THE BENEFITS OF SLOW MOBILITY.

AN APPLICATION OF CONTINGENT VALUATION METHOD

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XVII Riunione Scientifica Siet

Milano, I Luglio, 2015

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STRUCTURE

- ✓ **Aim of the work**

- ✓ The CdM project

- ✓ Data and Methodology

- ✓ Descriptive statistics

- ✓ CVM results

- ✓ Conclusions

AIM OF THE WORK

Investigating the benefits of a slow mobility infrastructure (bike & pedestrian path) called "Cammino dei Monaci" in the Southern neighbourhoods of Milan
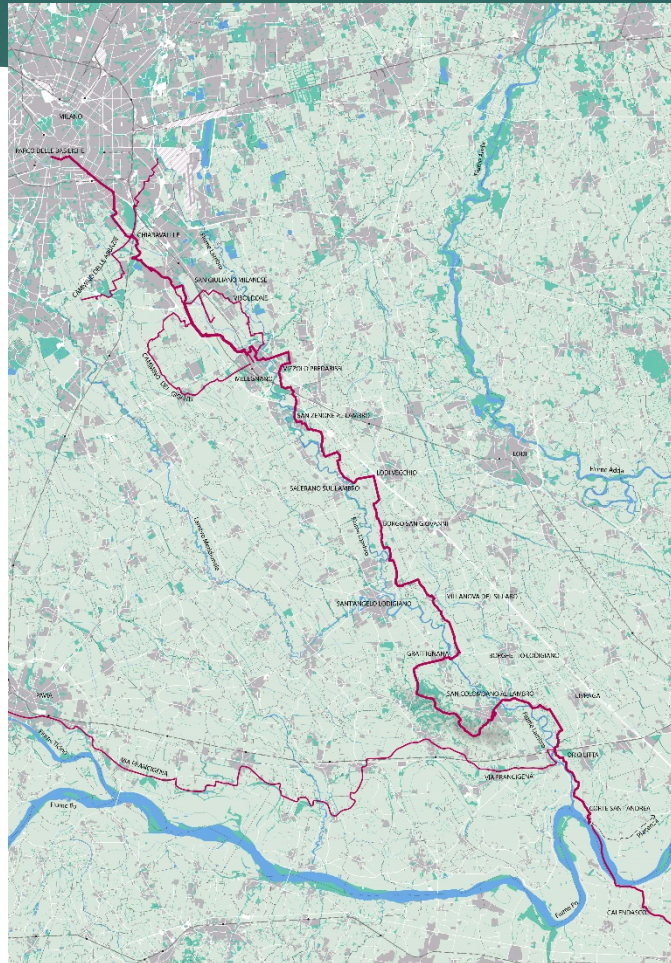
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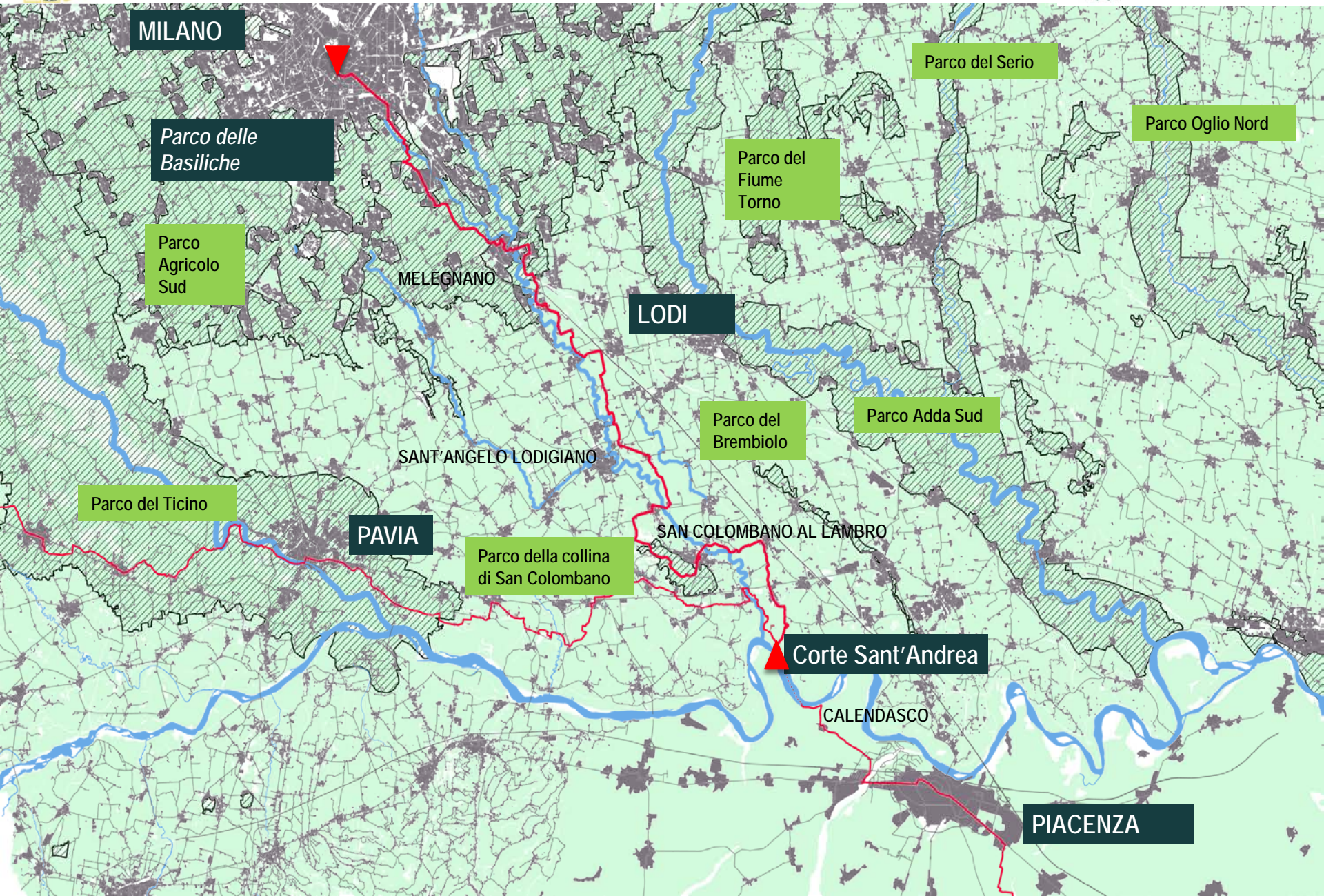
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Cammino dei Monaci

