

Rebuilding the Edge

The Ferrovia dei Parchi

Project Team

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Scale

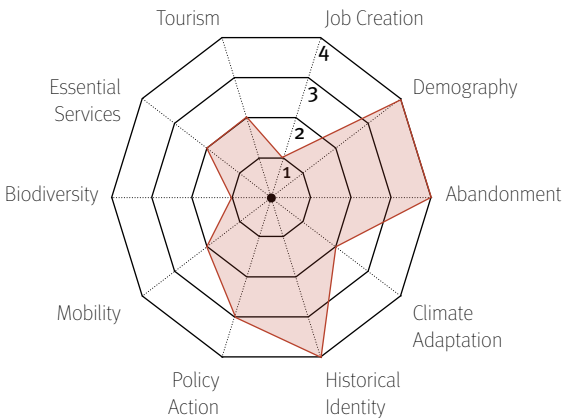
Town

Location

Pettorano sul Gizio



Measuring Presence



- 1 Not addressed
- 2 Somewhat addressed
- 3 Minor focus area
- 4 Major focus area

In the past 100 years Italy, and Europe more generally, has been experiencing depopulation in rural areas. Although the pattern is widely acknowledged, the methods currently used to measure rates of depopulation in Italy are sometimes lacking in precision, leading to a misrepresentation that affects policy making.

Pettorano sul Gizio, a small town in Central Abruzzo is an example of this issue. Looking at population statistics from the national database ISTAT, the municipality has had a 7% increase between 2001 and 2020. Nevertheless, when we look more specifically at its urban core rather than peripheral municipal areas nearby the larger city of Sulmona, the population has dropped. In 1971 the urban population was around 700 people, whereas now it is 418. Comparatively, the suburban population was approximately 800, whereas now it is 926. This overall growth has in the recent past deprived the urban core from accessing government grants for regeneration and adaptation projects.

This phenomenon is common: with cars, increasing square footage standards for homes and changing cultural needs, suburban development has grown at the expense of urban cores. But the depopulation of these medieval towns involves loss of culture and heritage embedded with forms of intelligence that are proving once again relevant.

The team chose to look at Pettorano sul Gizio as a case study through which to develop a new spatial metric for abandonment, hoping to contribute a more nuanced representation of depopulation patterns in rural areas that can lead to policy initiatives that address challenges on the ground more effectively.



