



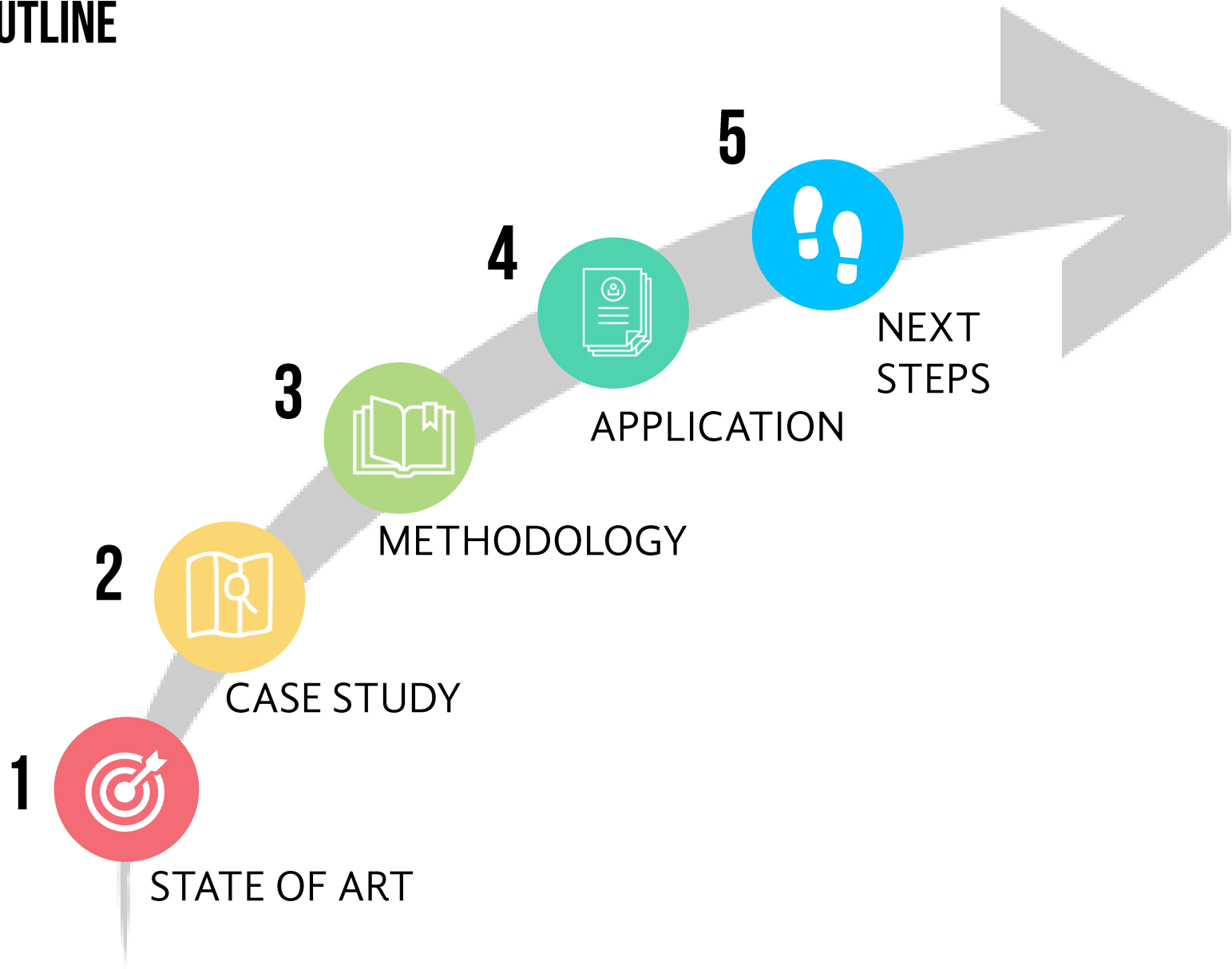
ESTIMO: TEMI E QUESTIONI CONTEMPORANEE 4.0

Un modello integrato Choice Experiments/GIS per la valutazione di scenari di rigenerazione urbana sostenibile in un'area critica della città di Torino

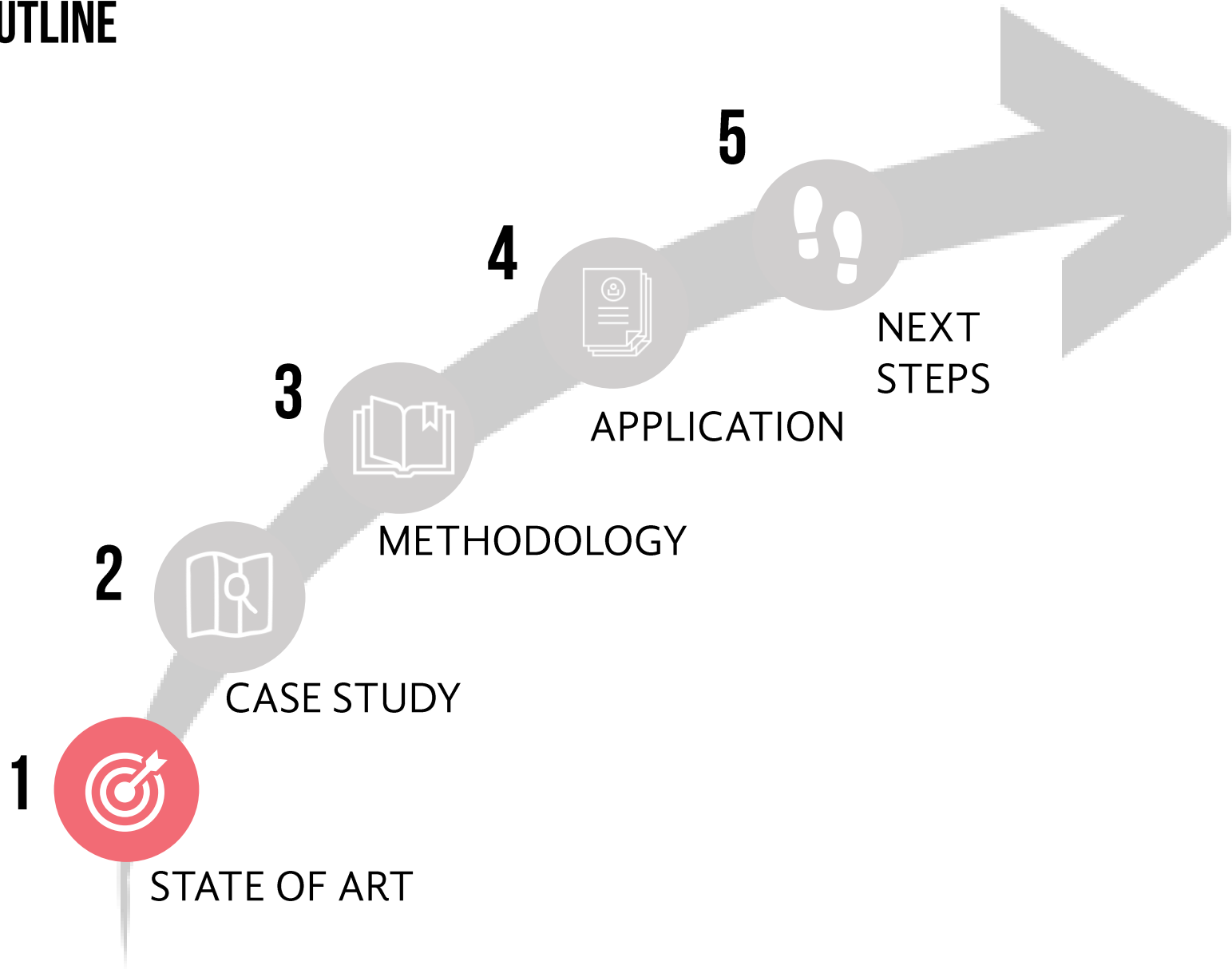
SOCIETA' ITALIANA DI ESTIMO E VALUTAZIONE (SIEV)
POLITECNICO DI BARI - 11 LUGLIO 2018

Marta Bottero, Marina Bravi, Caterina Caprioli, Federico Dell'Anna, Giulio Mondini, Giulia Vergerio

OUTLINE



OUTLINE



SMART URBANISM



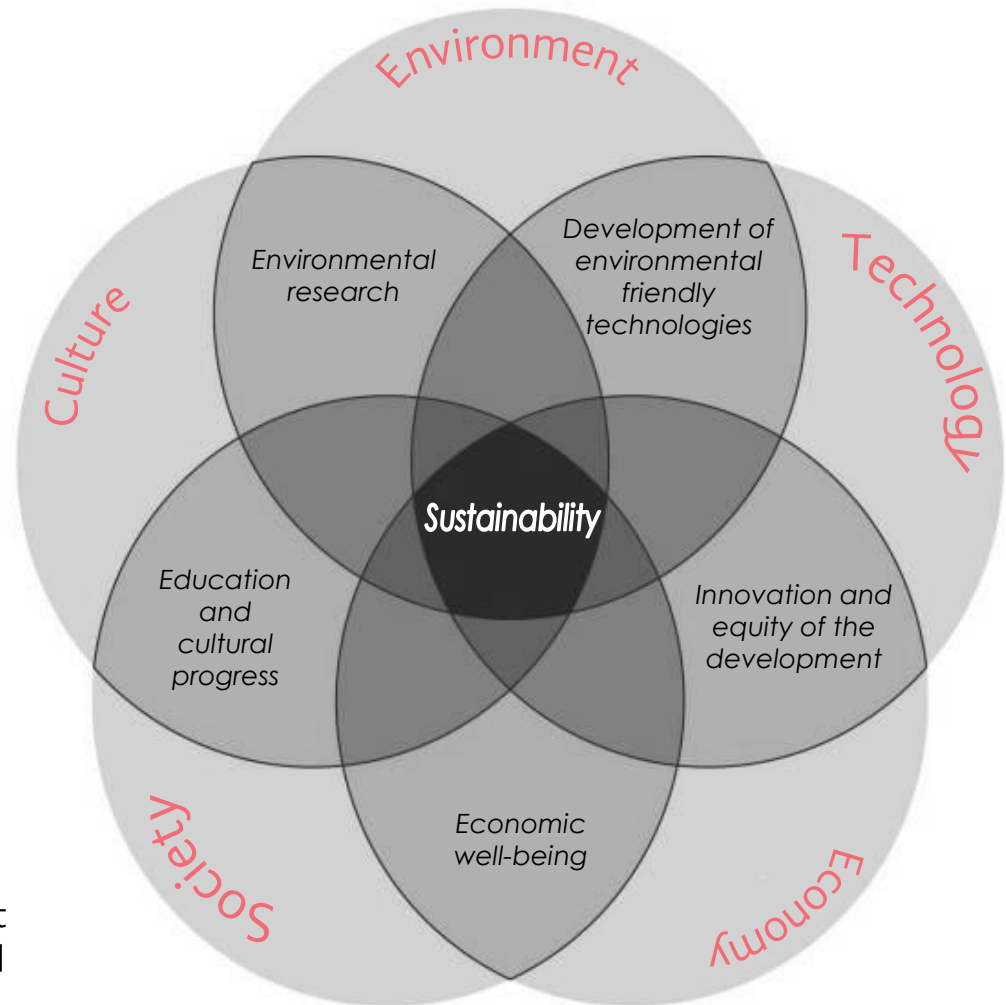
An instance that is emerging in the urban context refers to the energy question.