Physical infrastructure: bike and pedestrian lane

Network infrastructure: tourism and connectivity

Approximately 67,2 km from Milan to Calendasco (PC)

Historical and Religious Pilgrim Route

Il territorio del Cammino dei Monaci

MILANO

Parco delle Basiliche

Parco Agricolo Sud

Parco del Ticino

PAVIA

Parco della collina di San Colombano

MELEGNANO

SANT'ANGELO LODIGIANO

SAN COLOMBANO AL LAMBRO

LODI

Parco del Serio

Parco Oglio Nord

Parco del Fiume Torno

Parco del Brembiolo

Parco Adda Sud

Corte Sant'Andrea

CALENDASCO

PIACENZA

Il Tracciato del Cammino dei Monaci

MILANO

Parco delle Basiliche

Parco delle Basiliche

Nosedo

Strada delle Abbazie

Viboldone

Melegnano

Sentiero dei Giganti

LODI

Salerano al Lambro

Sant'Angelo Lodigiano

PAVIA

San Colombano al Lambro

Corte Sant'Andrea

Via Francigena

Calendasco

PIACENZA

Milano Parco delle Basiliche	Nosedo	Viboldone	Melegnano	Salerano al Lambro	Sant'Angelo Lodigiano	San Colombano	Corte Sant'Andrea
5,1	7,8	6	12,7	7,4	16	12,2	

