

# WSUD Maintenance: a European Perspective

## Lyon, France

Nina Cossais, PhD student

# Location of Lyon, France



Source: Melbourne Museum

# PhD context

Prof. Anne Honegger



Prof. Denis Martouzet



University of Tours

Two labs:

One “local government”: **GRAND LYON**  
la métropole

Three years financial support:  
(March 2015 – March 2018)



# The metropolis of Lyon, France

# 1 333 032

INHABITANTS  
living in 59 municipalities



## 3 250 km

SEWER

1 841 km combined sewer

449 km stormwater



## 12

WASTEWATER  
TREATMENT PLANTS

## 265

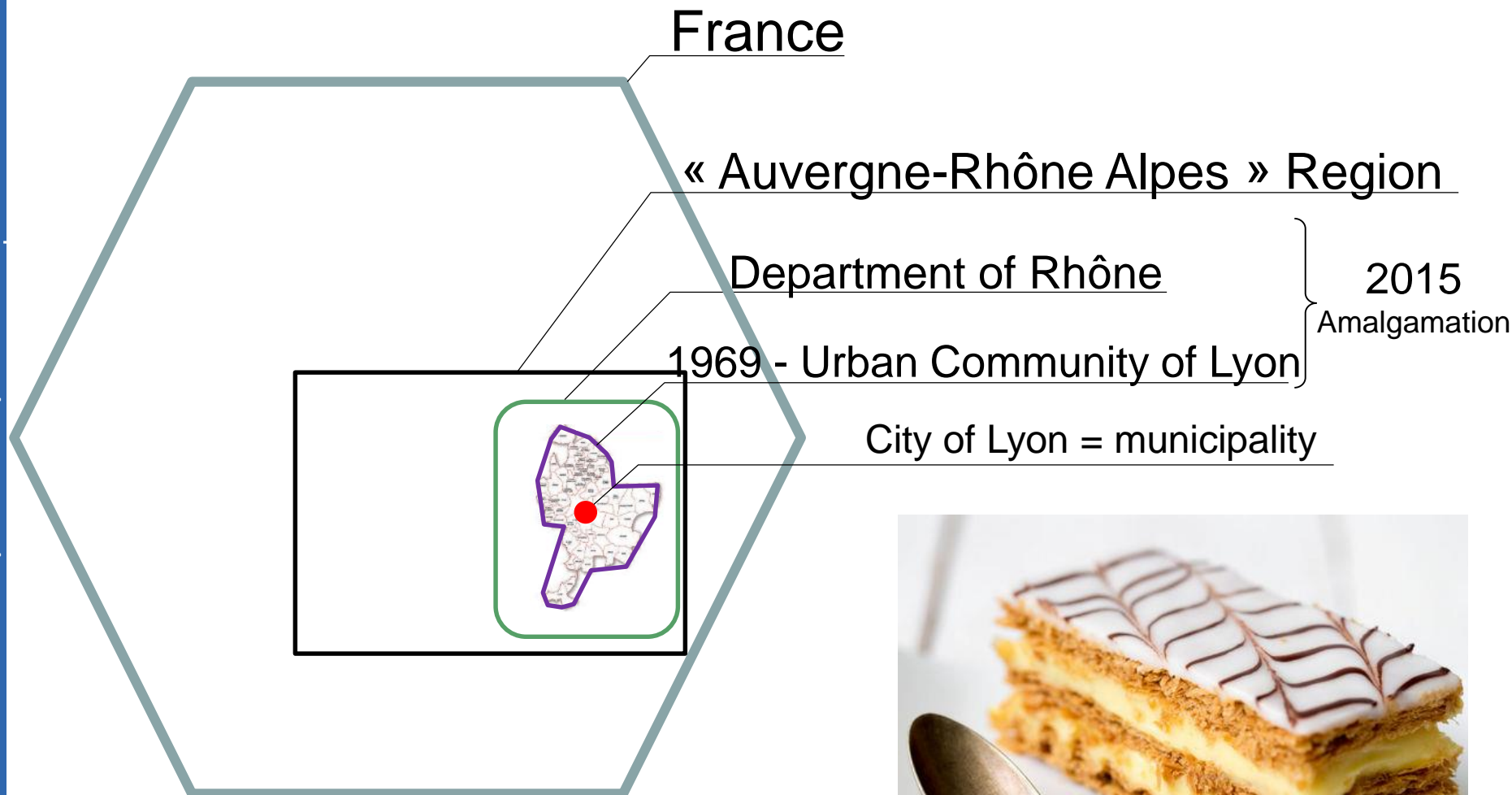
DETENTION or INFILTRATION  
STORMWATER BASINS

