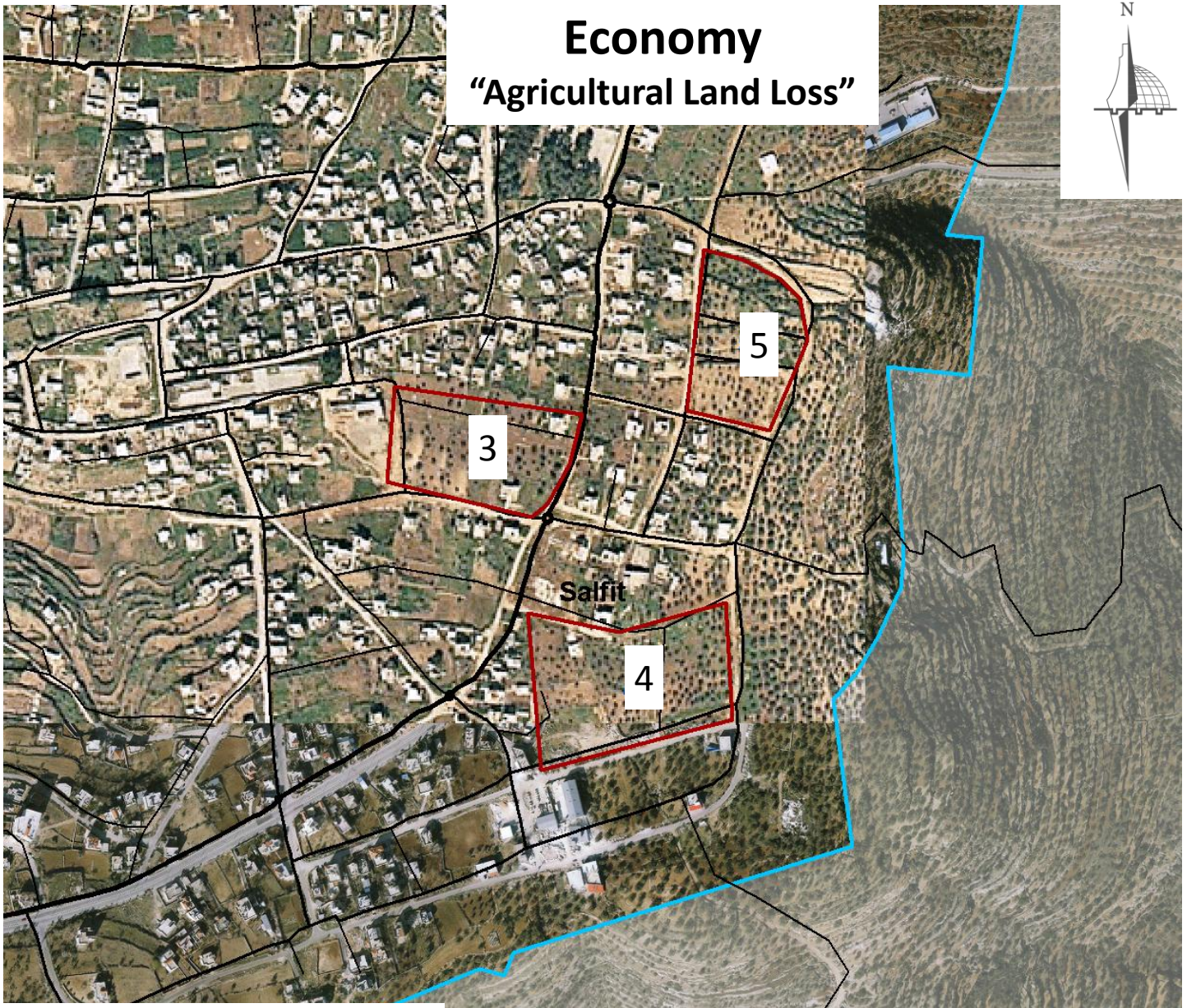


ID	Area (Meters Square)
2	101773

Economy

"Agricultural Land Loss"

ID	Area (Meters Square)
3	20739
4	27946
5	17977



Legend

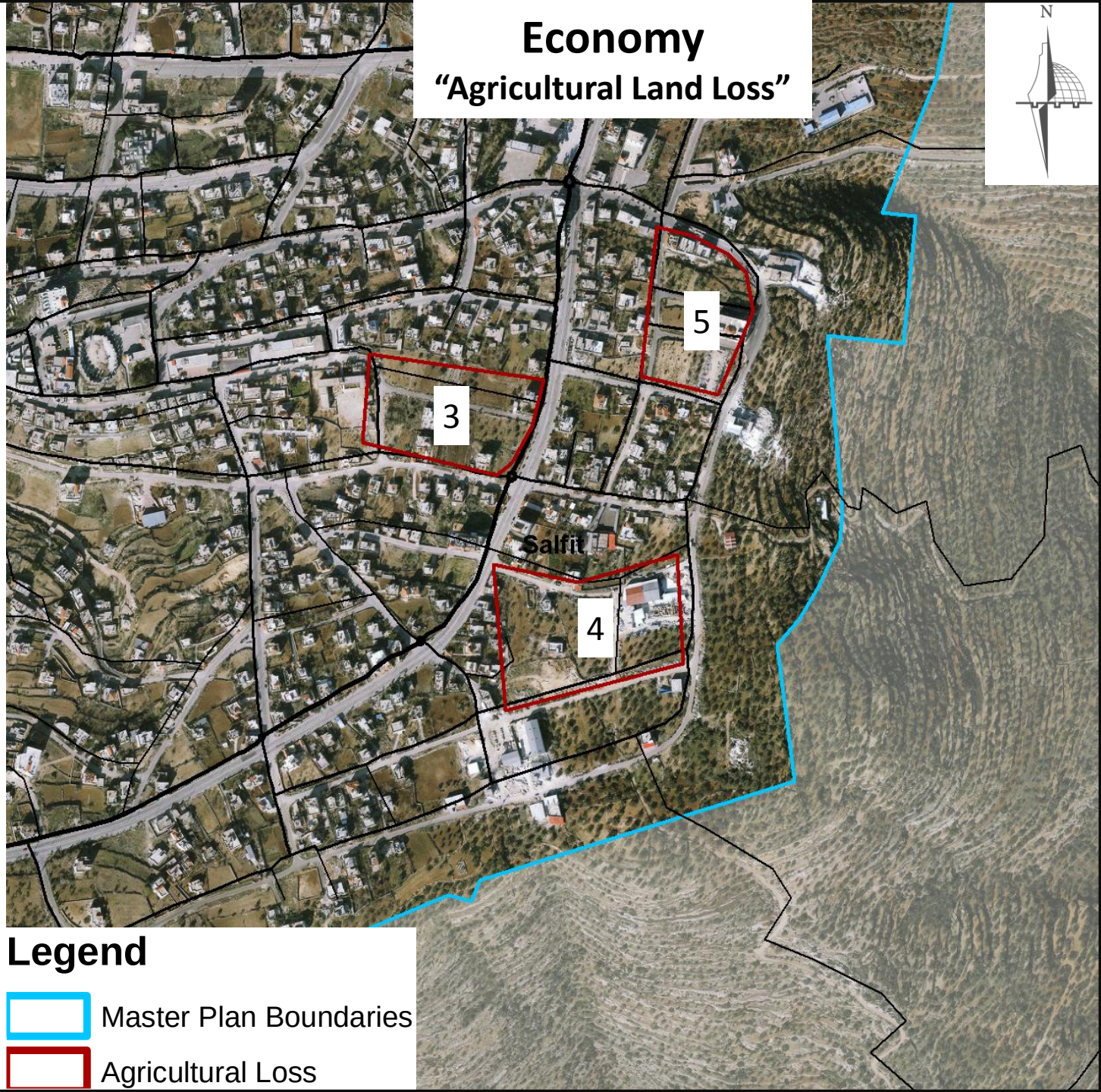
Master Plan Boundaries

Agricultural Loss

Economy

“Agricultural Land Loss”

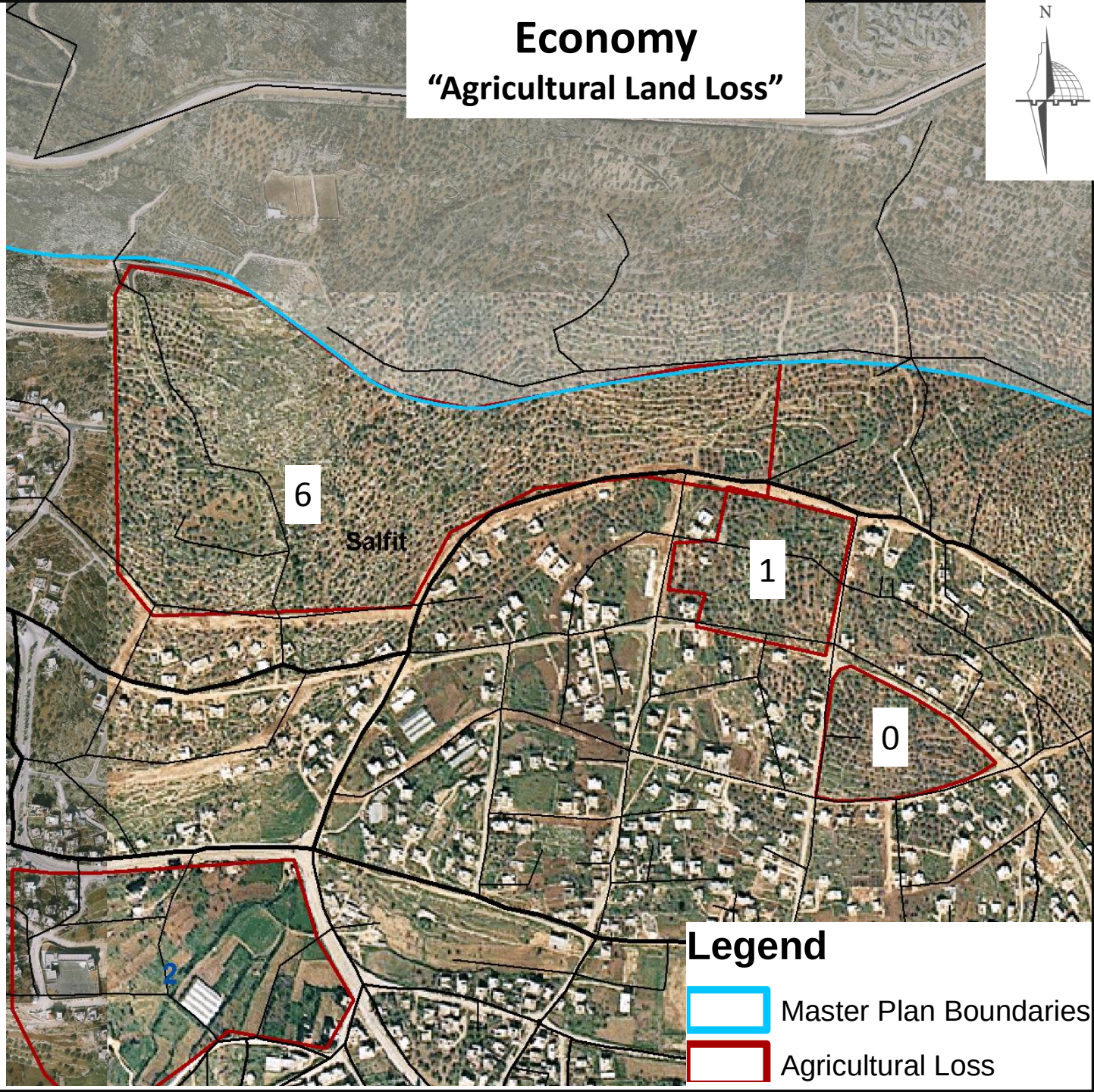
ID	Area (Meters Square)
3	20739
4	27946
5	17977