Sulmona
Urban Core

Sulmona Effective
Suburban Reach

Ferrovia dei Parchi

Municipality of
Pettorano Sul Gizio

62.85 km²

↑ 926 people

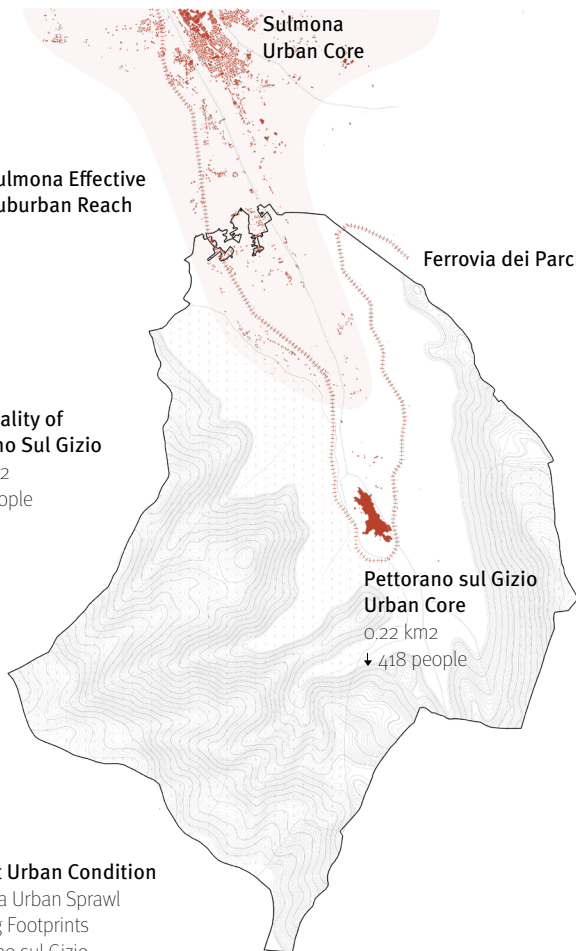
Pettorano sul Gizio
Urban Core

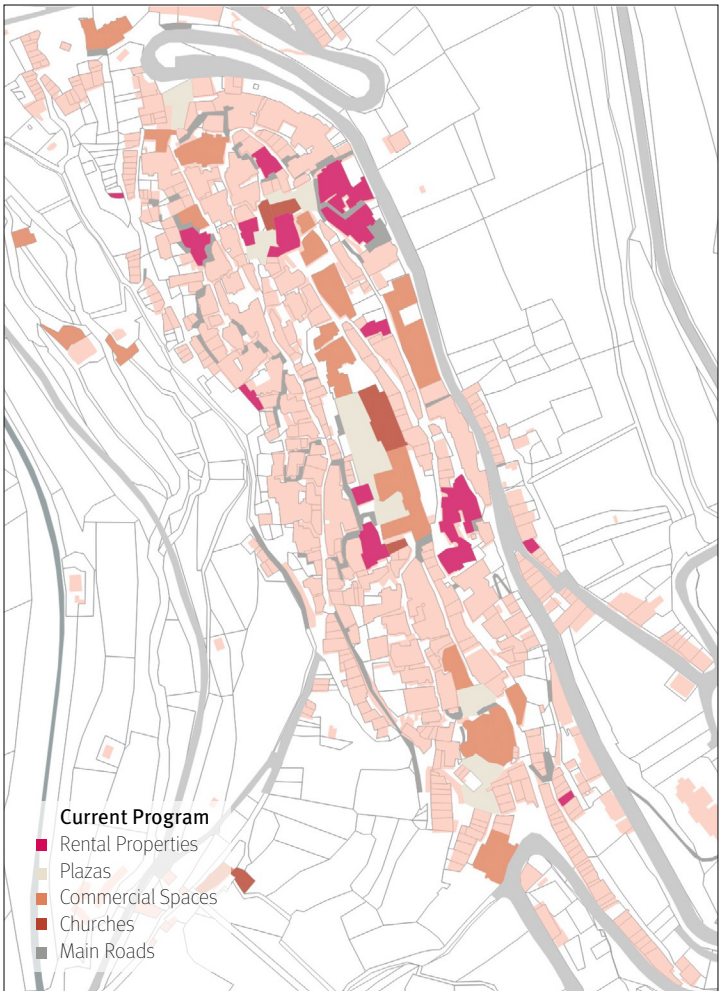
0.22 km²

↓ 418 people

District Urban Condition

- Sulmona Urban Sprawl
- Building Footprints
- Pettorano sul Gizio
Municipal Boundary







Observations from the Town

Collecting Objective Data

The team began the research period with a walk around Pettorano sul Gizio to establish the scope of the project and begin distilling a list of ‘symptoms’ of occupation and abandonment visible from the street. Once the list was narrowed down to less than 25 parameters, the team created a phone based survey to collect data throughout the town. In order to account for all buildings, the cadaster of the town was numbered radially and then divided into sections amongst the three students for them to go out and begin the data collection phase. For accuracy purposes all of the survey entries included pictures of the buildings and were also geo-tagged.

Screenshot of a mobile survey app. The app is titled "PSG_DegradationStudy". The form contains the following fields and options:

- lot number: 98 B
- sounds of life: Yes, No
- name on buzzer: Yes, No
- AC / Satellite: Yes, No
- kept plants: Yes, No
- dead plants: Yes, No

A checkmark icon is visible at the bottom right of the form.