Directives by EUROPEAN UNION (UE)

↓ CO2 emission

↓ Energy consumption

HOWEVER,
when we talking about urban management and energy planning, it becomes fundamental to consider all dimensions of urban problems...



Source: adapted from Mondini, 2009



EVALUATION APPROACHES

From

ANALYSIS OF A SINGLE BUILDIGN

To

**DISTRICT/NEIGHBOURHOOD OR
THE WHOLE CITY**



Requires AD HOC TOOLS & METHODS

- Evaluate new urban policies
- Support decision makers
- Stakeholders participation
- Spatial & temporal dimension

MIXED METHOD

Cost Benefit Analysis (CBA)

Travel cost method

Hedonic prices

Multicriteria analysis (MCDA)

SWOT analysis

Stakeholders analysis

Agent based model (ABM)

Conjoint analysis (CA)

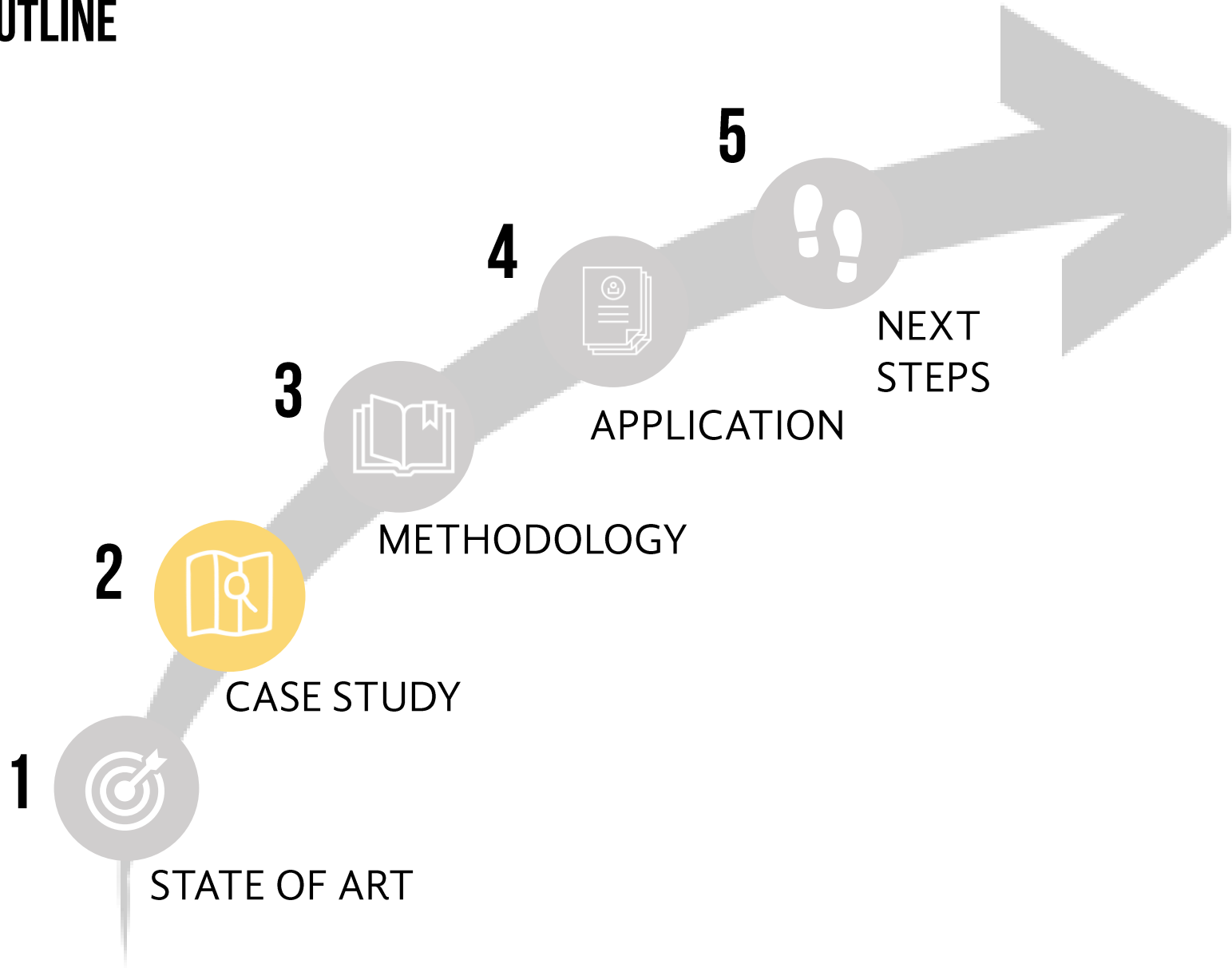
Choice experiments (CE)

NON-MONETARY

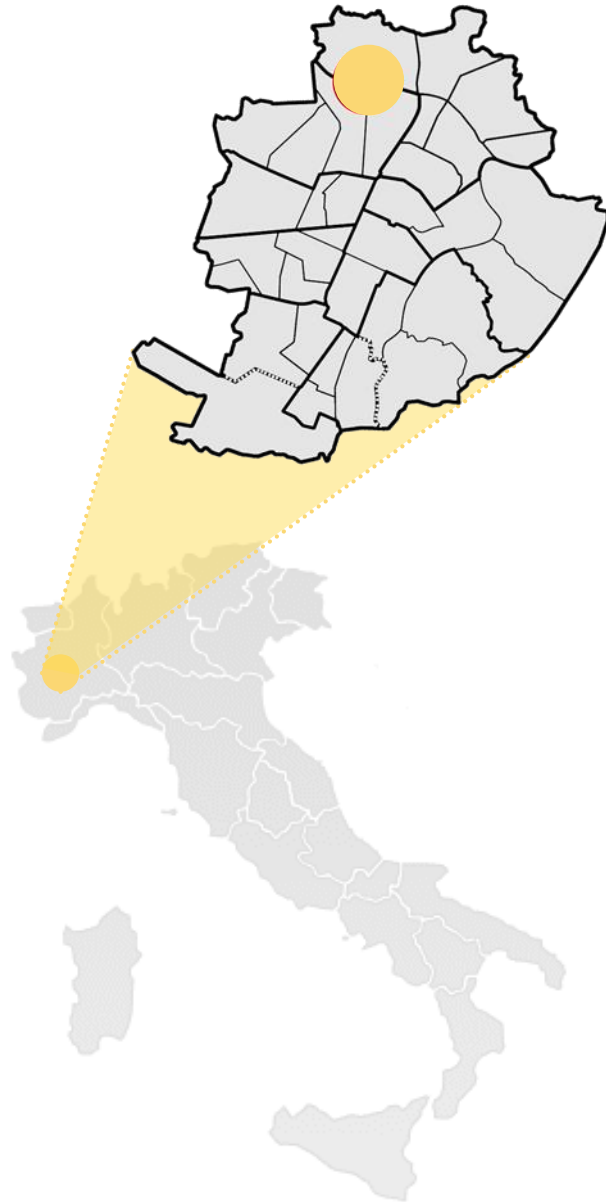
MONETARY



OUTLINE





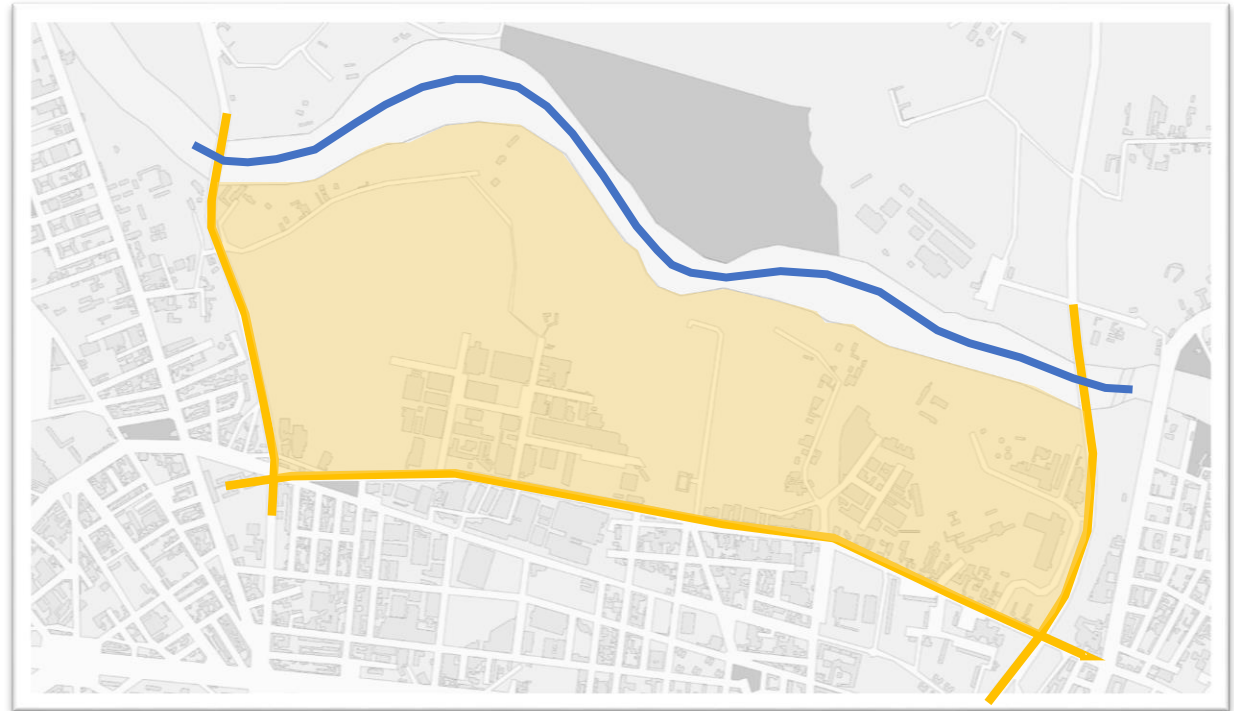
CASE STUDY: BASSE DI STURA



The Basse di Stura, with its 150 hectares, is a large area located in the northern part of the city of Turin.

Its name “Basse” came from the high difference in level of the ground between the riverbed of the Stura (224m above sea level) and the roads (Via Reiss Romolis 241m above sea level) that surround the area.

