



Bauhaus Competition

Submission for Arch 384: Competitions Essay Component

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August 22, 2005

Building Type: Transit System

Materials: Steel, Glass, Concrete

Precedents:

- Alfred E. Beach - **Beach Pneumatic**. 1867.
- Various Authors - **Early Bicycle Networks**. Late 1800's.
- Various Authors - **Science Fiction Images**. 1890's – 1960's.
- Norman Bel Geddes – **Futurama**. 1939.

Velo-city is a visionary proposal for a future sustainable transit system. Using bicycles as vehicles – Velo-city is an enclosed highway for bikes. Velo-city was first submitted as a competition entry for the Bauhaus Dessau Foundation's Third International Bauhaus Award in August 2004. The competition was an open call for projects addressing new spatial relations of "Transit Spaces": transnational agglomerations without a city, "diasporic public spaces", and areas where informal economies intersect. Although unsuccessful in that competition the velo-city project has since been exhibited at the Toronto Free Gallery, the Design Exchange, and the University of Art and Design, Helsinki. Velo-city has been published in Saturday Night Magazine, Dronti, Spacing Magazine and a book entitled uTOpia by coach house press.

There are many precedents throughout the 20th century of future transport systems that have influenced the Velo-city project. These precedents share much in common: linear infrastructure located under, on, or above the ground as well as adjacent stations, terminus and support facilities. The history of mobility in the 20th century is an extensive but important



Velo-city.

influence for the Velo-city project. This paper will briefly summarize the major moments that have influenced the project while highlighting three precedents: the Beach Pneumatic, the Cyclists' Handy Road Map and Futurama.

Beach Pneumatic

Major cities around the world in the mid-1800's faced a transportation crisis. The population of cities was increasing at a rapid rate and the only means of transportation at the time was by foot or in horse drawn carriages. Streets were predominately unpaved and dirty.

New York City in the mid 1800's was the fastest growing city in the world. Alfred E. Beach, the owner and editor of a new publication called The Scientific American, had some ideas that he thought might solve the traffic problems in New York. He had an optimistic view about the ability of technology to make daily life better. His idea was simple. He wanted to separate the transportation network from the dirty congested streets. He had two ideas one to go underground and the other to go above ground.

In 1849 he proposed to tunnel the entire length of Broadway and put down a double track for horse drawn cars. This scheme was derailed by the mayor and others for political reasons. In January of 1863 the London subway was opened and the technology was considered for New York City but rejected because the system had exhaust problems with the steam engine smoke.

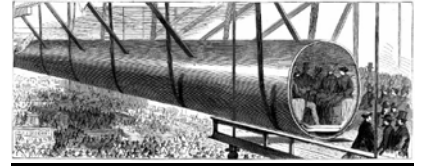


Beach Pneumatic Dispatch system.

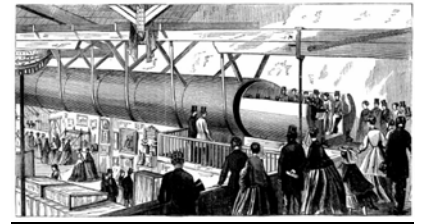


The West Side and Yonkers Patented Railway

In order to avoid the exhaust issue Beach created a new system that was based on a pneumatic system rather than steam engines. He unveiled the new transit idea at the American Institute Fair in 1868. His prototype was a tube six feet in diameter built of one and one-half inch thick laminated wood. Beach suspended the 107 foot long tube from buildings between Fourteenth to Fifteenth Street. A ten foot diameter fan pushed a ten passenger car on wheels back and forth along the tube. The demonstration was a great attraction at the fair. More than 170, 000 people went for a ride during the exhibition. Beach received the Gold Medal for his invention.¹



**Beach Pneumatic Prototype.
American Institute Fair.**



**Beach Pneumatic Prototype.
American Institute Fair.**

Due to political opposition Beach decided to go underground and build a pneumatic subway in secret. He created a front company called the Pneumatic Dispatch Company that proposed carry mail packages under Broadway between Warren and Cedar Streets. Since Beach proposed to carry only mail there was no political opposition. Once he had secured approval for the two small mail tubes he later asked for a small variance to make one large tube to make construction simpler and obtained approval without attracting any attention.



