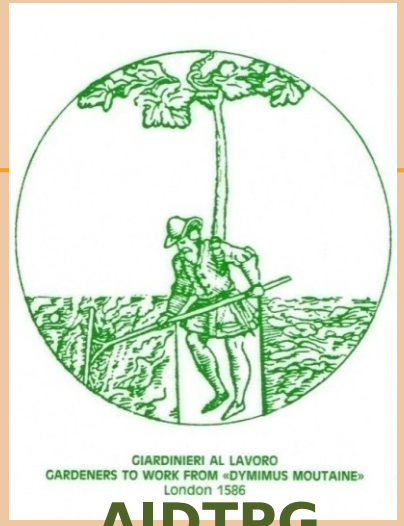

AIDTPG

Associazione Italiana Direttori e Tecnici Pubblici Giardini

Italian association directors and public gardens technicians

LINEE GUIDA PER LA GESTIONE DEI PATRIMONI ARBOREI PUBBLICI

(nell'ottica del Risk Management)

GUIDELINES FOR THE MANAGEMENT OF PUBLIC TREES

(taking into account Risk Management)

Alessandro Orlandi
Mantova

PRESENTATION STRUCTURE

- Damage caused by falling trees — IV
- Focus on the guidelines: macro-zoning of the municipal green land for risk management — III
- General overview on the guidelines for the management of public tree assets — II
- Brief introduction on the forms of management of public green areas in Italy — I

Part I

Italian association directors and public gardens technicians

Datasheet:

- 60 years of activity
- Many italian Municipalities
- Over 15.000.000 inhabitants

Facts:

- Voluntary activity
- Dissemination and sharing of information
- Training sessions and study of issues related to public green

ASSOCIAZIONE ITALIANA
DIRETTORI E TECNICI PUBBLICI GARDINI

La ns. Associazione è presente in:

VENETO - FRIULI VENEZIA GIULIA
Adria, Aviano, Basiliano, Castelfranco V.to, Castelli di Monfumo, Castions di Zoppola, Comune di Aviano, Cordenons, Creazzo, Dolo, Eraclea, Este, Fagagna, Fiumicello, Fogliano Redipuglia, Fontanadda, Gemona del Friuli, Gorizia, Grado, Jesolo, Lido, Lignano Sabbiadoro, Lucinico, Marcon, Mestre, Monfalcone, Padova, Pasian di Prato, Preganziol, S. Angelo di Piave, S. Daniele del Friuli, Sacile, Sagrado, Salvezzano dentro, San Donà di Piave, Spinea, Taglio di Po, Tavagnacco, Trieste, Trivignano, Udine, Venezia, Verona, Vicenza, Zoppola

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PUGLIA
Bari, Brindisi, Foggia, Galatone (LE), Mesagne, Trinitapoli

SARDEGNA
Cagliari, Sassari, Sestu, Tortoli

LIGURIA
Albenga, Bordighera, Genova, San Bortolomeo al Mare, Sanremo

LAZIO
Frascati, Frosinone, Latina, Roma

PIEMONTE - VALLE D'AOSTA
Alba, Alessandria, Asti, Città di Aosta, Collegno, Grugliasco, Moncalieri, Novara, Sciolze, Torino, Venaria Reale

TRENTINO ALTO ADIGE
Bolzano, Cadine, Fondo, Lavis, Mattarello, Rovereto, Trento, Villa Lagarina

LOMBARDIA
Abbiategrasso, Brescia, Casalmaggiore, Como, Corsico, Cremona, Gazoldo degli Ippoliti, Mantova, Milano, San Donato Milanese, Saronno, Segrate, Seregno, Suzzara, Treviglio

SICILIA
Bronte, Catania, Gravinia di Catania, Isola delle Femmine, Palermo, Paternò, Siracusa, Tre Mestieri Etneo

TOSCANA
Arezzo, Campi Bisenzio, Carrara, Firenze, Livorno, Pistoia, Prato, Rosignano, San Miniato, Vecchiano

EMILIA ROMAGNA
Albinea, Bologna, Carpi, Casalgrande, Cento, Cervia, Faenza, Modena, Parma

CAMPANIA
Arzano, Caserta, Cava dei Tirreni, Maddaloni, Monte di Procida, Napoli, Pomigliano d'Arco, Pozzuoli, San Giorgio a Cremano

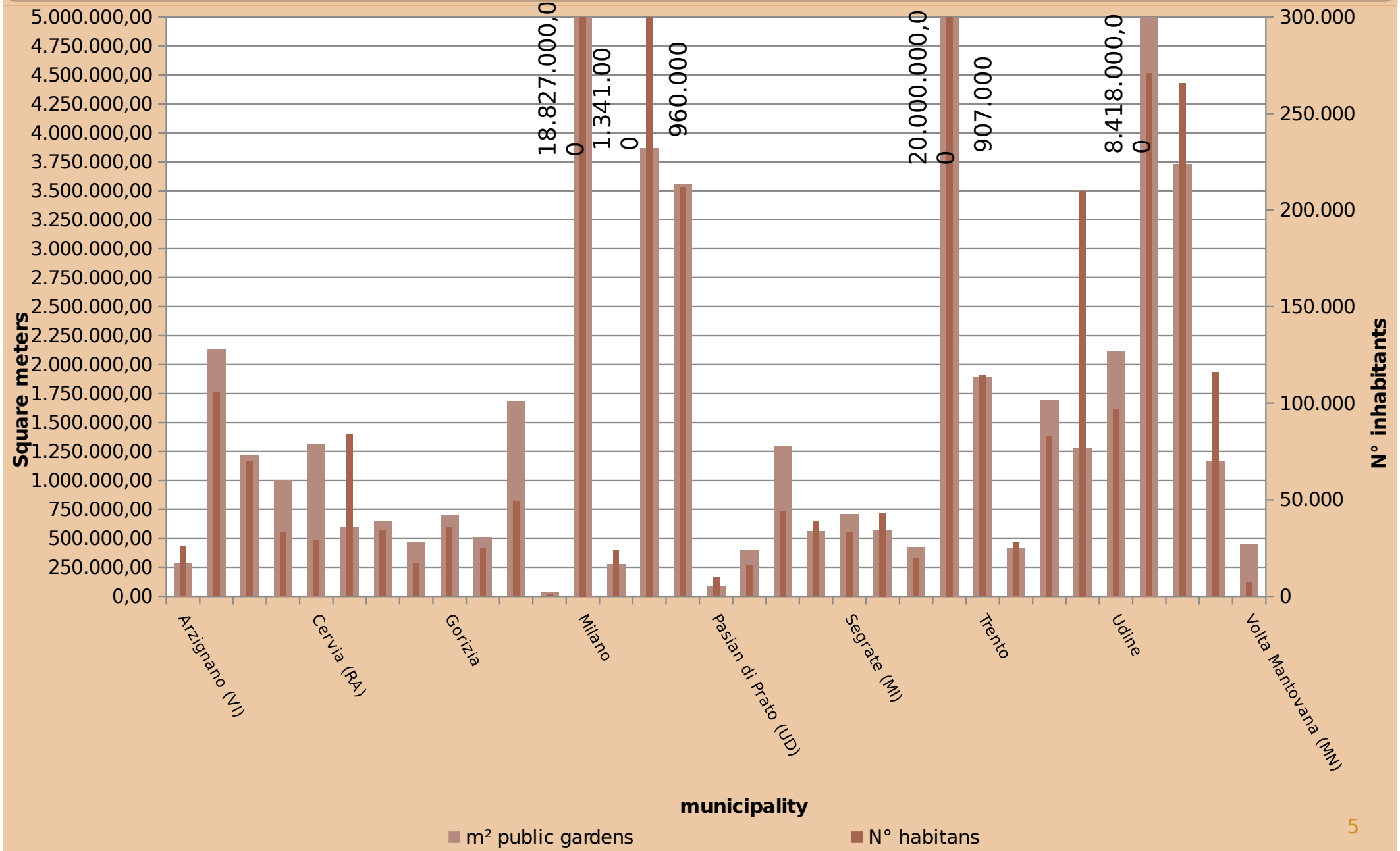
Italian association directors and public gardens technicians

In 2012 we did a survey to explore the theme of the forms of management of public parks and some parameters that we will see in the next slide

Not all municipalities responded to the survey, but a lot of information was gathered, useful to understand why we decided to write the guidelines for the management of public trees