-  INFRASTRUCTURAL BORDER: Via Reiss Romoli, the highway Torino-Caselle and the Strada dell'Aeroporto
-  NATURAL BORDER: River Stura



0 100 200 400 600 800
Metri



BASSE DI STURA: RELEVANT ELEMENTS

DIFFERENCE IN LEVEL

NATURE



LAKES



RELEVANT VIEWS



EX-LANDFILL



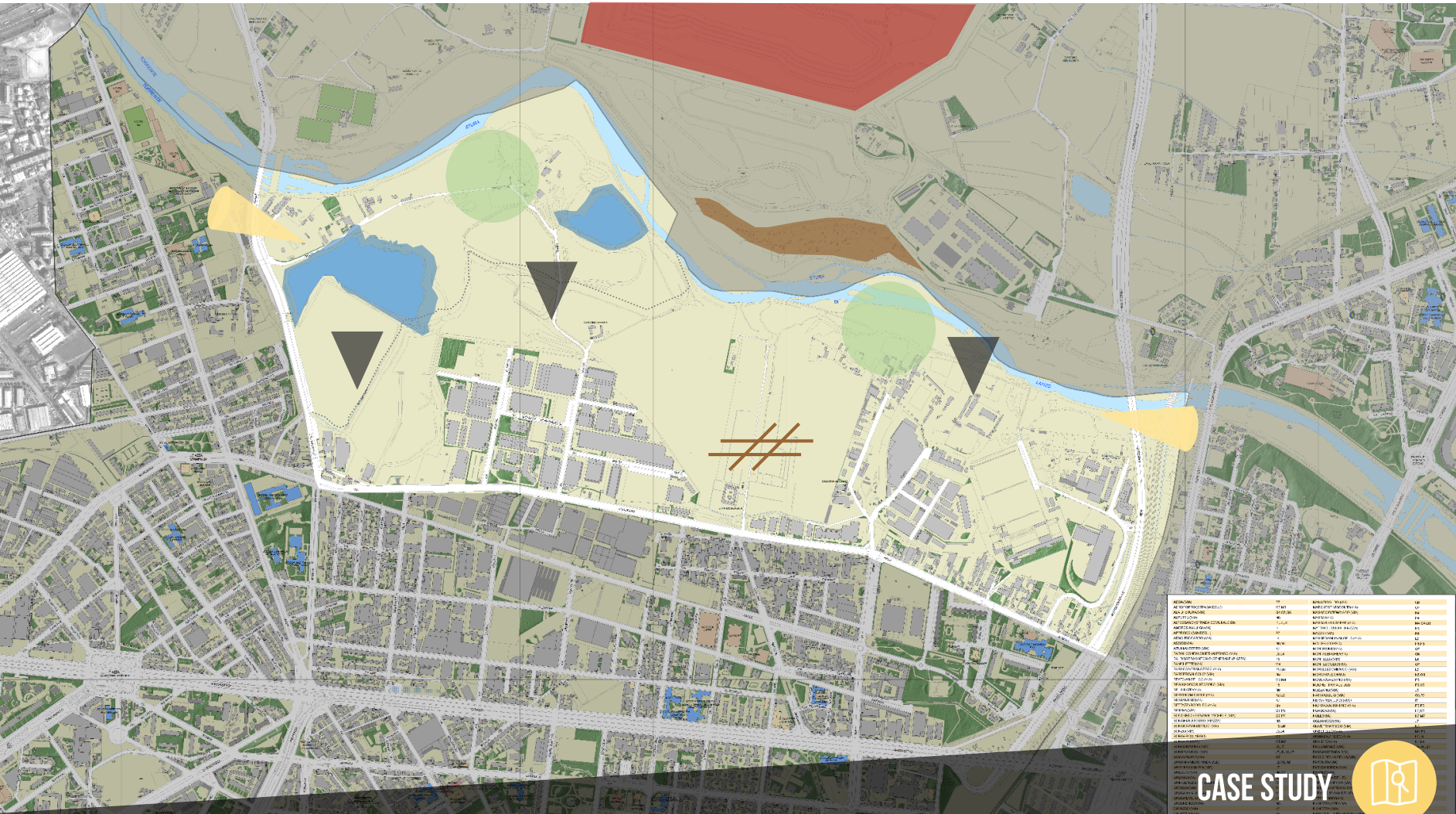
SOIL CONTAMINATION



GYPSY CAMP



EX ALLOTMENTS & FARMHOUSES

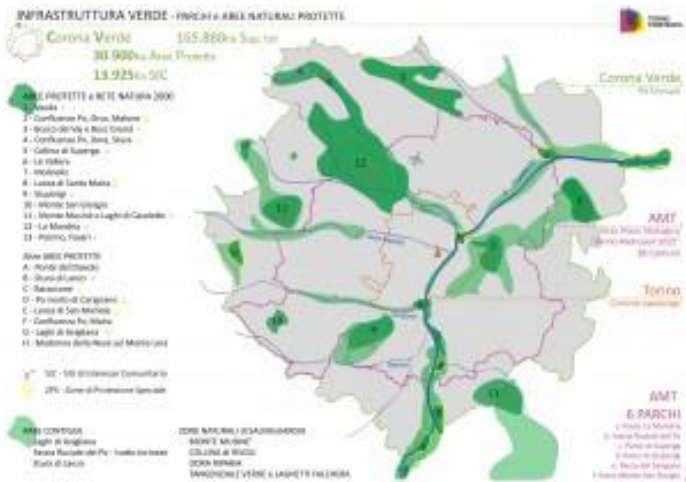


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CASE STUDY



BASSE DI STURA: A STRATEGICAL AREA

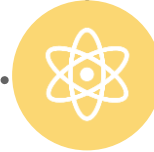


Source: <http://www.torinostrategica.it/progetto/a-4-agenzia-metropolitana-corona-verde/>

Source: coronaverdestura.it



CORONA VERDE
 TANGENZIALE VERDE



CORONA VERDE STURA
 TORINO CITTA' D'ACQUE





Source: <http://verdesettimo.comune.settimo-torinese.to.it/index.php/tangenziale-verde>


Source: <http://www.mauriziozucca.com/wordpress/?p=310>




BASSE DI STURA: MUNICIPAL PLAN


 P 17 Basse di Stura - cfr Scheda normativa "BASSE DI STURA"