Km 67,2

Le alternative ciclo-pedonali di progetto

MILANO
Parco delle Basiliche

Molino delle Armi

Porta Romana

Chiaravalle

VARIANTE 1: CHIARAVALLE-VIBOLDONE

VARIANTE 2: VIBOLDONE - MELEGNANO

Santa Maria in Calvenzano

LODI

VARIANTE 3: SALERANO-CA' DELL'ACQUA

San Zenone al Lambro

VARIANTE 4 : MAIANO-BARGANO

Graffignana

PAVIA

San Colombano al Lambro

Corte Sant'Andrea

PIACENZA
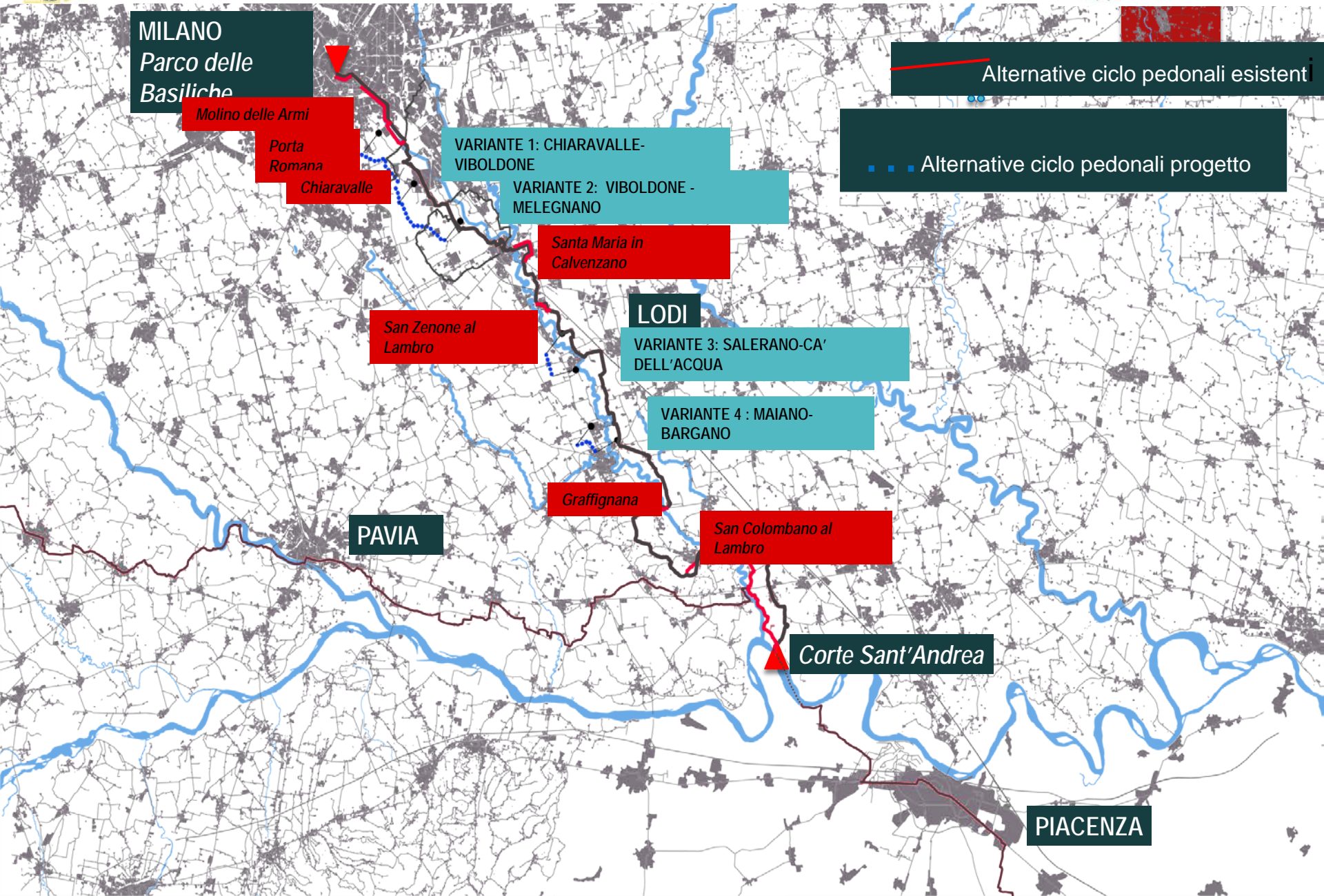
Alternative ciclo pedonali esistent
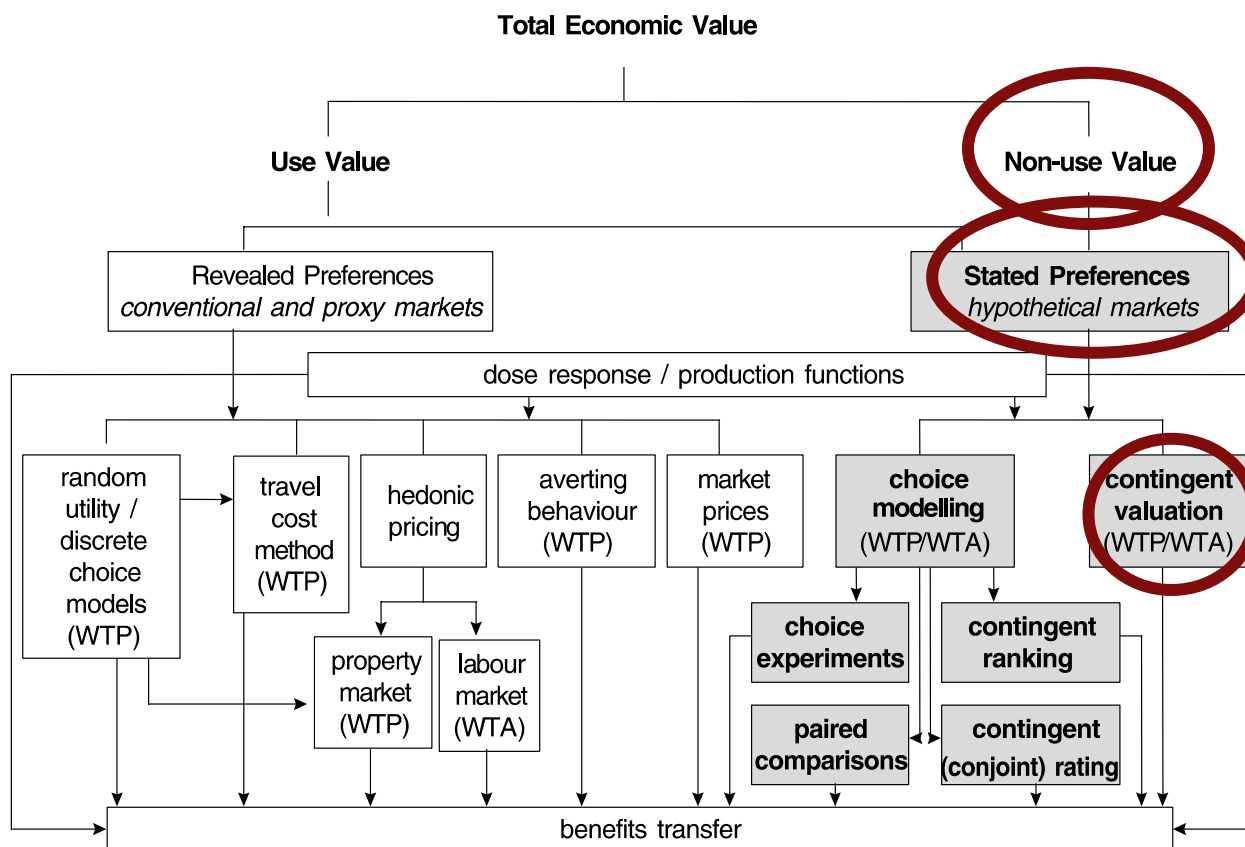
Alternative ciclo pedonali progetto

