WATER FUEL
A WATER-FUELED SCOOTER NETWORK
HYDROGEN FUELING STATIONS + INNER CITY SCOOTER PARKING

For the last 10 years hundreds of engineers, inventors, and scientists have been investigating the possibility of using water for fuel by means of electrolysis. It was not until recently when John Kanzius, a retired engineer, discovered an efficient method of burning saltwater with radio frequencies that commercial interests in the method began to rise. This prospect of running one's car on water stimulates a plethora of questions about economy, distribution, dependence, and the commoditization of the natural resource. This is a proposal that attempts to outline a procedure for harvesting, dispensing and commuting on water fuel.

The Water Scooter Network is to provide an alternative to Manhattan's overcrowded subways and expensive taxicabs. It is aimed at reducing the waste of the current taxi cab system in Manhattan where 69% of all rides are single passenger and 40% of cab mileage is spent cruising for passengers. The concept of the Water Scooter is that smaller is better. The smaller the vehicular footprint the less real-estate required and the better the fueling efficiency. As a network of shared scooters, the logic is park and go. It is a bottom-up strategy where the individual user becomes the key component in dispersing and fueling the water scooters.

The Water Scooter Network is mapped at two scales across Manhattan. The first scale occurs at the edge of the island, on the water, where harvesting mats collect water and extract hydrogen by means of electrolysis. These are the fueling mats. The second scale occurs within the streets of Manhattan, where current lanes for automotive traffic are converted to scooter lanes designated by the scooter parking pods that hover above.

ELECTROLYZER
THE PROCESS OF EXTRACTING HYDROGEN FROM WATER
FLOATING MAT:
A WATER SCOOTER FUELING PARK

> Secures Scooter
> Attaches To Existing Urban Elements
> Deposits By-product (Potable Water) Into City’s Water System
> Street Furniture
> Public Bathroom
> Water Fountain

CLIP:
SCOOTER INNER-CITY PARKING DEVICE

> Scooter Storage
> Scooter Water-fueling Tanks
> Floating Beach And Waterbeds
> Swimming Facility, Heated Throughout The Winter
> Showers
> Lockers
> Electrolysis Tank For Facility

TARGET USER:
THE INDIVIDUAL COMMUTER

Target population = 172,937 manhattan residents
14,193 scooters = 12 people to 1 scooter
Average distance traveled by single person in car in manhattan = 2.8 miles
1 kg of hydrogen = 60 miles of travel
12 people using 1 scooter a day = +/- 36 miles of travel per day
1kg of hydrogen can fuel a scooter for 1.6 days
12kg of hydrogen x 60 miles/kg = 720 miles of travel from 1 system per day

76% OF NYC CAB RIDES CONSIST OF A SINGLE PASSENGER
ENERGY GENERATION BECOMES RECREATIONAL

RELAX ON A HEATED BEACH OF BUBBLES

**ELECTROLIZER**

**BATTERY BANK**

**OUTPUT**

- H₂ at 3500 PSI

**INPUT**

- H₂ at 150 PSI

**STORAGE TANK**

- 416 WH per yard width

**CP INDUSTRIES**

- 20' x 24" D

**ENERGY GENERATION BECOMES RECREATIONAL**

**WAVE COLLECTION - SNAKE**

- 3M diameter buoy
- Produces 20 Kw/300 Wh
- INPUT
  - H₂ at 3500 PSI
- OUTPUT
  - 85 KG max capacity

**WAVE COLLECTION - POINT ABSORBER**

- 3M diameter buoy
- Produces 20 Kw/300 Wh
- INPUT
  - H₂ at 3500 PSI
- OUTPUT
  - HYDROGEN = 1 KG
  - NET PRODUCTION = 12 KG/24 HR

**HYDROGEN COMPRESSOR/DISPENSER**

- 3500 PSI
- 12 KG/day max

**PRESSURE PRODUCTS INDUSTRIES**

- H₂ SERIES
- 76" X 72" X 84"

**PRESSURE PRODUCTS INDUSTRIES**

- HYDROGEN™ H SERIES
- 76" X 72" X 84"

**INPUT POWER**

- 32 KWH IN

**OUTPUT**

- .830 KWH x ? = 32ND
  - = 38 buoys
  - AREA = 342 SQ FT

**WAVE COLLECTION - SNAKE**

- 416 WH per yard width

**OUTPUT**

- 1 PANEL - 2 W = .5 KWH
  - 64 PANELS = 32 KWH
  - AREA = 512 SQ FT

**OUTPUT**

- 1 PANEL - 2x4 = .5 KWH
  - .830 KWH x ? = 32ND
  - = 38 buoys
  - AREA = 342 SQ FT

