

E@UALETTES



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Executive Summary

One of the distinct smells along the Seine, Canal Saint-Martin, and other Parisian nightlife areas is that of urine. Paris, like many cities with vibrant nightlife, struggles with the issue of public urination. Partly due to a lack of available toilets, some people – mostly men – relieve themselves in streets, Métro, bushes, or along waterways.

The City of Paris has realized that public urination is a critical problem and has come up with several innovative solutions to deal with the issue. However, their solutions have been primarily skewed towards solving the problem for men, while women and disabled people still face a lack of available facilities.

Our project aims to solve the issue of public urination on the Seine and Canal Saint-Martin and the lack of accessible toilets for everyone (regardless of gender or disabilities), by designing and implementing inclusive, convenient, reliably effective, eco-friendly, and cost-effective toilets – Equalettes.



**The length of a minute
depends on which side of the
bathroom door you're on.**



Framing and Background



Parisian Nightlife

With thousands of bars, restaurants, clubs, theaters, cinemas, and cultural centers opened at night, Paris is internationally known for its nightlife districts, which together comprise one of the major driving forces behind its economy, its reputation, and its vitality.

Indeed, the nightlife districts create jobs and social interactions. Today the one of the five “pôles d'excellence touristique” aims to make Parisian nightlife more attractive to tourists (“La vie nocturne parisienne,” 2018). Improving toilet accessibility could benefit this campaign.

Nightlife has grown in importance to the City of Paris, and it should be accessible to all.

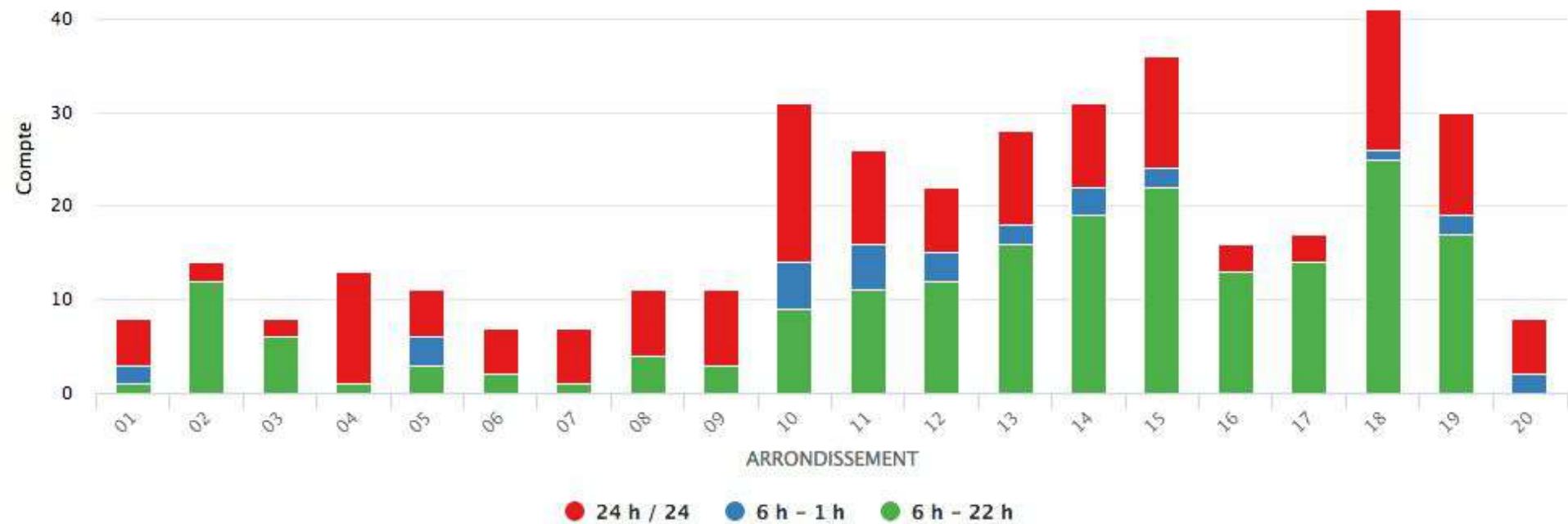
Our Challenge

Public urination has become a major issue in Paris, especially in areas that are highly frequented at night. This issue stems from a lack of access to facilities. Hence, the City of Paris has proposed several solutions aiming to provide more toilet facilities. Since the 1980's, the city has implemented roughly 400 Sanisettes, the only permanent public toilets accessible by women (Hotels Paris Rive Gauche Blog).

However, today, only 150 out of these 400 Sanisettes are open 24 hours a day, whereas the others are typically not accessible between 22:00 and 6:00 ("Les Sanisettes." *Retour à L'accueil - Paris*). To make matters worse, Sanisettes are often out of order or far from bars or populated areas. As such, women are left to find the Sanisettes on their own, asking bartenders to use their restrooms for free or relieving themselves in unsafe areas.