 Aree per le attivita' produttive IN


 cr Centri di ricerca

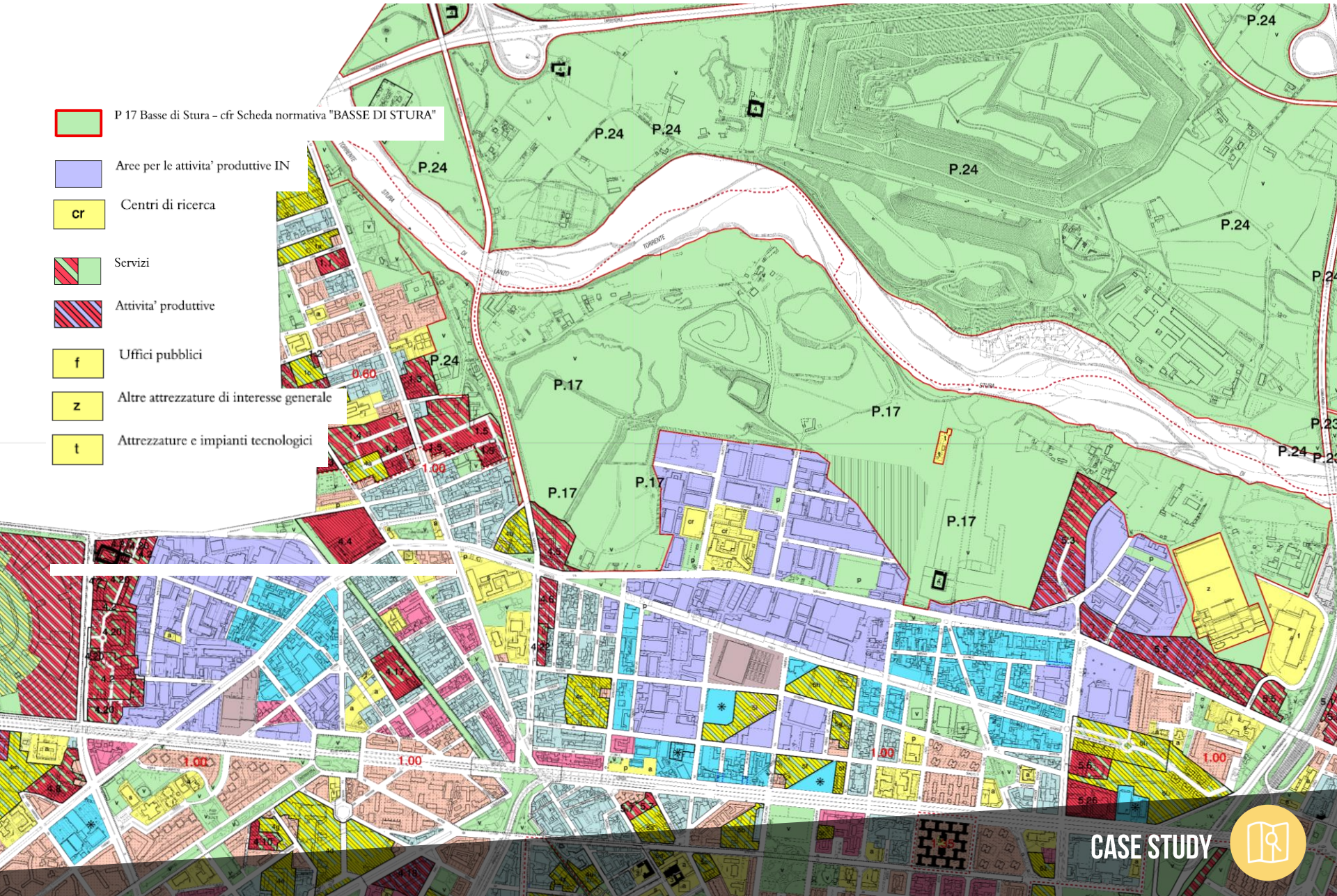
 Servizi

 Attivita' produttive

 f Uffici pubblici

 z Altre attrezzature di interesse generale

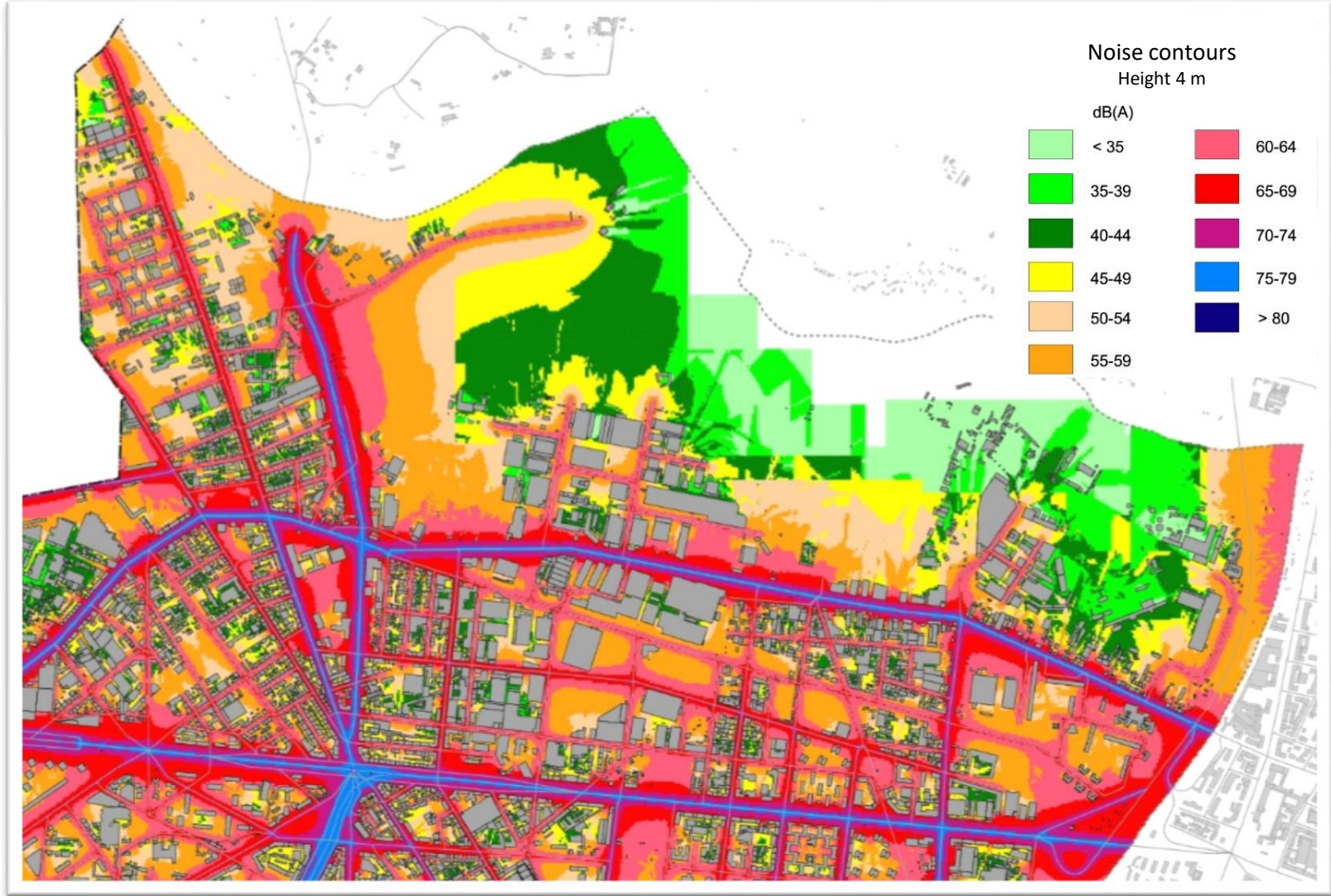
 t Attrezzature e impianti tecnologici



BASSE DI STURA: RIVER BANDS



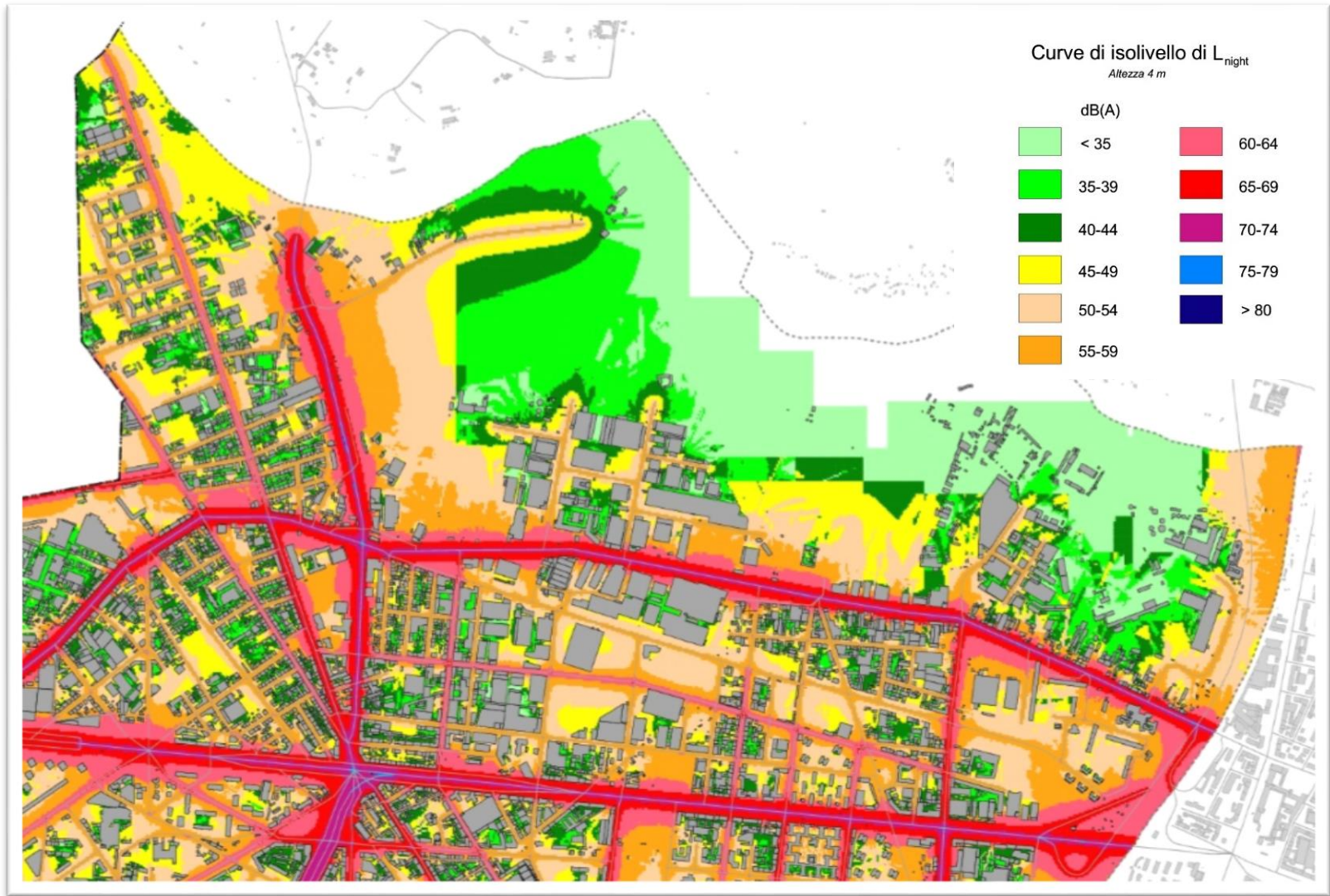
BASSE DI STURA: NOISE LEVEL DAY



0 250 500 750 1000 m



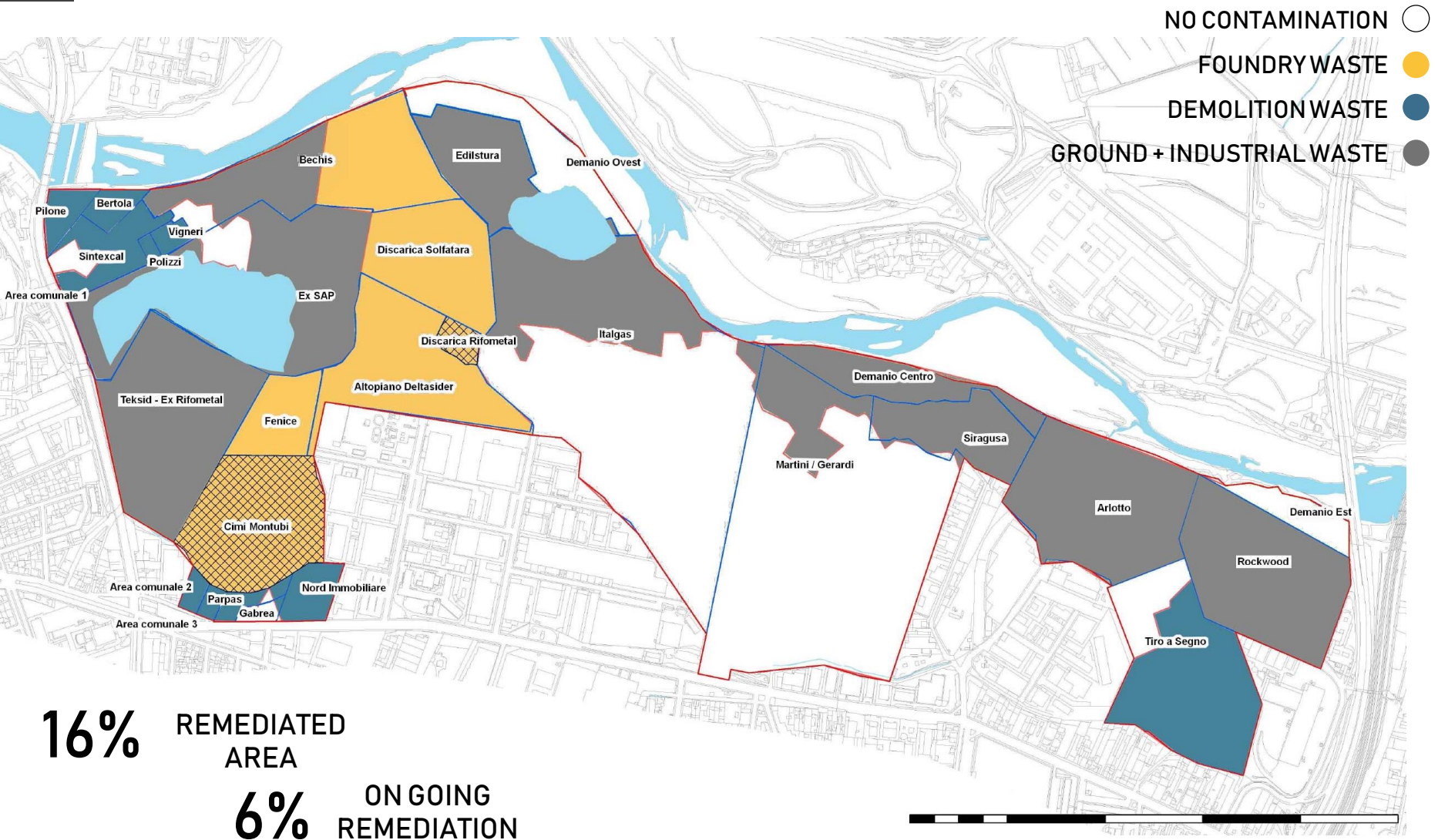
BASSE DI STURA: NOISE LEVEL NIGHT



0 250 500 750 1000 m



BASSE DI STURA: SOIL CONTAMINATION



16% REMEDIATED AREA

6% ON GOING REMEDIATION

78% REMEDIATION TO BE DONE

Source: Relazione conclusiva delle attività di caratterizzazione del SIN "Basse di Stura", pag. 44, Fig. 5.1.2



