Strategic Roadmap

Government Drone

Amsterdam canal bottoms collect a lot of heavy trash—from bicycles and boats to even an occasional car. To determine where to clean or to search for something in particular, Watermet uses partially submerged drones to look beneath the water's surface. The drone allows the professional to explore the floor of the canals using multiple cameras and a virtual-reality interface.

Dependencies: C, L

Benefits: Safety, Public health, Waste management

Roomboat

A lack of sufficient waste infrastructure in the city center leads to trash floating in the canals. The roomboat, an autonomous cleaning boat, collects trash floating near the water's surface in scheduled parts of the city to help keep the canals clean. The boat is monitored, and when its container is full, it returns to its dock to unload before returning to work.

Dependencies: S, N

Benefits: Public health, Waste management

Canal Traffic Camera

Amsterdam's 100 km of canals pose both public-safety and nuisance concerns beyond what the police can keep up with. Small police-boat boats equipped with cameras document and report illicit behavior on the water. In busy intersections, cameras run continuously, collecting data and reporting problems. Canal traffic cameras work with barrier boats to entrap offenders until the police arrive.

Dependencies: M, S, C

Benefits: Safety, Government

Fire Boat

Old canal houses are very vulnerable to fire, therefore acting fast and preventing the spread of flames is crucial. While Amsterdam's crowded streets, often clogged with delivery vehicles, can make responding to an emergency challenging, a fire boat can get to the site with ease. Thanks to being on the canal, it can pump the water directly to put out the fire, and it's ready to work almost immediately after arriving.

Dependencies: S, N

Benefits: Safety, Transportation, Government

Bottom Feeder

Approximately 15,000 bikes are salvaged annually from Amsterdam's canals. Cleaning canals and picking up sunken bikes, apart from being quite a spectacle, are necessary to maintain waterways' safety and accessibility. The bottom feeder is a boat that detects unwanted objects on the canal bottom and automatically removes them.

Dependencies: M, S

Benefits: Safety, Waste management

Floating Battery

Loud power generators placed in the tight canal streets during construction work create congestion and air pollution. Construction and other companies can rent a boat with batteries to provide power for construction sites. Battery boats are monitored and hot swapped out as needed. Charging of batteries occurs outside the city using solar and wind power. This solution reduces noise and air pollution and saves space in the narrow Amsterdam canal streets.

Dependencies: N, L

Benefits: Safety, Traffic reduction

Large Waste Barge

Bulk waste collection is unsightly for the city and often inconvenient for citizens. The large waste boat carries containers to different parts of the city throughout the month in order to collect waste before taking it to a sorting facility to determine what's usable, what's recyclable, and what should be incinerated.

Dependencies: S, N

Benefits: Waste management, Traffic reduction

Detachable Parks

Park docks provide much-needed green space in the city, but become problematic late at night when nuisance tourists crowd them. The new iteration of park docks attaches to the side of the canal during the day and detaches during night hours, moving into the center of the canal to keep away trespassers.

Dependencies: I, N

Benefits: Recreation

Driverless Water Taxi

With tourist crowds in the city center, taxis become less and less effective as a means of transportation. Autonomous water taxis avoid getting stuck in the road traffic and take passengers anywhere as long as it's on a canal. Ordering a taxi is done via an app. Surge pricing may apply.

Dependencies: R

Benefits: Transportation, Traffic reduction

Grocery Delivery

With too much congestion on the streets of Amsterdam, Albert Heijn replaces many of their trucks with boats for its grocery-delivery service. Refrigerated boats carry significantly more groceries than trucks, reducing the amount of time spent restocking. Humans complete the delivery, bringing grocery boxes from boat to door.

Dependencies: M, N

Benefits: Food, Commerce

Water Filtration

Amsterdam's canals are cleaner than they have been in 400 years, but the water often remains unsanitary for activities like swimming. Amsterdam's Watermet aims to purify it even more. Both to reduce pollution in the canals and to help beautify the city, Amsterdam launches a fleet of filtration vessels that float on the canals. These small, autonomous boats filter toxic and dangerous chemicals from the water. They detect areas with more pollution and work where they are needed most.

Boats also report data back to the city for use with Amsterdam's City Data program.

Dependencies: S, C, N, F

Benefits: Safety, Public health, Recreation

Mini Lifeboats

Police and Public Health Service reports indicate that 2–5 people drown in Amsterdam's canals every year, a number that's on the rise with immigration. Small boats use pump-jet engines to move quickly through canals, enabling them to rapidly approach a drowning person, help them remain afloat, and get them to land. When not in use, lifeboats attach to dedicated charging docks on canal walls and are ready to go when they are summoned by a scream. Boats find a person in need by detecting sound, movement, and heat.