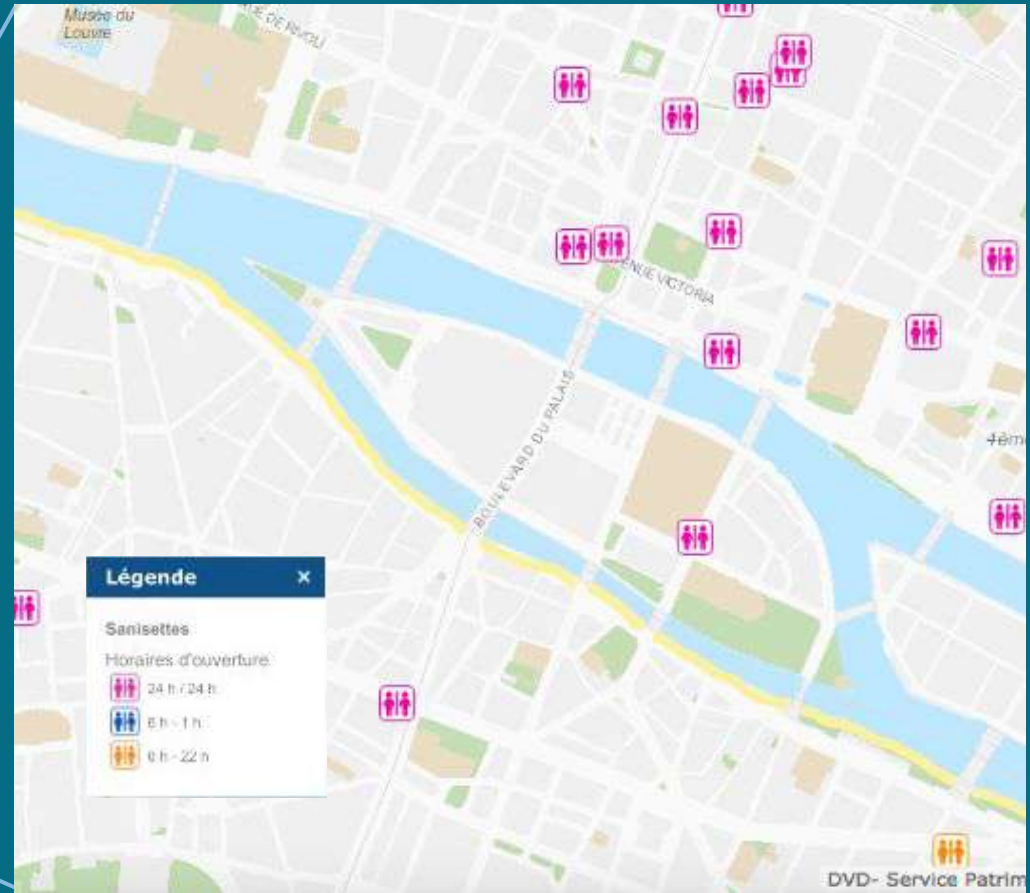
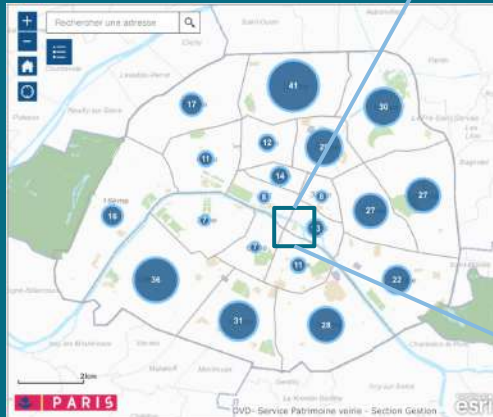


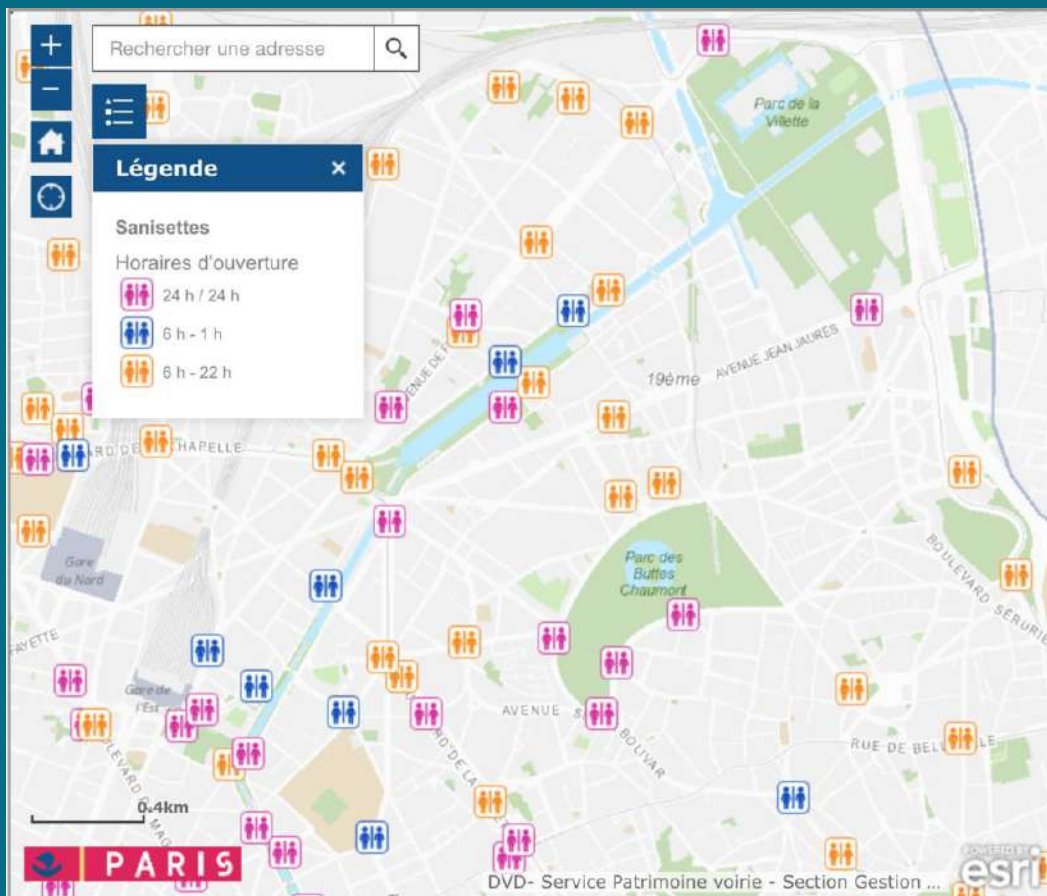
A Sanisette in Paris, by night.