BASSE DI STURA: LANDLORDS

MUNICIPALITY JURISDICTION ●

PRIVATE JURISDICTION ●

80%

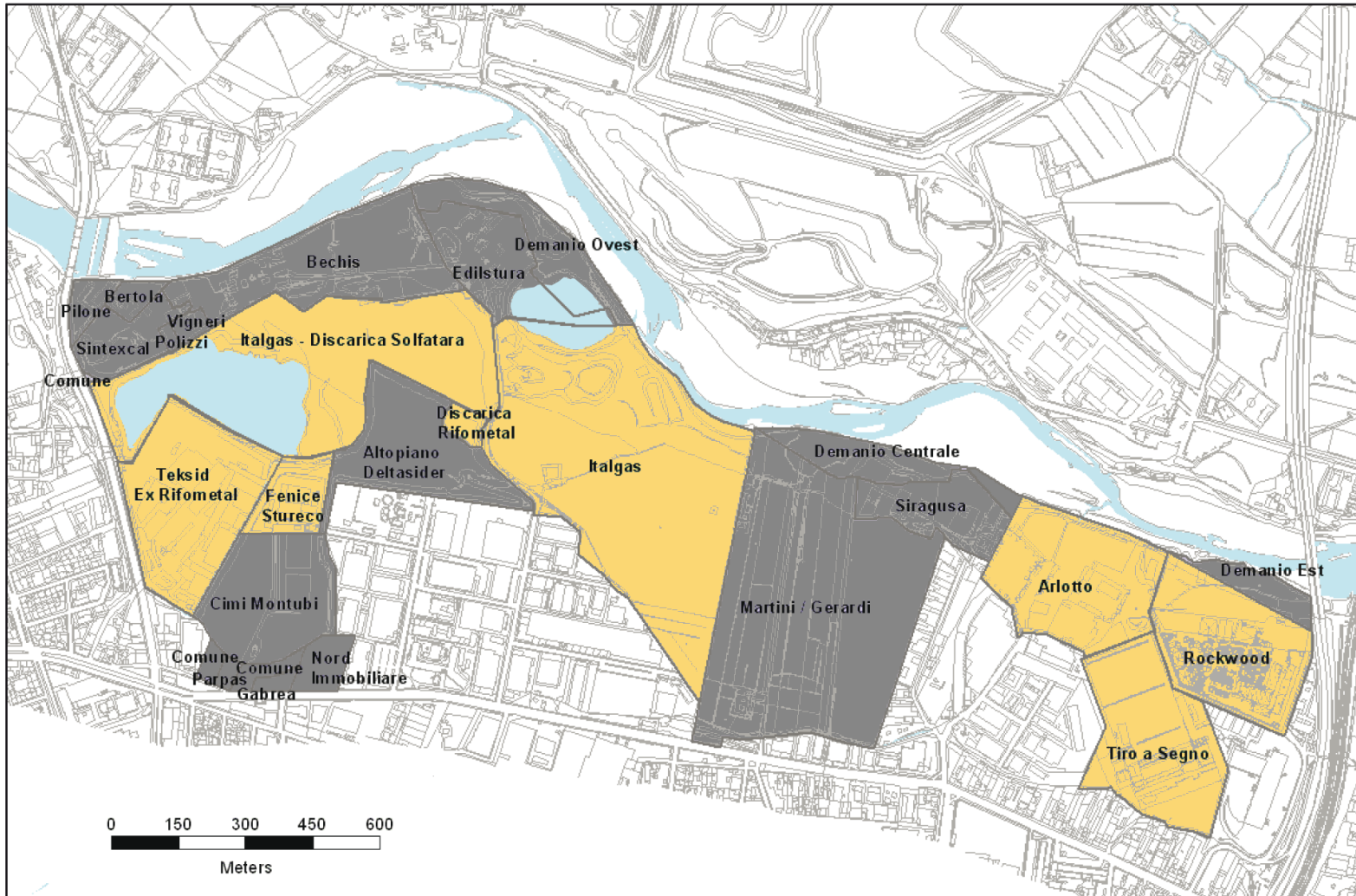
PRIVATE

17%

MUNICIPALITY

3%

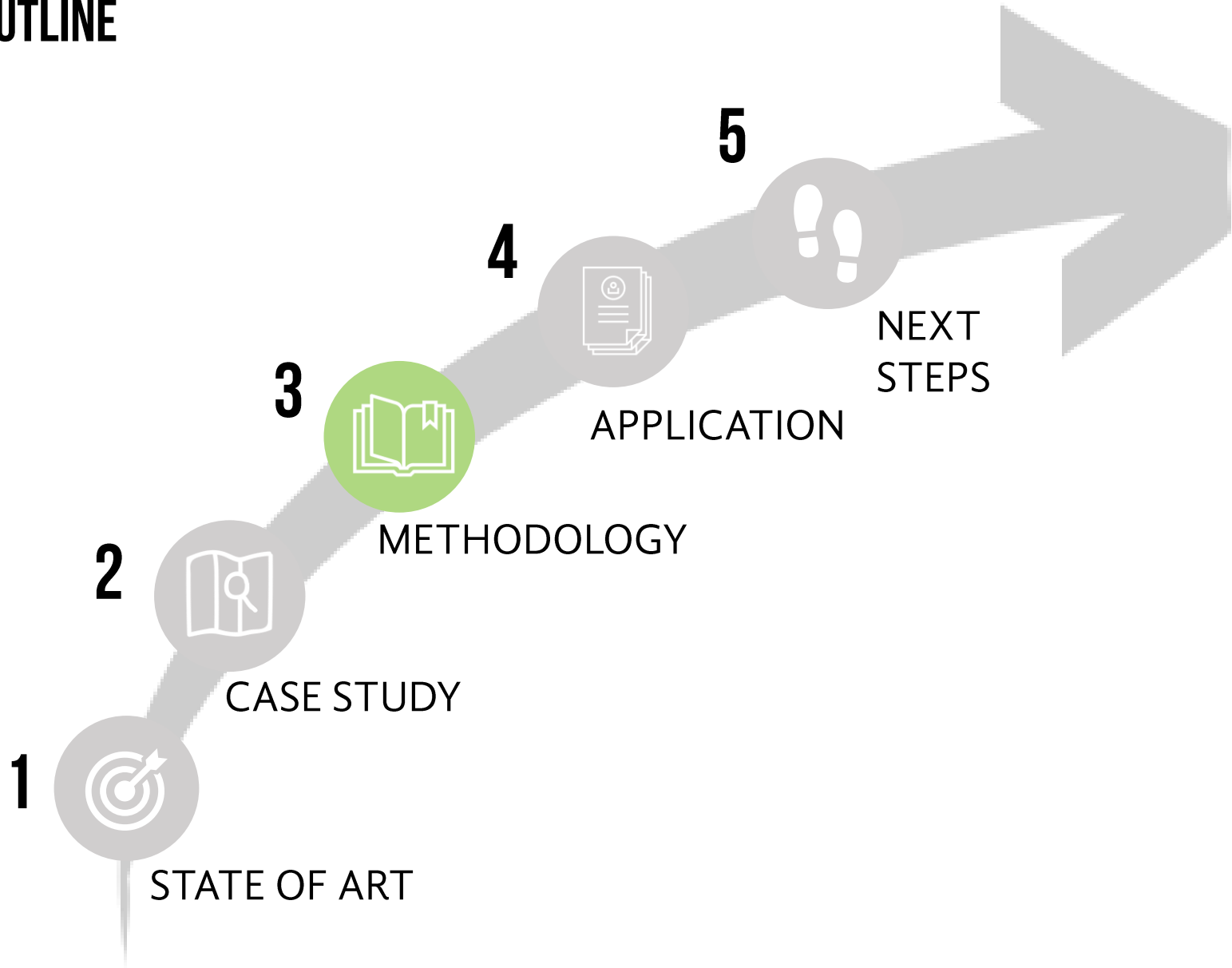
STATE



Source: Relazione conclusiva delle attività di caratterizzazione del SIN “Basse di Stura”, pag. 16, Fig. 3.1



OUTLINE



MULTI-LEVEL METHODOLOGY

OBJECTIVE: test mixed methods to evaluate scenarios for sustainable neighbourhoods

MODEL
STRUCTURE



**PROBLEM
FRAMING**

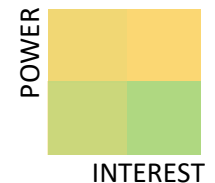


**SCENARIOS
EVALUATION**

SWOT
ANALYSIS



STAKEHOLDERS
ANALYSIS



REVEALED & STATED
PREFERENCE

+

GEOGRAPHIC
INFORMATION
SYSTEM



REVEALED PREFERENCE WITH STATED PREFERENCE

FIRST IDEA Spatial Decision Support System: Choice Experiment model + GIS

Revealed-Preference with Stated-Preference

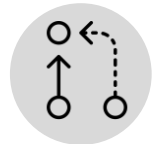


ACTUAL MARKET BEHAVIOUR

- Cognitively congruent with actual behavior
- Market and personal constraints accounted for

INCLUDE NON-EXISTING ALTERNATIVES

E.g., new electronic gadget ●



LARGER RANGES OF ATTRIBUTES

E.g., seat width and leg room ●



Source: adapted from Ben-Akiva, 2017



LITERATURE REVIEW: RP + SP

1989 Morikawa proposed the pooling of RP and SP

Other contributions: Ben-Akiva and Morikawa (1991); Ben-Akiva, Morikawa, and Shiroishi (1991); Bradley and Daly (1994); Hensher and Bradley (1993); Hensher (1998).

A different view is represented by the work of Swait, Louviere, and Williams (1994).



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Transportation Research Part B 42 (2008) 191–203

TRANSPORTATION
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PART B

www.elsevier.com/locate/trb

Transportation 19: 117–139, 1992

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Estimation on stated-preference experiments constructed from revealed-preference choices

Kenneth Train *, Wesley W. Wilson

*Department of Economics, University of California, Berkeley, CA 94720-3880, United States
Department of Economics, University of Oregon, United States*

Received 5 April 2007; accepted 12 April 2007

Abstract

Constructing stated-preference (sp) experiments from a choice that the respondent made in a revealed-preference setting can enhance the realism of the sp task and the efficacy of preference revelation. However, the practice creates dependence between the sp attributes and unobserved factors, contrary to the independence assumption that is maintained for standard estimation procedures. We describe a general estimation method that accounts for this non-independence and give specific examples based on standard and mixed logit specifications of utility. We show conditions under which standard estimation methods are consistent despite the non-independence. We illustrate the general methodology through an application to shippers' choice of route and mode along the Columbia/Snake River system.
© 2007 Elsevier Ltd. All rights reserved.

Keywords: Mixed logit; Stated-preference; Freight demand; Shipper mode choice

High speed rail market projection: Survey design and analysis

H. F. GUNN¹, M. A. BRADLEY² & D. A. HENSHER³
^{1,2} *Hague Consulting Group, Den Haag, The Netherlands;* ³ *Institute of Transport Studies, The University of Sydney, NSW, Australia*

Key words: high speed rail, survey, demand forecasting, stated preferences

Abstract. This paper summarises work done to assess the market potential and likely financial performance of a planned high-speed rail link connecting Sydney, Canberra and Melbourne, under a variety of scenarios concerning the services offered and the possible market responses of the competing transport modes in the corridor. In the Australian context, such a link has the characteristics of an essentially new transport mode since existing rail services are extremely poorly developed. The expectation was that generated demand could be a substantial part of the overall ridership. A programme of market research was commissioned by the private consortium considering the project, designed to support forecasting models capable of predicting both diverted and generated travel on the new service. A major survey of current travellers was conducted in 1988, followed by an extensive collection of stated preference evidence about the factors affecting the travel decisions of both existing travellers and those who had not recently made any journeys in the corridor. The paper focuses mainly on the design and organisation of the surveys, on the analysis approach, and on the methods used to generate forecasts for simulated populations and scenarios.



LITERATURE REVIEW: RP + SP

1989 Morikawa proposed the pooling of RP and SP

Other contributions: Ben-Akiva and Morikawa (1991); Ben-Akiva, Morikawa, and Shiroishi (1991); Bradley and Daly (1994); Hensher and Bradley (1993); Hensher (1998).

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Transportation Research Part B 36 (2002) 593–616

TRANSPORTATION
RESEARCH
PART B

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4th International Symposium of Transport Simulation-ISTS'14, 1-4 June 2014, Corsica, France

A revealed/stated preference approach to bus service configuration

Pascal Bourgeat

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A unified mixed logit framework for modeling revealed and stated preferences: formulation and application to congestion pricing analysis in the San Francisco Bay area

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Department of Civil Engineering – ECJ 6.8, University of Texas at Austin, Austin, TX 78712, USA

Received 9 November 2000; received in revised form 2 March 2001; accepted 6 March 2001

Abstract

This paper proposes a methodology to design an optimal public transport service configuration and forecast demand. It uses a combined revealed preference (RP) and stated preference (SP) approach as well as a Juster scale to ensure strong external validity to both bus choice elasticities and demand forecast. The paper details how elasticities of choice probabilities to bus service characteristics as well as personal and situational factors are adjusted using an RP model based on travellers' reported last trip to work/study or a nearby shopping centre. The Juster scale anchors the model to ensure it provides realistic forecasts through simulation.