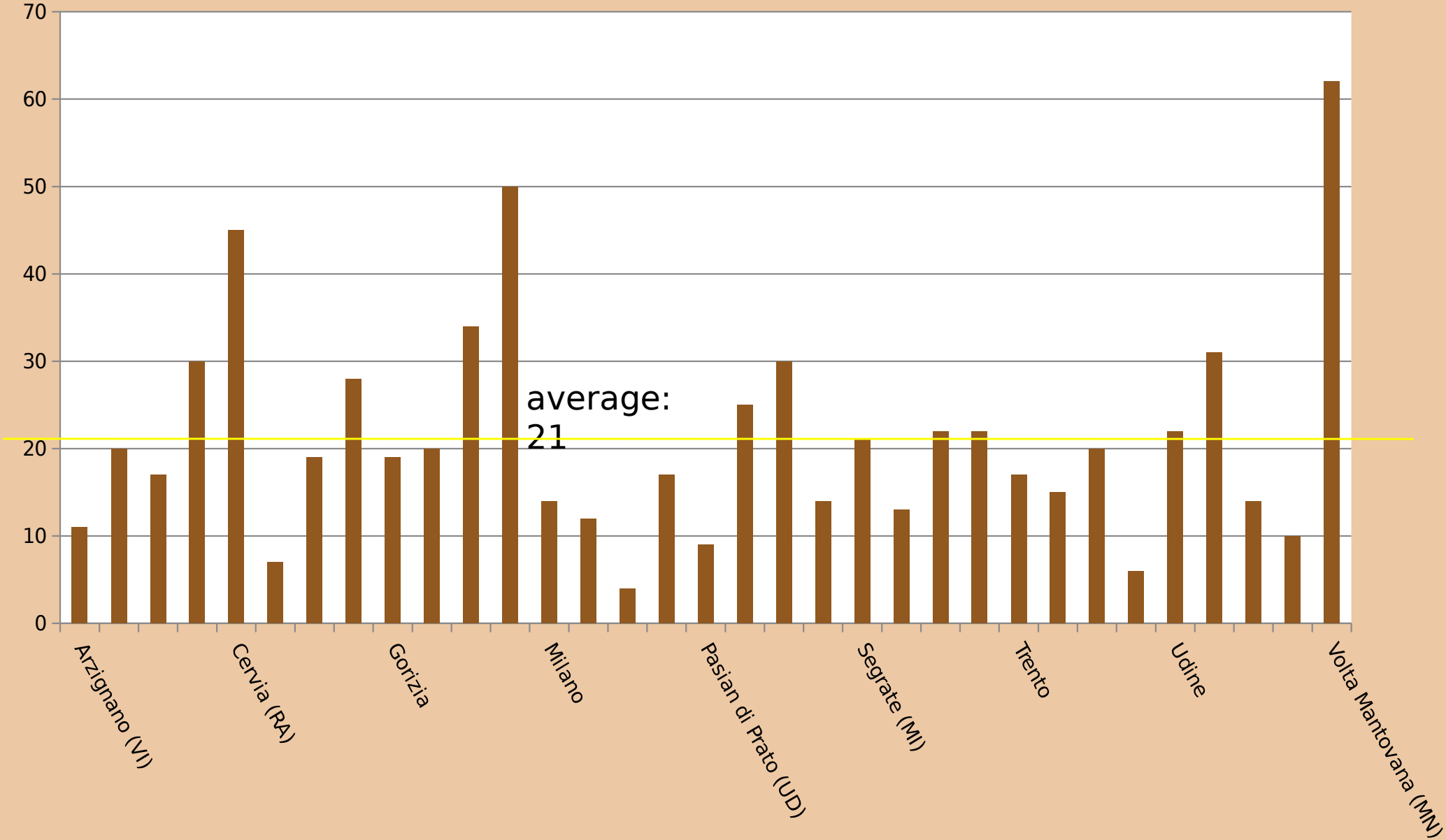
Survey results

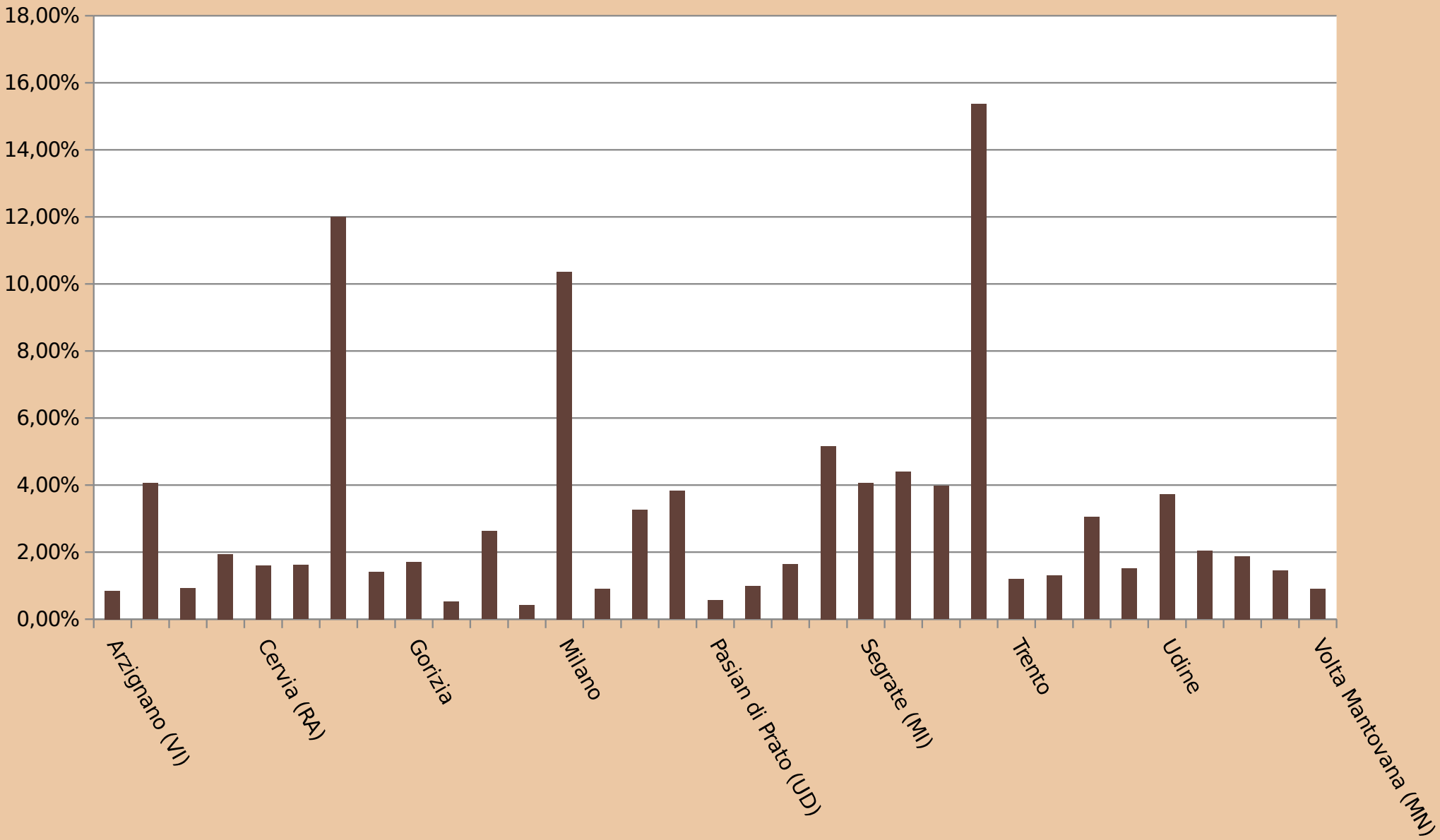
Square meters of public gardens

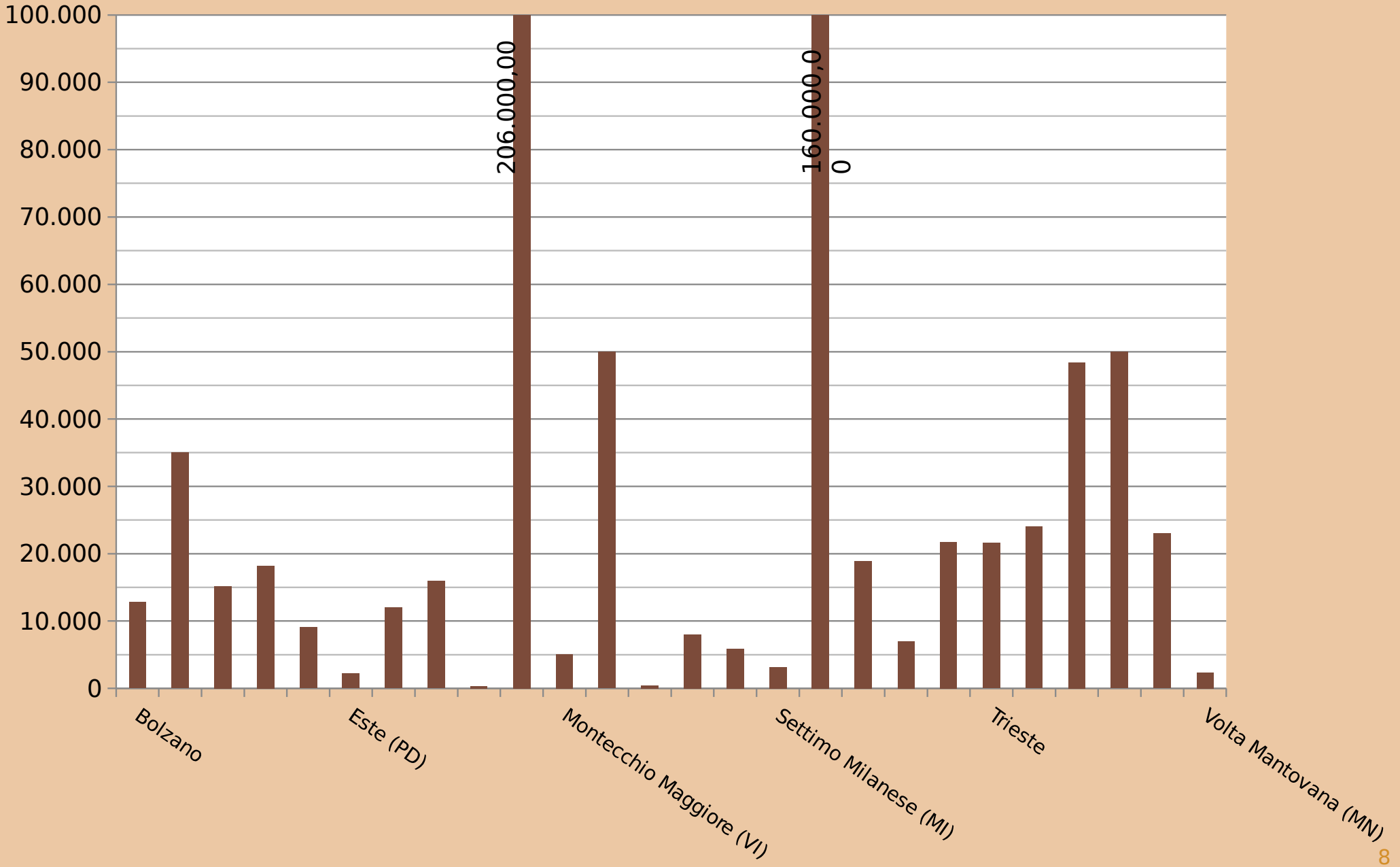


Survey results

Square meters / habitants




18,00%
16,00%
14,00%
12,00%
10,00%
8,00%
6,00%
4,00%
2,00%
0,00%
Arzignano (VI)
Cervia (RA)