Dependencies: S, I, N

Benefits: Safety

Urban Yacht

With the city's government growing more aggressively anti-car, Amsterdam's elite need to find a new way to move through the city. These individually sized private boats transport those who can afford it through Amsterdam's canals. Each boat is piloted by an AI chauffeur who integrates with users' digital personal assistants, knowing when to appear and where to go without needing any input from the user.

Dependencies: M, N

Benefits: Transportation, Recreation

Barrier Boats V2

When all boats are equipped with GPS, barrier boats predict upcoming difficulties on waterways and assist to redirect the traffic. In this later iteration, the swarming barrier boats use access to boat location data and machine learning to manipulate flow, optimizing traffic through the canals. While they are still able to view and manually adjust barrier behavior, police take a less active role in directly manipulating barrier boats.

Dependencies: M, C, N

Benefits: Safety, Public health, Traffic reduction

Pop-Up Boat

Development in Inner Amsterdam has made affordable real estate unavailable to unestablished brands, so the city searches for new ways to facilitate the growth of small businesses. Valet tugs make new space available on many canals, and open docks enable boats to have more robust functionalities and make pop-ups available to multiple neighborhoods. Mobile retail and kitchen boats provide locations for emerging talent through a series of mobile pop-up restaurants and shops.

Dependencies: I, N, L

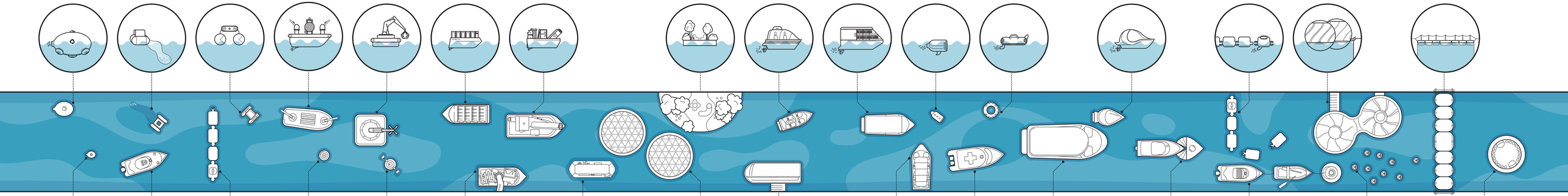
Benefits: Commerce, Recreation

Floating Bridge

Amsterdam's infrastructure can be flexible and adjust to ensure accessibility. When a bridge is closed for renovation or when an additional bridge is needed to provide easy access to an event, a temporary solution is placed on water, assembled from a swarm of boats. When necessary, boat bridges can restructure, allowing other boats to pass.

Dependencies: M, S, C

Benefits: Transportation, Traffic reduction



Personal Drone

With the heavy regulation of drones in the Netherlands making it virtually impossible to fly drones in Amsterdam, hobbyists turn to underwater drones. With the proliferation of DIY consumer-grade drone kits, everyone can explore the underwater world of treasures that lives in the canals. This boat drone allows users to discover what's under the water's surface using a camera and virtual reality.

Dependencies: L

Benefits: Recreation

Canal Traffic Map

Especially on sunny days, Amsterdam's canals are overwhelmed with boats. To keep traffic moving smoothly, both private and commercial boats are individually equipped with GPS, enabling the city to track and produce an anonymized map of boat traffic in the canals. The map is accessible to all drivers via an app and a website.

Data collected is used by the city to help control traffic where necessary and eventually informs self-driving boat algorithms for optimized efficiency.

Dependencies: C, L

Benefits: Safety, Transportation

Barrier Boats V1

The laissez-faire attitude around traffic management in the Amsterdam canals has failed to scale to the increased tourist traffic. Swarming barrier boats manage traffic to keep flow steady without decreasing rentals or commercial boat lines. In their first iteration, barrier boats take instruction from the police to block off areas, especially during events.

Dependencies: C, N

Benefits: Safety, Public health

Swimmers V1

While tempting, swimming in Amsterdam's canals is often unsafe due to chemicals and other toxins in the water. Small boats use sensors to detect levels of toxins in the water, and, when a stretch of the canal is clean and the area safe, boats provide visual indication to humans that the area is safe for swimming.

In case of accidents, swim boats come with floatation devices and first aid kits.

Dependencies: S

Benefits: Safety, Recreation

Snitch

Leaking boats and loud, drunken boaters are just two threats to safety on the canals. Small, resilient sensor boats live in set locations throughout the canals, sensing irregularities in craft behavior and pollution. When an irregularity is detected, the snitch boat attaches itself to the offending vehicle and alerts officials using light and sound as well as specific notifications. Alerting behavior might also attract the attention of passersby, who may want to avoid the situation.