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Selection and/or peer-review under responsibility of the Organizing Committee of ISTS'14

Keywords: public transport, bus service configuration, demand forecast, revealed preference, stated preference, behaviour change, status quo bias, prospect theory

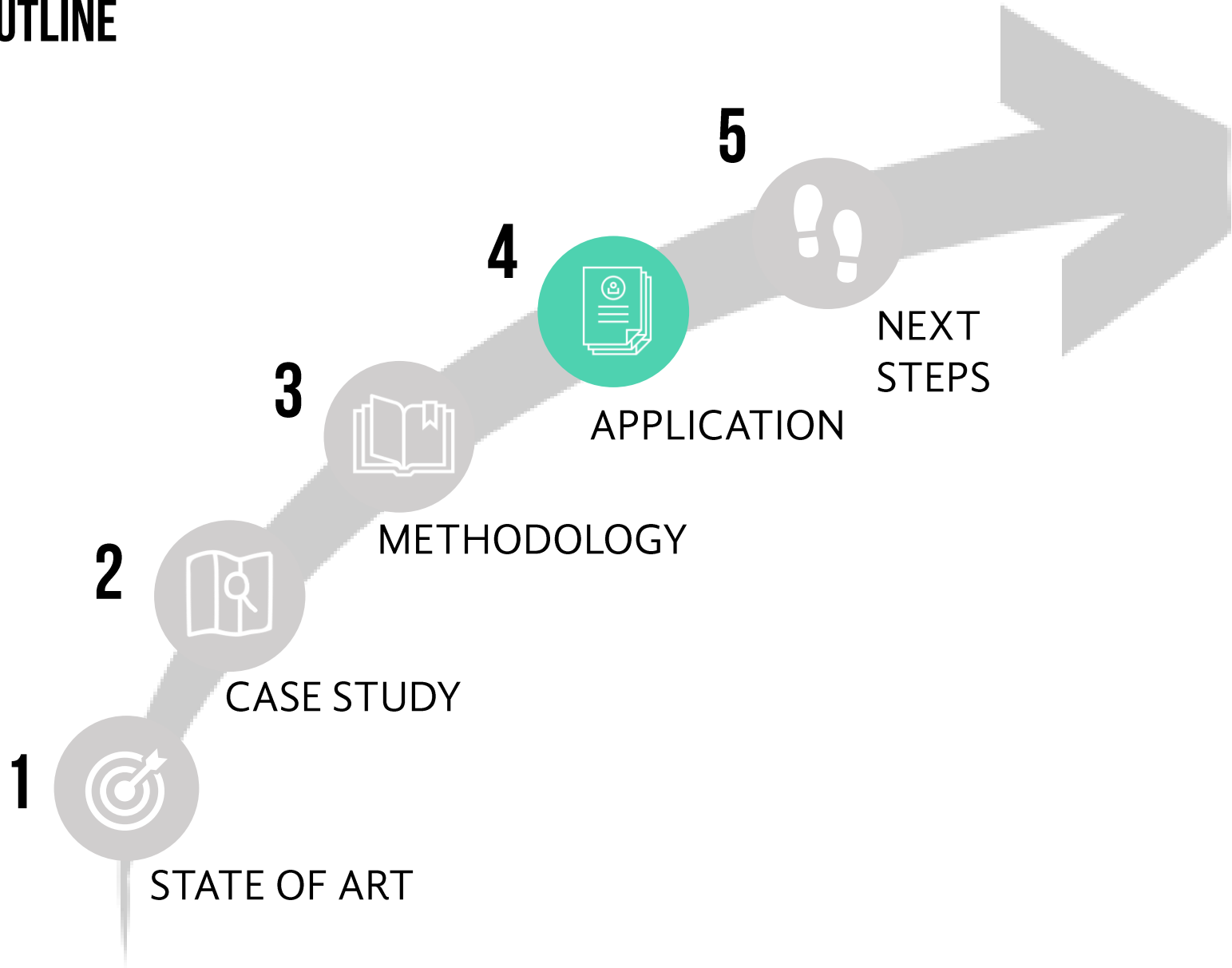
Keywords: Mixed logit; Stated-preference; Freight demand; Shipper mode choice

Abstract

This paper formulates and applies a unified mixed-logit framework for joint analysis of revealed and stated preference data that accommodates a flexible competition pattern across alternatives, scale difference in the revealed and stated choice contexts, heterogeneity across individuals in the intrinsic preferences for alternatives, heterogeneity across individuals in the responsiveness to level-of-service factors, state-dependence of the stated choices on the revealed choice, and heterogeneity across individuals in the state-dependence effect. The estimation of the mixed logit formulation is achieved using simulation techniques that employ quasi-random Monte Carlo draws. The formulation is applied to examine the travel behavior responses of San Francisco Bay Bridge users to changes in travel conditions. The data for the study are drawn from surveys conducted as part of the 1996 San Francisco Bay Area Travel Study. The results of the mixed logit formulation are compared with those of more restrictive structures on the basis of parameter estimates, implied trade-offs among level-of-service attributes, heterogeneity and state-dependence effects, data fit, and substantive implications of congestion pricing policy simulations. © 2002 Elsevier Science Ltd. All rights reserved.