Gorizia
Milano
Pasian di Prato (UD)
Segrate (MI)
Trento
Udine
Volta Mantovana (MN)
% m² public gardens/ m² municipality area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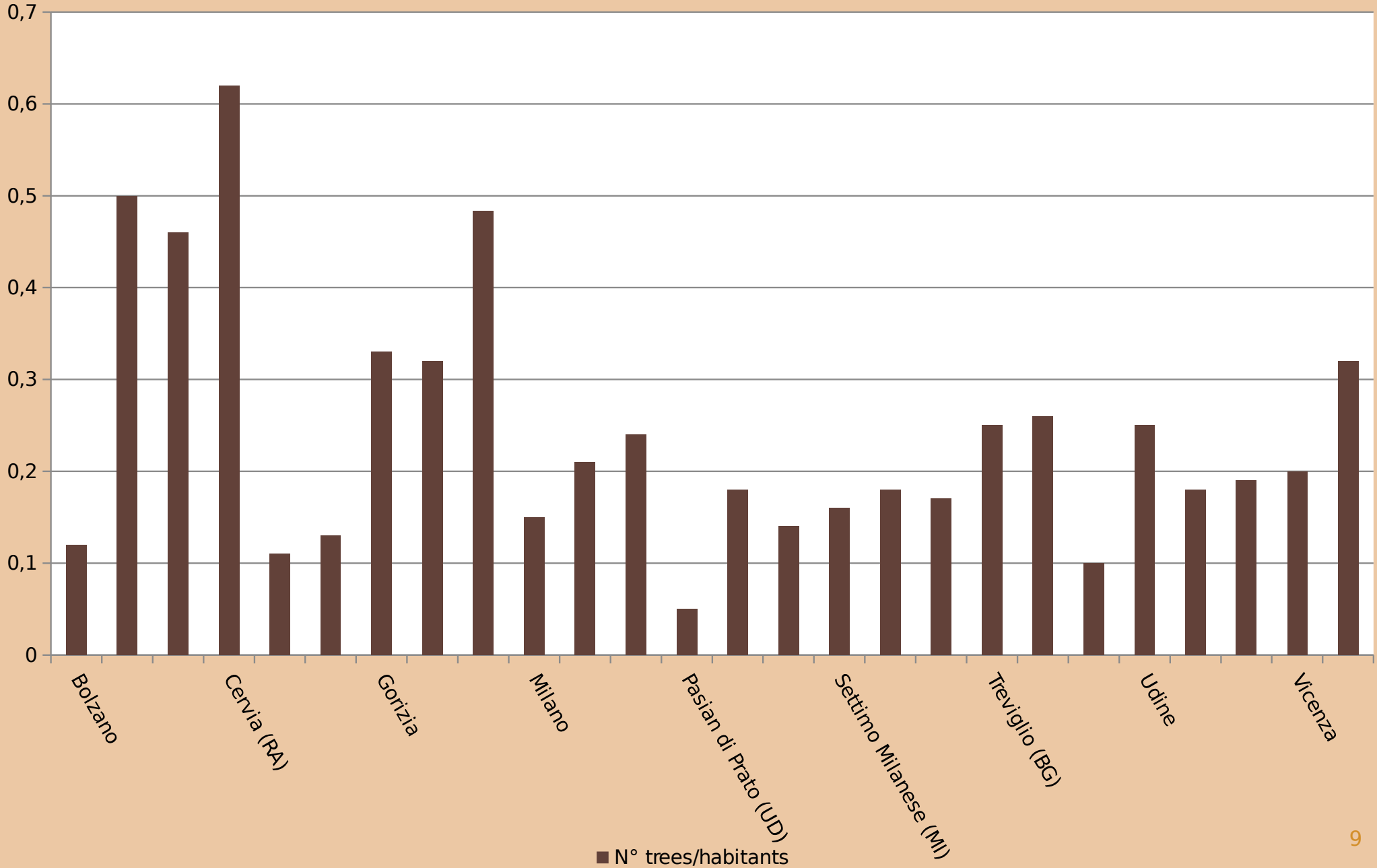
Bolzano
Este (PD)
Montecchio Maggiore (VI)
Settimo Milanese (MI)
Trieste
Volta Mantovana (MN)