## 2 500

SOAKAWAYS



# A "multi-layers" administration

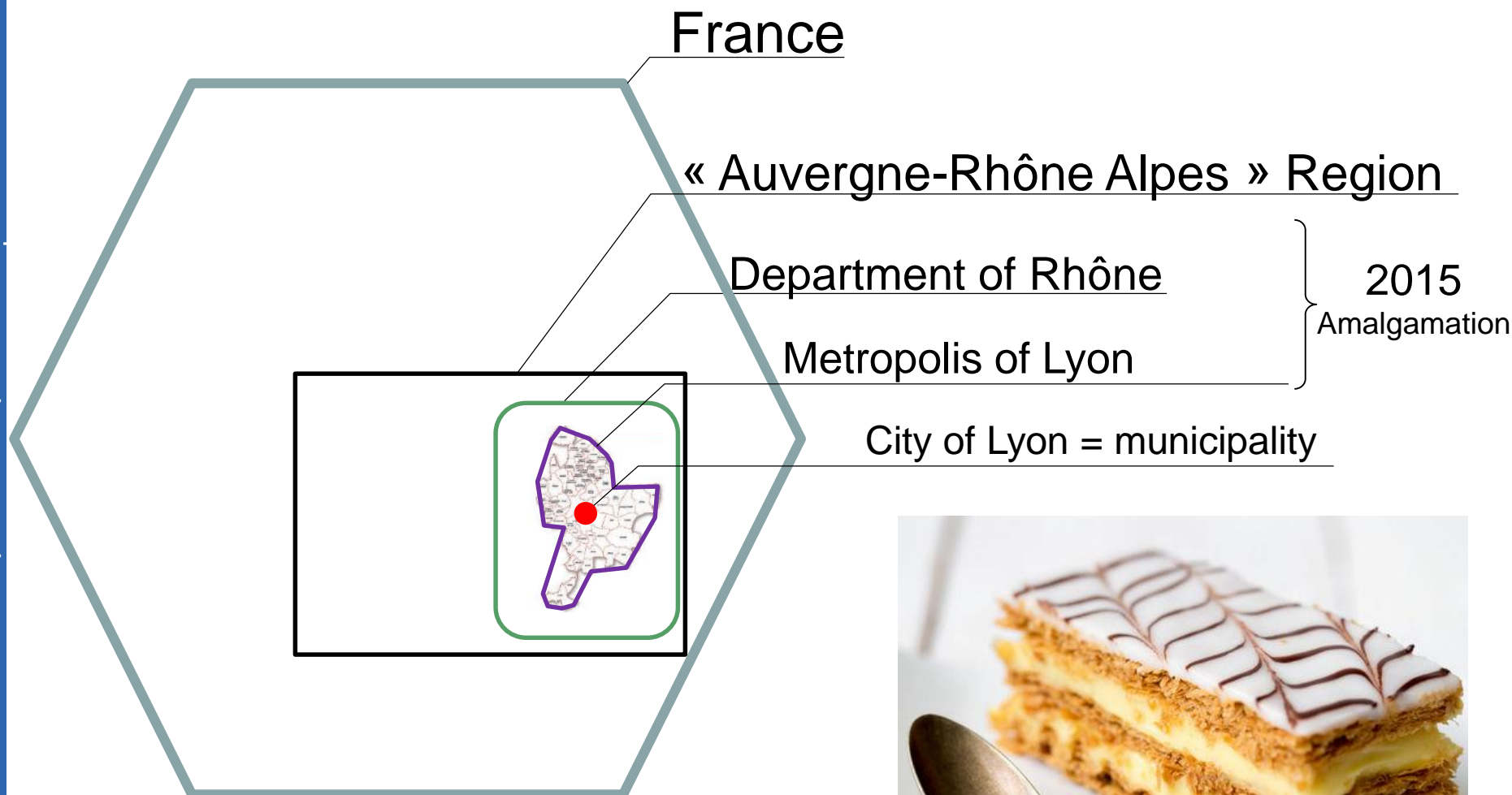


The "one thousand layers administrative cake" →



Source : [www.femmeactuelle.fr](http://www.femmeactuelle.fr)