***Digging the Beach Pneumatic tube
with the shield. From Scientific
American, March 5, 1870.***

He built his new system at night to avoid attention. A 312 foot tube was constructed twenty one feet below street level and he opened the Pneumatic Subway for service in 1870 to great acclaim. The *New York Herald* quickly called for the building of a pneumatic subway that went to every corner of the city. Due to political corruption and short sightedness and the financial panic of 1873 the Pneumatic Subway was never extended and was closed forever.² It was not until 1912 when the present

New York subway system was built using electric railway technology.

The Beach Pneumatic was a very early example of a level separated idea for modern public transit.³ The story of the Pneumatic has several connections to the velo-city proposal. One is the level separation which is a direct precedent for the typology of the velo-city system. The second influence is the use of fluid dynamics as a propelling system. Obviously the beach pneumatic is propelled by air power. Velo-city in comparison uses a cyclical air system to direct the air flow caused by the cyclists in a circle. As each bike tube in the system has only one direction of travel the resulting air flow eliminates wind resistance and gets stronger with more cyclists. The third connection between the Pneumatic and Velo-city is the fact that both systems have no pollution or noise implications for the surrounding urban fabric. Although the Pneumatic system would have energy requirements for powering the fan along the length of the system there would be no adverse effects to the city.

Early Bicycle Networks

One of the most important cultural aspirations of the Industrial age was the increased desire for mobility. The history of the railroads, the highways, even the streetcars and the subways is well known. Often overlooked in the history of mobility are failed transit systems – strange and wonderful ideas that never came to fruition. These schemes and images have been saved informally due to their populist appeal. The history of those images is more exciting and more telling of our cultural



Velo-city.



Massey Harris Ad. 1897.

aspirations than the history of the successful systems.

Another form of transit that is often overlooked by history is the humble bicycle. There was a brief moment in the late 1800's before the advent of the car where the bicycle was seen as the future of modern transportation. The birth of the bicycle coincided with the birth of science fiction. H.G. Wells the science fiction writer was at the peak of his writing career at the same time that the bicycle was at the height of its popularity. He was a great advocate for the bicycle. Two of his books feature the bicycle as the miracle of mobility. Wheels of Chance is a Quixotian romance that features a chivalrous store clerk that spends his holiday trying to save a cycling damsel in distress from a cycling cad in the pastoral hills of Southern England.⁴ In A Modern Utopia Wells describes his version of utopia which features the bicycle as the primary mode of transportation.⁵

Well's utopia might have been visionary but the popularity of the bicycle in the late 1890's was not science fiction. Even in the cold country of Canada bicycles were used widely. Bicycles first came to Canada in the 1860's. They were typically manufactured as unique designs by blacksmiths and carriage makers who made less than 5 bicycles a year. These cottage industries grew over the next 30 years to become major manufacturing industries. By the year 1900 companies like Massey Harris and Canada Cycle and Motor Company (CCM) were producing over 50,000 bicycles a year for about the third the cost of the original bicycles.⁶

The reduction of the cost of the bicycle transformed it from a



**Bicycle Club in the Don Valley.
Late 1800's.**

“Every time I see an adult on a bicycle, I no longer despair for the future of the human race.”

H. G. Wells. A Modern Utopia.

luxury item to a mobility solution for the masses. The Cyclists' Handy Road Map from 1894 shows bicycle trails that extended 60 miles around the City of Toronto.⁷ The Road Map shows how extensive the use of bicycles was even without paved roads or high tech bicycles.

Early Canadian inventors tried to come up with solutions to help the bicycle adapt to the colder climate. A number of patents were issued for bicycles with skis and even one with an umbrella to shelter from the rain. In the early 1890's bicycle groups started forming and lobbying the government for better roads. Up until that time the roads were built and maintained by the adjacent ratepayers. The Good Roads Association and the Canadian Wheelmen put pressure on the government to create a road tax that would be used by the government to improve the roads. The first paved roads in Canada were a result of the bicycle lobby.⁸

Ironically, both the development of the factories and the Good Roads Movement paved the way for the advent of the automobile that would very quickly eclipse the popularity of the bicycle. Modern progress was unforgiving and many of the bicycle factories were converted to car factories and soon the roads were filled with automobiles.