0,7
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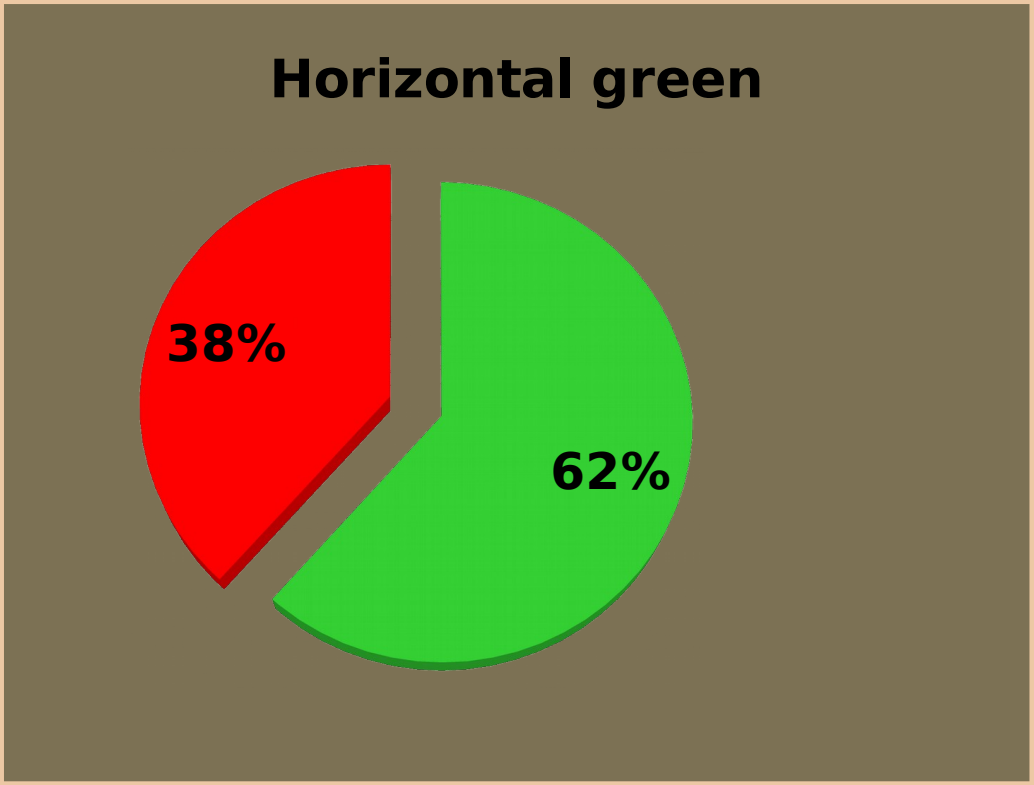
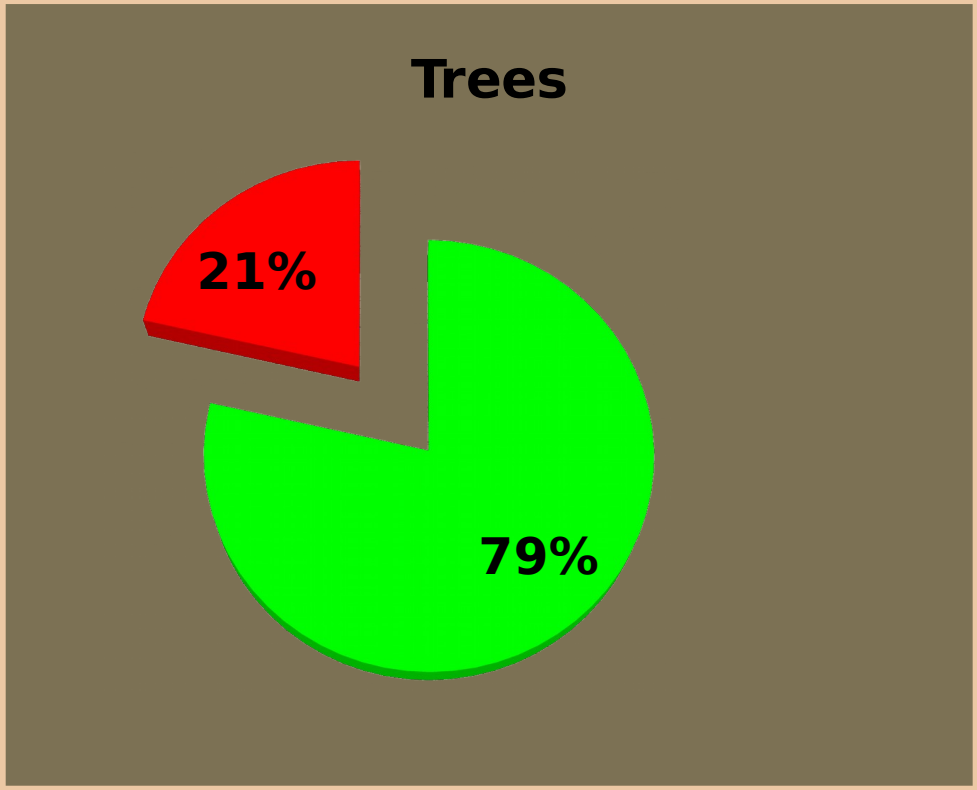
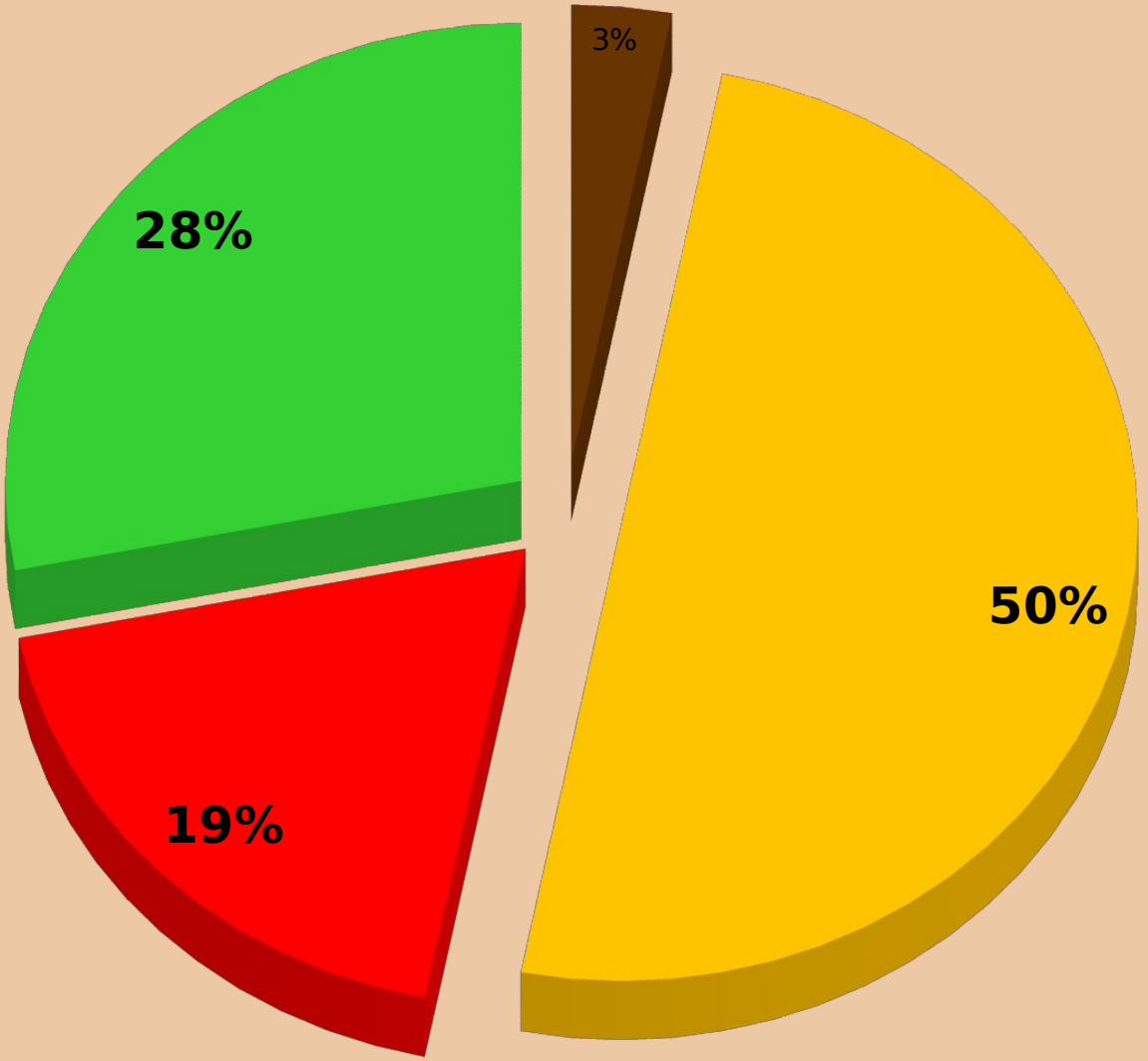
0,4
0,3
0,2
0,1
0
Bolzano
Cervia (RA)
Gorizia
Milano
Pasian di Prato (UD)
Settimo Milanese (MI)
Treviglio (BG)
Udine
Vicenza
N° trees/habitants





61,50 % of the municipalities that responded to the survey have an inventory of public parks, but there are many small towns that do not have accurate data on the size of their green heritage and especially the monumental trees… and sometimes this can be a big problem !