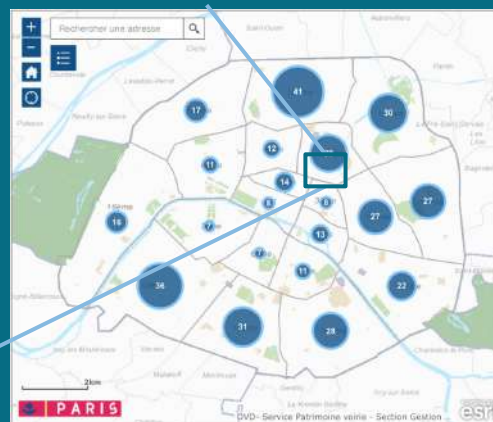
This chart indicates the number of Sanisettes per arrondissement in Paris and their operating hours. The neighborhoods with a significant number of 24h Sanisettes (in red) are often associated with high nighttime attendance and would benefit from additional sanitary installation — even relatively well-served areas cannot adequately meet toilet demand today.

The figure to the right shows that our first targeted area (highlighted in yellow), the Left Bank of the Seine. The region has a lack of accessible Sanisettes, even though it is often frequented at night.





The figure to the left shows the sanitary installations along Canal Saint-Martin, our second targeted area. Most of the Sanisettes are closed at night, and the 24h ones are concentrated in Buttes Chaumont and Gare de l'Est areas, a 10-minute walking distance from the Canal.



Portable Chemical Toilets

Another solution commonly implemented is that of porta potties. They are used mostly during events such as festivals and are not permanent infrastructures. Moreover, many stay away from porta potties because they tend to be unappealing to the user. One can see the waste from all the other previous users mixed with Deodorizer (blue chemical liquid).

This causes the porta potties to take on a foul smell (Kneiszel, Making Porta-Potties More Appealing to The Public).

Sanisettes and portable toilets are two different approaches; however, both of them are not efficient because there are not enough functional facilities and the general public associates public toilets with bad odor and uncleanliness.

A Portable Toilet.



The Toilet Infrastructure Gap

Since the creation of the Sanisettes and the deployment of portable toilets, innovations in toilet design have almost exclusively targeted men. Yet there is a need for an increase in efficient, gender-neutral bathrooms. Women are routinely discriminated against when it comes to public toilet access, despite making up half of the population. Moreover, disabled people are often excluded from public spaces and infrastructure.

The installation of urinals is cheaper and more convenient than that of actual toilet cabins, especially of cabins linked to the city's water and electricity networks (the Sanisettes are an example of this). We have seen the installation of the Uritrottoir (an eco-friendly urinal that produces compost as fertilizer, see the next slide for an image of this) but not the unisex urinal.

We have seen the run of the “La Nuit Est à Tous” campaign (above) to caution men against urinating in the streets but not the effort to improve access to available toilets for women or disabled people.

A “La Nuit est à Tous” panel.



Male-Exclusive Solutions



A urinal along Canal Saint-Martin.

Urinals are significantly lower in physical footprint and in cost than Sanisettes (5.000€/unit vs. 200.000€/unit). For these reasons, the City of Paris has installed them in an increasing number of locations and adopted a variety of models.

These infrastructure elements appear to be well-used along Canal Saint-Martin, but are effectively only available for non-disabled men to use.



An Uritrottoir in Paris.

Heard Along the Canal Saint-Martin

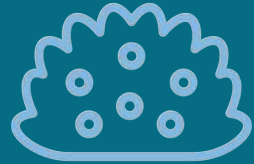
We interviewed some groups of people along the Canal on 18 July 2018. They said the following:



“In Paris, it is never easy to pee when you are a woman! I usually hold it for the entire night. I am so jealous that men have urinals!”



“I usually hide behind cars, and ask for a friend to come with me, to feel more secure. It is a constant struggle, but I always end up finding a spot somewhere.”



“I only use the public toilets when there is not a line. And honestly, I would rather go in a bush. The smell [of the toilets] is disgusting.”



A vandalised panel along the Canal Saint-Martin, as seen on 25 June 2018.

The original black text reads:
“Yesss. You have used one of the toilets at your disposal.”

The graffiti reads: “And for the girls? Do they not pee?”

Bridging the Gap

The City of Paris has mainly focused on infrastructure solutions for men, whereas the few gender-neutral solutions that have been implemented, such as the Sanisettes, seem to be inefficient (Stone, 2017).

The Equalettes tackle the challenge of providing efficient, low-cost public toilets for all.

People queuing for toilets at the Paris
Lollapalooza Festival, July 2017.



UN Sustainable Development Goals (SDGs)

At a United Nations Summit in September 2015, world leaders adopted 17 Goals for sustainable development globally, which were implemented in January 2016. The goals aim to “end all forms of poverty, fight inequalities and tackle climate change, while ensuring that no one is left behind” (The Sustainable Development Agenda).



The broad Goals are meant to apply to all humans in all countries. Under each Goal, the United Nations provides detailed targets to help tackle the challenges, in addition to indicators for measuring progress. In the following section, we detail the four Sustainable Development Goals targeted by Equalettes, as well as a specific target for each of the Goals.

UN Sustainable Development Goals (SDGs)

SDG 3: Good Health and Well-Being

One of the key objectives of the Equalettes is to ensure that people in Paris can have a healthy night. An indicator of progress toward this SDG is a reduction in the bladder pain that results from a lack of toilet access.



Target 3.9:

By 2030, substantially reduce the number of deaths and illnesses from contamination.



SDG 5: Gender Equality

Our project aims to augment access to public toilet infrastructure, which currently tends to heavily favor non-disabled men – especially in nightlife districts.

Target 5.1:

End all forms of discrimination against all women and girls everywhere.

UN Sustainable Development Goals (SDGs)



SDG 6: Clean Water and Sanitation

Our project aims to make progress toward this SDG in a nuanced manner — by providing sanitation while conserving water. We will use dry soap and dry flush to lessen water consumption in Paris.

Target 6.2:

By 2030, achieve access to adequate and equitable sanitation and hygiene for all.

SDG 11: Sustainable Cities and Communities

Whereas most toilets are effectively wet dumpsters, the Equalettes will aim to be dry recycling facilities. By using the potential of human waste for agriculture, we will further sustainability and green thinking.



Target 11.6:

By 2030, reduce the adverse per capita environmental impact of cities.