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Valuation Issue

- Environmental
- Cultural
- Health

Intangibles

Non excludable
Non rival

or

No revenues

Missing markets

Use value +
Non use value

Total Economic Value
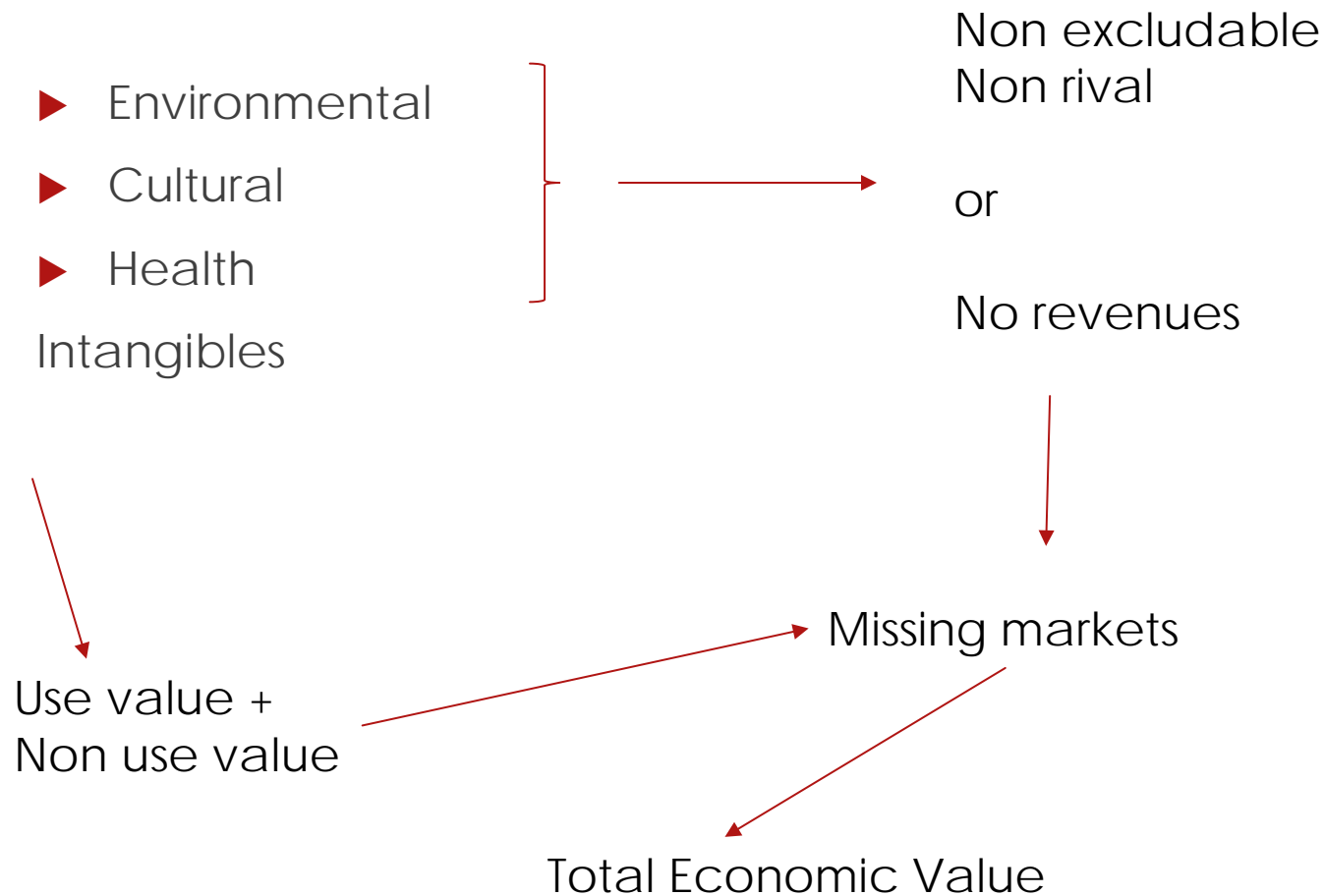
Methodology: Total Economic Valuation