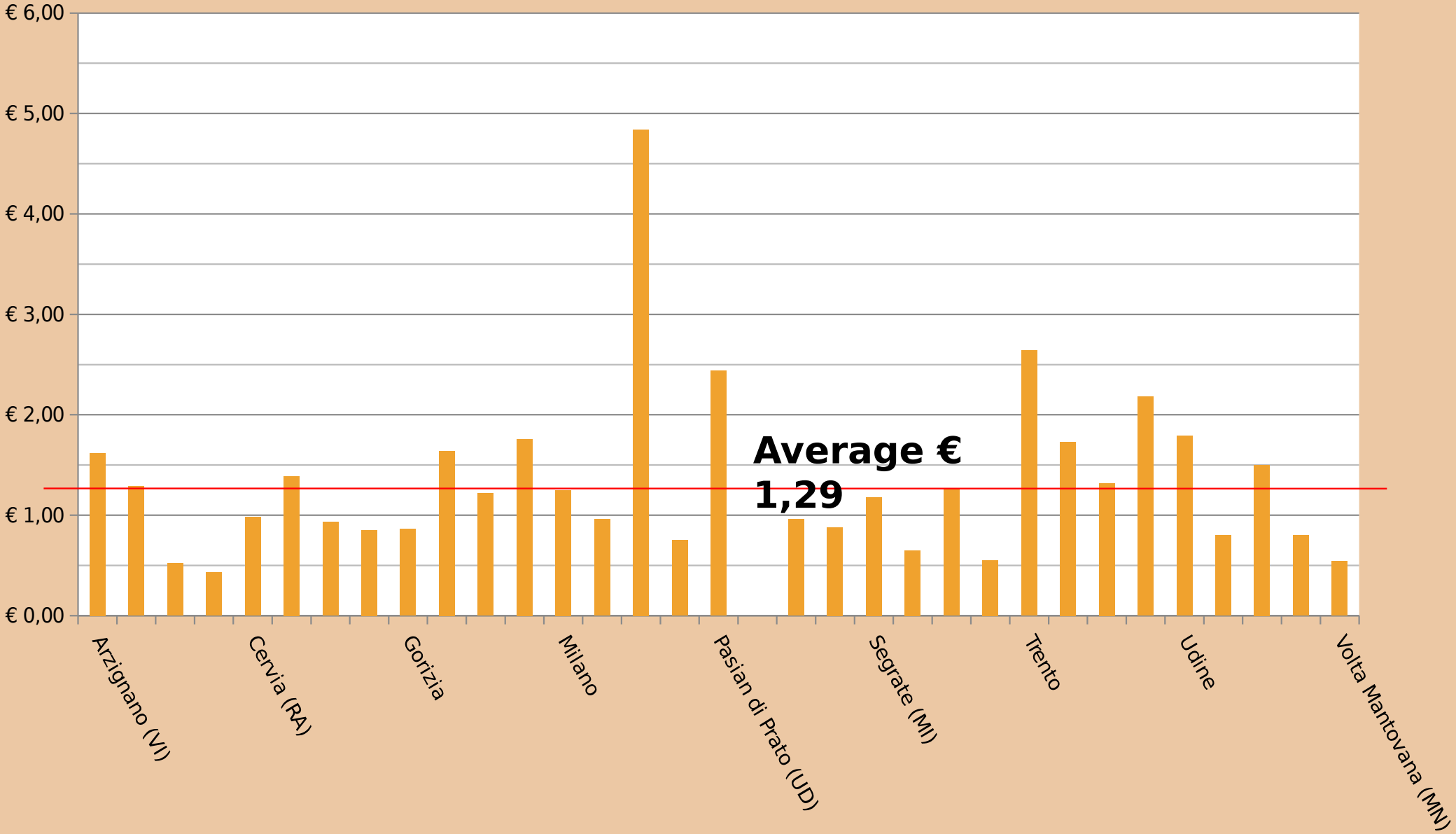


<u>Direct administration</u> in cooperation with sporting clubs and associations

<u>Mixed</u>: direct administration and mostly contracts and agreements with social cooperatives

<u>Global Service</u>: all management activities are externalized and the municipality has a controlling function

In house Companies (former "Stadtwerke")


€ 6,00
€ 5,00
€ 4,00
€ 3,00
€ 2,00
€ 1,00
€ 0,00
Average € 1,29
Arzignano (VI)
Cervia (RA)
Gorizia
Milano
Pasian di Prato (UD)
Segrate (MI)
Trento
Udine
Volta Mantovana (MN)
€/m² year

GUIDELINES FOR THE MANAGEMENT OF PUBLIC TREES

INDEX

INTERFERENCE WITH THE MANAGEMENT OF PUBLIC TREES

... a few days before it was a beautiful tree.
Now it’s a big clotheshorse !

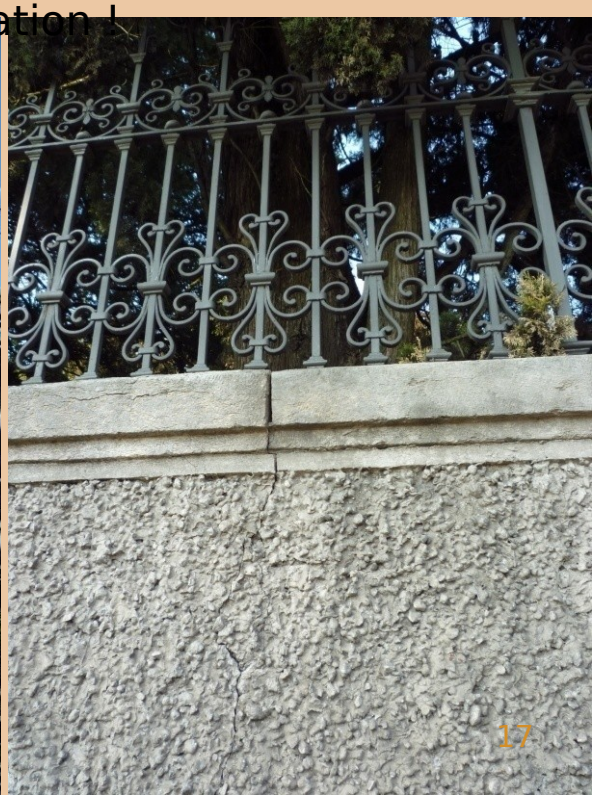
If you stumble in the root of a tree is it to blame?

Citizens are strange, they never agree with us...

Pines has known roots problems, and sometimes they can become dangerus.
A wrong choice in the past, a problem today.

What if we fell these trees can we can plant in asphalt ?

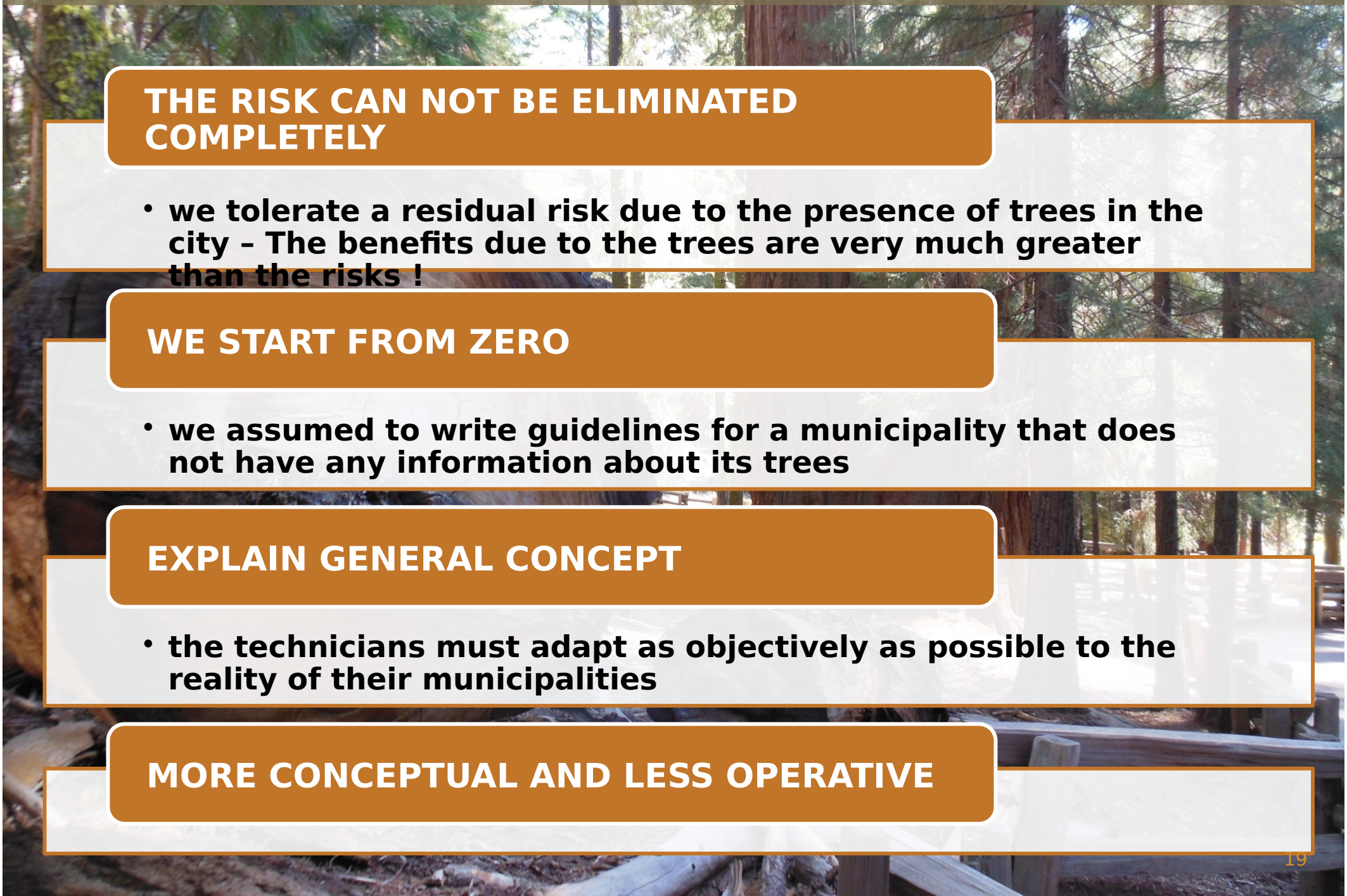
Sometimes excessive protection laws can be an impediment to the proper management of trees. Over 4 months to keep fell authorization !



This big tree fallen by uprooting … but where are roots ?

In the past underground utylities companys has dig around to lay pipies … sand is the proof !