Continuation of the mobile survey app form. The form contains the following fields and options:

- dead plants: Yes
- plant infiltration: Yes
- cobwebs: Yes
- spalling: Yes
- collapsed roof: Yes
- new paint/plaster: Yes

tionStudy

No

No

No

No

No

PSG_DegradationStudy

new paint/plaster

Yes No

trashcans

Yes No

open door/window

Yes No

cat pee board

Yes No

pad lock

Yes No

for sale sign (vendes)

PSG_DegradationStudy

for sale sign (vendes)

Yes No

mixed preservation

Yes No

updated fixtures

Yes No

broken windows

Yes No

functional gutter

Yes No

bench



B Beppone

Beppone was born in Pettorano sul Gizio and has always lived in the town. He is a builder and has constructed, refurbished and maintained many buildings within the town. With changing comforts and rising square footage standards, Beppone has expanded his family home and has purchased and renovated three properties from people who moved away.

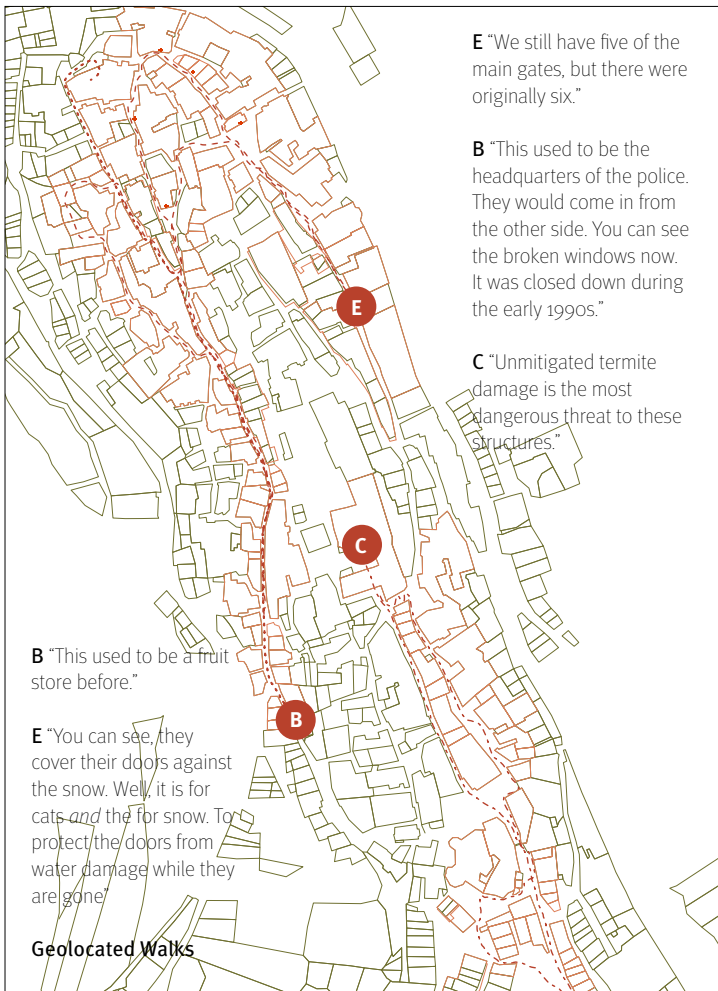
E Eugenio Vitto Massei

Eugenio was born in Pettorano sul Gizio, son of one of the wealthy families in the town. He moved abroad for his studies and worked in several cities both in Europe and in Italy. He returned to the town during the Covid lock-downs in early 2020. He now supports and collaborates with several initiatives fighting the issue of abandonment in the town.

C Caitlin Mueller

Prof. Mueller teaches structural engineering and design at MIT. She walked around the town with the team looking and discussing the diverse range of structural reinforcements visible on dwellings from the street.





E “We still have five of the main gates, but there were originally six.”

B “This used to be the headquarters of the police. They would come in from the other side. You can see the broken windows now. It was closed down during the early 1990s.”

C “Unmitigated termite damage is the most dangerous threat to these structures.”

B “This used to be a fruit store before.”