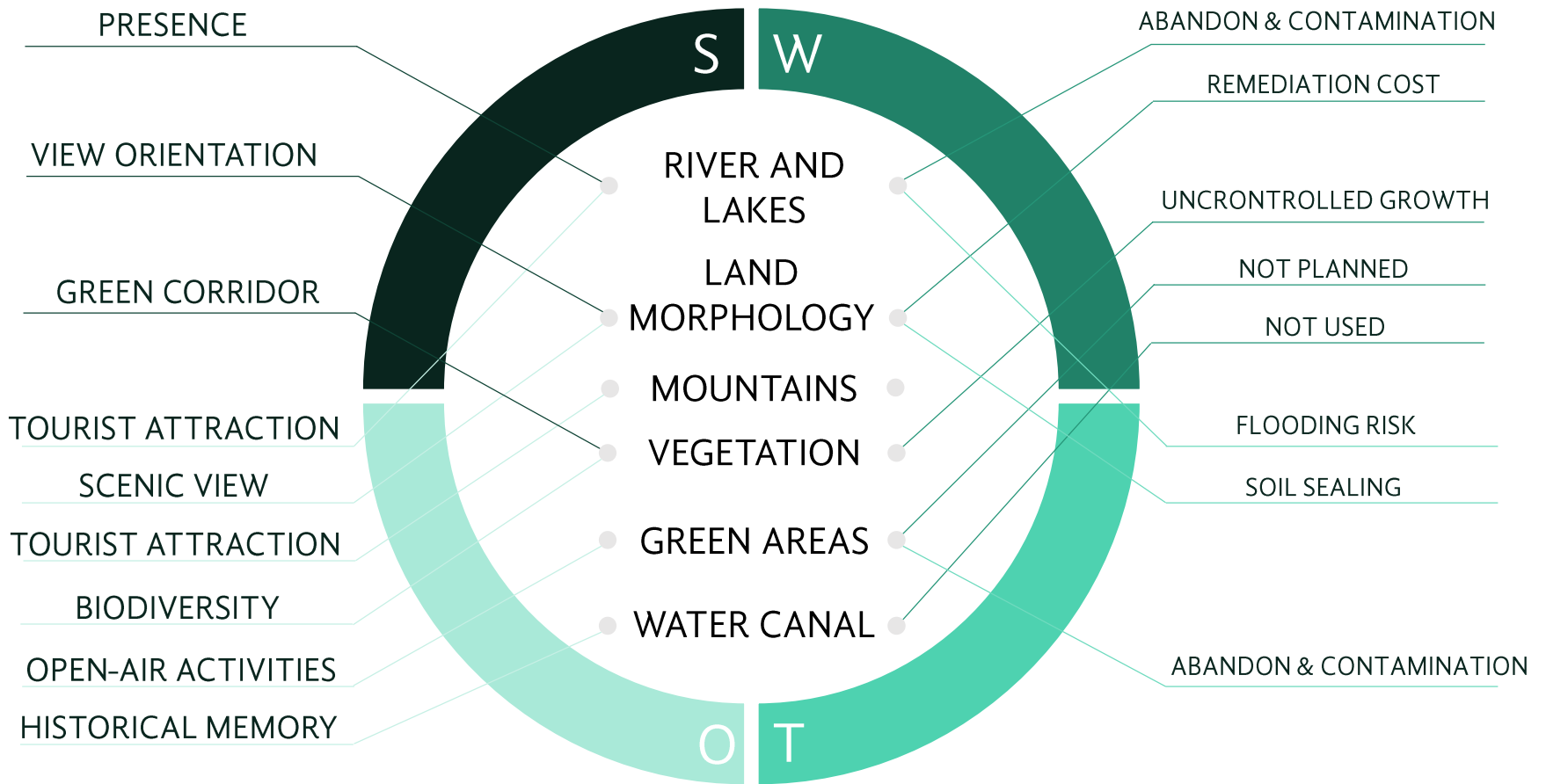


OUTLINE



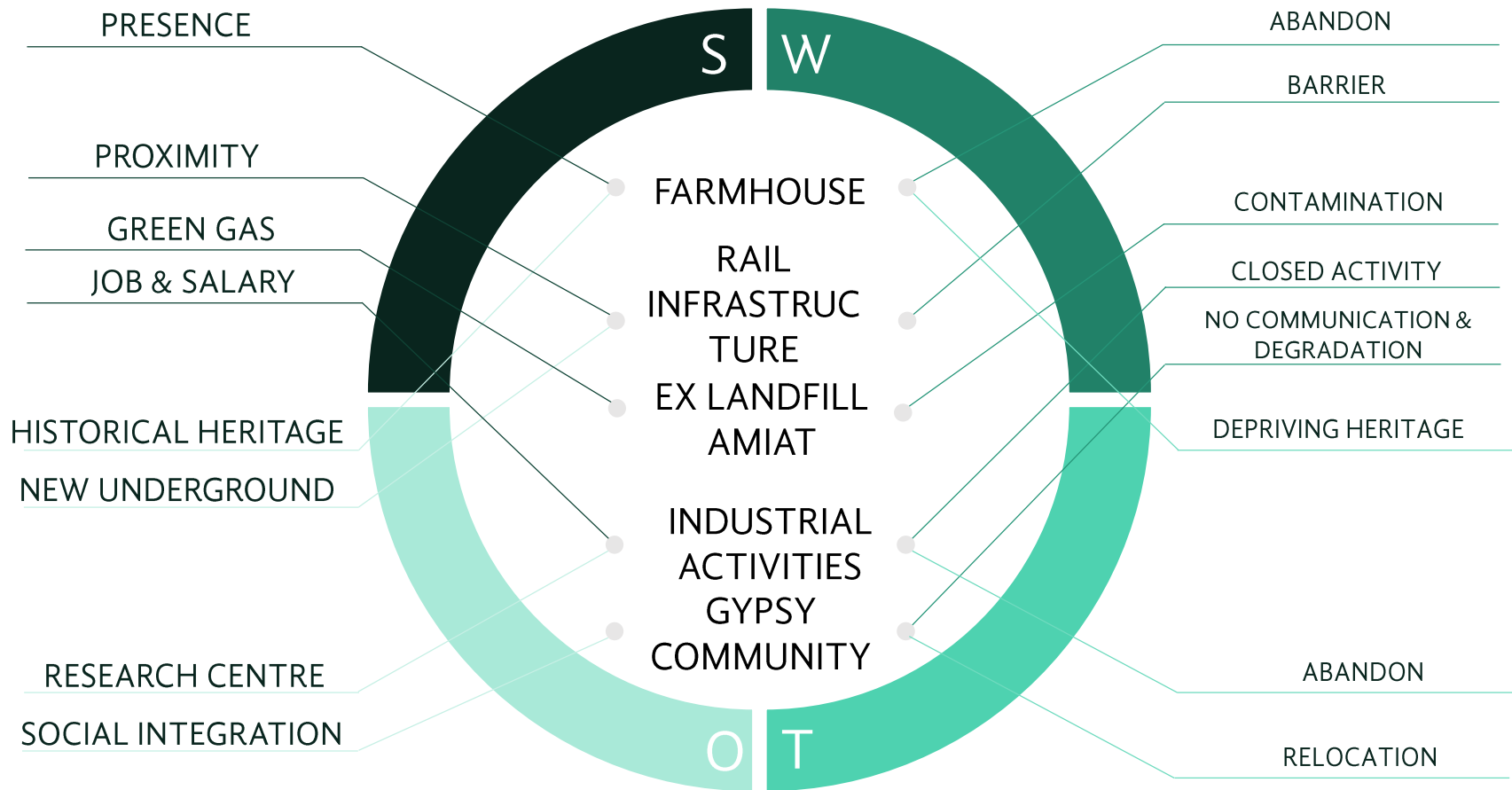
PROBLEM FRAMING: SWOT ANALYSIS

NATURAL ELEMENTS















PROBLEM FRAMING: SWOT ANALYSIS

ANTHROPIC ELEMENTS

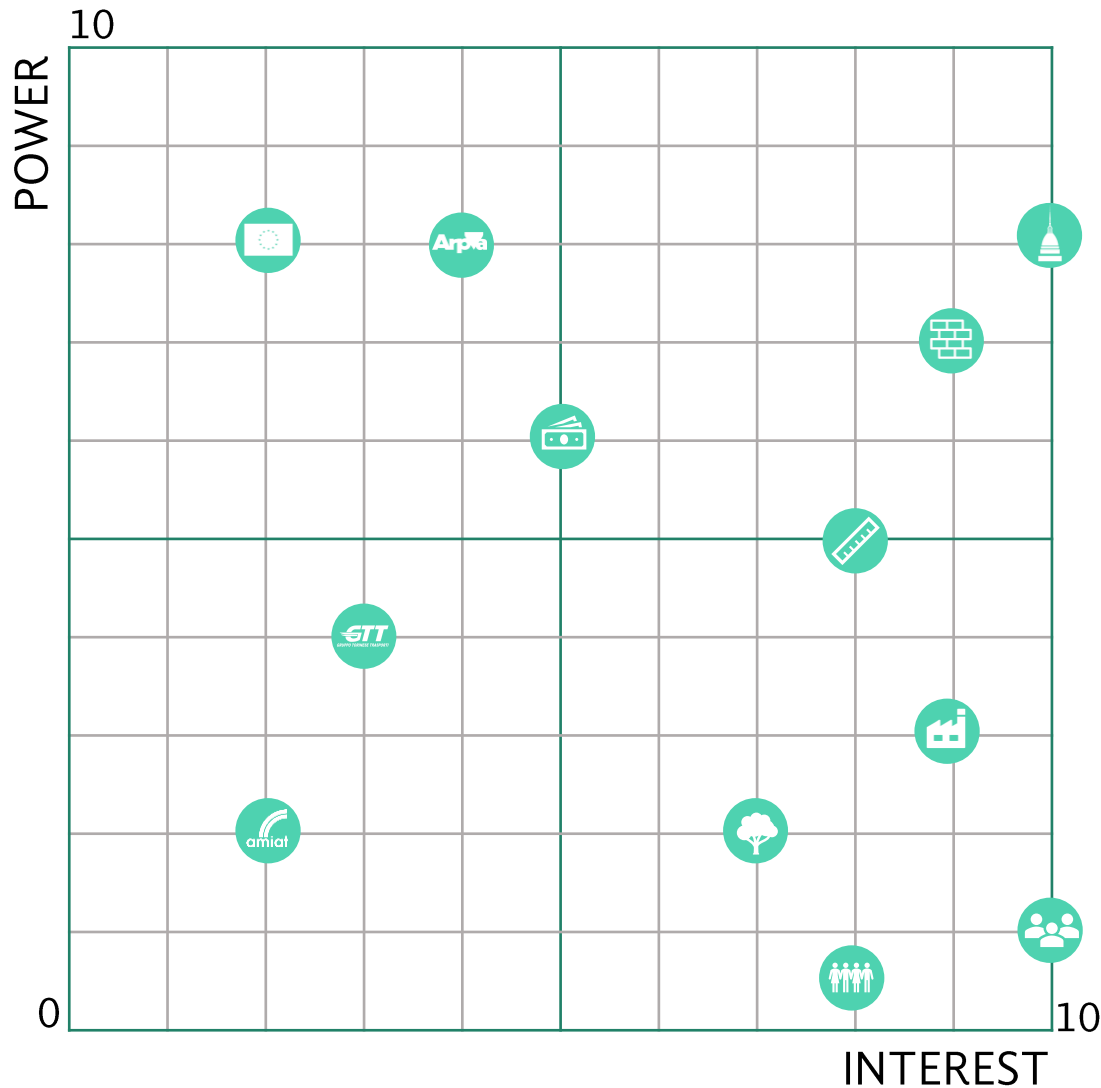


PROBLEM FRAMING: STAKEHOLDERS ANALYSIS













STAKEHOLDERS	LEVEL	RESOURCE	TYOLOGY
 Metropolitan city of Turin	local	legal, cognitive, political, economic	administrative
 UE (European Union)	international	legal, political, economic	political, administrative
 AMIAT	local	economic	special interest
 ARPA (environmental agency)	regional	legal, cognitive	administrative
 GTT (transport agency)	local	economic	special interest, political
 Designers (architects, planners...)	national, regional, local	cognitive	expert
 Landlords	national	legal, political, cognitive, economic	special interest
 Investors	national, regional, local	economic	special interest
 Environment groups	national, regional	cognitive, political	general interest
 Citizens	local	cognitive	special interest
 Gypsy community	local	cognitive	special interest
 Owners of industrial activities	local	economic, cognitive	special interest



STAKEHOLDERS ANALYSIS: POWER/INTEREST



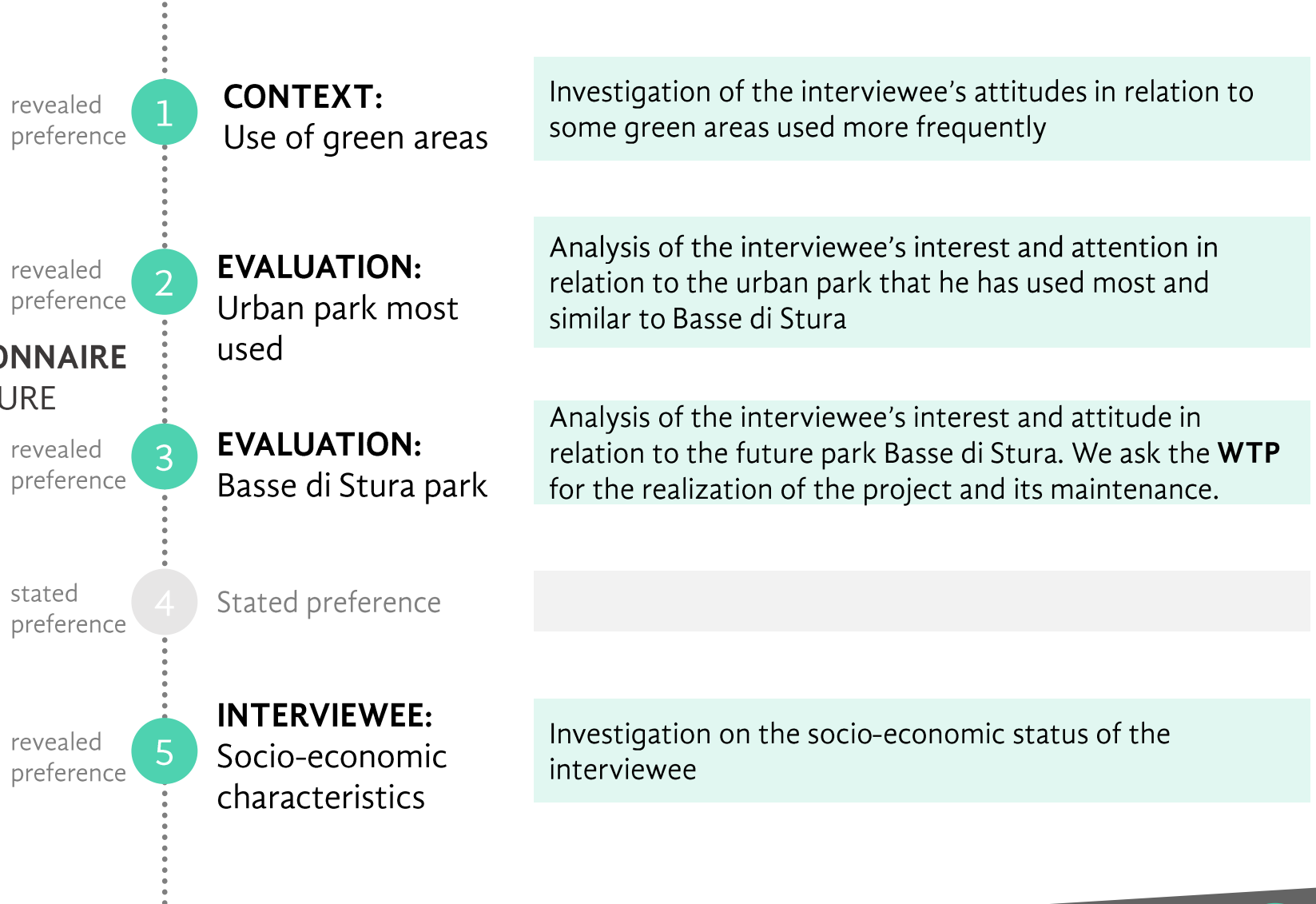
STAKEHOLDERS

-  Metropolitan city of Turin
-  UE (European Union)
-  AMIAT
-  ARPA (environmental agency)
-  GTT (transport agency)
-  Designers (architects,...)
-  Landlords
-  Investors
-  Environment groups
-  Citizens
-  Gypsy community
-  Owners of industrial activities



SCENARIOS EVALUATION: REVEALED PREFERENCE WITH STATED PREFERENCE

QUESTIONNAIRE STRUCTURE



SCENARIOS EVALUATION: REVEALED PREFERENCE WITH STATED PREFERENCE

- R 1
- R 2
- R 3
- S 4
- R 5

PARK MOST USED

The interviewee describe his most used park based on the attributes defined for the Basse di Stura scenarios

RP

+

BASSE DI STURA (scenario 1)

A set of attributes characterized the first scenario of Basse di Stura (created to the orthogonal design)

SP

BASSE DI STURA (scenario 2)

A set of other attributes characterized the second scenario of Basse di Stura (created to the orthogonal design)

SP

STATED PREFERENCE: Choice Experiment

Investigation of the interviewee's preferences with respect to possible transformation scenarios for the Basse di Stura area

The method estimates the relative importance of the attributes of a product by breaking down the consumer overall choice regarding a certain set of alternatives.