Dependencies: M, S, C

Benefits: Safety, Public health

Construction-Refuse Boat

Construction-waste containers create congestion for car, bicycle, and pedestrian traffic. Rather than take up space on the land, construction-waste containers are moved from the streets to the canals, allowing normal traffic to resume. For construction projects, the waste-boat service can be ordered ahead of time and scheduled for the duration of the project. When full, an empty boat arrives, while the full boat returns to its dock to recharge and dump its waste in a designated place.

Dependencies: S, N

Benefits: Waste management, Traffic reduction

Moving Services

To help reduce congestion, the city of Amsterdam mandates that large delivery and moving trucks be replaced with boats in the canal belt. Delivery and moving boats become common for residences and businesses on canals. Boats can be scheduled with or without crew to help with loading and unloading.

Dependencies: R

Benefits: Transportation, Traffic reduction

Vertical Water Farm

Both limited space and access to sunlight make sustenance gardening in Amsterdam a challenge. Farm boats provide local hobbyists and origin-conscious restaurateurs space to effectively grow ingredients locally. Following the sun, farm boats use mobility and sensors to get optimal amounts of light and fresh water for crops to grow.

Dependencies: M, S, N

Benefits: Food

Delivery Locker

Delivery trucks often clog city streets, trying to deliver packages for residents who aren't at home. To reduce traffic problems, autonomous delivery boats meet recipients when and where it's convenient for them to pick up their parcels. Users open their lockers using NFC.

Dependencies: M, N

Benefits: Commerce, Traffic reduction

Boatpool

As the city center becomes less and less hospitable to private vehicles, boats become the new way to commute. Sharing a journey with passengers who regularly travel the same route reduces both street and canal traffic. Boatpooling can be arranged on a website as well as via a dedicated app.

Dependencies: N

Benefits: Transportation, Traffic reduction

Water Ambulance

With more than 800,000 citizens and over 5 million tourists visiting every year, Amsterdam rescuers struggle to help everyone in need. Conventional ambulances can easily get stuck in clogged canal streets, losing precious time. Rescuers use ambulance boats to move through the city traffic fast to help take care of the injured, maintain life functions, and transport people to a hospital for further care.

Dependencies: N

Benefits: Safety, Public health, Government

Smart Ferries

Plane, train, and other transportation schedules change unexpectedly, leading to travelers getting stuck or being late. Smart Ferries make themselves available in case of transportation delays and cancellations or bad weather conditions to help travelers and commuters keep up with their schedule and to take them where they need to be.

Dependencies: M, N

Benefits: Transportation

Valet Tug

To cope with overwhelmed parking along Amsterdam's canals, the city creates a parking program where tugs collect boats from docks where they let off passengers, and parks them in out-of-the-way structures safe from thieves and weather. Boat owners use an app to request their boat from parking and for pickup.

Dependencies: R, L

Benefits: Traffic reduction

Tug Tows

Half-sunken, forgotten boats take up coveted space while making Amsterdam less beautiful. To free up available parking space and to prevent abandoned boats from sinking, the city creates a program similar to its bike program, where boats are towed when they show signs of being abandoned. A human walks along the shore to detach boats while the towboat collects the boats and moves them to a garage where they can be either picked up or purchased if unclaimed.

Dependencies: S, N

Benefits: Safety, Waste management

Swimmers V2

While the first iteration of swim boats helped people find safe places to swim, the second iteration is far more proactive. Swarms of small filter boats use sensors to detect levels of toxins in the water. When a stretch of the canal has filterable toxins, the flock of boats begins filtering and moves to physically indicate a safe zone for swimming.

Dependencies: C, N, F

Benefits: Safety, Public health, Filtering technology

Fast-Food Boats

To help subsidize their pop-up program, the city government recruits food chains like FEBO to take advantage of the city's open-docking program. This provides established companies with the infrastructure to have locations where they otherwise might not—at festivals, concerts, and tourist events.

Solar panels on boats feed energy back into the grid.

Dependencies: I, N, L

Benefits: Food, Commerce, Energy

Overview

Waterways in cities are often underutilized spaces. They're difficult to keep clean, and they provide little value aside from beauty and tourism. But what if we were to reconsider a city's waterways as a more integrated part of the city?

This speculative series of boat concepts provides a glimpse into how future technologies and creative thinking might transform our waterways.

Dependencies

- M Machine learning
- S Sensors
- I Infrastructure
- C Connectivity
- N Autonomous navigation
- L Laws and regulations
- F Filtering technology

Benefits

- Safety
- Transportation
- Public health
- Government
- Commerce
- Recreation
- Waste management
- Traffic reduction
- Food
- Energy