E “You can see, they cover their doors against the snow. Well, it is for cats *and* the for snow. To protect the doors from water damage while they are gone.”

Geolocated Walks

How could we establish a metric for symptoms of occupation and abandonment that could be used to inform policy change?



Ranges of Abandonment

Restoration

Updated Fixtures *
Tension Ties
Concrete Beams
New Paint or Plaster
Mixed Preservation

Occupation

Open Doors or Windows
Kept Plants
Legible Buzzer Names
Sounds of Life*
Visible Furnishings
Trash Cans
AC/Satellites

Seasonal Use

Dead Plants/Empty Pots
Lower Door Boards*



* Absolutes

Lived vs. Abandoned

As the team walked the town collecting data they noticed the degree of abandonment was much more varied than in urban centers. On its limited square footage Pettorano sul Gizio's urban fabric possesses intense variations of occupancy outlined in the spectrum below.

Abandonment

Unmaintained Gutters
For Sale Signs
Padlocks
Boarded Doors
Dirty Windows
Cobwebs

Structural Degradation

Collapsed Roofs*
Broken Windows
Plant Infiltration
Spalling

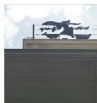




Tension
Ties



Laundry



Empty Pots



Furniture



Legible Buzzer
Names



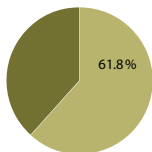
Collapsed
Roof



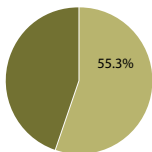
Reading and Correlating the Data

With the collected data, the team looked at the most prevalent and rarest metrics documented. They studied which correlations between indicators were stronger in order to index buildings in the town on a spectrum of abandonment and occupation.

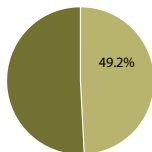
Updated Fixtures



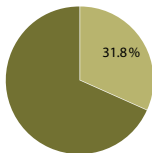
New Paint or Plaster



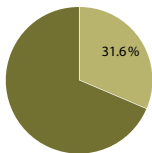
Spalling



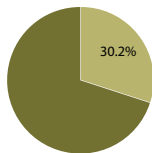
AC/Satellites



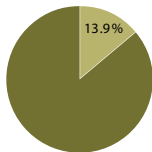
Functional Gutters



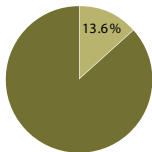
Legible Buzzer Names



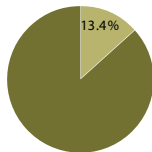
Collapsed Roofs



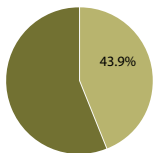
Sounds of Life



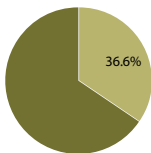
Lower Door Board



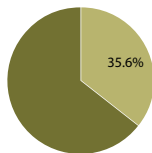
Mixed Preservation



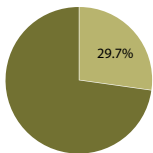
Tension Ties



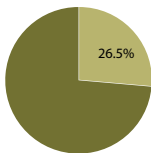
Plant Infiltration



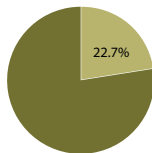
Broken Windows



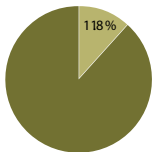
Cobwebs



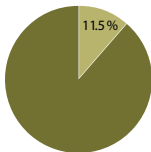
Open Doors or Windows



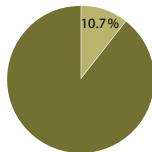
Dead Plants / Empty Pots



Boarded Door



Trash Cans

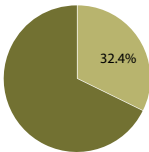




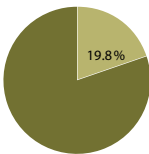
Where's the Data?