Economy

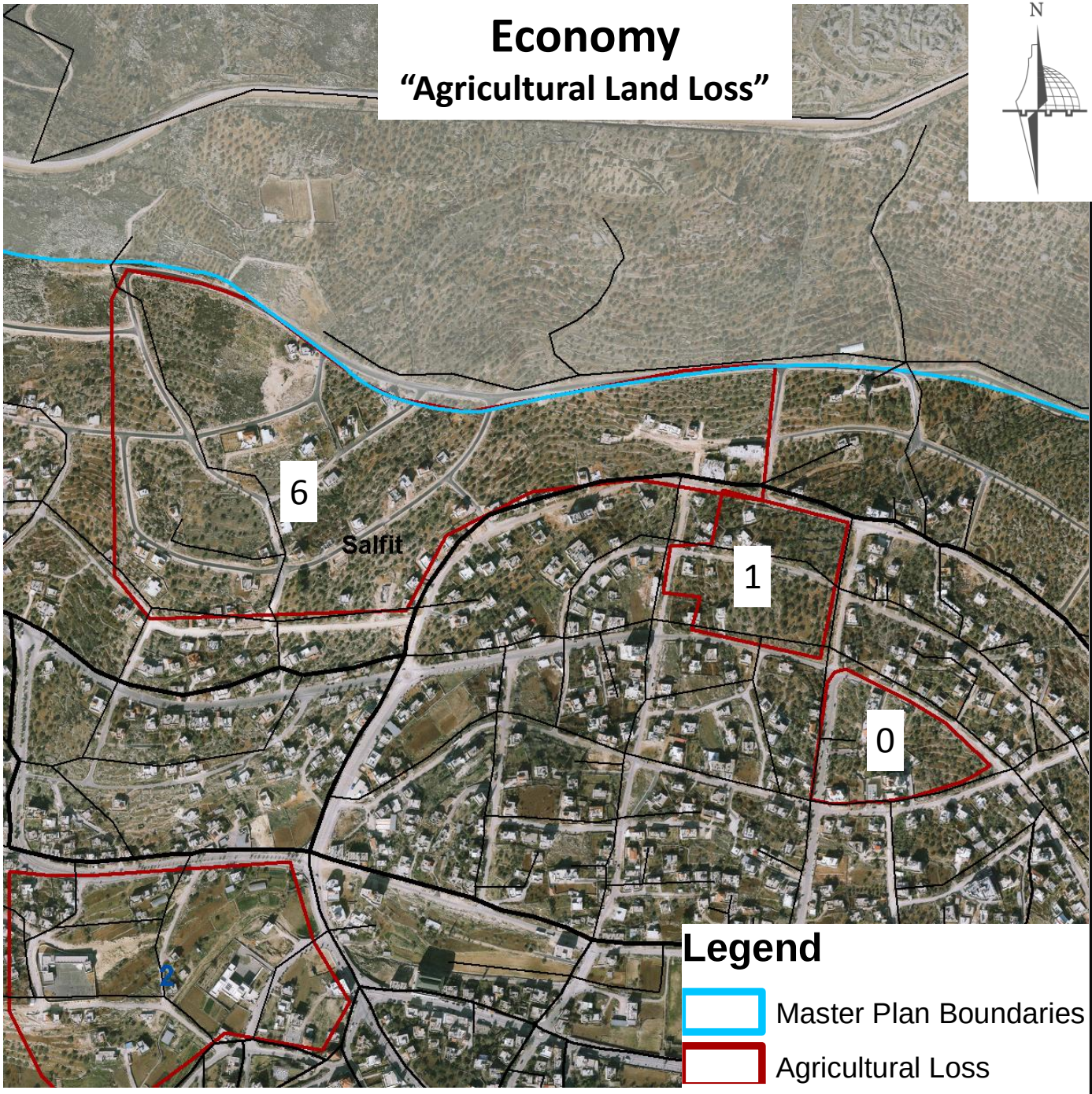
"Agricultural Land Loss"

ID	Area (Meters Square)
0	25065
1	33392
6	209110



Economy

"Agricultural Land Loss"



ID	Area (Meters Square)
0	25065
1	33392
6	209110

Economy

"Industrial Area"

- Contribute to The Economy
- Provide Health & Security

Legend

- Master Plan Boundaries
- Industrial Unit
- Buildings
- Buildings in Industrial Area

Factories

- Al Monzir Garage
- Hitten Gaz Station
- Olive Land Factory For Chemicals
- crasher stones

1:6500

Methodology

Macro-Scale

Set-up The Criteria on the Macro-Scale

Examine the Ecological potential in the three regions

Select the region With the Highest Potential

Site Selection

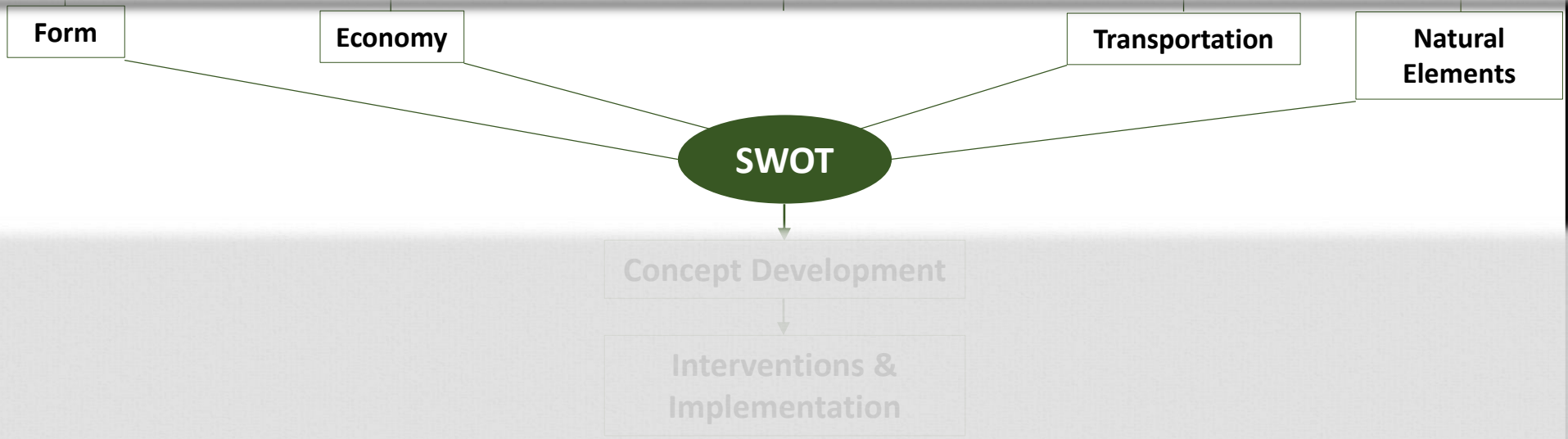
Micro-Scale

Set-up The Criteria on the Micro-Scale

Examine the potential in the Cities

Select the city with the highest potential

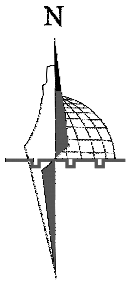
Site Analysis



Concept Development

Interventions & Implementation

Form Weaknesses & Threats



*Why Doesn't Selfit Maintain its form?

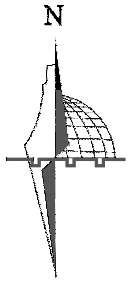
Legend

- Master Plan Boundaries in 1945
- Master Plan Boundaries in 1976
- Current Master Plan boundaries

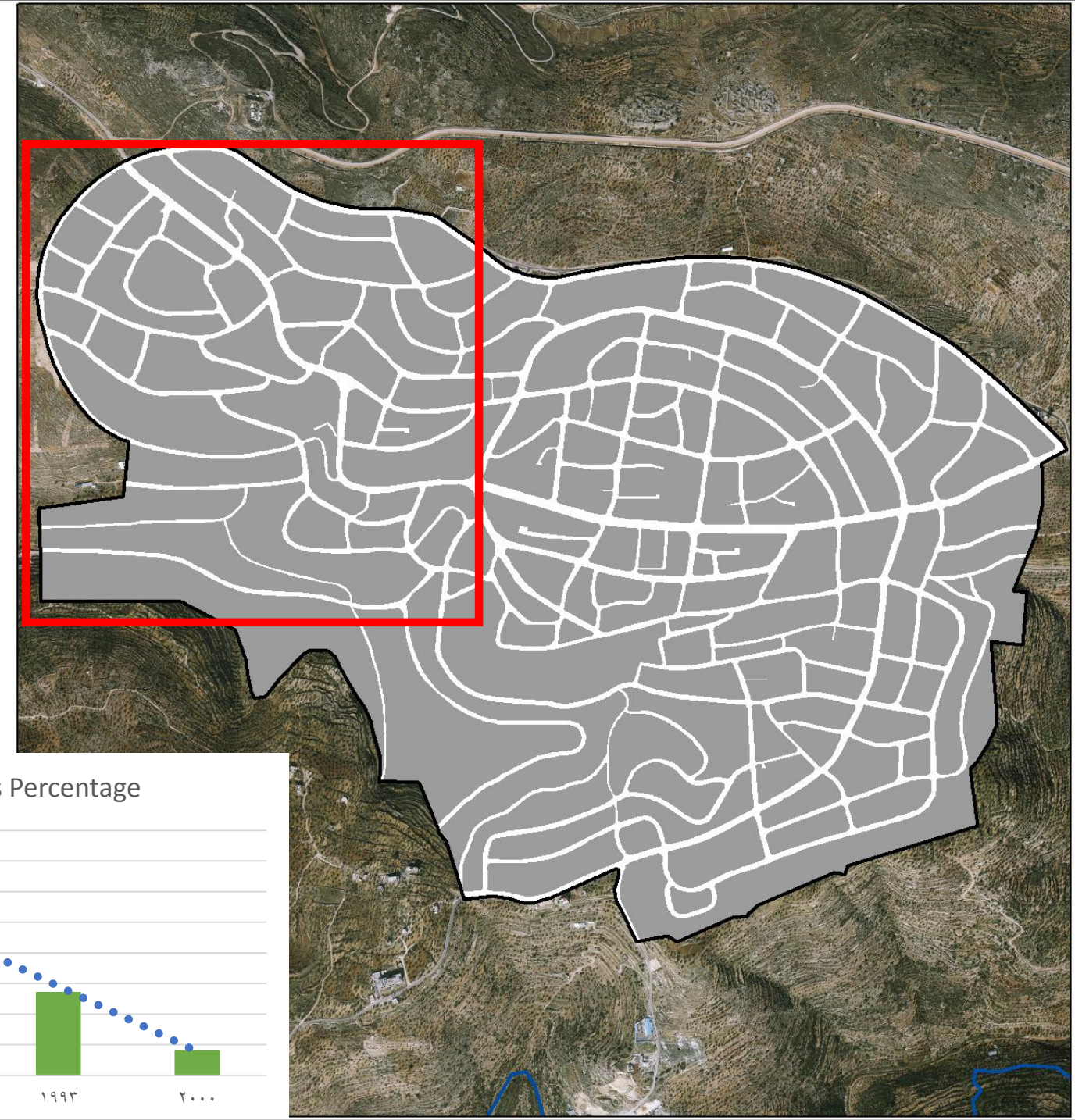
Geo-political Classification

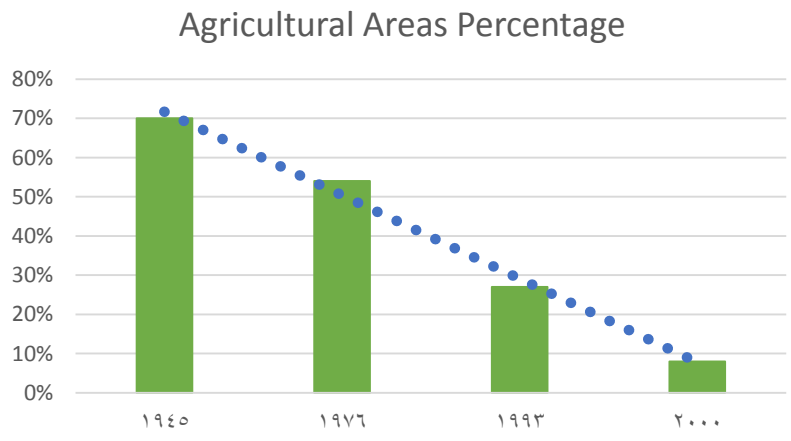
- Area B
- Area C
- Colonies
- Biodiversity
- Contour lines

Form Weaknesses & Threats

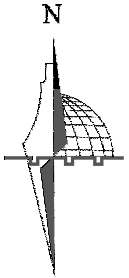


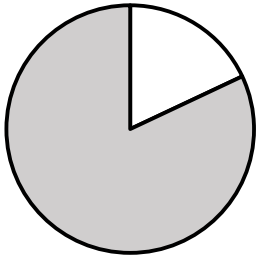
No Clear Street Pattern with unreadable form of Blocks