SOME BASIC ASSUMPTIONS OF THE GUIDELINES



THE RISK CAN NOT BE ELIMINATED COMPLETELY

- **we tolerate a residual risk due to the presence of trees in the city – The benefits due to the trees are very much greater than the risks !**

WE START FROM ZERO

- **we assumed to write guidelines for a municipality that does not have any information about its trees**

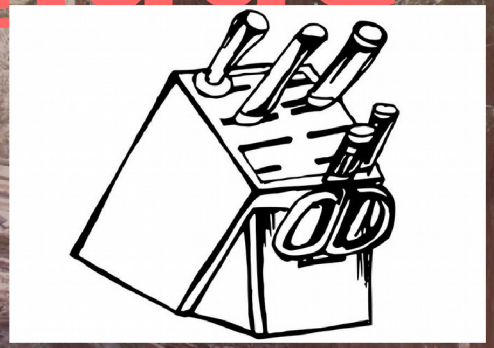
EXPLAIN GENERAL CONCEPT

- **the technicians must adapt as objectively as possible to the reality of their municipalities**

MORE CONCEPTUAL AND LESS OPERATIVE

… A BASIC EQUATION

Risk= danger x damage



Low Risk

Hight Risk

LET'S LOOK TO THE DAMAGE FACTORS …

PROCESS FOR MANAGING THE SECURITY OF PUBLIC URBAN TREES

MACRO ZONING PUBLIC GREEN LAND

Vulnerability of the area

Fruition of the area / Intensity of use

	LOW	MEDIUM	HIGH
TREES ALONG STREETS			
SCHOOLS GARDENS			
DISTRICT EQUIPPED GARDENS			
EXTENSIVE LAND			

susceptibility of the area to the falling of a tree

PROCESS FOR MANAGING THE SECURITY OF PUBLIC URBAN TREES

SUSCEPTIBILITY OF THE AREA TO THE FALLING OF A TREE

SUSCEPTIBILITY		Use Intensity / fruition level		
		Less used area	Medium used area	Intensive used area
Type of green land - VULNERABILITY	Trees along streets			
	School gardens			
	Building gardens			
	Disctrit equipped gardens			
	Gardens and historical gardens in the city centre			
	Parks in the city			
	Extensive parks (with some equipment and pathway) near city			
	Very extensive parks or forestry land			

SUSCEPTIBILITY	DESCRIPTION	RISK TOLERANCE
HIGH	FALLING OF A TREE PROBABLY CAOUSES SERIUS DAMAGE	LOW
MEDIUM	FALLING OF A TREE COULD CAUSE DAMAGE	LOW OR MEDIUM
LOW	FALLING OF A TREE CAN HARDLY CAUSE SERIUS DAMAGE	MEDIUM OR HIGH

PROCESS FOR MANAGING THE SECURITY OF PUBLIC URBAN TREES

… AND DANGER FACTORS

TREE INVENTORY

Control information	
Detailed description of impalntation site	• Soil, pavings, underground infrastrutture
Planting data	
Plant health	• It expresses an judgment as bad, limited, adequate, good
Pathogens	• indicate the presence of pathogens and, if possible the species
structural defect	• it must indicate the presence and possibly the severity
Structural judgment	• It expresses an judgment as bad, moderate, good
Danger factors/level	• for example whether there are serious dangers, or if there are no obvious dangers
Structural analysis	• indicate whether a need for specific stability/structural analysis
Type of care treatment	• indicate the treatment that is necessary to manage correctly the tree : pruning, anchorage, irrigation, (felling)
Priority of the treatment	• Indicate the timing of treatment

TREE INVENTORY

PRIORITY OF THE TREATMENT

Emergency

- Treatments that are necessary to eliminate an imminent danger (BMP). Usually this is an extraordinary intervention, such as felling or hard pruning to ensure the safety after an extreme weather event

Urgent

- Care treatment to be carried out as soon as possible: trees with many dead branches, overhanging branches, dense and heavy canopy/branches, etc. Trees generally untreated or in a state of abandonment. It also includes felling. The treatment must be performed within 1 year

Necessary

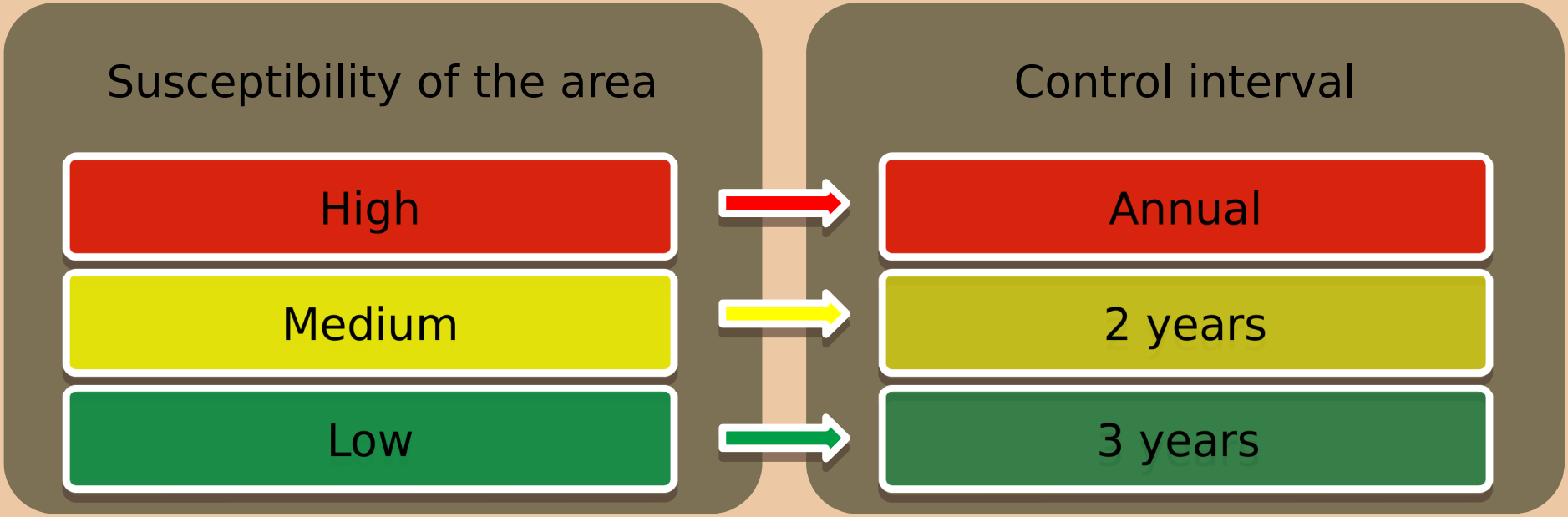
- For example trees that need thinning of the canopy, containment toward buildings, but generally already pruned previously. The treatment must be performed within 3 years

Recommended

- Trees that do not currently have a particular need for care; reasonable treatment may be postponed preferring subjects included in the other categories. The timing to perform the treatment can be estimated in 5 years

SELECTIVE CYCLICAL CHECK

It consists in periodic and continuous rechecking of the trees, with the data recorded



SELECTIVE CYCLICAL CHECK

EXAMPLE OF CHECK LIST	
DATA	DESCRIPTION
Homogeneus trees group references	Insert all the references necessary to identify easily the trees
Control date	
Tenhnical	Name of the technician who did the check
Previus care treatment type	Field compiled in office
Previus care treatment priority	Field compiled in office
New care treatment type	like in the census
New care treatment priority	like in the census
Issues	Report on any issues on trees
Danger factors / necessity of stability assessment	We can also report on a single tree
Notes	

PLANNING TREE MANAGEMENT – STARTING STEPS

The main purpose of this step is to **ensure** the safety in the urban green areas

Tips:
-The assessment can be an important step in the process. Remember that this analysis has a specific cycle of monitoring depending on the plant health.

Tips:
- We are working on the single trees distributed on the municipality green areas;
- No repetitive treatment.

PLANNING TREE MANAGEMENT–HOMOGENEUS TREES GROUP

Homogeneous trees group: this is a new concept that we used in the guidelines. In the care planning of large arboreal heritage it is no longer possible to think just punctual interventions, extemporaneous and emergency, because they are difficult to control; punctual treatment may not be well organized and are very expensive.

It’s useful to work with larger numbers of merged trees, both to economize interventions and always to keep an overview of the maintenance status of the heritage.