Source: Pearce et al., 2002

CVM: a long story…

- Ciriacy-Wandrup: idea, 1947
- Mack & Mayers, 1958: first application, an entrance fee in a park
- Davis, 1963, Goose hunting
- Mitchell e Carson, 1989, who put together economics, markets and political sciences, psychology, sociology.
- Carson et al. 1992, on Exxon Valdez accident-breaktrough in 1989
- NOAA Panel (Arrow et al.), 1993, Guidelines and debate
- Hanemann (1984, 1994), McFadden, 1994, Debate
- Lopez-Feldman (1998) . Stata command
  - In particular for bike facilities (health, safety, reduced congestion, mobility, liveability, fiscal-tax, RE …)
   - Krizek (2006) focuses on the NON –USE value

Bidding mechanism

	Output	QUESTION	*Nr Question*	Main Problem	Estimation Method
Open-ended question	WTP	How much would you pay at maximum…?	1	Expertise	Linear regression OLS, GLS
Bidding game	A range for WTP	Would you pay…?	Until NO	Anchoring	
Payment card	A range for WTP	Choose the amount	1	Anchoring	
		REFERENDUM			
Single-bounded	A range for WTP	Would you pay…?	1 (yes/no)	Poor info/Anchoring	Logit, Probit
Double-bounded	A range for WTP	Would you pay…?	2	Hard to manage	RUMS

Close ended

NOAA blue ribbon

Methodology: CVM

Target population and Sample frame
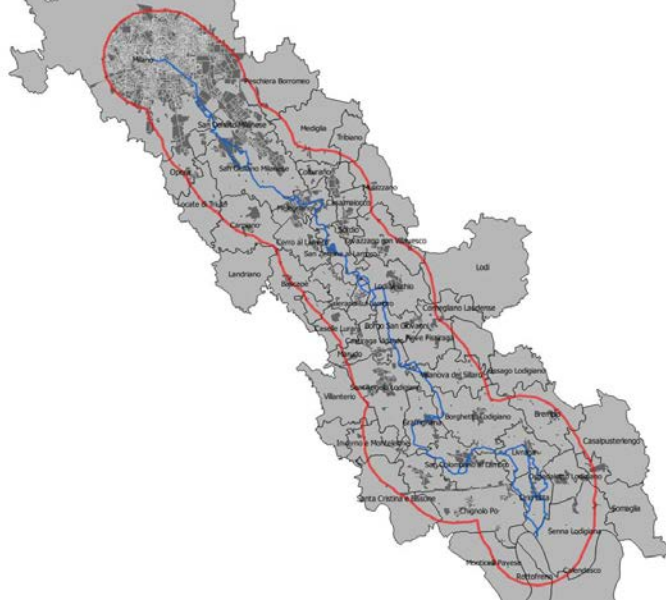
In-person
Intercept
Survey

Quota sample

21 collectors

May - June , 2015

Year	Buffer area	Spatial scope	Buffer population	Sample
Istat, 2011	3,75 km (15 minutes at 15 kmh speed by bike)	40 Municipalities	850.000 people; 415.000 families (86% of the total)	472 respondents over 15 y.o. (living in the buffer area) (medium sample dbDC + o.e. follow up) 74 pre-test (open ended,

Methodology: CVM

Questionnaire design

PURPOSE
ATTITUDINAL QUESTIONS
USE OF THE GOOD
THE SCENARIO Payment vehicle Value elicitation question Follow-up questions
SOCIO-ECONOMIC CHARACTERISTICS

Improvement of cycle and pedestrian path

Travel patterns and propensity for slow mobility

Knowledge of the project and interest for it

Voluntary Donation to a trust fund

WTP, Close Ended – DC Double bounded

Preference intensity for TEV components

NOAA Protocol

		TEST		TEST
SAMPLE	Probability sampling	✓	Declared sampling method	✓
PRE-TEST	Pretesting for interviewer	✓	Pretesting of questionnaire	✓
TEST	Personal interview	✓	Briefing to interviewers	✓
MEANING	Accurate description	✓	No-answer option available	✓
FORMAT	Referendum format	✓	Yes-no follow ups	✓
WTP	WTP instead of WTA	✓	Conservative design	✓
MISSING	Minimize nonresponses	✓	Declared non-response rate	✓