Previous Approaches

Previous Approaches in Paris



Sanisettes:

Sanisettes are free for users but cost the city roughly 200.000€/unit because they are linked to the sewage system. Their self-cleaning cycles lead to malfunctions and long wait times. Most close at 22:00.

Pollee:

A Danish company created the Pollee to provide public urinals for women; however, they do not offer a safety for women. Its deployment was voted for in the Paris 2015 *budget participatif*, but was never implemented.



Chemical porta potties:

These toilets, located on the Banks of the Seine (such as near the Musée d'Orsay), are free to use and contain many single-gender units. Because of their strong odor, many people do not opt to use them.

Previous Approaches Abroad

Urilift (Amsterdam):

The Urilift is an expensive, retractable urinal that rises from the ground during the night; however, there is currently only one Urilift available for women to use out of the 16 installed.



GARV (India):

The GARV toilet is the Indian version of the Sanisette, offering a gender-neutral, self-cleaning public toilet. It does not reuse human waste and lends itself to frequent breakdowns.



Ecosan (Benin):

The Ecosan is tackling the issue of poor access to toilet facilities in rural parts of Benin by implementing dry toilets that separate liquid and solid waste, with each to be used as organic fertilizer.



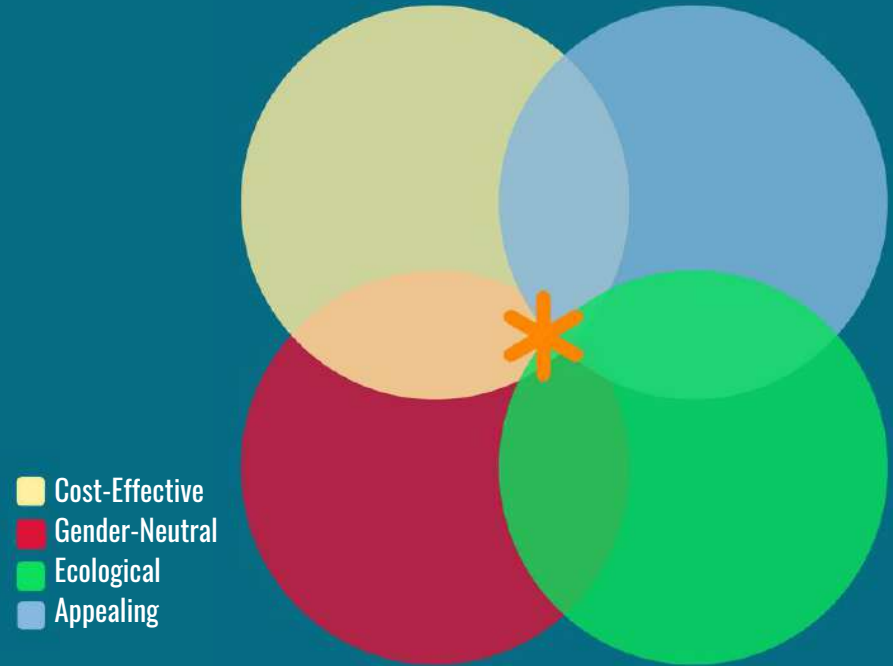
Proposed Solution

Our Proposal

We aim to implement inclusive, appealing, eco-friendly, and cost-effective toilets along the Canal Saint-Martin and the Left Bank of the Seine — two areas of Paris that are highly frequented at night — and signage to guide users to them, in order to increase accessibility to toilet facilities for all during nighttime.

The Equalettes will only be in place during spring and summer, when the outdoor nightlife is intense, and access to toilet facilities is potentially harder for people to find. The Equalettes will be easy for the City of Paris to install and maintain, and we hope that they will change public opinion regarding public toilets.

Equalettes *



Ecological

The dry toilet will be independent of the city's sewage system.

Dry soap will eliminate the use of water entirely.

Waste will be mixed with wood chips, composted for 1-2 years, and sold to farmers for local, non-alimentary agriculture.



Appealing

The toilet and cabin will be made from recycled plastic that resembles wood.

Fresh bamboos integrated with the exterior and the regular cleaning process will reduce odor.

An emergency button inside the cabin will heighten safety.



Cost-Effective

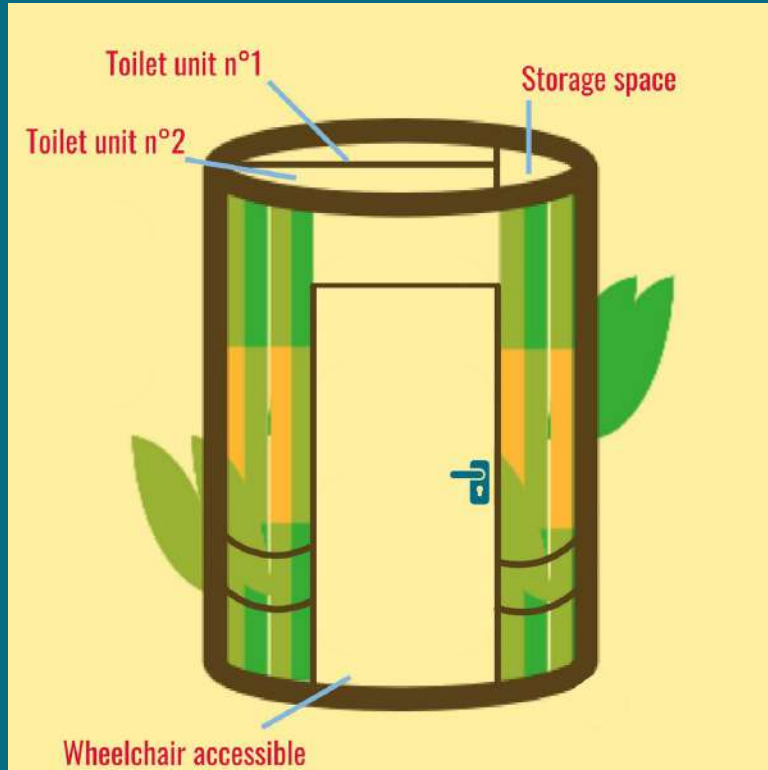
The Equalette will have a lower price point than the expensive Sanisette.