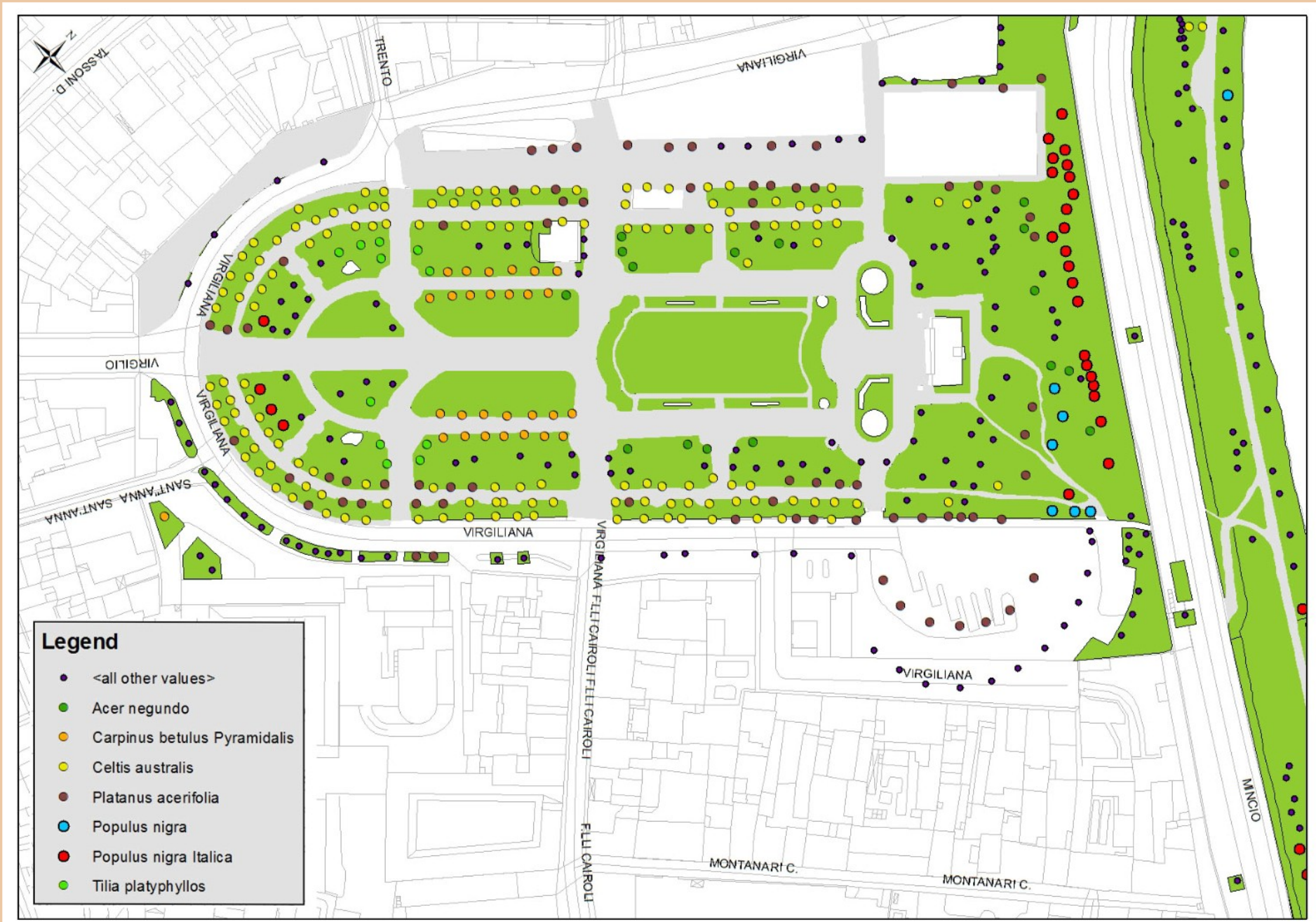
The homogeneity of groups of trees is to be understood primarily as homogeneity of the species, size, age, and / or position in a given area: it follows the uniformity of the maintenance requirements.

Mantua, Virgiliana Square view

PLANNING TREE MANAGEMENT–HOMOGENEUS TREES GROUP

Mantua, Virgiliana Square view

PLANNING TREE MANAGEMENT–HOMOGENEUS TREES GROUP



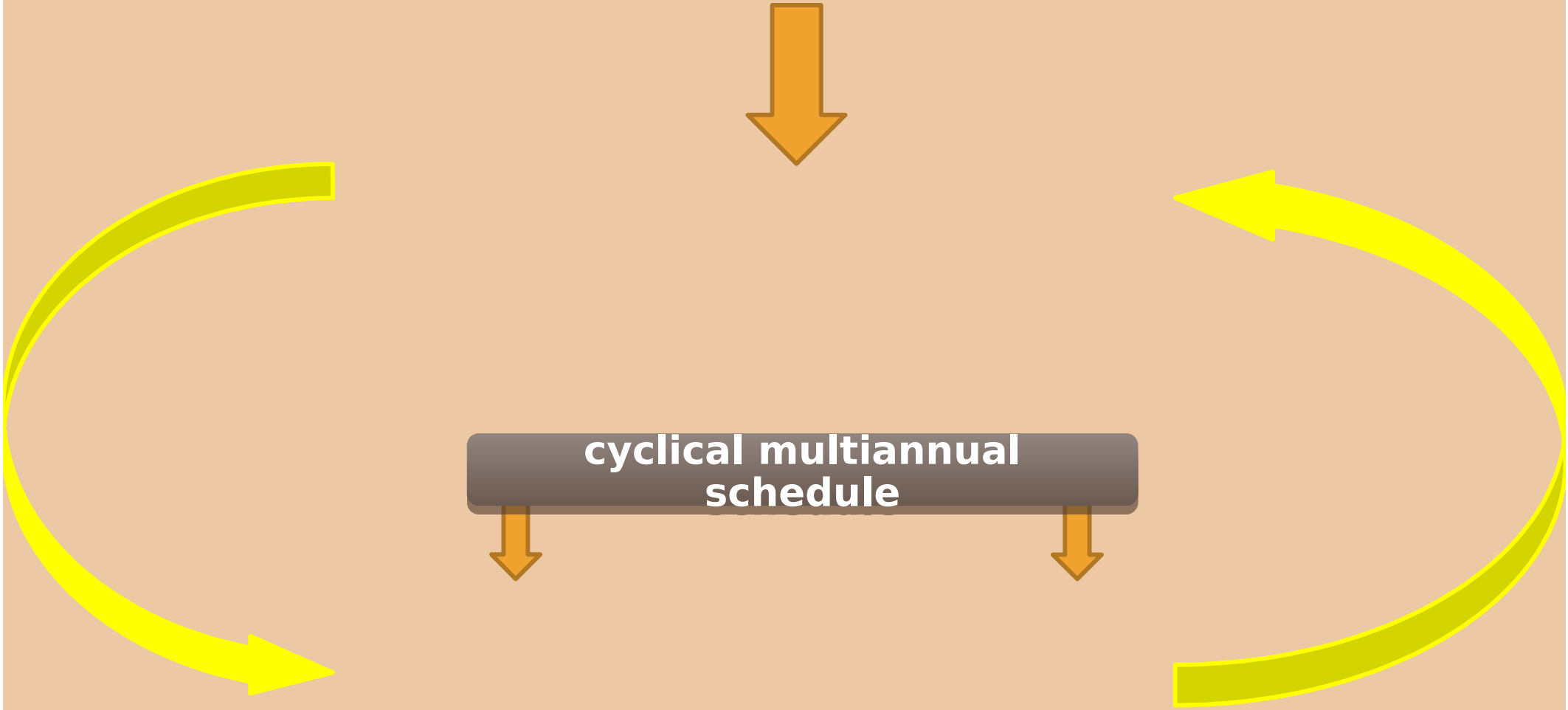
PLANNING TREE MANAGEMENT – PERIODIC SCHEDULE

Care requirement of homogeneus trees groups (by census)				
LOCATION	HOMOGENEUS GROUPS	TREATMENT	PRIORITY	LAST TREATMENT
Rossini Street	Row of Platanus x acerifolia	containment pruning	urgent	2004
Rossini Street	Traffic roundabout Carpinus betulus	containment pruning	recommended	2012
Verdi Street	Row of Ulmus pumila	thinning pruning	necessary	2010
Vivaldi School	Populus nigra group	restoration pruning	urgent	2008
Mozart School	Tilia x vulgaris group	dry pruning	recommended	2014

Tips: during the census we give a treatment type and a priority to each tree. Homogeneus group will take the higher priority among all the trees that compose it (theoretically) .
Really every technician must find the right balance, always in an objective manner and with the purpose to increase the safety of the managed trees.

PLANNING TREE MANAGEMENT –MULTIANNUAL SCHEDULE

The main purpose of this step is to **ensure** the safety in the municipal green areas, remembering to grow correclty our trees



PROCESS FOR MANAGING THE SECURITY OF PUBLIC URBAN TREES

PLANNING TREE MANAGEMENT - MULTIANNUAL SCHEDULE

LOCATION	HOMOGENEUS MASTING	TREATMENT	PRIORITY	SUSCEPTIBILITY
Rossini way	Row of Platanus x acerifolia	containment pruning	urgent	high
Rossini way	Traffic roundabout Carpinus betulus	containment pruning	recommended	high
Verdi way	Row of Ulmus pumila	containment pruning	necessary	high
Vivaldi school	Populus nigra group	restoration pruning	urgent	high
Mozart school	Tilia x vulgaris group	dead pruning	recommended	high
Town hall	Carpinus betulus	containment pruning	recommended	high
Primary school Frescobaldi	Quercus robur	dead pruning	necessary	high
Albinoni garden	Populus alba	thinning pruning	recommended	high
Uccellini park	Celtis australis	containment pruning	urgent	medium
Allegri district park	Row of Tilia x vulgaris	dead pruning	urgent	medium
Boito offices	Acer campestre	dead pruning	necessary	medium
Pergolesi way	Tilia cordata	manintenance pruning	recommended	medium
Puccini district	Populus nigra	containment		

SUSCEPTIBILITY OF THE AREA TO THE FALLING OF A TREE

DEFINE VULNERABILITY OF THE AREA

Classify areas according to their vulnerability (school gardens, street, urban park, extensive park, etc.)