Form Strength & Opportunities

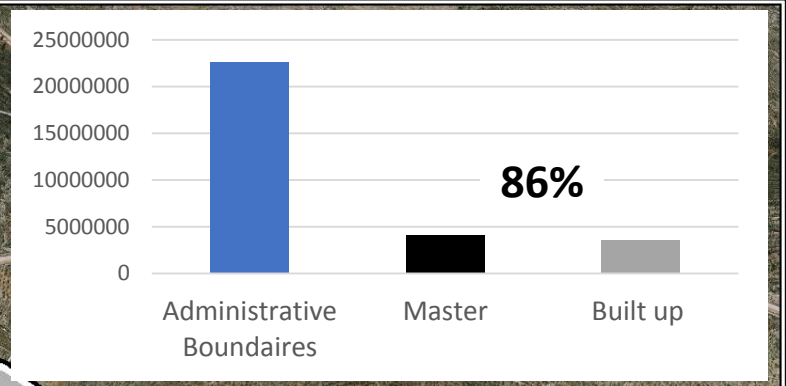




Roads other uses

Density = Population/Area
= 36 Person/km Square

Clear Street Pattern and Blocks

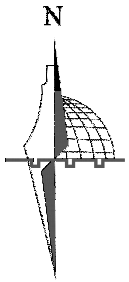


Legend

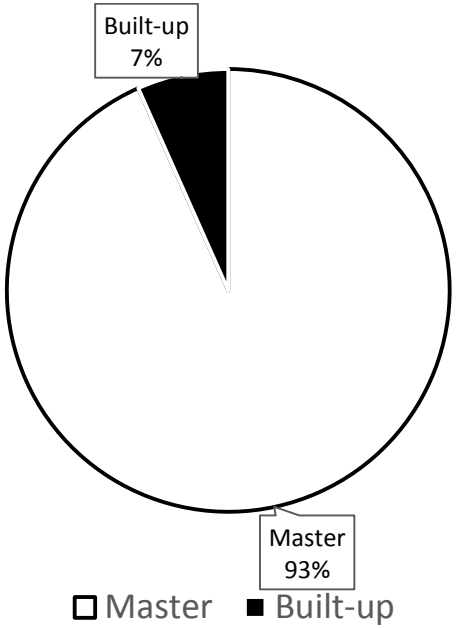
Built up area

Master Plan Boundaries

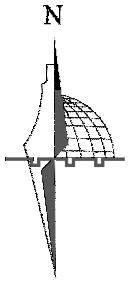
Form Strength & Opportunities



Open Spaces



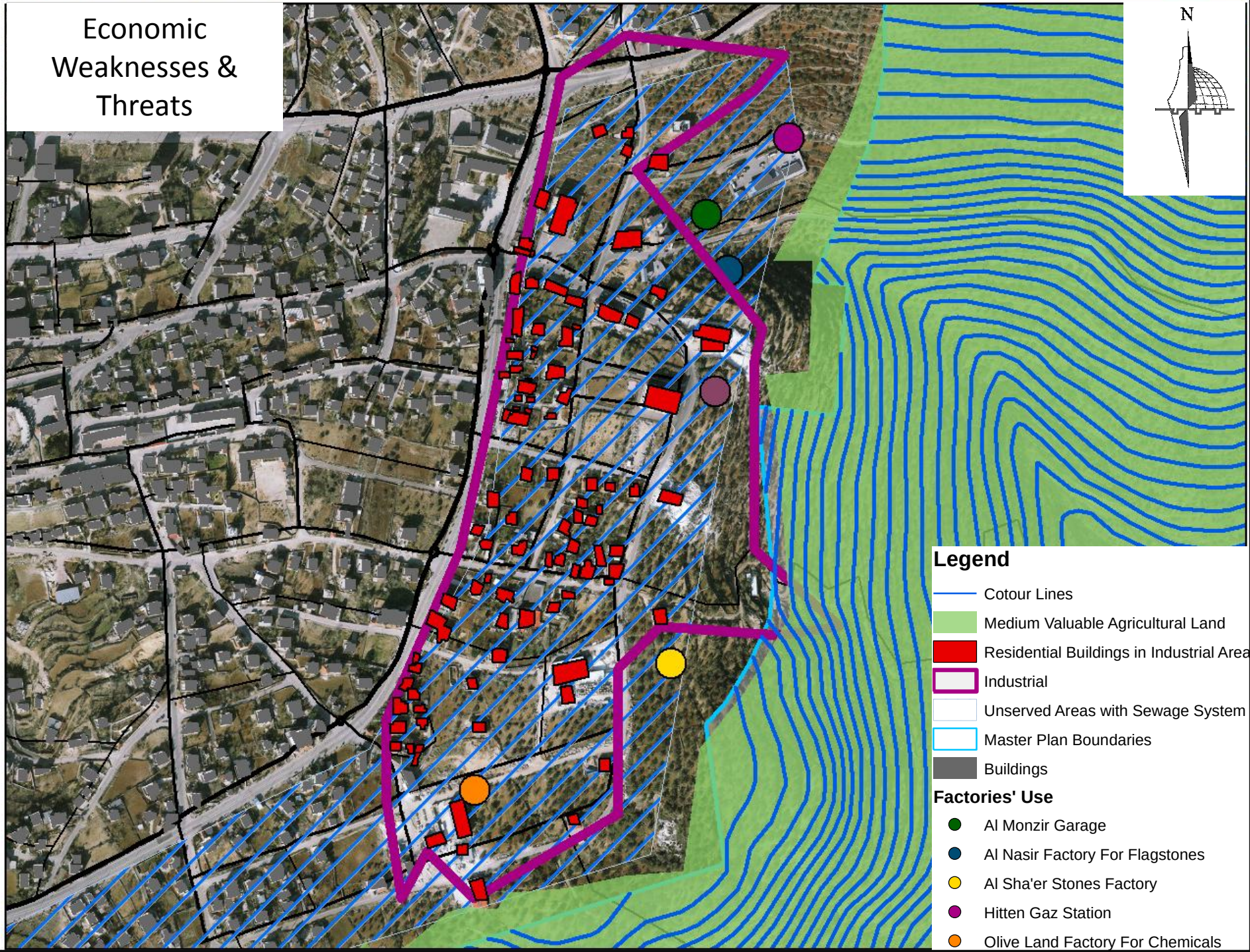
Socio-Economic Weaknesses & Threats



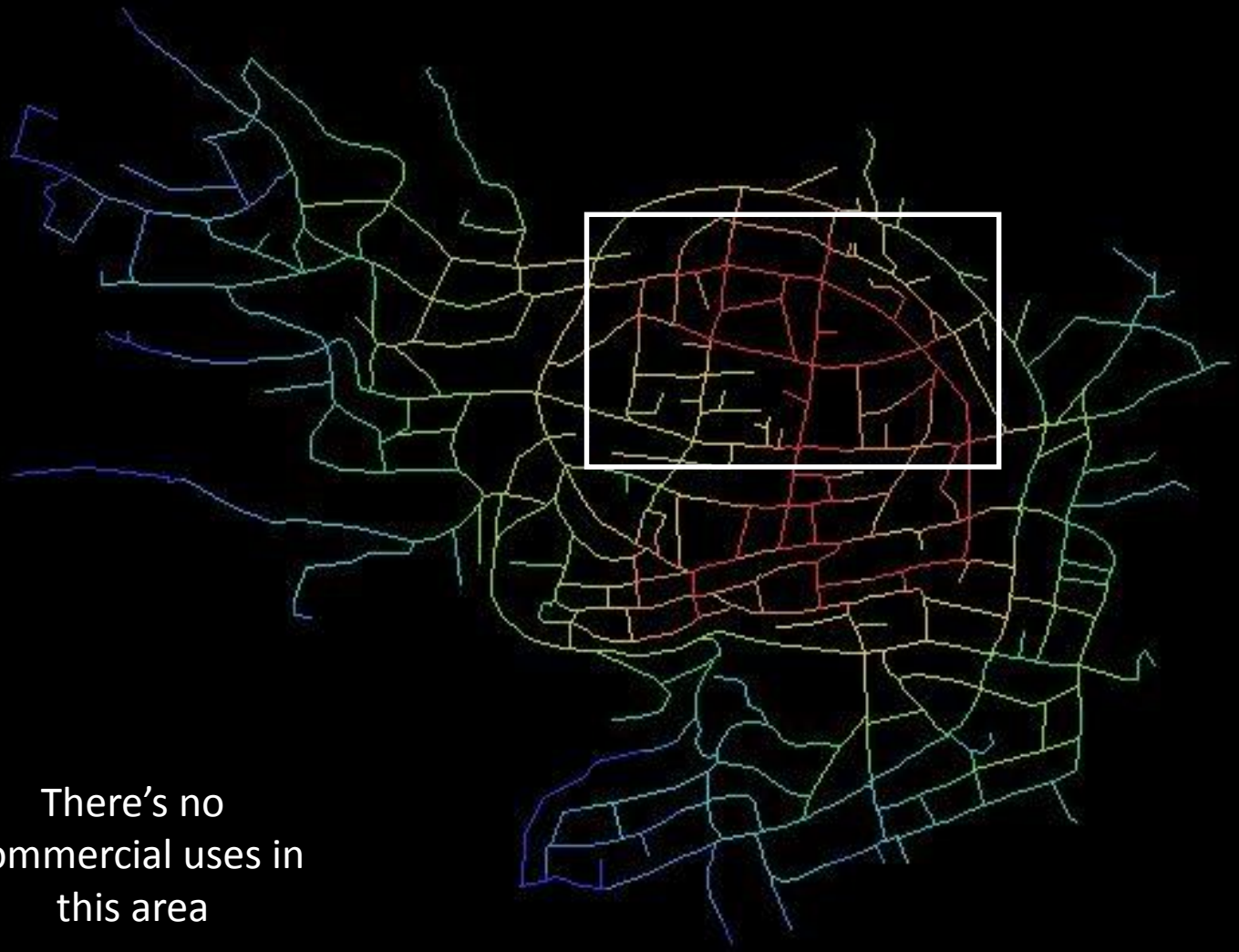
Legend

- Master Plan Boundaries
- Bad condition of "Down Town"
- Industrial Zone
- Agricultural Land Loss
- No Recreational Use
- Unexploited Agricultural Land
- Unexploited Archaeological Site