# A "multi-layers" administration



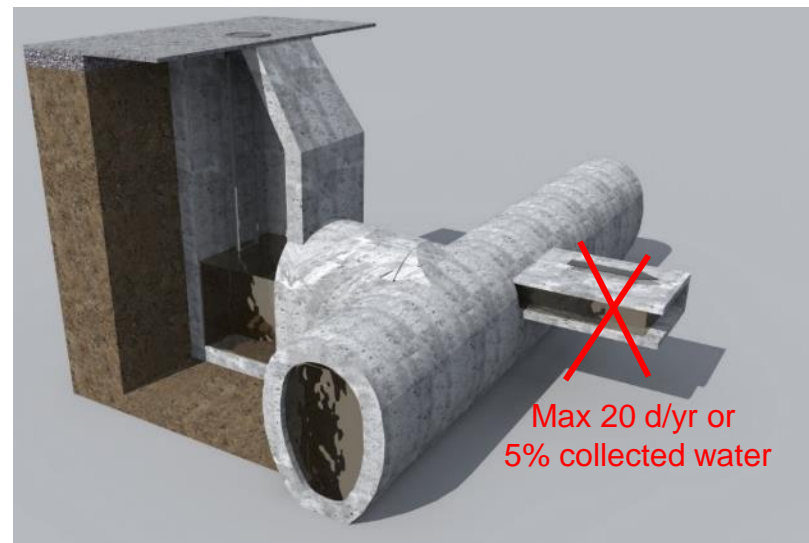
The "one thousand layers administrative cake" →



Source : [www.femmeactuelle.fr](http://www.femmeactuelle.fr)

# Context

- Sewer system
  - Combined sewer (85%)
  - Partially saturated
  - 21 July 2015 decree: limits the combined sewer overflowing