The compiled data of the 375 documented buildings with linked geo-tag and images are available at the QR above. The isolated versions of the 'IF... THEN...' statements found in the following pages are also found in the Excel Sheet's tabs.

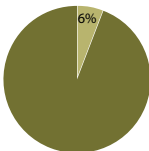
Kept Plants



Padlocks



For Sale Signs



Data Exclusions

If **collapsed roof** then:

If **sounds of life** then:

Always

- Spalling
- Broken Windows

- New Paint or Plaster
- Updated Fixtures
- Functional Gutters

Often

- Cobwebs

- Legible Buzzer Names
- Ac/Satellites
- Kept Plants
- Trash Cans
- Open Doors/Windows
- Mixed Preservation

Rarely

- Padlocks
- For Sale Sign
- Tension Ties

- Lower Door Boards
- Benches
- Tension Ties

Never

- Sounds Of Life
- Legible Buzzer Names
- Ac/Satellites
- Kept Plants
- Dead Plants
- New Paint or Plaster
- Trash Cans
- Lower Door Boards
- Open Doors/Windows
- Benches

- Plant Infiltration
- Cobwebs
- Padlocks
- Collapsed Roofs
- Dead Plants
- For Sale Signs
- Broken Windows

=if(and(X3="yes",S3="no",AE3="no"),true,false)

If **door board** then:

If **for sale sign** then:

If **updated fixtures** then:

-
- Spalling
 - Broken Windows

-
- Ac/Satellites
 - New Paint or Plaster
 - Updated Fixtures
 - Functional Gutters

-
- Padlocks
 - Cobwebs
 - New Paint or Plaster
 - Updated Fixtures
 - Functional Gutters

-
- New Paint or Plaster
 - Open Doors/Windows
 - Functional Gutters

-
- Kept Plants
 - Dead Plants
 - Plant Infiltration
 - Open Doors/Windows
 - Padlocks
 - Broken Windows

-
- Legible Buzzer Names
 - Ac/Satellites
 - Kept Plants
 - Collapsed Roofs
 - Open Doors/Windows
 - Padlocks
 - Broken Widows
 - Tension Ties

-
- Sounds Of Life
 - Dead Plants
 - Plant Infiltration
 - Spalling
 - Trash Cans
 - Lower Door Boards
 - Padlocks
 - For Sale Signs
 - Benches