The electrical features will be battery-operated, independent of the city's power grid.

The unit be movable but seasonally permanent (in one location for eight months).



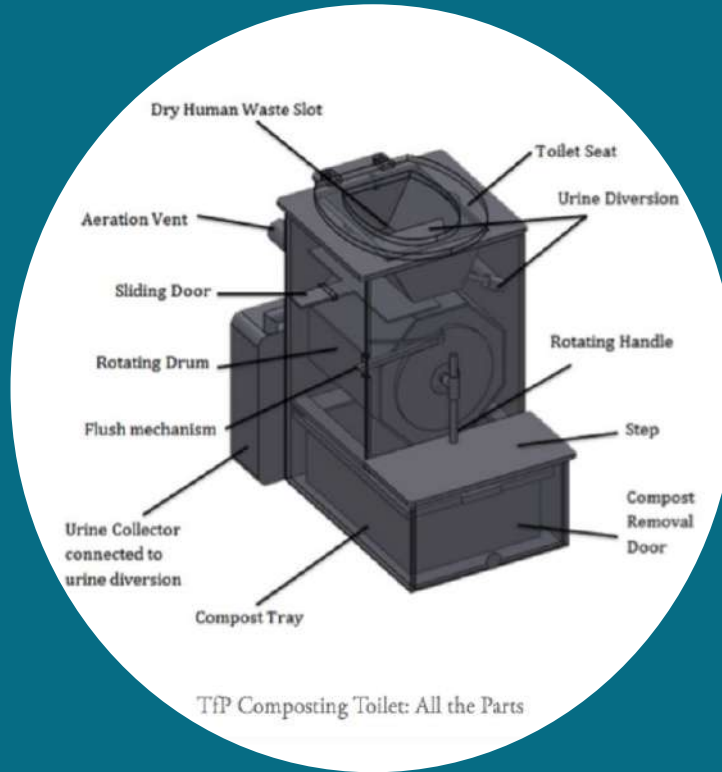
Design of the Toilets



The Equalette is cylindrically shaped to optimize its space. Each cabin includes two toilet units, a storage unit to hold waste and a battery to power the units. Bamboo plants are fixed on the outside walls, to improve smell and the aesthetics of the Equalette. The Equalette is also wheelchair accessible.

Technology of the Toilets

The Equalettes will use the waste disposal technology of “The Crapper,” made by Toilets for People, a Vermont-based company that specializes in creating dry, composting toilets. The liquid and solid waste are disposed into two different containers. Both containers are easily removable in order to facilitate maintenance, transport, and compost processes.



The Crapper and its components.

The Crapper is also equipped with a ventilation fan to aid in odor reduction. The Crapper is currently sold for less than 1.000€ far as a private home facility, but we believe that it may be scalable. The use of a similar or identical technology would likely allow us to build Equalettes for far less than 25.000€, Uritrottoir’s estimate for a dry toilet cabin.

Potential Locations: Quais de Seine, Left Bank

The Left Bank of the Quais de Seine, a highly populated nightlife area, does not have any public toilets from Pont Neuf to the Tino Rossi gardens (Université Pierre et Marie Curie). Most of the existing toilets are placed at street level or on the Right Banks of the Seine, limiting their access by nightlifers. This area would be equipped with six Equalettes of equidistant spacing.

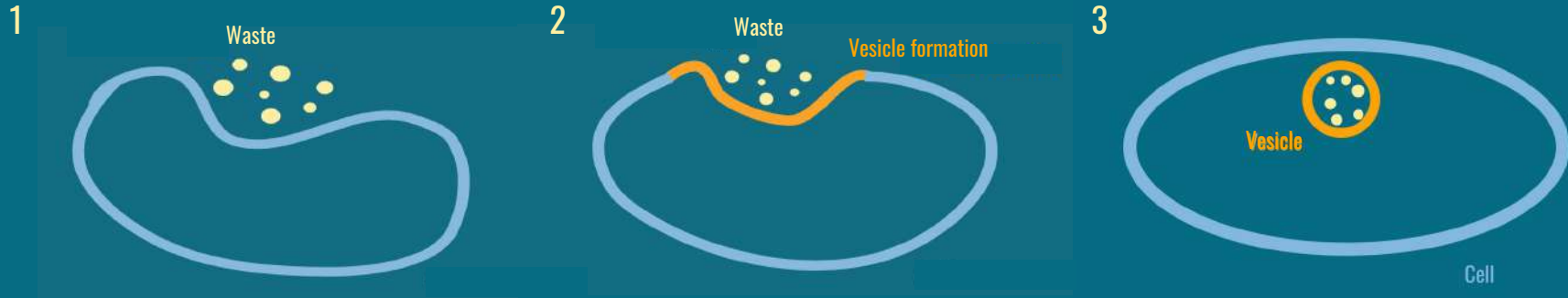


Potential Locations: Canal Saint-Martin



The Canal Saint-Martin, spanning from the Métro station Jaurès to the Pont d'Amélie, would be equipped with four Equalettes, two on each bank. Though the Canal has a vibrant nightlife, the available Sanisettes are often inaccessible because there are not many bridges linking the two sides, which also include too many stairs.

Biological Inspiration: The Lysosome

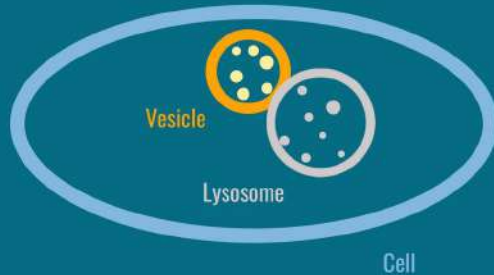


Upon detecting extracellular waste, the cell extrudes a portion of the cell membrane (1) to surround and engulf the waste (2), bringing it into the cell. A membrane-bound compartment called a vesicle is formed around the waste in a process is called endocytosis (3).