Economic Weaknesses & Threats

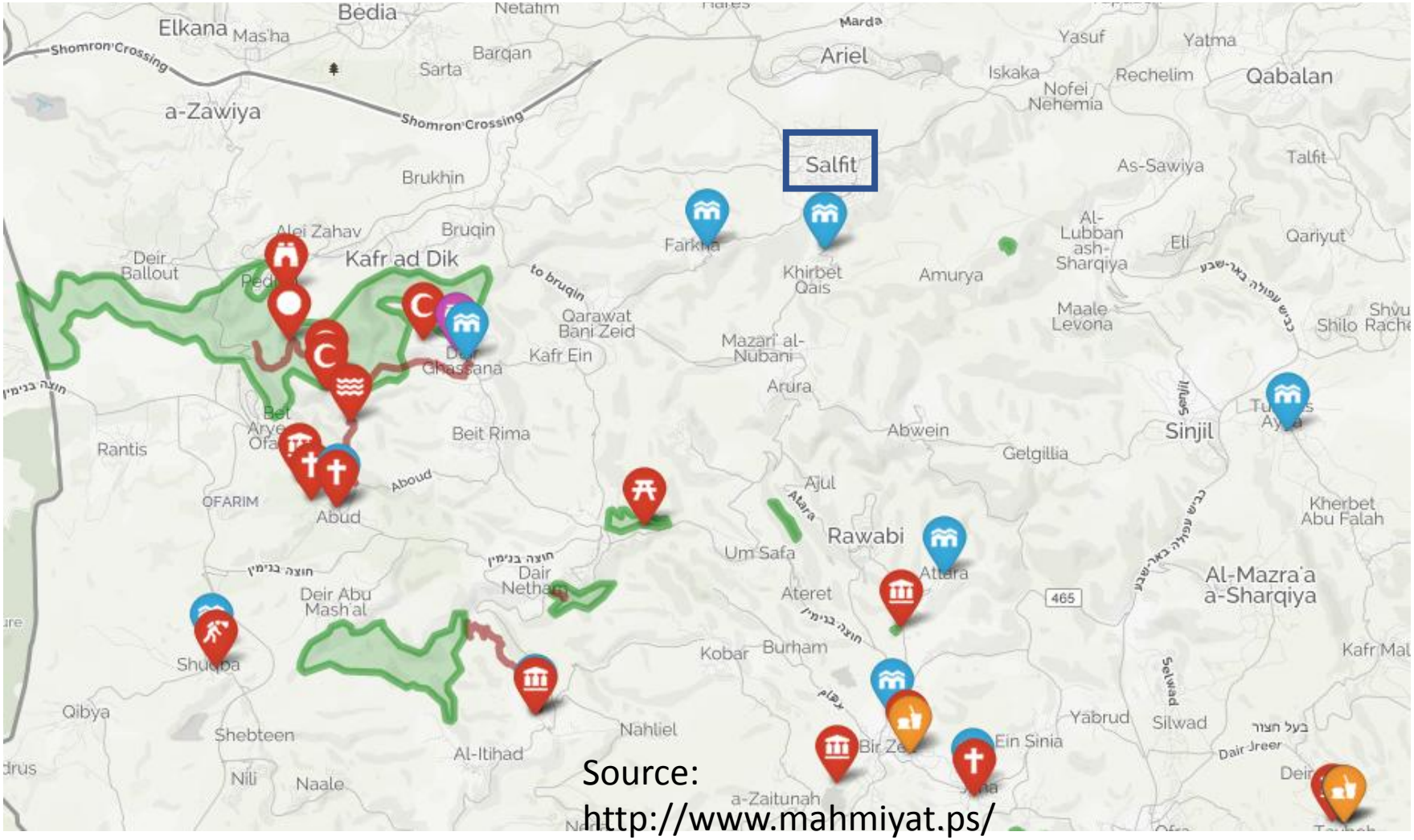


Integration



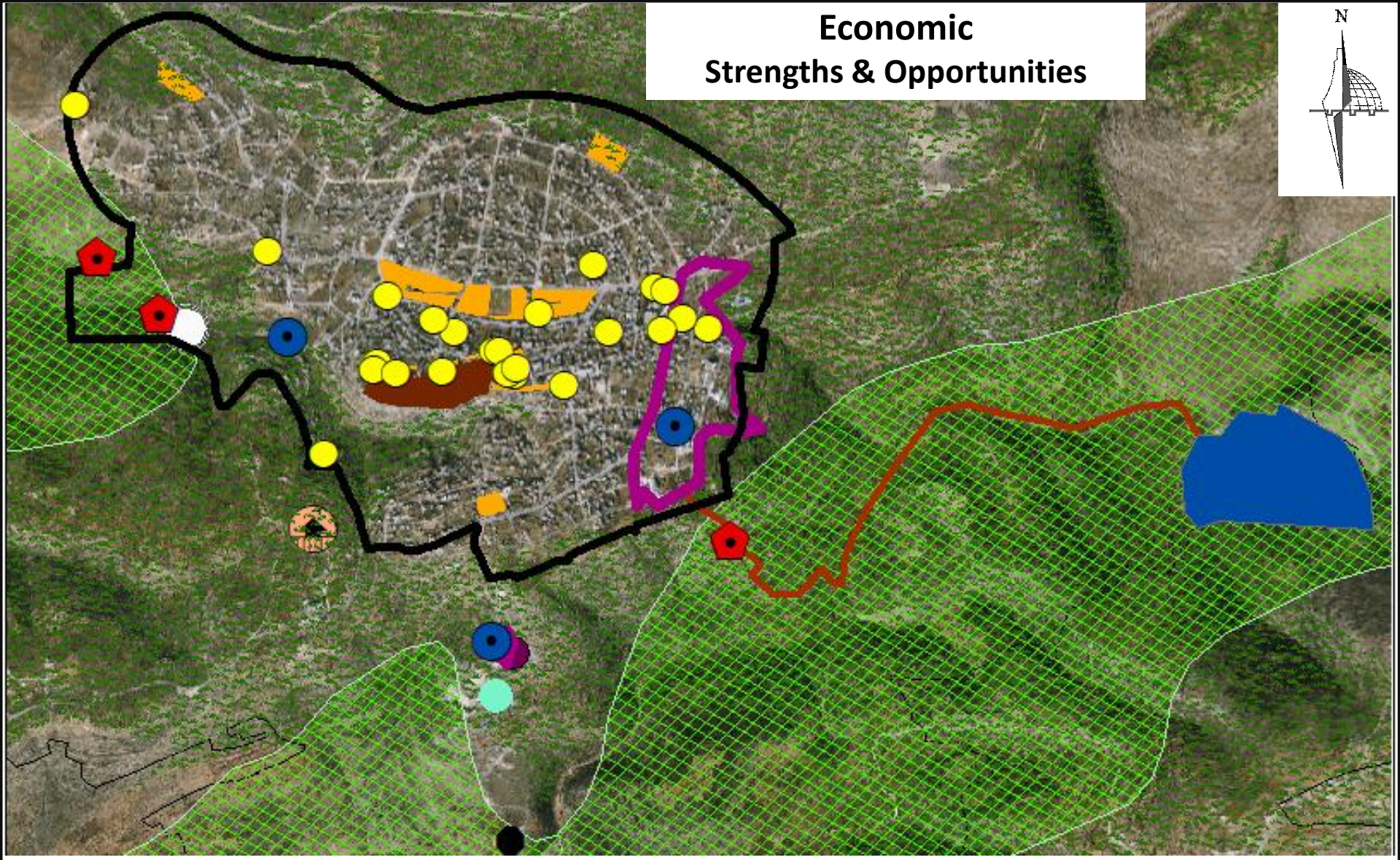
There’s no Commercial uses in this area

No Ecological Paths & Eco-Tourism in Selfit City



Source:
http://www.mahmiyat.ps/

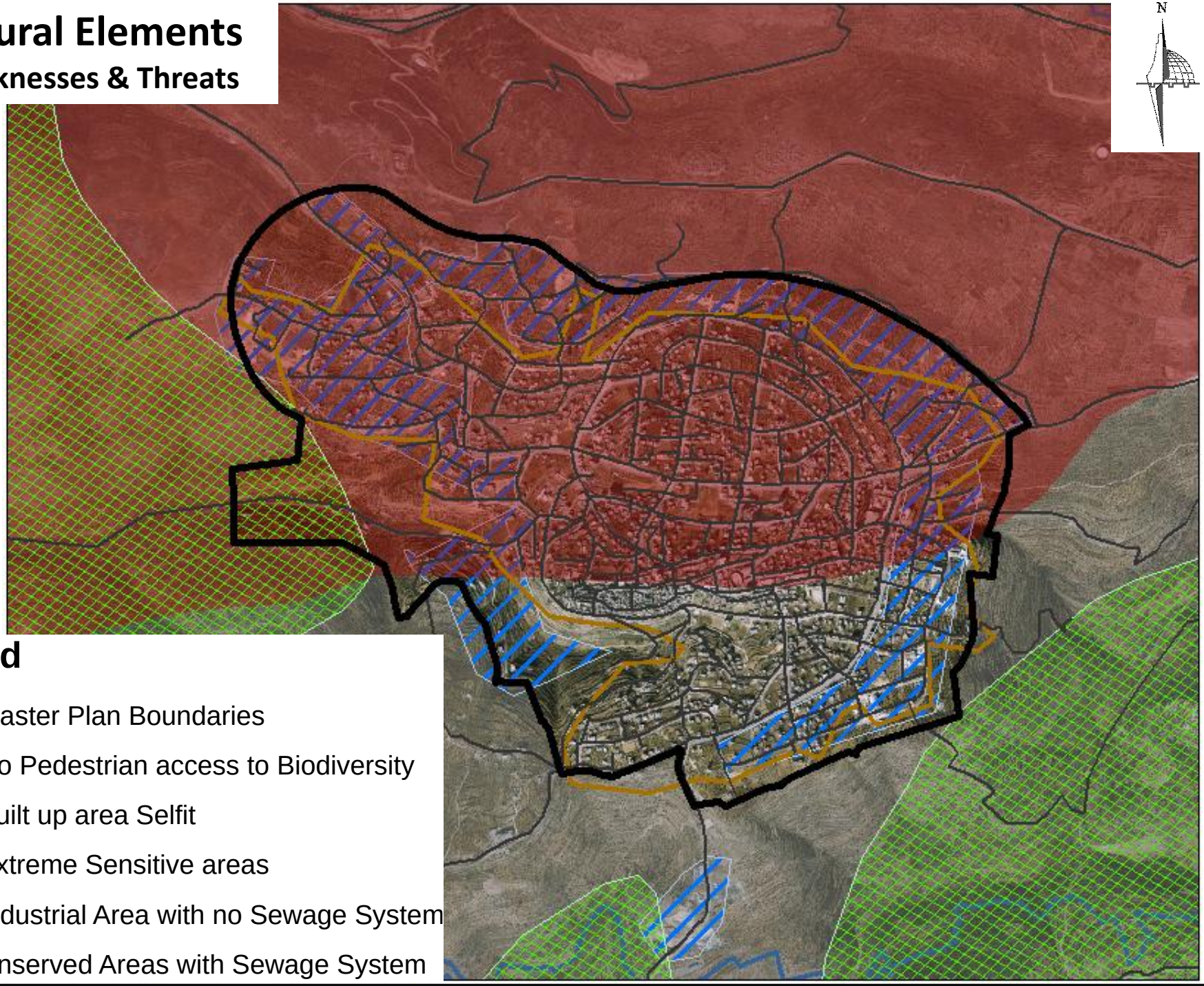
Economic
Strengths & Opportunities



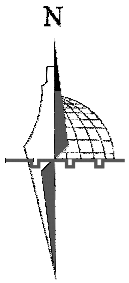
Master Plan Boundaries
Commercial Uses
Industrial Zone
Zaytona-University
Potential For Environmental Tourism
Fruit Trees & Olive Groves
Zaytoona University Street
Public Buildings (Employment Sector
Agricultural Facilities
Olive-press
Bricks Factory
Concrete Factory
Dairy Factory
Juice Factory
Special Archaeological Site

Natural Elements

Weaknesses & Threats



Natural Elements Strengths & Opportunities



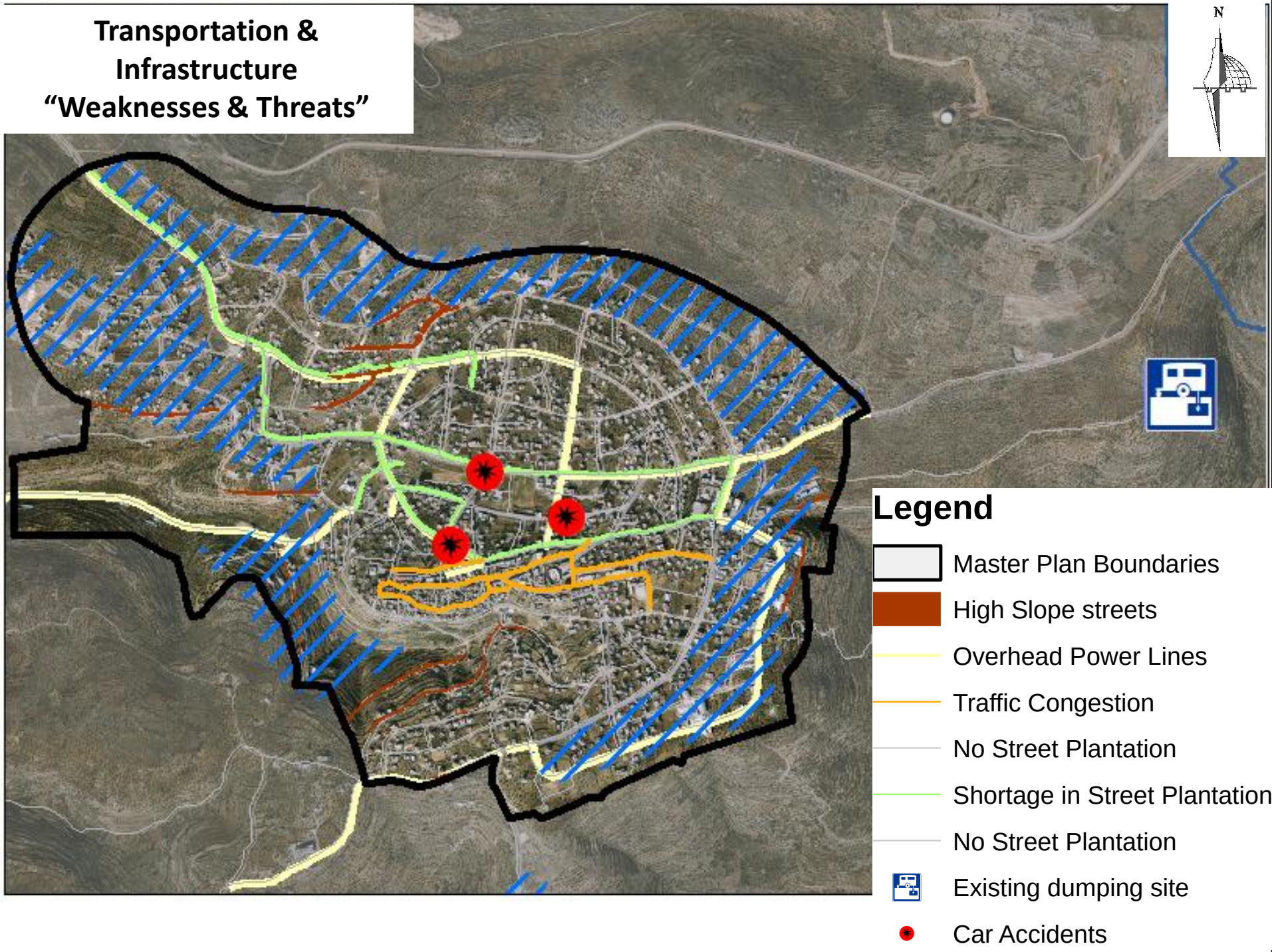
Legend

- Master Plan Boundaries
- Biodiversity
- Medium Value Agricultural land

Landcover

- Fruit Trees
- Natural Grass Land
- Olive Groves
- Soil Type: Clay
- Springs

Transportation & Infrastructure "Weaknesses & Threats"