↑ Infiltration basin in Décines, March 2016



↑ Swale, Garibaldi Street in Lyon, June 2016

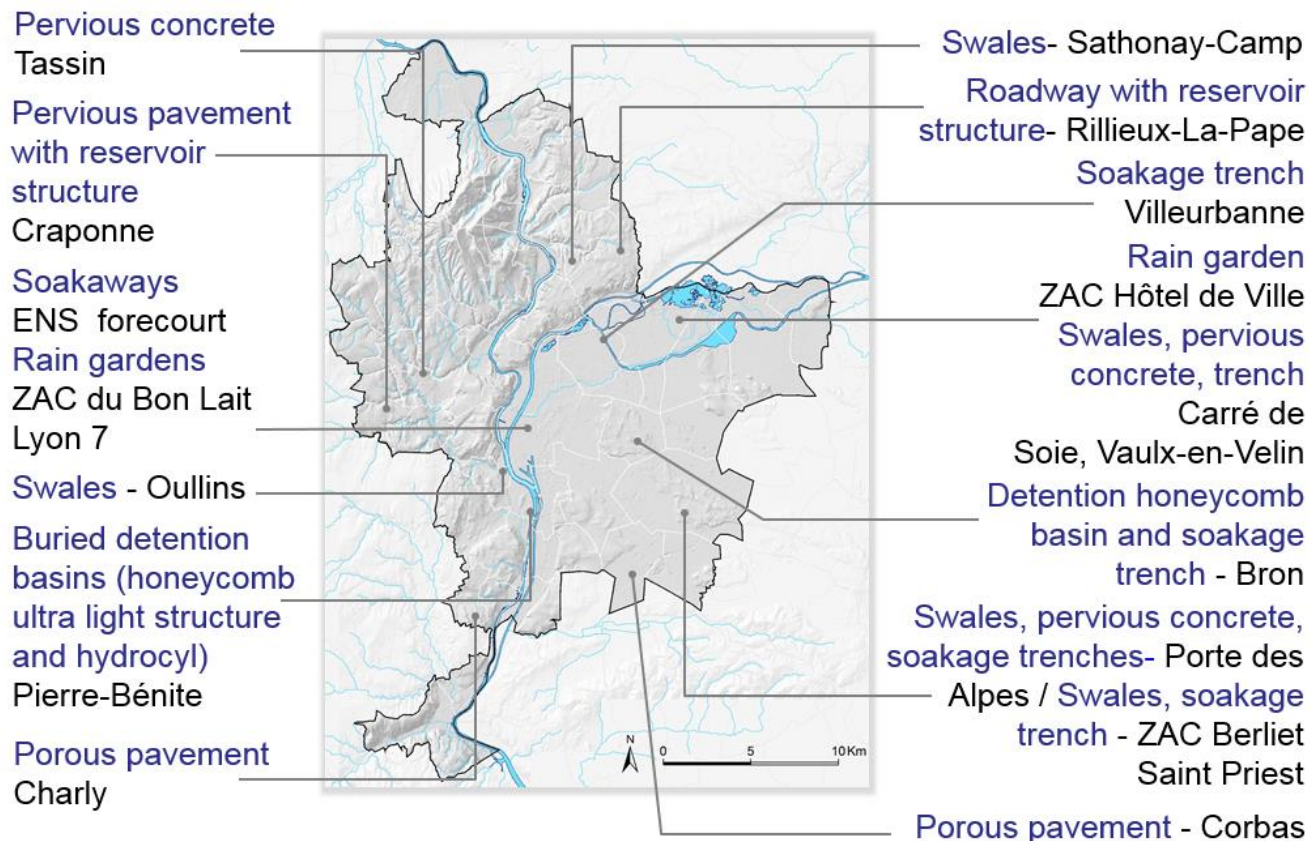
# Problem

- Since 1990, WSUD to:
  - limit overflowing
  - recharge water tables
  - cool the city
  - improve living conditions
- Yet, **reluctance** to WSUD's adoption persists
- Rank barriers: operation and maintenance

# Questions

- How are stormwater assets maintained?
- By who?
- What are the main difficulties?
- What should we do about it?

# "Pervious City" field workshops



Localization of visited sites and facilities in Lyon metropolis area.

Production : N.Cossais. Design : SAFEGE Suez Consulting.

Source : Lyon metropolis

Field workshops in March 2015 and June 2016 →



# Field workshops: first findings



Stormwater detention ponds - Portes des Alpes - Saint-Priest, Lyon, France



← Lights in a trench  
Porte des Alpes, Lyon, France, March 2015

# Field workshops: first findings



WSUD's adoption:  
roles and responsibilities

→ “On-the-job” immersion  
and roads designed



# Field workshops: first findings

- Main results

- Most important barriers to WSUD's adoption:

- Demarcation issues: tasks, costs and responsibilities
    - Technical aspects (pollution, trash, mosquitoes, sustainability, esthetics)