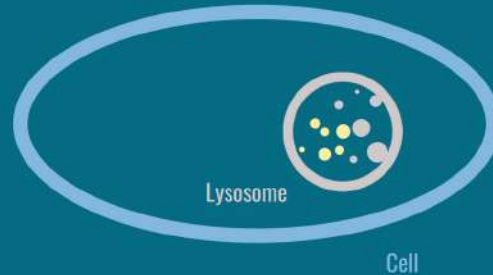
Biological Inspiration: The Lysosome

This vesicle is then sent to the lysosome (4). The lysosome is a specific compartment in cells responsible for breaking down cellular waste and recycling the components (5). Here, the vesicle contents are broken down into needed materials for the cell (6).

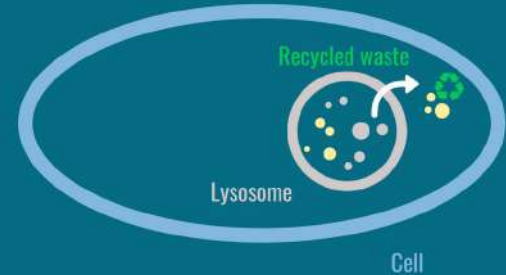
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5



6



The Lysosome-Inspired Equalette



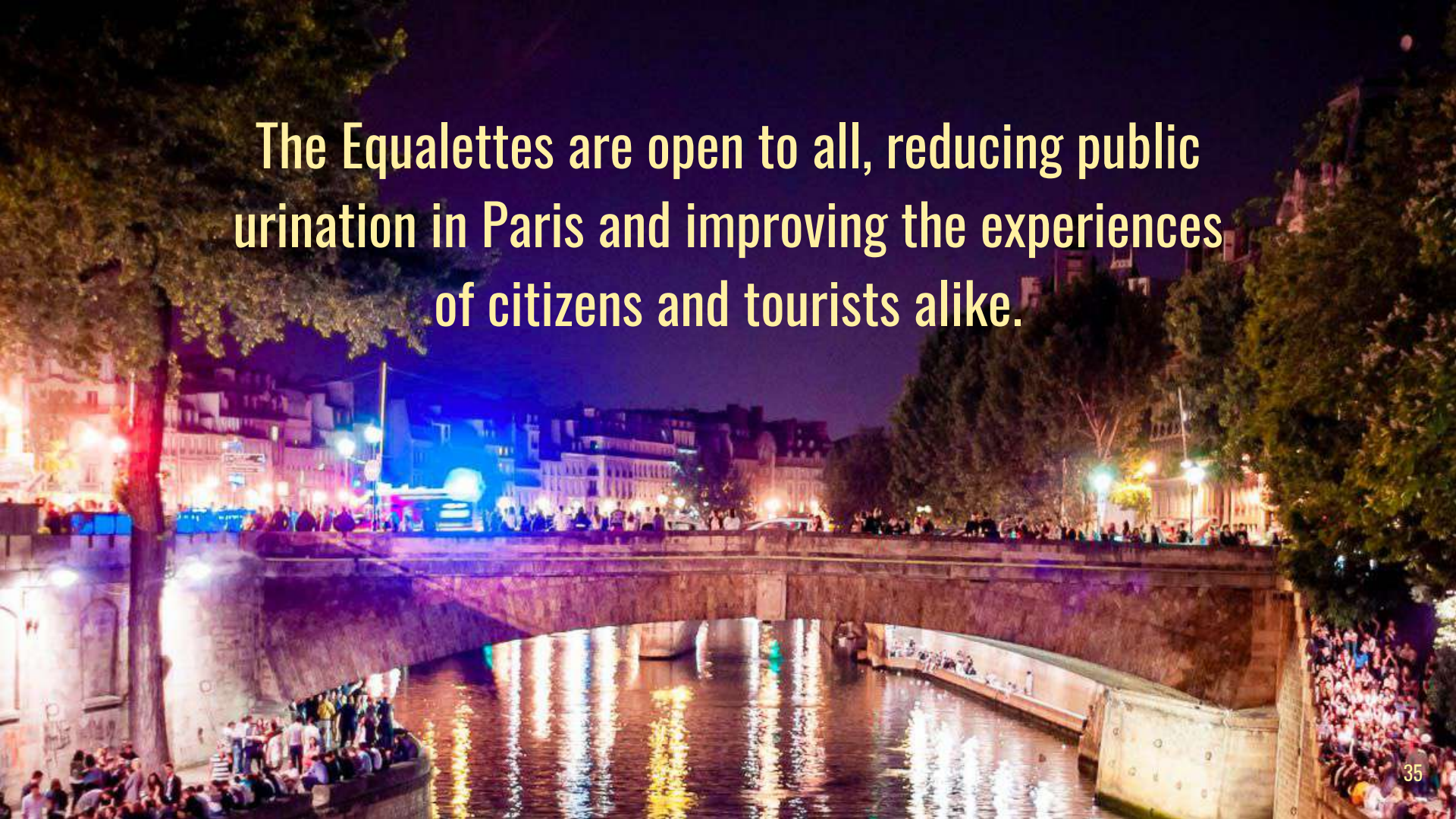
A similar dance occurs when night lifers need to use a toilet. A person leaves the group in search for our Equalette to relieve themselves and the Equalette is left to break down the waste. Once the person flushes the Equalette, the waste goes through a filtration system that sends urine to a separate location and feces to a box to be collected for use as a fertilizer for farmers.



Comparative Table: Current Solutions vs. Equalettes

	Sanisettes	Uritrottoir	Porta Potty	Ecosan	Pollee	Urilift	Equalettes
Gender-Neutral	X		X	X		X	X
Ecological	X	X		X		X	X
Appealing		X					X
Cost-Effective		X	X	X	X		X

The Equalettes are open to all, reducing public urination in Paris and improving the experiences of citizens and tourists alike.





Value Proposition

1



2



3



The Equalettes create accessible and gender-neutral toilets for the city of Paris to implement in nightlife districts. Unlike the 24h Sanisettes, we offer a cost-effective, ecological, and appealing public toilet option.

Potential Partners



The City of Paris would confirm the locations of the Equalettes and rent them, in addition to paying for structure maintenance (regular and irregular).