Transportation & Infrastructure Strengths & Opportunities

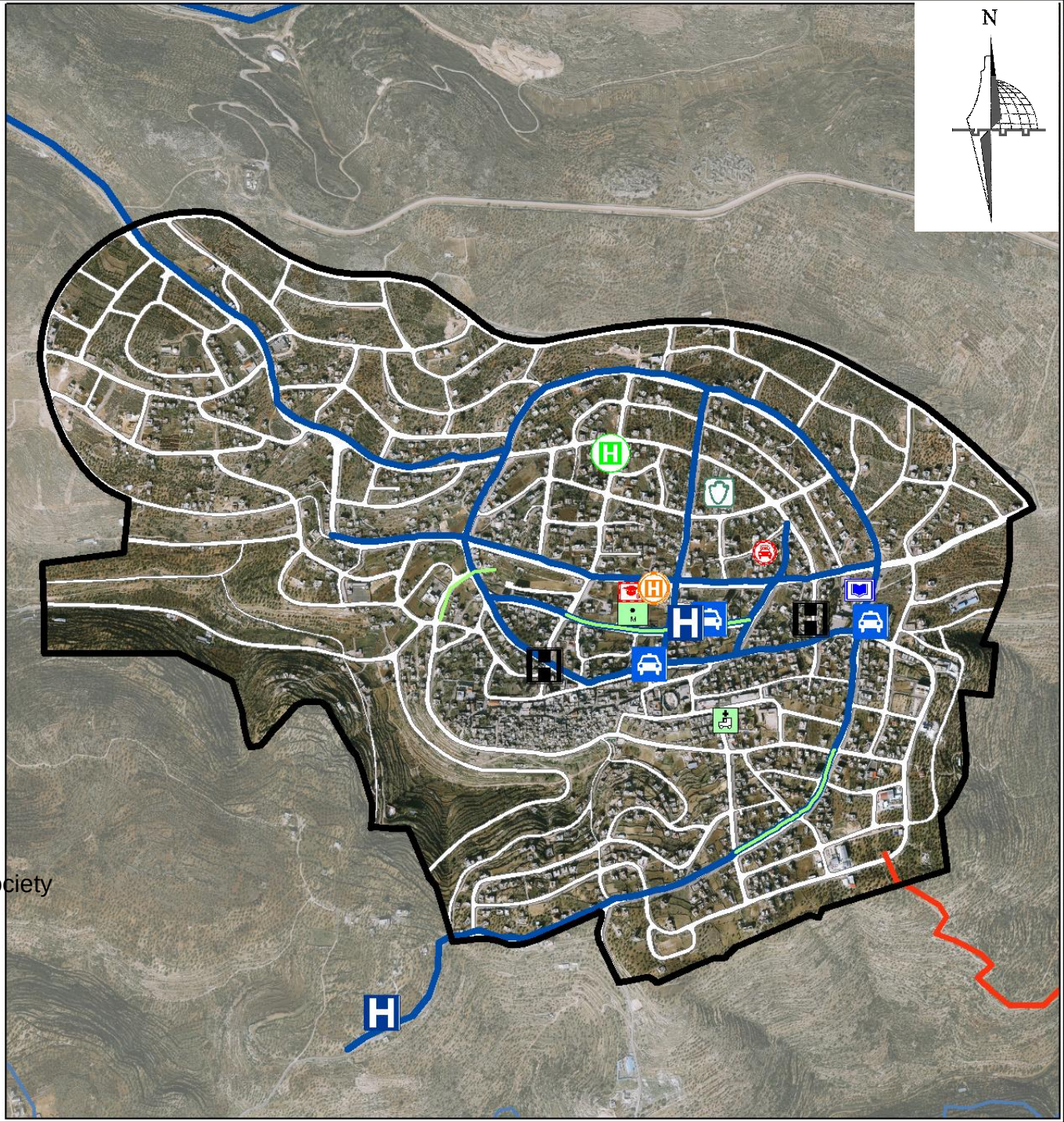
Legend

- Master Plan Boundaries
- Good Plantation
- Good Sidewalks
- Good Traffic Flow
- Zaytoona-University Street

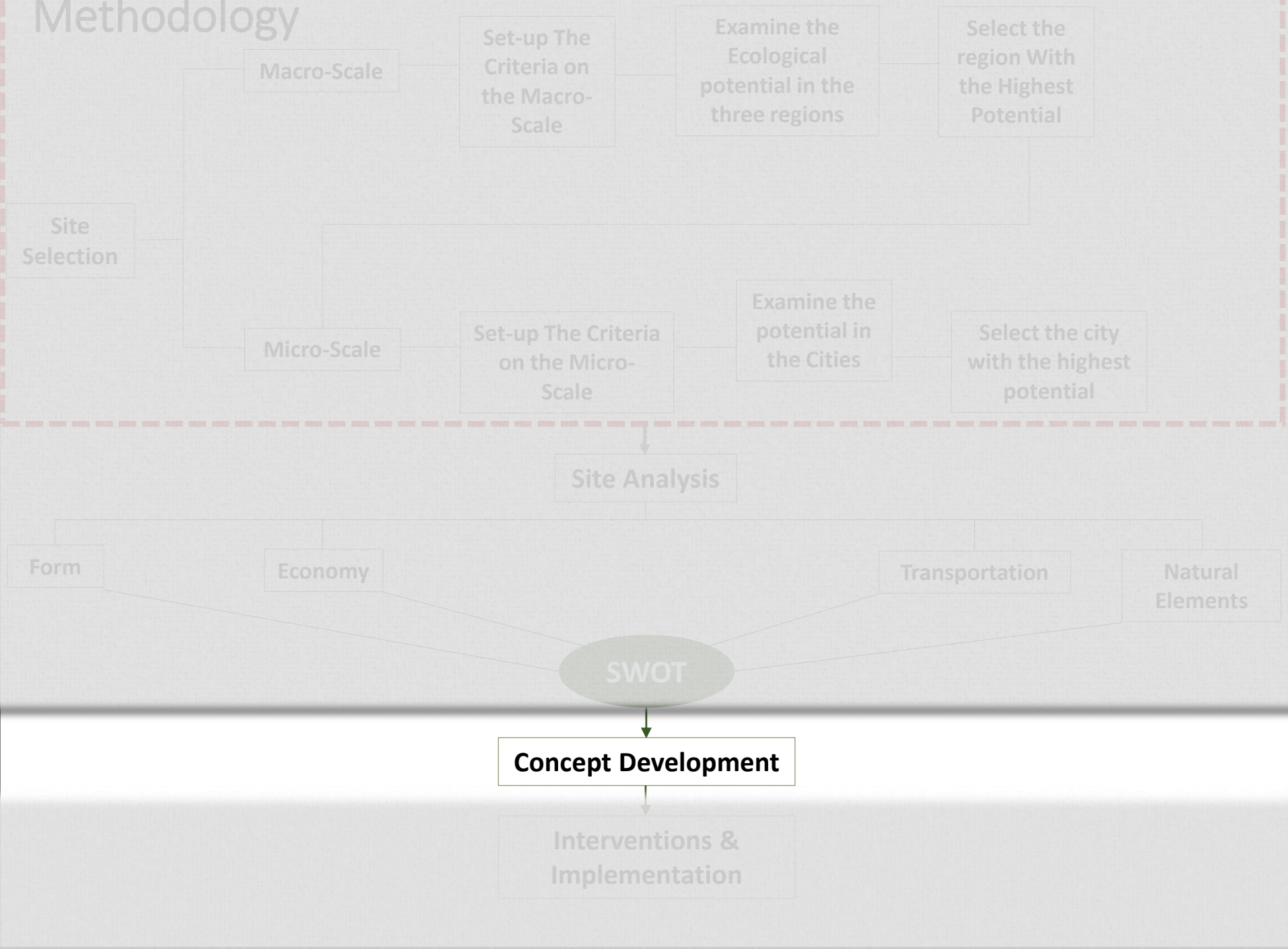
Accessibility to Services

Services

- Melitary Health Services
- Clinic
- Directorate of Health
- Hospital
- Al-Quds University
- The Palestinian Red Crescent Society
- Directorate of Education
- Police Station
- Football Stadium
- Park
- Taxi

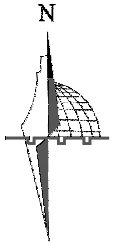


Methodology



Eco-City Components	+ve	-ve
Form	• Availability of Open Spaces	• Lack of Green Spaces • Absence of Agricultural Landuses in the master plan
Economic	• Availability of Agricultural Lands • Existence commercial Landuses in master plan • Existence of Biodiversity • Existence of the old city in Selfit • Establishment of Zaytoona University Project • Opportunity of work and employment in the industrial area • The majority of the factories are classified as light industry	• Unexploited Agricultural Lands • Loss in Agricultural lands • Absence of Environmental Tourism • Absence of accessibility to Biodiversity • Absence of “Agro-Industry” • Absence of Commercial landuses in the master plan in some areas with high integration “Based on Space Syntax” • Absence of Sewage System in the industrial area • The existing industrial area contains a lot of residential building
Natural Elements	• Availability of sunrises to all houses • Existence of Biodiversity • Availability of Medium Value Agricultural lands • Suitability of the Soil “Clay soil” for Agricultural uses	• Horizontal Urban Expansion • Pollution in biodiversity due to Wastewater resulted from Settlements • Absence Sewage System for some areas
Transportation	• Good Traffic flow in the city	• Lack of street furniture

Negatives “-ve”

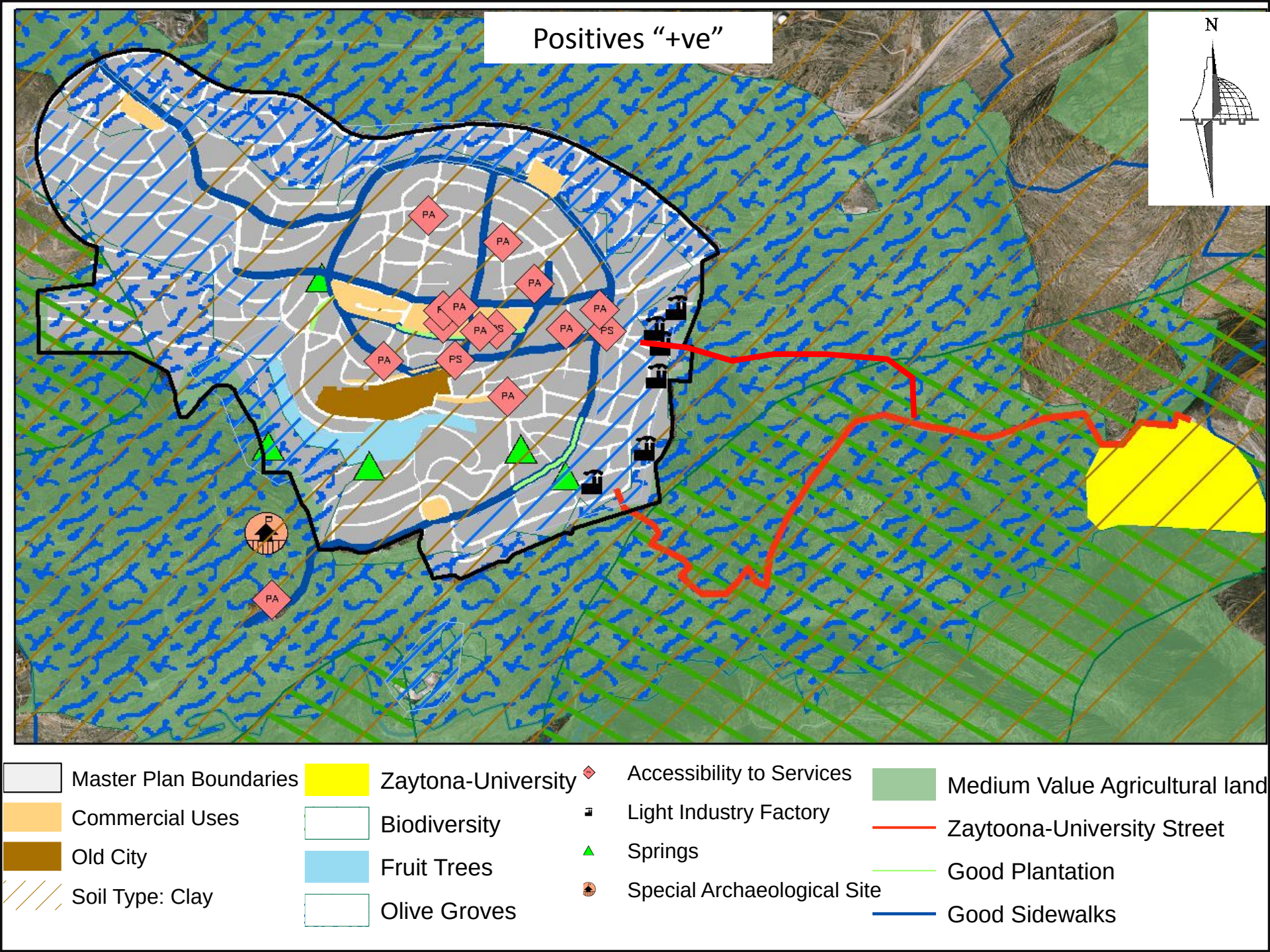


Legend

- Master Plan Boundaries
- Agricultural Land Loss
- Biodiversity
- High Slope
- High Slope streets
- Colonies
- Shortage in Street Plantation
- Traffic Congestion
- Roads for Cars Only No Pedestrian Access
- Unserved Areas with Sewage System
- Unexploited Agricultural Land