-
- Cobwebs
 - Collapsed Roofs
 - Trash Cans
 - For Sale Signs
 - Benches

-
- Sounds Of Life
 - Lower Door Boards
 - Benches

-
- Cobwebs
 - Collapsed Roofs

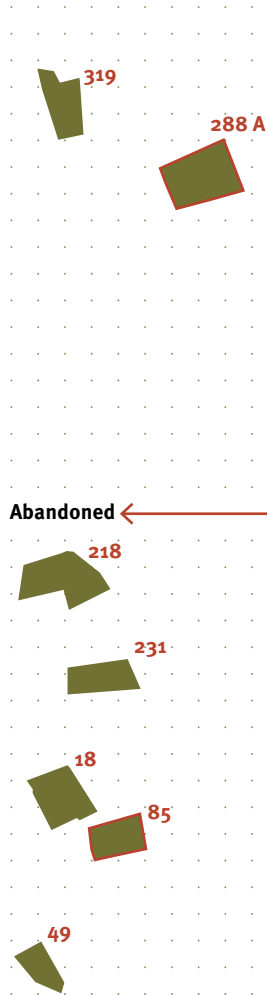


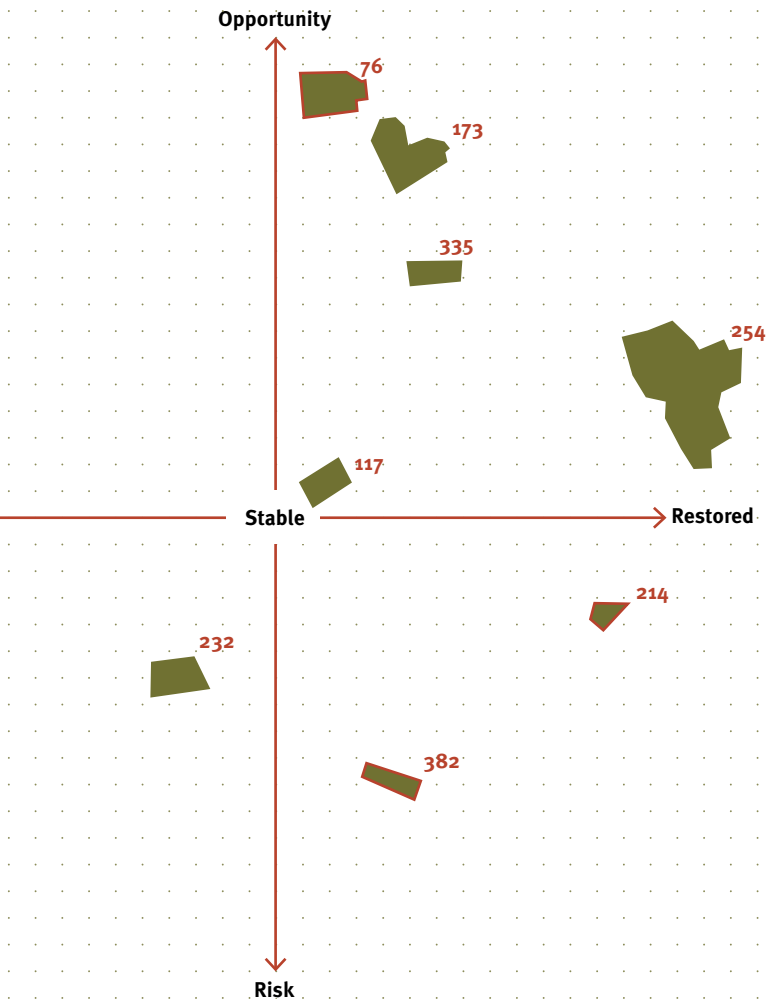
A Risk & Opportunity Tool

A Spectrum Logic

For the initial 'IF ... THEN...' statements the team chose to utilize the most certain parameters such as 'collapsed roof' for abandonment. These initial groupings gave the team clarity over which equations of parameters could be assembled into '... + ... + ... - ... = ...' rules and could provide a precise way to read and use the excel data sheet as a tool to plot each building on a scale of risk and opportunity as seen below.

The graph seen here has been manually populated. A following exercise will be to write the necessary code for the spreadsheet to automatically populate the graph.





Affordable to Restore and Occupy

Example Lot 288 A

YES – Tension Ties

YES – Updated Fixtures

YES – For Sale Sign and Padlocks

Location: Accessible Via Car

At Risk of Falling into Deterioration

Example lot 382

NO – Tension Ties

NO – New Paint or Plaster

YES – For Sale Sign

Opportunity for Tourist Rental

Example Lot 76

YES – Updated Fixtures

YES – Lower Door Board

YES – Live Plants

Location: Historic Center, Accessible Via Road

Hazardous in Case of a Seismic Event

Example Lot 85B

NO – Tension Ties

YES – Broken Windows

YES – Spalling

Location: Uphill of Residential Area

Arrested Degradation

Example Lot 214

YES – Broken Windows

YES – New Paint or Plaster

YES – Spalling

YES – Tension Tie



Moving Forward





1. Revise indicators to perform further data collection and analysis in Pettorano sul Gizio
2. Establish definitive property types and populate the matrix of intervention priority based on documented indicators
3. Reconsider uses for lots that are currently abandoned



1. Further Data Collection

Data could be collected in Pettorano Sul Gizio and other towns by hand or using mobile devices. Data collection could eventually become automated through the use of artificial intelligence that recognizes the visual indicators within Google Earth Street View imaging as shown above.