**ONE FUELING UNIT**

**HYDROGEN/WATER FLOW DIAGRAM**

**INPUT POWER**

- 32 KWH IN

**OUTPUT**

- .500 KWH x ? = 32ND
  - = 38 buoys
  - AREA = 342 SQ FT

**WAVE COLLECTION - POINT ABSORBER**

- 3M diameter buoy
- Produces 20 Kw/300 Wh
- INPUT
  - H₂ at 3500 PSI
- OUTPUT
  - HYDROGEN = 1 KG
  - NET PRODUCTION = 12 KG/24 HR

**INPUT**

- H₂ at 5000 PSI

**OUTPUT**

- 1 KG H₂ FUEL TANK
- INPUT
  - POWER = 32.9 KWH
  - WATER = 1.4 G/HR

**HYDROGEN SCOOTER**

- ALLOWS BACK TO BACK FUELING

**RELAX ON A HEATED BEACH OF BUBBLES**

**WAVE COLLECTION - SNAKE**

- PHOTOVOLTAICS

**WAVE COLLECTION - POINT ABSORBER**

- WATER = 1.4 G/HR

**INPUT**

- H₂ at 3500 PSI

**OUTPUT**

- H₂ at 3500 PSI

**INPUT**

- HYDROGEN = 1 KG

**OUTPUT**

- HYDROGEN = 1 KG

**INPUT**

- HYDROGEN = 1 KG

**OUTPUT**

- HYDROGEN = 1 KG

**dispenser**

- Allows back to back fueling

**Hydrogen scooter**

- Retrofitted Vespa
- 1 KG H₂ fuel tank
On the water, a new type of public space is rendered: the images of the fueling mat illustrate a type of environment that emerges from this new transportation network. These new floating landscapes’ size, use, and distribution along the shore are directly informed by the demands of the new water-hydrogen conversion system. Each unit within the fueling mat contains an electrolyzer which requires power collected by wave energy-harvesting components. In turn, these electrolyzers are then capable of generating fire and heat from water extracted from the river. A sectional perspective describes this system as a heated beach, which extends its seasonal use beyond the summertime into the winter. Also reliant on fuel, are secondary spaces which contain barbeque pits and heated baths as a means to generate further personal connections with the water-hydrogen technology. Emerging from the infrastructural demands for fuel is a new recreational landscape for Manhattan.
In opposition to the monumental public works swimming pools and highways of the Robert Moses era, the Water-Fuel Network is conceived as an incremental staging event. The growth of the network and infrastructure is completely dependent on the need and popularity of the water scooter. The methodology of the Water-Fuel Network is that great things happen when small things accumulate. The floating mat, the electrolyzers, the modular water pods, and the scooters are all small components that can be controlled incrementally.

There are two staging milestones in the business plan for the development of the Water-Fuel Network: 2012 and 2030. The year 2012 represents the finalization of the first installment of CL-AT, while 2030 represents Bloomberg’s proposed deadline to reduce Manhattan’s automobile traffic by 20 percent. The goal by 2012 is to have 2458 scooters on the streets supported by 178 parking stations scattered throughout lower Manhattan, 28 miles of dedicated scooter paths, and 4 fueling mat sites. By 2030, in order to replace the cars removed by the Bloomberg Plan, the Water-Fuel Network is projected to grow to a system of 14,193 scooters on the street, 1014 parking stations located throughout Manhattan, 163 miles of dedicated scooter paths, and 13 fueling mat sites along the Hudson and East Rivers.
INFRASTRUCTURAL PARK BARBECUE WITH HYDROGEN AT THE FUELING MAT

PLAYING IN INFRASTRUCTURE FUELING MAT HEATING POOLS

PLAYING ON INFRASTRUCTURE FUELING MAT CISTERNS FOUNTAINS

THE MAT INFRASTRUCTURE RECREATION + INFRASTRUCTURE

FUEL: INFRASTRUCTURE

SAND: RELAX CAMPO

HEATING ELEMENT ELECTROLYZER

PIEZOELECTRIC ENERGY HARVESTING

WATER: KAYAKING

WATER: HOT AIR BALLOON
At the scale of the street existing lanes are re-appropriated in order to accommodate the new Water Scooter, encouraging a more efficient commute and transforming underutilized traffic lanes into useful urban territories. Public restrooms that hover above the street provide distribution points within the city where scooters are able to park and refuel using grey water from the restrooms. The restrooms are conceived as modular pods that operate as inhabitable electrolyzers and clip to existing street elements such as lamp post and bollards.
The water pods create nodal spaces that allow extremely private activities to occur within the vast public space of the street. It is one’s own apartment or office, distributed throughout the city. The water pod is an isolation device used to remove oneself from the immediate public realm. The pods are deserted islands located within the street. The method of construction also relates to the concept of embedding faith in the small, individual agent. The system of mats and clips are composed of manageable components that are linked or clipped together.