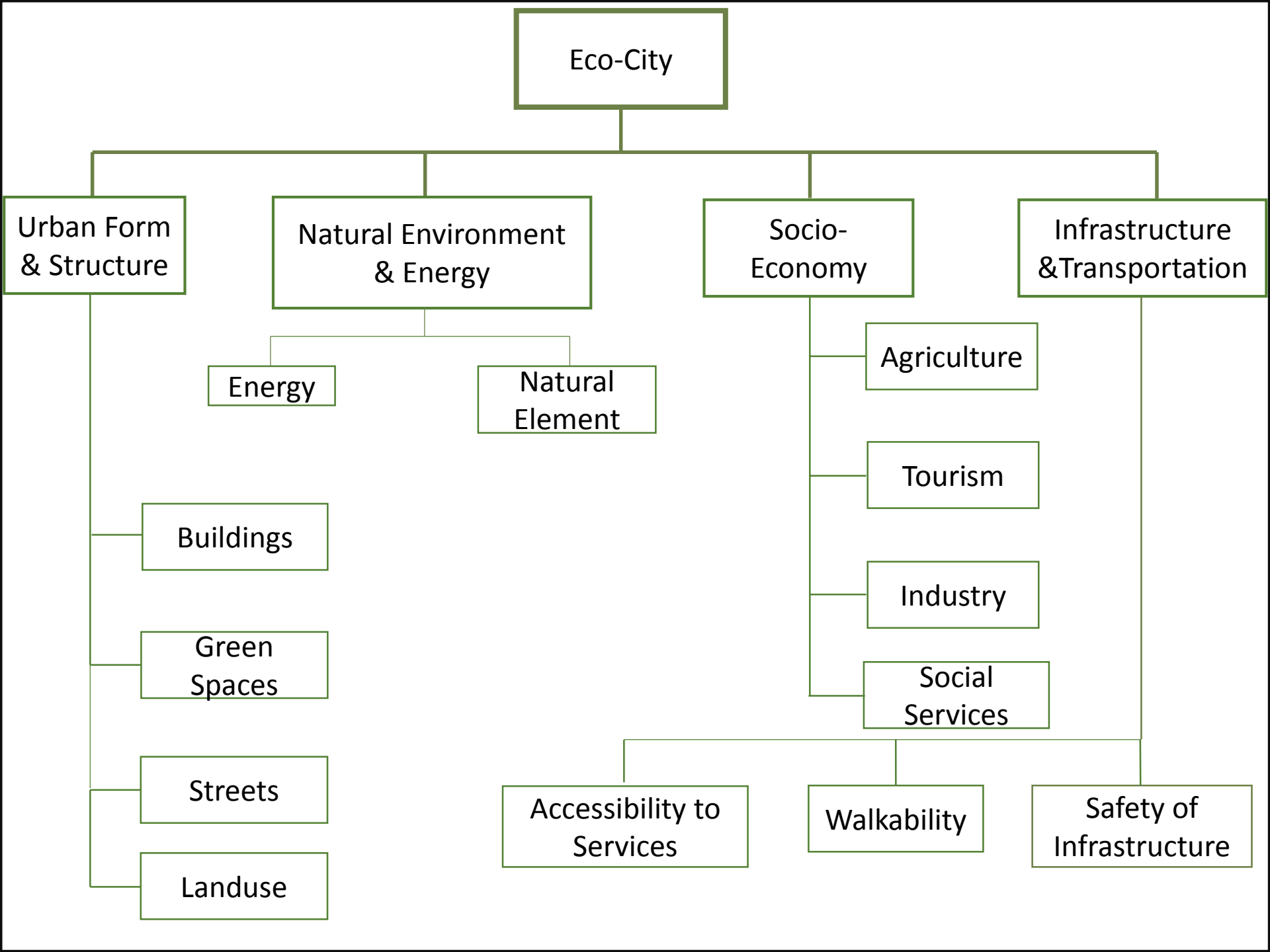
Geo-political Classification

- Area B
- Area C
- Extreme Sensitive areas
- No Street Plantation
- Industrial Area with no Sewage System
- Car Accidents
- Existing dump site

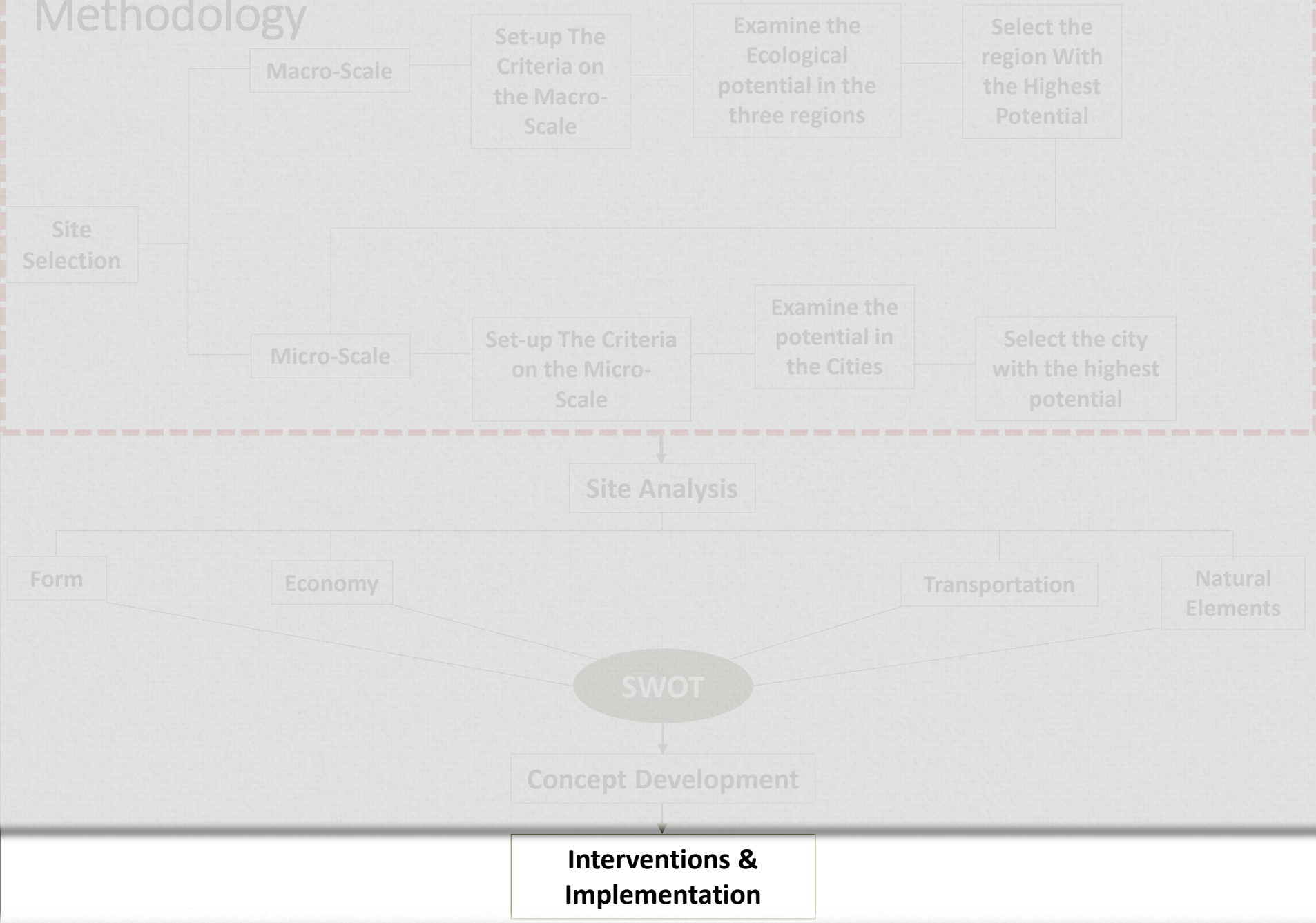

Positives “+ve”
N
PA
PS
Master Plan Boundaries
Commercial Uses
Old City
Soil Type: Clay
Zaytona-University
Biodiversity
Fruit Trees
Olive Groves
Accessibility to Services
Light Industry Factory
Springs
Special Archaeological Site
Medium Value Agricultural land
Zaytoona-University Street
Good Plantation
Good Sidewalks

Principle	Condition*		
	Good	Fair	Bad
Restore Degraded Land.			
Fit the Bioregion.			
Balance Development.			
Create Compact Cities.			
Optimize Energy Performance.			
Contribute to the Economy.			
Provide Health and Security.			
Encourage Community.			
Promote Social Justice and Equity.			
Enrich History and Culture.			

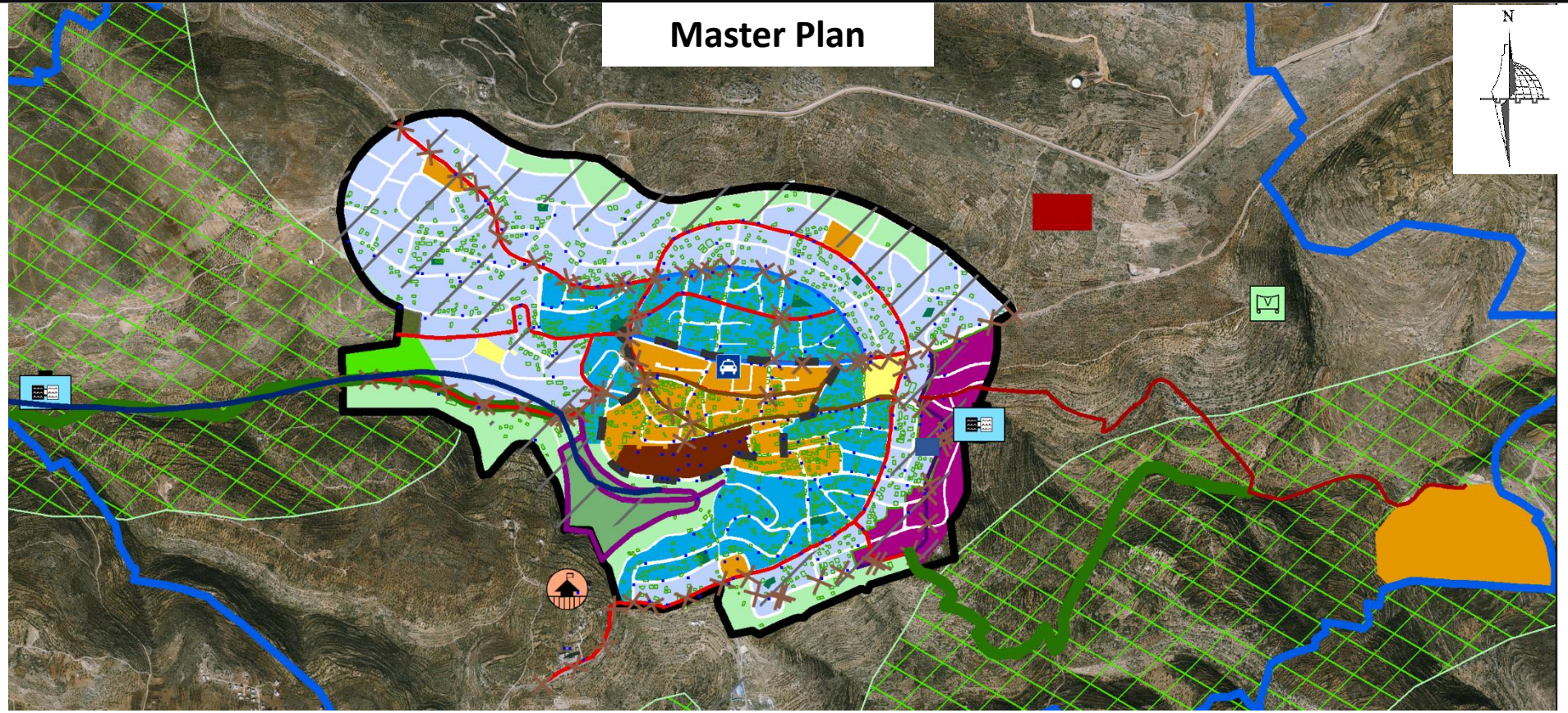
*What is the current condition for this principle in the city?
To what extent is this principle achieved in the city?