The fundamental principle is consumer utility and the two main assumptions are that consumer choice is governed by the maximization framework and that a product, or service, can be seen as a set of attributes from which a person gains utility (Green & Rao, 1971).



REVEALED PREFERENCE WITH STATED PREFERENCE: THE ATTRIBUTES

THE ATTRIBUTES CHOSEN ARE ALL DUMMY VARIABLES

Social & Educational activities



Farm school on no-food crop and for phytoremediation

Educational tour on the industrial history of the area

Social activities («casa del quartiere»)

Allotments

Sport activities



Soccer/tennis/basket/volley (etc) fields

Skatepark/Roller rink

Outdoor equipment

Cycle path

Natural activities



Nature trails along the river

Birdwatching

Butterfly farm

Horse farm

Organised sites



Children's play area & pic-nic area

Dog park

Relax area and study spaces

Organised beaches along the river

Bio-energy



Cultivated areas of no-food crop

Bio-energy areas

Research centre

Cost



25%

50%

75%

100%



REVEALED PREFERENCE WITH STATED PREFERENCE: EXAMPLE

PARK MOST USED



Soccer/basket/volley fields
Outdoor equipment
Cycle path



Children's play area & pic-nic area



0 €



BASSE DI STURA (scenario 1)

Farm school on no-food crop and
for phytoremediation

Butterfly farm

Cultivated areas of no-food crop

Outdoor equipment

Children's play area & pic-nic area

75% of WTP



BASSE DI STURA (scenario 2)

Social activities («casa del
quartiere»)

Birdwatching

Cultivated areas of no-food crop

Cycle path

Relax area and study spaces

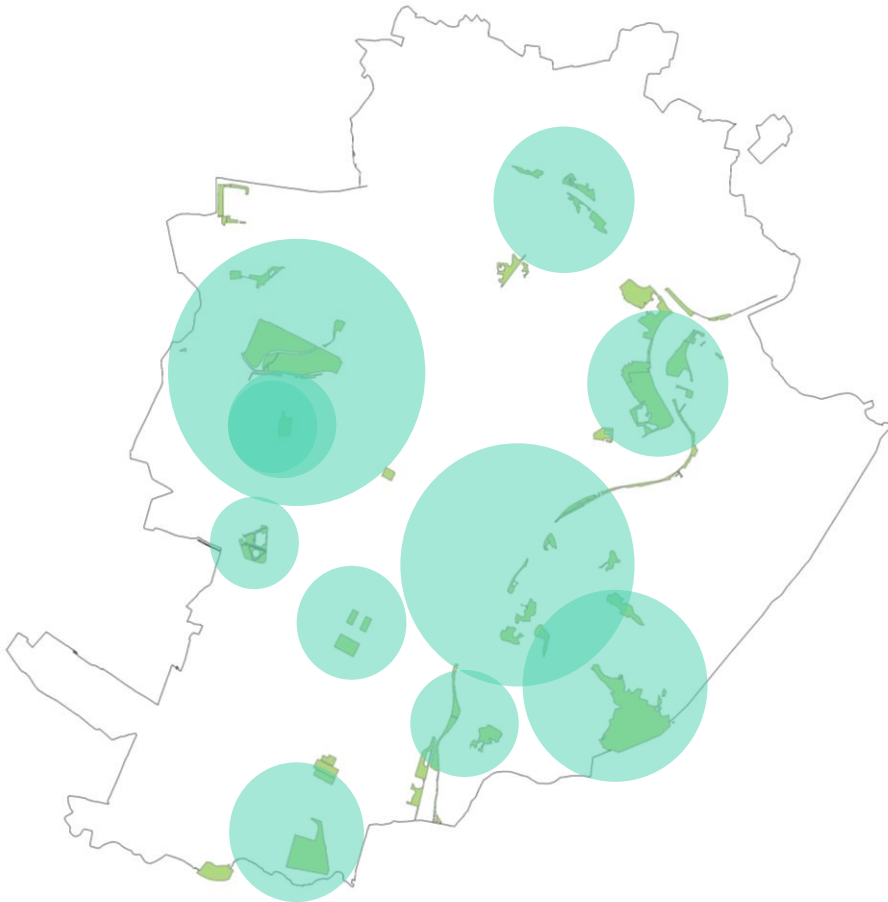
50% of WTP



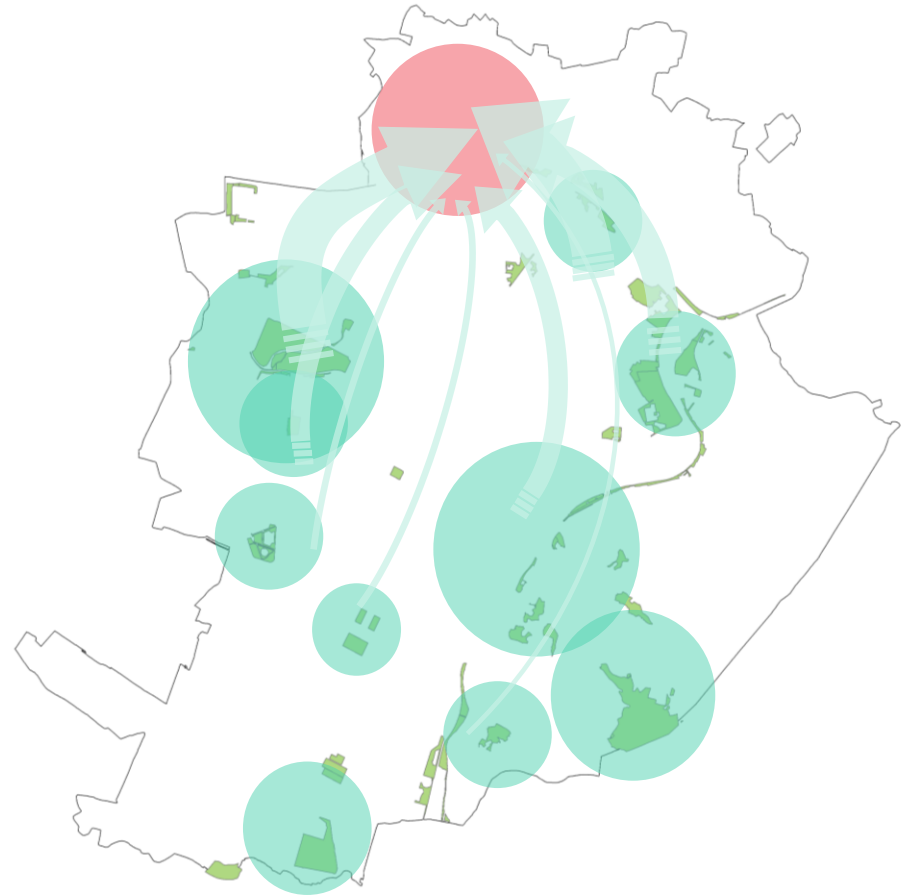
REPEATED EXPERIMENT FOR 4 TIMES



REVEALED PREFERENCE WITH STATED PREFERENCE + GIS



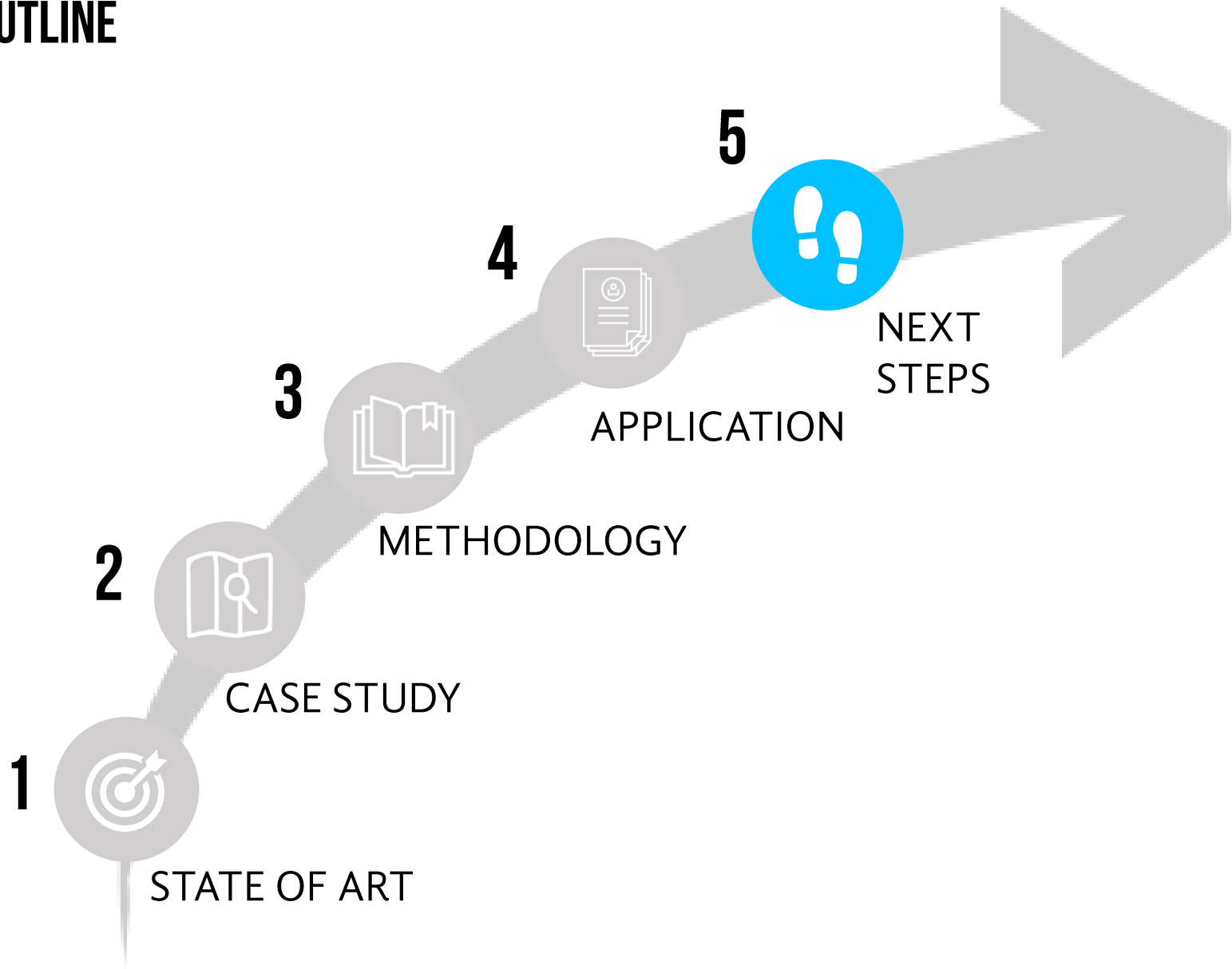
ACTUAL SCENARIO



FUTURE SCENARIO



OUTLINE



FUTURE STEPS

FUTURE STEPS

1

GENERATE

ORTHOGONAL DESIGN

through the use of SSI , software able to the dummy variables

2

PRE TEST

THE QUESTIONNAIRE TO A “SMALL” SAMPLE

in order to asses possible changes and implementation

3

SURVEY

A REPRESENTATIVE SAMPLE OF THE ALL POPULATION OF TURIN

but also a representative sample of technical experts and one of citizens around Basse di Stura

4

ANALYZE

THE COLLECTED DATA

and implement with GIS





GRAZIE PER L'ATTENZIONE

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