We will need Toilets for People to create a macroscale of the dry toilet that they currently make for homes to be used in a nightlife district.



After 1-2 years of composting and treating the human waste, farmers would purchase our fertilizer for non-alimentary agriculture.



We will need Uritrottoir to create the straw formula that allows human waste to be converted into fertilizer.



Malaysia Edotco would consult us on the integration of bamboo with the Equalette's exterior structure.



Berner would provide the dry foam soap to be used in our toilets.

Implementation Timeline



June - July 2018:

Create virtual prototype of Equalette.
Present the design to the Biopolis.

Jan - June 2019:

Gather funding through grants and donations.
Acquire needed licenses and permits for public spaces.

Jan - June 2020:

Discuss with city of Paris about where the Equalettes should be implemented along Canal Saint-Martin and the Left Bank of the Seine.
Fix any issues found in the physical prototype of Equalette.

Aug - Dec 2018:

Assemble a team of engineers, urban designers, and finance chairs.
Create partnerships with potential partners.

June - Dec 2019:

Design and build physical prototype of Equalette.

June - Aug 2020:

10 Equalettes implemented along Canal Saint-Martin and the Left Bank of the Seine.

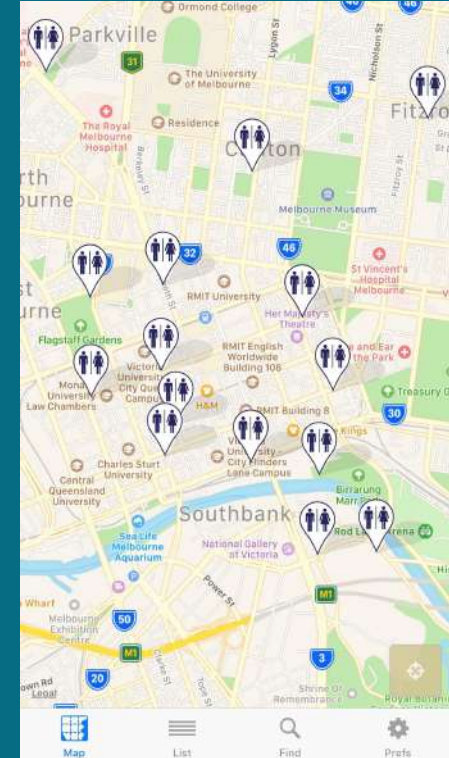
Integrating the Toilet Network: Digital Map



Before installing the Equalettes, the City of Paris should create a digital platform linking all of its public toilets, allowing users to find the nearest preferred facility.

Australia's National Public Toilet Database is the best example of this: a functional app allowing users to locate nearby toilets after selecting from 23 "Prefs" (preferences).

Left: The Prefs as seen on the Database.
Right: A Map resulting from chosen Prefs.





Integrating the Toilet Network: Signage

Bloeme, Randy, et al. found that signage effectively dealt with the problem of nighttime public urination by positively impacting people's behavior, orienting them toward available public toilets (Persuasive Technology Against Public Nuisance–Public Urination in the Urban Nightlife District, 2017).

In addition to the Equalette, we will be implementing physical signages, such as arrows on the ground, to indicate the nearest toilet. They will glow in the dark so that people will be able to see them at night. These arrows will be placed during the time that the Equalettes will be placed: 1 March to 31 October.

A commissioned sign indicates a Sanisette near the Canal Saint-Martin.

Overview of the Cost Structure & the Revenue Stream



Apply for various grants and programs to pay for the upfront costs of designing and manufacturing the Equalettes, estimated to cost 9.000€ per unit.



Lease the affordable 2-unit cabin to the City of Paris to be implemented in 10 locations along the Left Bank of the Seine and Canal Saint-Martin, with payments occurring yearly.



Charge the city for cabin maintenance, which includes changing the waste containers and restoring the infrastructure from alcohol-induced damage or vandalism.

Breakdown of the Cost Structure

INITIAL COSTS	SEASONAL COSTS (Mar-Oct)
Adapted version of the “Crapper”: 2.000 €/unit	Weekly cleaning and compost shipping: 500€/unit-month (4.000€/unit-year)
Cabin walls, roof and floor: 4.000€/unit	Batteries and light bulbs: 500 €/unit-month (4.000€/unit-year)
Signage and emergency button (linking to a call centre): 1.500€/unit	Bamboo decoration: 200€/unit-year
Disabled access ramp & installations: 1.500 €/unit	Vandalism and breakdown contingency costs: 1.000€/unit-year
TOTAL INITIAL COST ESTIMATE: 9.000€/unit	TOTAL SEASONAL COST ESTIMATE: 9.200€/unit-year

Breakdown of the Revenue Stream

We will enter competitions such as *Budget Participatif* and Talents Paris 2024 for a chance to win money to begin the production of the Equalette. We will work with DG Vie nocturne et économie culturelle to apply to grants to upfront the costs of building the Equalette.

We will lease the Equalette to City of Paris for eight months (Mar-Oct) at 20.000€. The cost to lease the Equalette will include the price of the object and maintenance, such as repairs to the cabin or objects within the cabin, changing the waste containers, and adding signage that lead to the object.

Though we will be in charge of maintaining the infrastructure, during the eight months that the City of Paris has the Equalettes placed in the two locations, it will be in charge of cleaning the facility. This would likely occur through the Direction de la Propreté et de l'Eau.



The Left Bank of the Seine,
a popular spot for summer
nightlife.



Assessment Plan

Summary of the Assessment Plan

After 1 Year

Data Analysis:

Data about the number of public urination fines issued would be collected and analyzed to estimate the potential correlation or causality links.

Public Consultation:

An online and a paper survey would be open to users of the infrastructure and all Parisian citizens to express their thoughts about the Equalettes.