Eco-City
Urban Form & Structure
Natural Environment & Energy
Socio-Economy
Infrastructure &Transportation
Energy
Natural Element
Agriculture
Tourism
Industry
Social Services
Buildings
Green Spaces
Streets
Landuse
Accessibility to Services
Walkability
Safety of Infrastructure

Methodology



Master Plan



Street Function

- Commercial Street
- Leisure Path
- Services street
- Shared Taxis Path
- Industrial street
- Green Corridor

Socio-Economic

- Commercial Center
- Agriculture Research Center
- Rehabilitation of old City
- Public Park
- National Public Park
- Light Industrial Area
- Public Buildings
- Biodiversity (Eco-Tourism)
- Green Roof Buildings
- Special Archaeological Site

Infrastructure & Transportation

- Wastewater Treatment Plant
- New Taxi Station
- Recycling Unit
- Recycling Garbage Container
- Underground Overhead Power Line
- Expansion of Sewage System
- Walkable Area

Urban Form

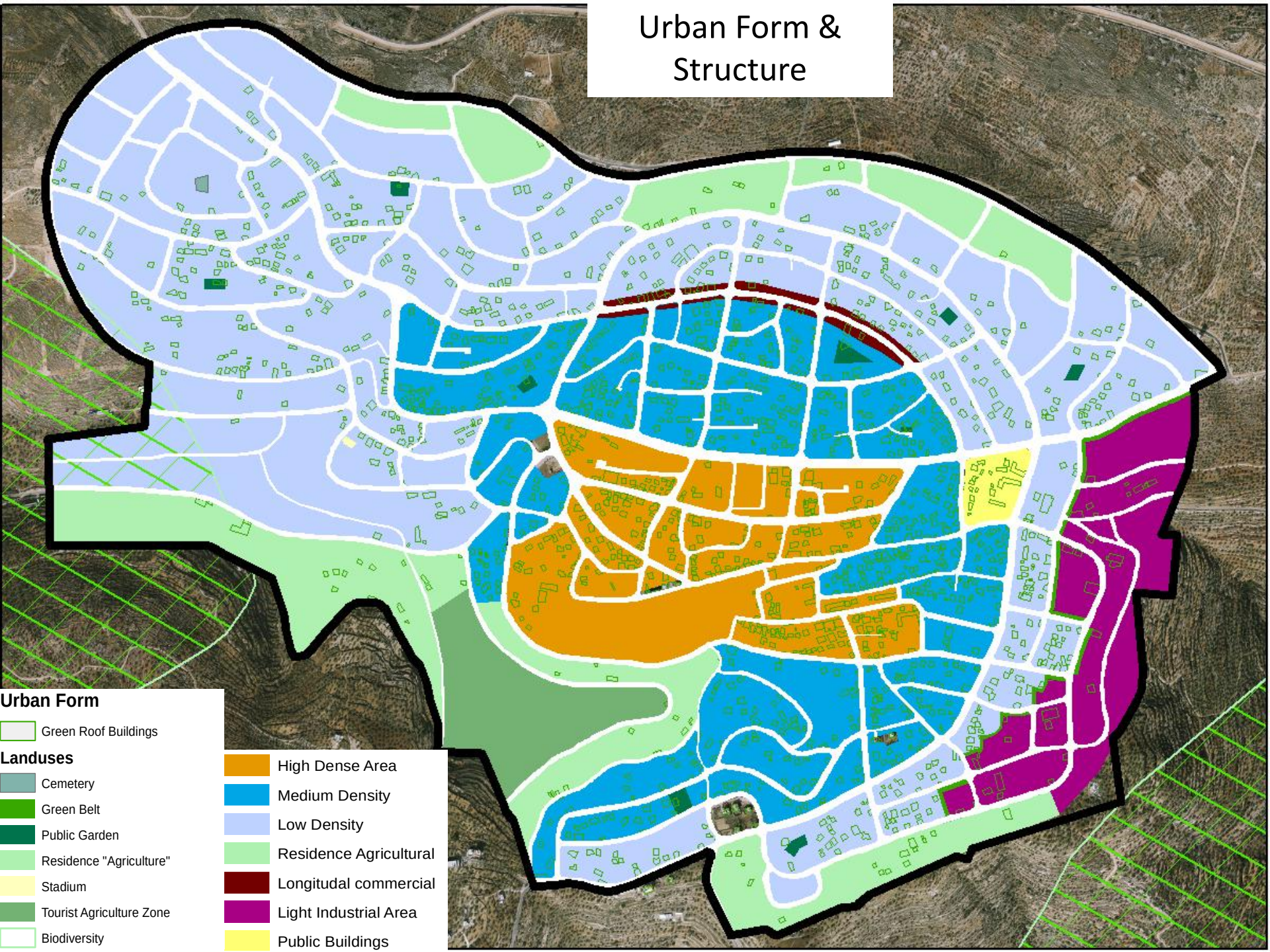
Landuses

- Cemetery
- Green Belt
- Public Garden
- Residence "Agriculture"
- Stadium
- Tourist Agriculture Zone
- Public Buildings
- Light Industrial Area
- Green Roof Buildings
- Biodiversity
- High Dense Area
- Medium Density
- Low Density
- Residence Agricultural
- Longitudal commercial

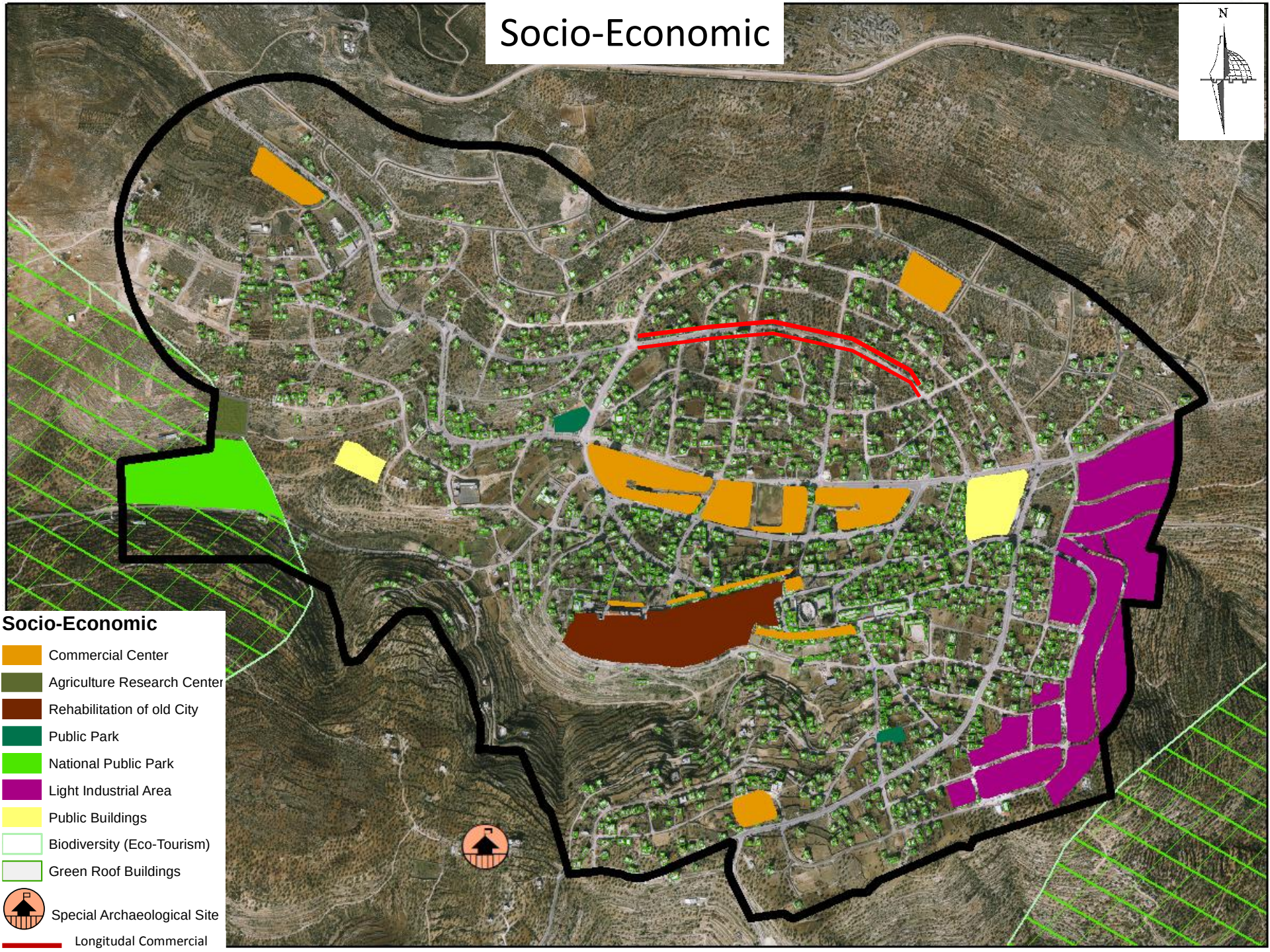
Energy & Material Flows

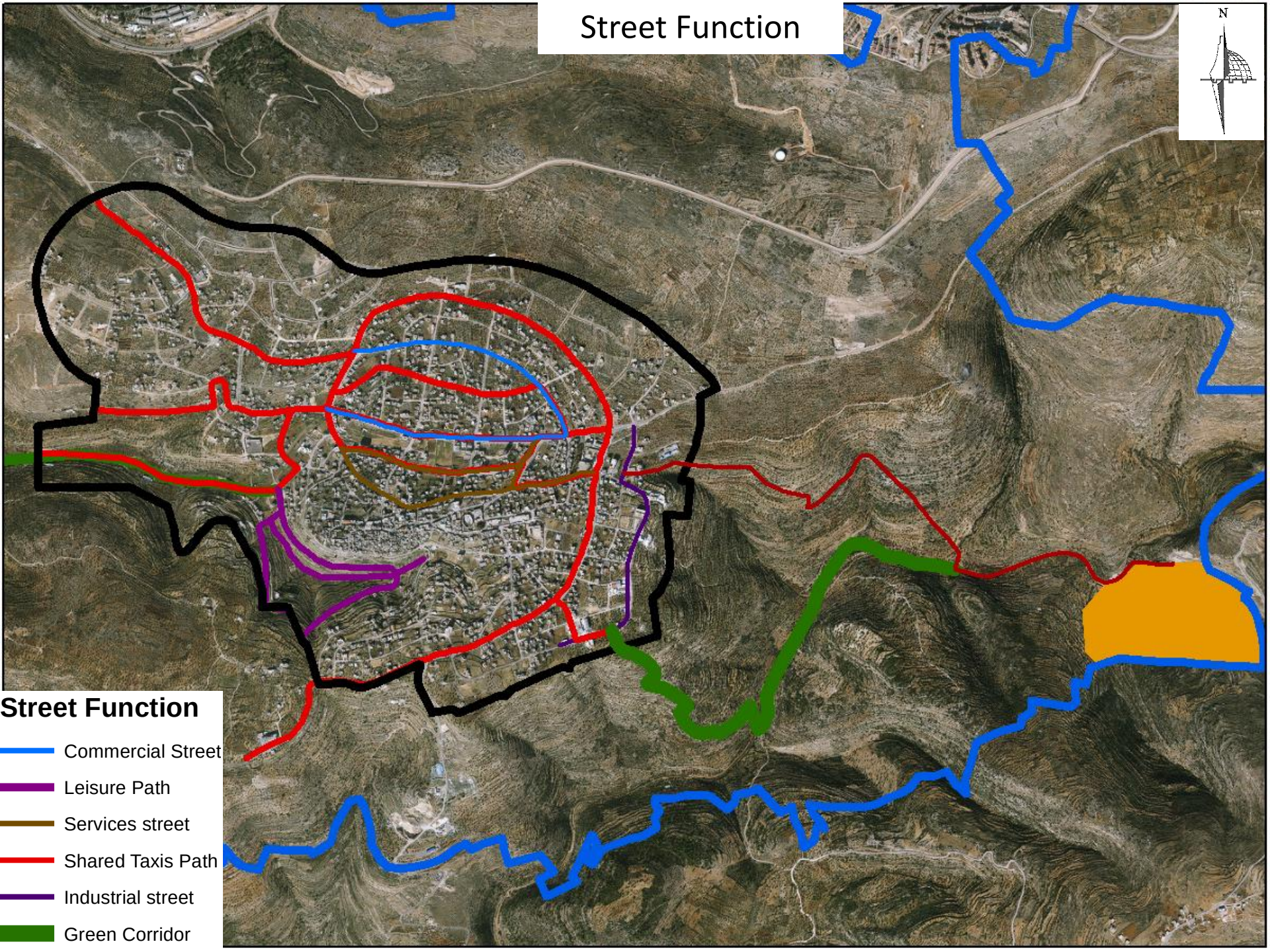
- Wadi-AlMatwi
- Water Network
- Underground Overhead Power Line
- Recycling Unit
- Compost Farm Factory
- Solar Energy Station