Methodology: CVM

Value elicitation format

Main question	1° answer	Follow up question	2° answer	EXITUS
			Yes	WTP>2X
		And for 2X?		
	Yes		No	X<WTP<2X
Would your family pay X for the CdM?				
	No		Yes	X/2<WTP<X
		And for X/2?		
			No	WTP<X/2

Price vector	20€	40€	60€	80€	100€

20% for each bid

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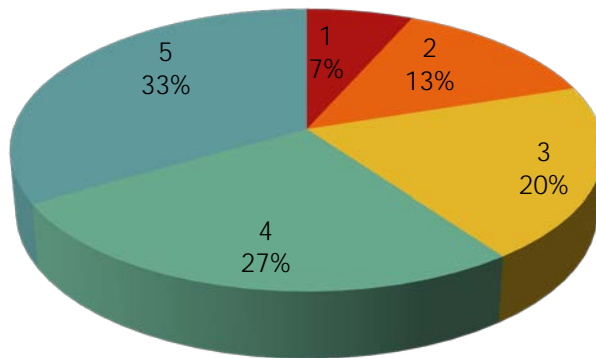- ✓ Conclusions

Sample socio-demo characteristics

- Age: 42
- Household size: 3
- Household monthly income (out of 60%) : 1548, 73€
- 58% working
- 77% have studied at least 13 years
- 82% owns a bike:
- 58% bike-owners travel at least 2 times a week by bike
- 58% use it as a proper transport means; 52% also for leisure and sport
- 21% went on a pilgrimage

Knowledge and interest for CdM

▶ Road conditions: for 77% roads are unsafe

▶ 56% of the respondents prefer bike to car for short distance travels; 25% also for longer distance travels

▶ 68% of the respondents prefer walking to car for short distance travels (less than 1 km);16% also for longer distance travels (more than 5 kms)

▶ 22% knew the project, 83% are interested; only 7% owns a business in the neighbourhoods
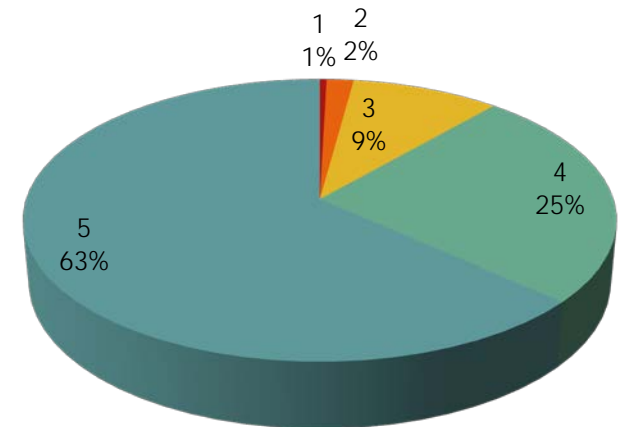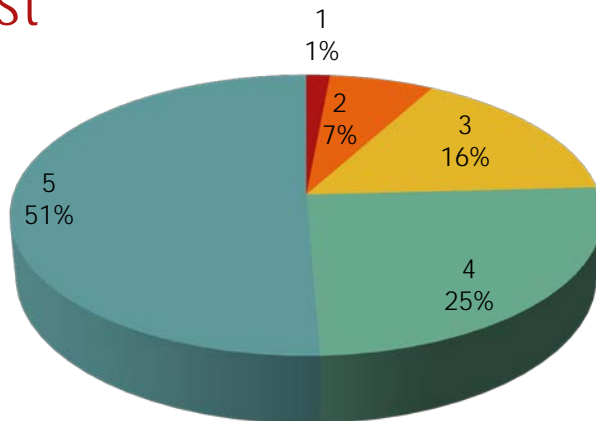
Total Economic Value components