After 2 Years & Beyond

Cost Efficiency:

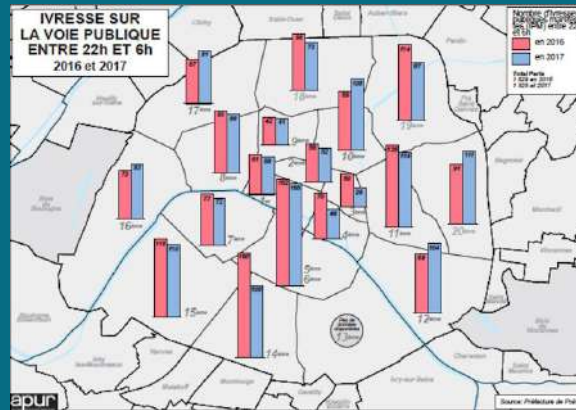
The Equalettes would be considered efficient if each unit's initial costs and yearly maintenance costs are each lower than the ones proposed by competitors.

Long Term:

If data and public opinion confirm the usefulness of the toilets and if local farmers affirm the fertilizer, we would consider the Equalettes a sustainable and scalable project.

Assessment Via Data Analysis

At the end of the first eight-month season in place (March-October), we plan to collect data from the City of Paris about the number of fines issued for public urination in the areas where the Equalettes have been installed. In partnership with Atelier parisien d'urbanisme (APUR), we will compare these figures with those of previous years, and of other areas of the city.



Similar data are used to map the distribution of public drunkenness fines.

A significant reduction in these fines in our target areas could represent a beneficial correlation with the presence of the Equalettes.

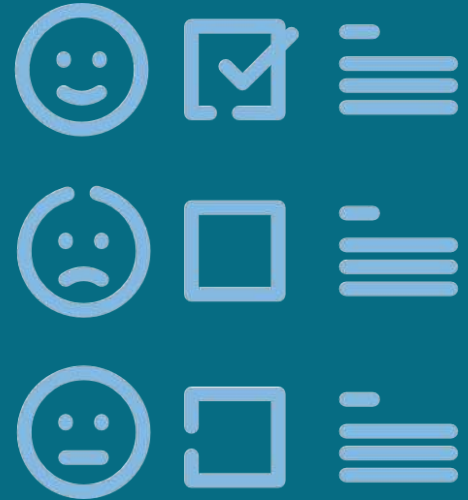
A stagnation or an increase, however, would not necessarily indicate complete failure — public urination fines cannot measure the potential impacts of the Equalettes in the realms of ecology or accessibility.

Assessment Via Public Consultation

To assess whether the installation of the Equalettes in the nightlife districts of the Left Bank of the Seine and the Canal Saint-Martin is effective, we plan on having a public survey addressed to nightlife users, as well as to bar owners and employees. This would aim to evaluate the effectiveness of both the physical toilets and the signage that would accompany them.

Available as both a paper version distributed in the target areas and an online version, the survey would assess the public perception of Equalettes (design, comfort, cleanliness) and role they had in the evolution of their outdoor urination practices.

The Paris Night Council could be a valuable partner in this survey process.



Assessment Via Cost-Efficiency

One of the aims of the Equalettes is to provide to the City of Paris a more sustainable and cost-effective solution to the problem of public urination for all. We would consider our product efficient and scalable if each Equalette's initial costs and yearly maintenance costs are lower than those of one unit of each main competitor (Uritrottoirs, Parisettes).



In terms of yearly maintenance, we would need to account for both regular and irregular costs (with the latter encompassing vandalism and unexpected malfunctions). If, on average, these costs significantly exceed our contingency estimate of 9.200€/unit-year – especially after one season – then we would question the sustainability of the Equalettes.

Assessment in the Long Term



After two or more seasons of activity, we will distribute another survey to assess whether the Equalettes have been received favorably by members of the public and nightlife professionals, as well as whether women and disabled people have seen them as a factor for improving the quality of their night outdoors.

This assessment will be accomplished through another survey, also to be distributed in both online and physical form in nightlife regions of Paris. Additionally, after a few seasons we will assess through our agricultural association partners whether the fertilizer produced from the waste of the Equalettes is known and appreciated by local farmers.

A Positive Outcome

If the general assessment of the impact of Equalettes is positive and the costs are sustainable, we will consider extending the deployment of our dry toilets to other Parisian nightlife areas, such as Oberkampf or Butte-aux-Cailles.

The exact locations of the new units will be based on public consultation through the official website of the City of Paris.



Although Equalettes originate from an insufficiency in nighttime infrastructure, they will be fully accessible 24h. Our surveys will ask users if they find Equalettes helpful during the day. If they appear to be a popular daytime option, we will look into deploying them to neighborhoods in Paris lacking adequate public toilets, such as Porte de la Chapelle or Porte de Clignancourt.

Dry, gender-neutral, sustainable toilets for Paris are on their way!



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Page 8: <https://bit.ly/2NdpiB2>

Page 9: <https://bit.ly/2JMQ085>

Pages 10–11: Maps from <https://www.paris.fr/equipement>

Page 12: <https://bit.ly/2zygdrb>

Page 13: <https://bit.ly/2uvlSsb>

Page 14, left: Photo taken by Eloisa Capezzuto June 25, 2018

Page 14, right: <https://bit.ly/2LKAiw0>

Page 16: Photo taken by Eloisa Capezzuto June 25, 2018

Page 17: <https://bit.ly/2zBoBGz>

Pages 18–20: <https://bit.ly/2v1wz6c>, <https://bit.ly/1Qk5cqI>

Page 22, top-left: goo.gl/4C4GQW

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Page 22, top-right: Photo taken by Eloisa Capezzuto June 25, 2018

Page 23, bottom-left: <https://goo.gl/images/LRHHoi>

Page 23, top-middle: <https://bit.ly/2L6WeEE>

Page 23, bottom-right: <http://www.garvtoilets.com>

Page 27: Free Logo Maker. Logomakr.com.
<https://logomakr.com/>

Page 28: <https://www.toiletsforpeople.com/>

Pages 29–30: Maps edited from
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Page 35: <https://bit.ly/2L6tE69>

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Page 40: Screenshots from Australian National Public Toilet Database, iPhone application

Page 41: <https://bit.ly/2NJimCS>

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The End