- Sewer workers are unhappy with the evolution of their profession

→ “On-the-job” immersions with maintenance teams and roads designers

# Anthropological approach



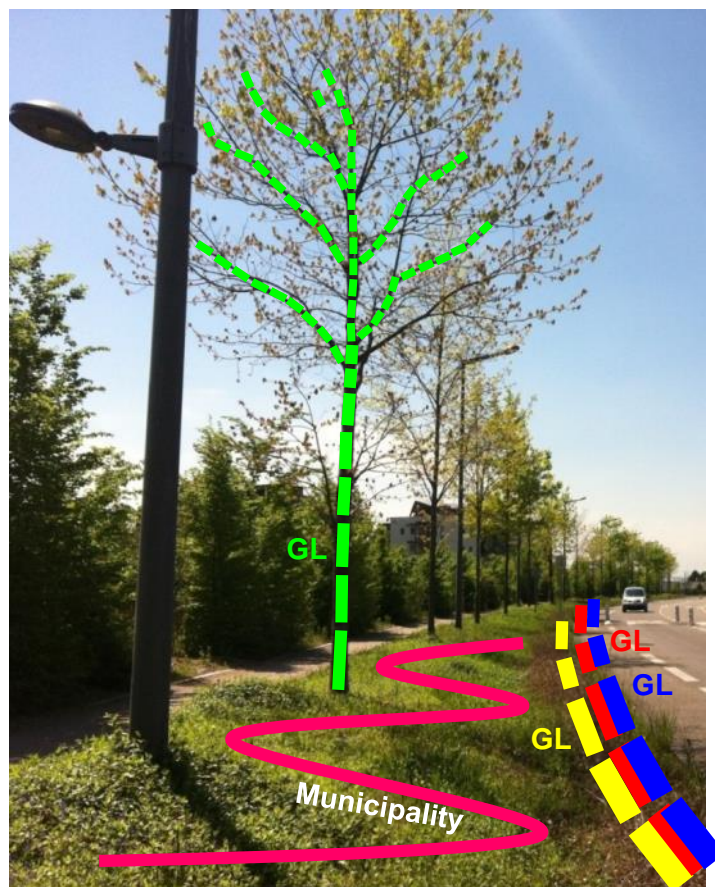
- Inductive procedure
- Participant observation
- Learn about what is “not said”

# Anthropological approach

## First findings

- General context
  - Increase in the number and the complexity of stormwater facilities
  - Stagnating or decreasing budgets
  - Demarcation issues
- Source control measures
  - Still seen as “new” (swales)
  - Mixed perception (sand covers, swales)
  - Little consideration of water needs and opportunities when planning green spaces

# Demarcation issues

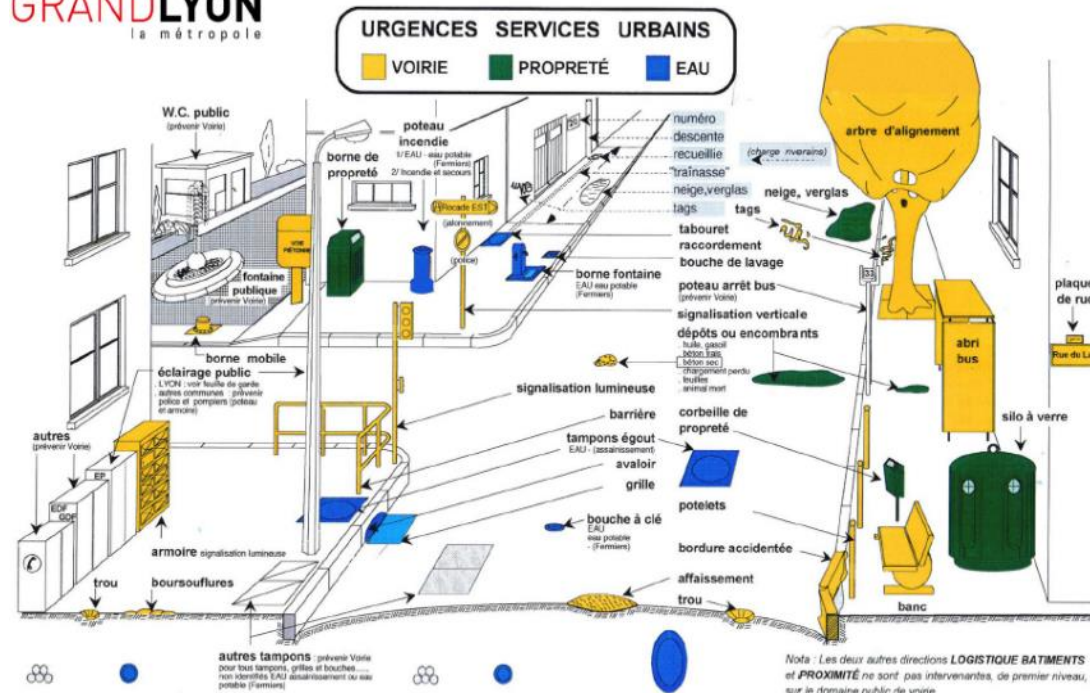


↑Roadside in Bron (Lyon, France), April 2015

**Key:** maintenance and/or control

- █ Green spaces department (municipality)
- █ Roads direction – Trees and Landscape department
- █ Cleaning department
- █ Roads department
- █ Sanitation department

GRAND LYON  
la métropole



Une anomalie se produit sur un des éléments ci-dessus !... Qui prévenir pour l'intervention ?