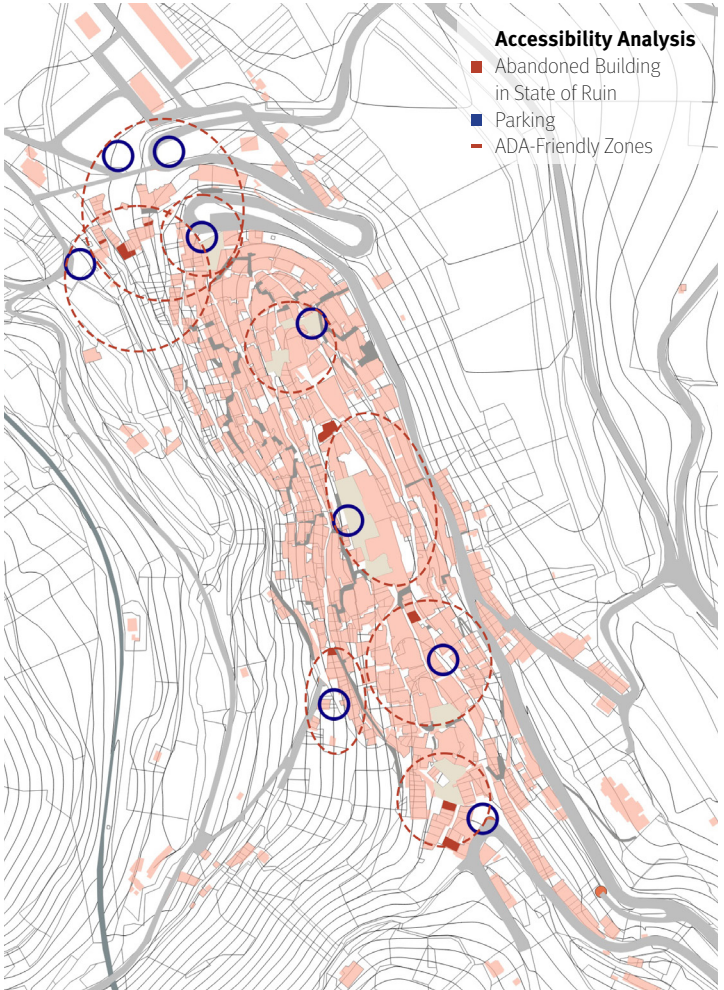
2. Establishment of Property Types and Matrix of Intervention Priority Based on Indicators

Given the known risks of abandoned structures, especially in seismic regions, the provided data and equations can yield an intervention list: an acupunctural map, of the locations in which regular inspection or interventions are urgent.



Accessibility Analysis

- Abandoned Building in State of Ruin
- Parking
- ADA-Friendly Zones



3. Reconsidering Uses for Abandoned Lots

Some abandoned lots have already been re-purposed by their owners or neighbors for patio spaces, an extended living room or just storage space—what is most commonly seen in the town.

This analysis could yield other options. For instance, by overlaying the inaccessible locations via car, we can see if specific lots can be taken advantage of as ramps to provide more vehicular access. This is key for grocery deliveries or emergency services to have better reach within the town. The example shown here explains how two ADA-friendly zones could be merged through the re-purposing of an abandoned block, guaranteeing the structural safety of surrounding buildings as well as increasing accessibility between two different levels of the town.





A Different Census Tool

Although depopulation and abandonment have been widely acknowledged issues in Italy since the 1950s, it seems governmental efforts to counter the loss of citizens in small agricultural and mountainous villages have been ineffective. For over 70 years the population in these remote regions has been decreasing. This project responds to the issue with the creation of a new, diversified census data system, based on the population but also the state of real estate assets.

With this project, the team of students sought to provide a tool to counter depopulation trends through preventative measures: using visual symptoms of abandonment to highlight regions of risk and opportunity in a town in order to inform policy changes. The work done by the team is only the beginning of the tool's development, providing a preview of the economic and social impact that can be provided by new technologies of data collection. It demonstrates the possibility of creating a helpful resource for town mayors, as well as regional and national authorities.

Workshop

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MIT Digital Structures Group

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