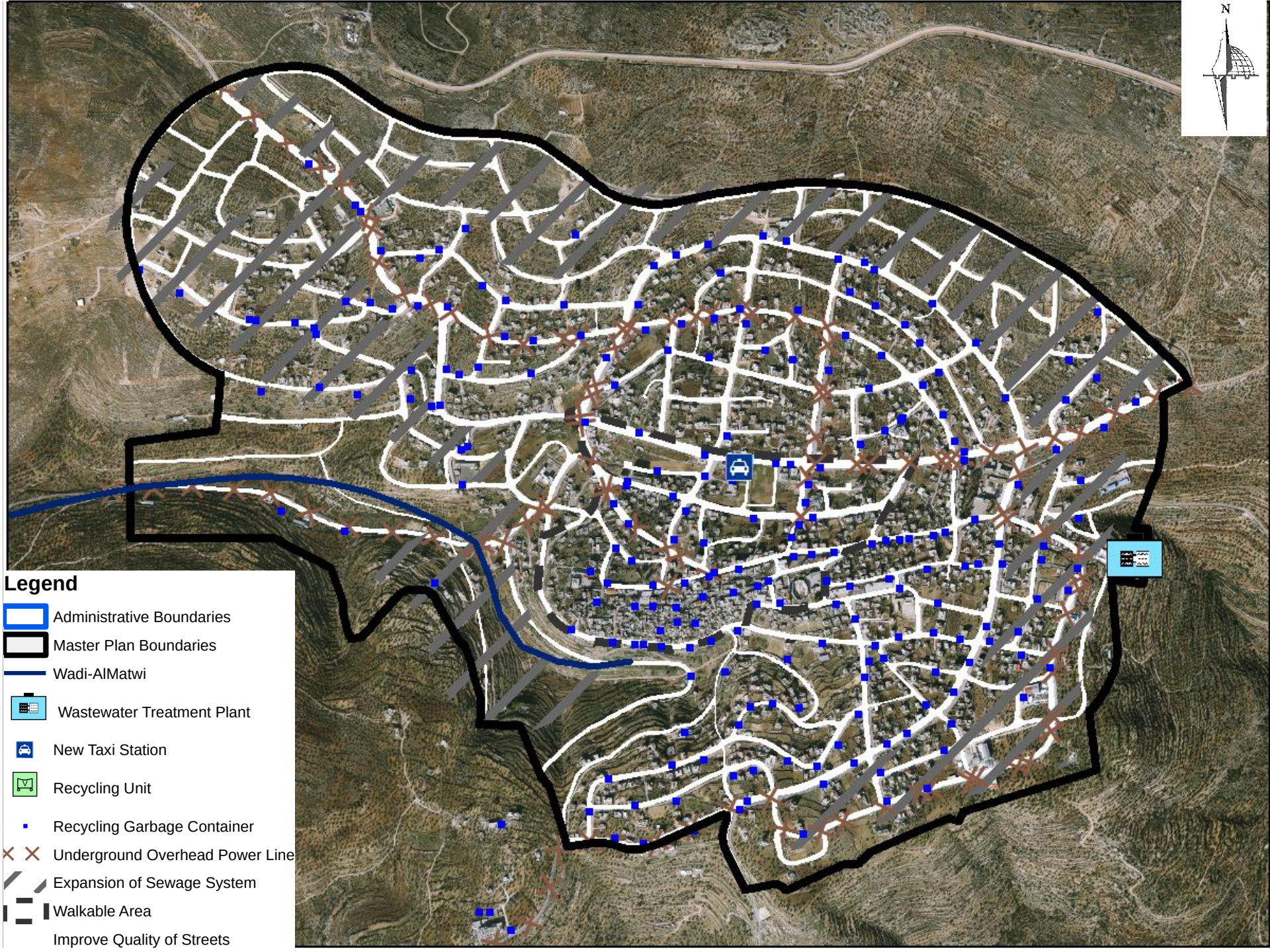
Urban Form & Structure



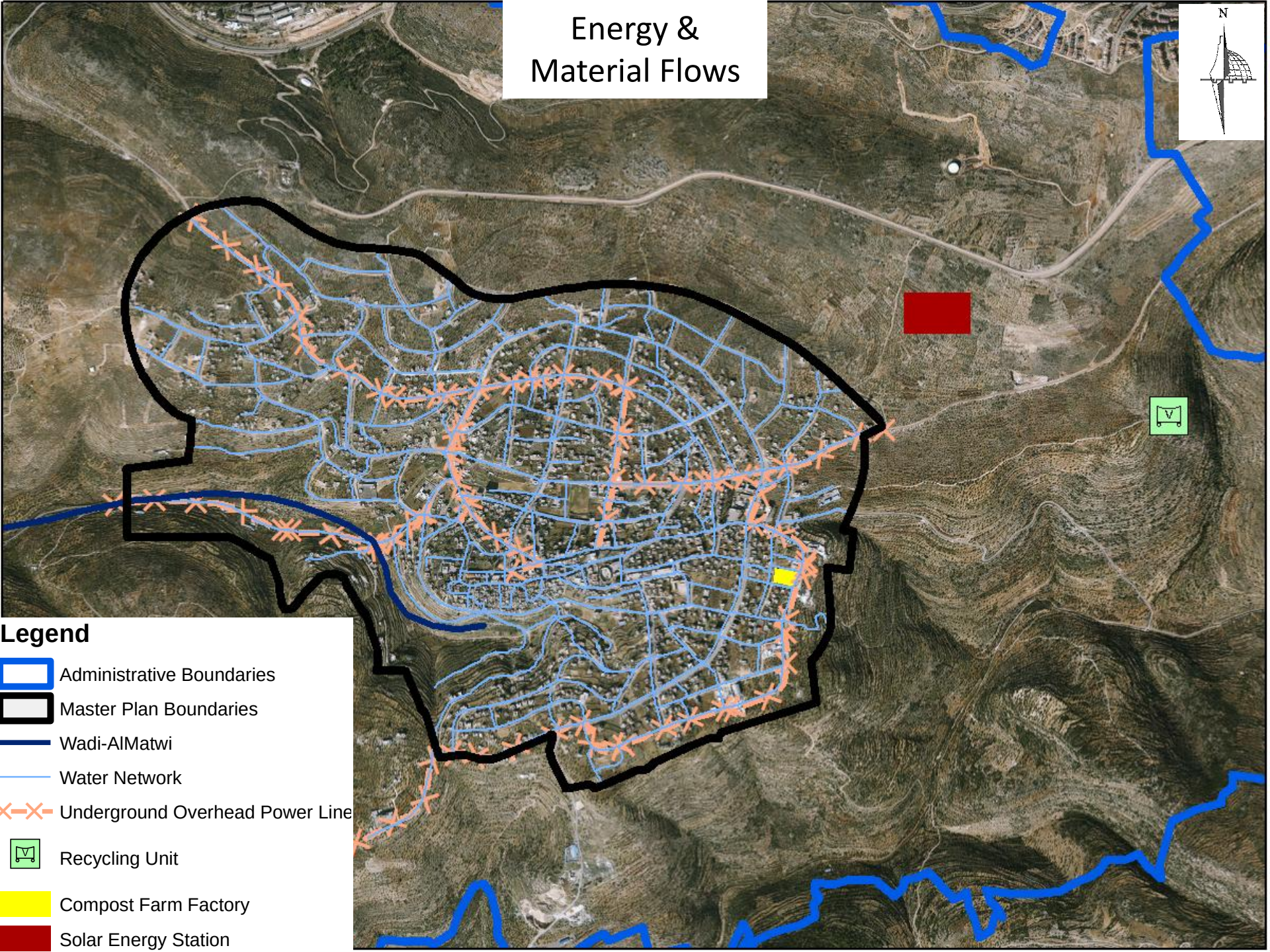
Socio-Economic



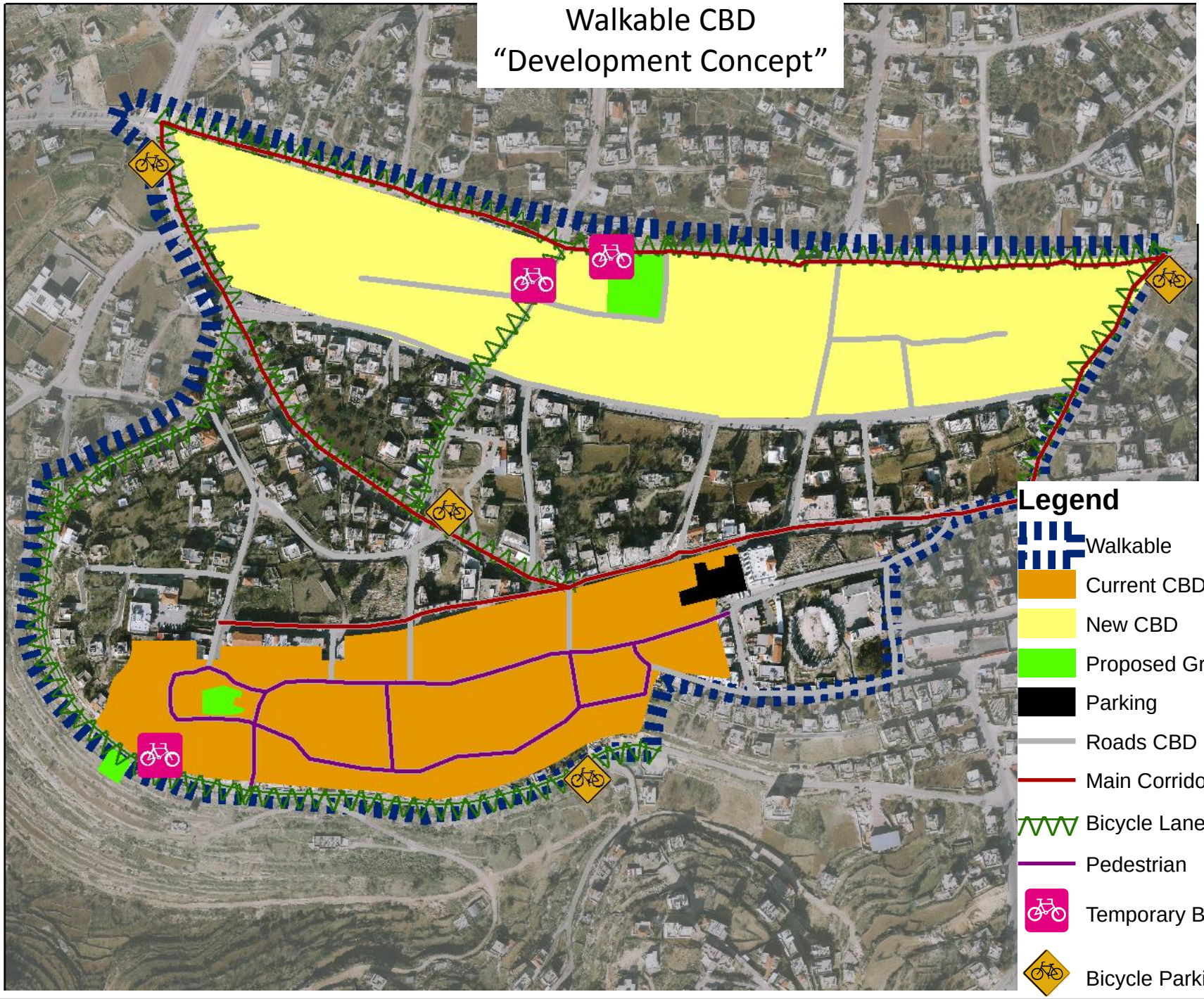

Street Function
N
Street Function
Commercial Street
Leisure Path
Services street
Shared Taxis Path
Industrial street
Green Corridor


N
Legend
Administrative Boundaries
Master Plan Boundaries
Wadi-AlMatwi
Wastewater Treatment Plant
New Taxi Station
Recycling Unit
Recycling Garbage Container
Underground Overhead Power Line
Expansion of Sewage System
Walkable Area
Improve Quality of Streets

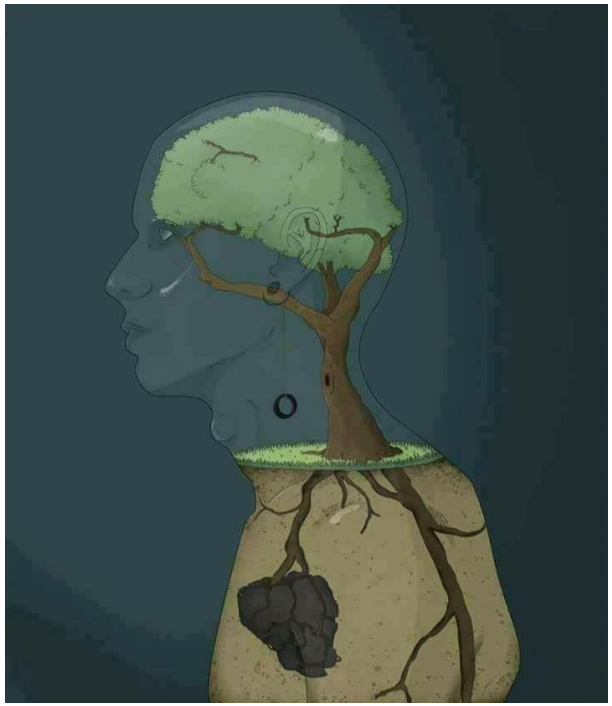
Energy & Material Flows



Walkable CBD
“Development Concept”



Thank you
for listening



Be Smart
Be Ecologist …

Any
Questions?