**REPONSE : La direction repérée par sa couleur**

Metropolis of Lyon  
(« Great Lyon »)

# Demarcation issues

- WSUD maintenance complexity
  - List of tasks for each type of WSUD
  - Nature of tasks: specialty or not
  - Department in charge
  - **S**=Sanitation Dptmt, **G**=Green Spaces Dptmt



**S**



**G**

↑ Cleaning of a screen inside the sewer, March 2016

↑ Mowing in Confluence, Lyon, France, May 2016

		Cleaning Department	Sanitation Department	Green Spaces Service	Roads Direction
Soakaways		C1 Surface and storm drains cleaning (when needed)	S1 Hydraulic structures maintenance (when needed)  +	-	-
Soakage trench				-	-
	grassy	C1 C2 Trash collection (depending on dirt and requirement) G1 Mowing (1 to 4 times/yr)		-	
Swales	vegetated (herbs, shrubs, trees)	C1 C2	S2 Hydraulic structures cleaning or flushing (when needed)	C2 / G1 G2 Pruning (about 1 to 2 times/yr) G3 Weeding (when needed) G4 Watering	E2
Buried basins		C1	S1	-	-
Open-air basins	enclosed	-	S1/S2/C2/J2 V1 Fences and signs maintenance S3 Self-monitoring	1 <sup>st</sup> adv. for centralized systems : simple O&M (MicroMégas)	
	open to the public	C1 C2	S1/S2/S3	C1/C2 G1/G2/G3/G4	-
Pervious pavement		C1 / G3 R2 Pavement maintenance	-	-	R1 Pavement repair R2/S2

		Cleaning Department	Sanitation Department	Green Spaces Service	Roads Direction
Soakaways		<b>C1</b> Surface and storm drains cleaning (when needed)	S1 Hydraulic structures maintenance (when needed)  +	-	-
Soakage trench				-	-
Swales	grassy	<b>C1</b> <b>C2</b> Trash collection (depending on dirt and requirement) <b>G1</b> Mowing (1 to 4 times/yr)		-	<b>E2</b>
	vegetated (herbs, shrubs, trees)	<b>C1</b> <b>C2</b>	S2 Hydraulic structures cleaning or flushing (when needed)	<b>C2</b> / <b>G1</b> <b>G2</b> Pruning (about 1 to 2 times/yr) <b>G3</b> Weeding (when needed) <b>G4</b> Watering	
Buried basins		<b>C1</b>	S1	-	-
Open-air basins	enclosed	-	S1/S2/ <b>C2</b> V Fences and signs Self-monitoring	« Picking up waste, I am telling you this honestly, I don't want to do it »	
	open to the public	<b>C1</b> <b>C2</b>	S1/S2/S3	<b>C1/C2</b> <b>G1/G2/G3/G4</b>	-
Pervious pavement		<b>C1</b> / <b>G3</b> <b>R2</b> Pavement maintenance	« It was made in 1999-2000. I think it was only once cleaned up » <b>S2</b> repair		

# What should we do about it?

- On-going work
  - On-site measures to assess hydraulic and climatic performance
  - Internal workshops on pollution, climate change and service levels
  - Internal courses on stormwater management
  - Costs and benefits assessment
  - Populating GIS with location of WSUDs
  - Asset hand over
  - WSUD guidelines for urban designers

# What should we do about it?

- Needs

- Define a systematic demarcation of tasks
  - Who pays what and at what scale?
  - Who is responsible for what?
- Work together with green spaces departments
- GIS?
- Asset audit guidelines

- Perspectives

- Implementing WSUD asset management
- Build an ambitious (but realistic) project to work together with executive managers and local politicians

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*Photographs and illustrations : N. Cossais*