MAP INTENSITY OF USE

Map within each area parts which are intensively used and parts which are less used

CALCULATE AND MAP SUSCEPTIBILITY

Combine the vulnerability and intensity of use to obtain the susceptibility of the area to damages caused by trees

CALCULATE CONTROL PRIORITY

Obtain through susceptibility the control priority, taking into account the area of falling of trees.

FOCUS : MACRO-ZONING OF THE MUNICIPAL GREEN LAND FOR RISK MANAGEMENT

SUSCEPTIBILITY OF THE AREA TO THE FALLING OF A TREE

SUSCEPTIBILITY			Use Intensity / fruition level		
			LESS USED AREA	MEDIUM USED AREA	INTENSIVE USED AREA
		value	1	3	5
Green land type–VULNERABILITY	TREES ALONG STREETS	6	6	18	30
	SCHOOL GARDENS	6	6	18	30
	BUILDING GARDENS	5	5	15	25
	DISCTRIT EQUIPPED GARDENS	4	4	12	20
	GARDENS AND HISTORICAL GARDENS IN THE CITY CENTRE	4	4	12	20
	PARKS IN THE CITY	3	3	9	15
	EXTENSIVE PARKS (WITH SOME EQUIPMENT AND PATHWAY) NEAR CITY	2	2	6	10
	VERY EXTENSIVE PARKS OR FORESTRY LAND	1	1	3	5

VALUE	SUSCEPTIBILITY	DESCRIPTION	RISK TOLERANCE
GREATER THAN 17	HIGH	FALLING OF A TREE PROBABLY CAOUSES SERIUS DAMAGE	LOW
BETWEEN 9 AND 17	MEDIUM	FALLING OF A TREE COULD CAUSE DAMAGE	LOW OR MEDIUM
LESSER THAN 9	LOW	FALLING OF A TREE CAN HARDLY CAUSE SERIUS DAMAGE	MEDIUM OR HIGH

SUSCEPTIBILITY OF THE AREA TO THE FALLING OF A TREE

	SUSCEPTIBILITY		Intensity of use			SUSCEPTIBILITY
			LESS USED AREA	MEDIUM USED AREA	INTENSIVE USED AREA	
			1	***3***	***5***	
Type of green land - VULNERABILITY	**TREES ALONG STREETS**	**6**				
	Rossini street	6		18		HIGH
	Verdi street	6			30	HIGH
	SCHOOLS	**6**				
	Vivaldi primary school	6			30	HIGH
	Frescobaldi school	6		18		HIGH
	BUILDINGS	**5**				
	Paganini town hall	5			25	HIGH
	Boito office	5	5			LOW
	DISCTRIT EQUIPPED GARDENS	**4**				
	Pergolesi gardens	4		12		MEDIUM
	Albinoni gardens	4			20	HIGH
	Monteverdi gardens	4	4			LOW
	EXTENSIVE PARKS	**3**				
	Uccellini	3			15	MEDIUM
	Allegri	3		9		MEDIUM
	Piccinini		3			LOW

SUSCEPTIBILITY OF THE AREA TO THE FALLING OF A TREE

Extensive urban green area

Area segmented according to intensity of use

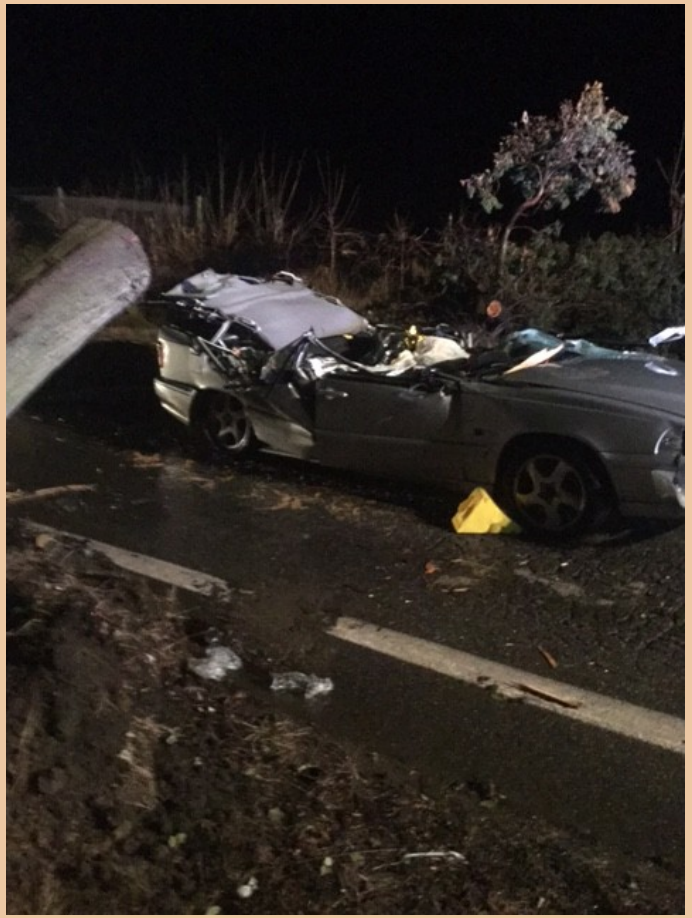
STABILITY ASSESSMENT

- **Generic plan** (inventory without visual assessment): the compromise between the need for control and optimization of available resources can be achieved by establishing appropriate and objective entry criteria fixed in the analysis program. For example diameter threshold, species, age, etc.

- **Analytical plan** (inventory with prescription of stability assessment): in the census has been identified the trees wich need more assessment and possibly the type of analysis (VTA, traction, resistograph, tomograph) to do.

Tips: the frequency of recheck stability analysis generates a stream of independent data that should not be confused with selective cyclical monitoring described in the previous paragraph. The reasons are obvious: these trees require a greater level of attention than the others because they are a known hazard. The stability analysis must be conducted only by qualified arborist technicians, and assessment methodologies already provide the necessary rechecking shifts.

DAMAGE AND INJURIES DUE TO TREES FALLING: WHERE ENDS OUR RESPONSIBILITY ?



DAMAGE AND INJURIES DUE TO TREES FALLING: WHERE ENDS OUR RESPONSIBILITY ?

1) when the damaging event causes have really exceptional, unpredictable and unexpected.

NOTE: Italian laws excludes cases of extreme weather situations (like summer storms, intense off season snowfall, strongs winds) because anyway they are predictable… but tornadoes ?

“I think that we cant calibrate the risk at a so high level: otherwise to prevent hazards we must cut all trees in the urban land!!. However today there is no regulaments, no threshold or limits to consider a storm ordinary or exceptional.

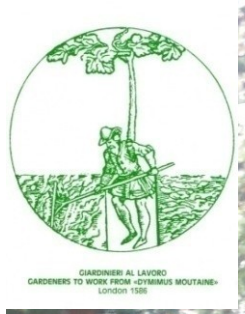
DAMAGE AND INJURIES DUE TO TREES FALLING: WHERE ENDS OUR RESPONSIBILITY ?

2) when the harmful event does not depend on management failures and is therefore not attributable to who is in charge of the care and maintenance of public parks.

- Management of trees with programmed interventions, check and surveillance can avoid accidental events or predictable events.
- Careful and constant monitoring of the vegetative and stability condition of trees is the most effective form of accident prevention.
- **Application of the guidelines can help us to achieve a good level of management suitable to reduce (or exclude) our responsibility -> it can proof that the technicians have not been negligent**.
- Guidelines provide opportunity to involve public administrators and politicians, who often do not give enough importance to green management issues.
- We can not control everything: random harmful events sometimes happen. Risk can't be zero so we must manage it (with the available money) establishing priorities: low tolerance in high susceptibles areas, and more tolerance in low susceptible areas.
- Pruning, felling, anchoring trees, closing parks during storms, put warning sings, are all good techniques to reduce the risk. It is the municipal technician's responsibility to decide what to do on the areas under his responsibility.

Fortunately trees are always trying to stand up and survive, remedying as best they can to our mistakes…

Photo by A.S.TER SPA archives (Genova)



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LINEE GUIDA PER LA GESTIONE DEI PATRIMONI ARBOREI PUBBLICI

(nell'ottica del Risk Management)

GUIDELINES FOR THE MANAGEMENT OF PUBLIC TREES

(taking into account Risk Management)

Thank you everybody

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