Use

Potential use
(existence)
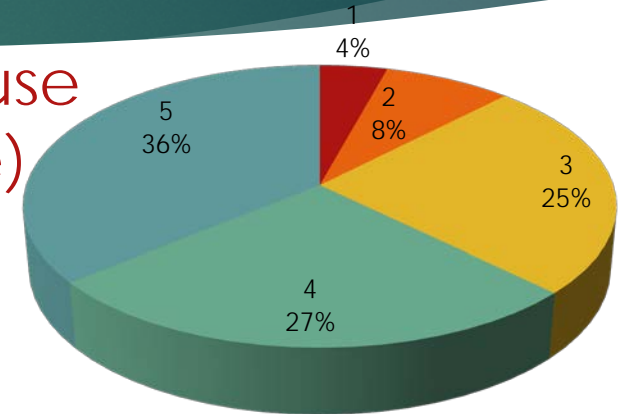
Safeguard

Bequest

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- ✓ **CVM results**

- ✓ Conclusions

Methodology: CVM

Econometric estimation of Dicothomous model

DC_Double Bounded

with covariates:

- existence value,
- safeguard value
- pilgrimage

Explanatory variables	Coeff. (1)	Coeff. (2)	Coeff. (3)
Beta			
Pilgrimage	16.54818***	17.01975***	17.24667***
Existence	11.77001***	13.44061***	12.79998***
Safeguard	17.89619***		18.13891***
Use	1.793178	0.2179079	
Bequest		10.21381***	
Cons.	-94.6359***	-57.77786***	-93.71779***
Sigma			
Cons.	55.05429***	55.63509***	55.05377***
Obs.	472	472	472
Prob.	0.0000	0.0000	0.0000
Log likelihood	-617.45704	-621.20099	-617.60827

	Coeff	Std.Err.
WTP	46.54316***	2.890323

RESULTS

According to the CVM,

the WTP for the buffer population (family units) is 46,54€

With 414.928 family units (Istat, 2011)

the estimated collective benefits are 19.310.749,1 €

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CONCLUSIONS **and** FRQs

▶ Compared to the project costs – approximately **8.381.556,53€ (124,72 €ml)** the benefits are **19.310.749€ (287,36€ml)**, thus suggesting to the administrations to realize this project (BCR=2,30).

▶ Other financial resources can be collected among private investors for sponsorships and advertising.

▶ Other costs must be considered for expropriation.

▶ Impacts on Tourism can be also considered.

▶ "If CV practitioners adopt the referendum approach, we see no reason not to use an open-ended follow up to the starting bid, which provides far more information on WTP and information on plausibility of response than alternatives such as the double referendum method". – Green et al. 1998

Thank you for your attention!

QUESTIONS AND SUGGESTIONS ARE WELCOME.

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OLS - open ended; means

$$Y_i = \beta_0 + \beta_1 X_i + u_i$$

	OLS			
	(1)	**(2)**	**(3)**	**(4)**
Knowledge	10.26225*	9.812021**	8.128532	9.855829
Pilgrimage	10.05842**	9.821145**	8.352502	6.396101
Existence	6.773595***		9.82038***	
Safeguard	7.653321***		6.701239	
Use		2.88632		3.19004
Bequest		7.132028***		10.57708**
Gender	-6.135506	-4.230777	-7.171839	-4.537414
SafetyRoads	12.90597***	15.64813***	10.82882	13.76113
Age	-0.984026	-0.8729219	-4.991319	-5.555302
Education	2.292495	2.686297	-8.703072**	-9.382326**
Income			7.915849***	8.663875**
Dummy municipality	Yes	Yes	Yes	Yes
Cons.	-42.3938***	-28.87161**	-31.93086	-25.40383
Obs.	471	471	285	285
Prob.	0.0000	0.0000	0.0000	0.0000
R-square_adj	0.1670	0.1537	0.1918	0.1776

Conclusions

WTP proves to be higher for:

1. Aware citizens
2. Concern for safer roads
3. Pilgrims
4. High scores in use, safeguard or bequest values