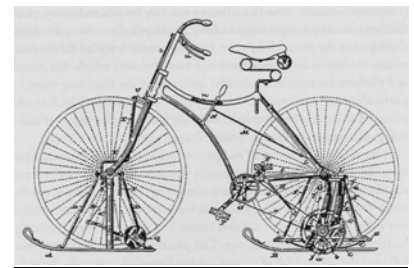
Velo-city takes the early popularity of the bicycle as a precedent and solves the problems of the first bicycle wave. The use of the bicycle in Toronto has grown dramatically in recent years without any improvement to the infrastructure. Velo-city as bicycle infrastructure is equivalent to highways for cars or tracks for street cars and trains. As it is enclosed it



**Cyclists Handy Road Map. 1894.
F.R. Ward.**



**Bicycle Umbrella. Pentelow &
Weston, 1890, Canada.**



**Coburn's ice-bicycle patent, 1891,
Canada.**



Velo-city.

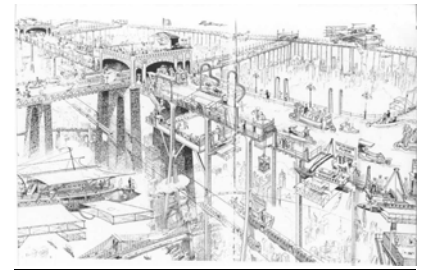
creates a hospitable environment even in the coldest winters. The velo-city network map takes its precedent from the Cyclist's Handy Road Map. Bicycle routes follow the natural terrain and infrastructure network and cut diagonally through the predominantly regular grid of the Toronto Street Network.



Velo-city.

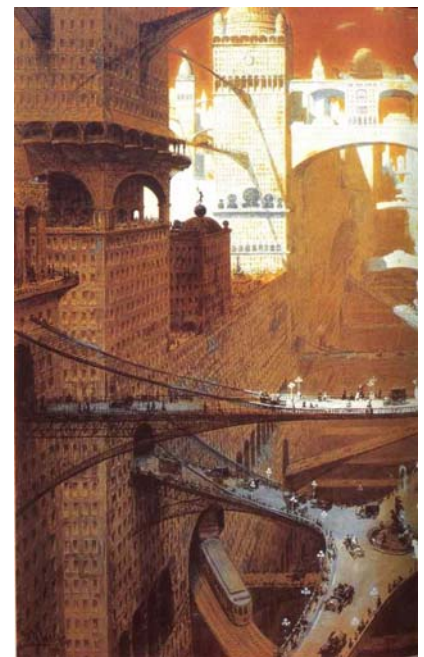
Science Fiction Images

Velo-city might look like science fiction but it isn't the first visionary transportation system. Another form of science fiction that developed in the late 1800's was visionary images of future utopias. Born out of the fervor of the industrial revolution and science fiction writing these illustrations often accompanied magazine articles or pamphlets speculating on the future. The rapid growth of the skyscraper inspired the illustrators to depict dense vertical cities which quite often featured elevated transportation systems as well as flying transport.



Harry Grant Dart. "What's to Hinder". Life Magazine. 1910.

Three early examples are Harry Grant Dart's cartoon "What's to Hinder" from Life Magazine 1910 and William Robinson Leigh's Visionary City from Cosmopolitan magazine, 1908 and Moses King's Views of Manhattan and Brooklyn from the 1910's. King's fantasy illustrations grew out of his illustrated guide books of New York City. These guide books were more than just maps and illustrations they were tourist objects that created a mythology of New York City as the city of the future. They portrayed the skyscrapers of New York as the vertical sublime.



William Robinson Leigh. "Visionary City" (1908).

The miniaturization of the skyscrapers in the small folios

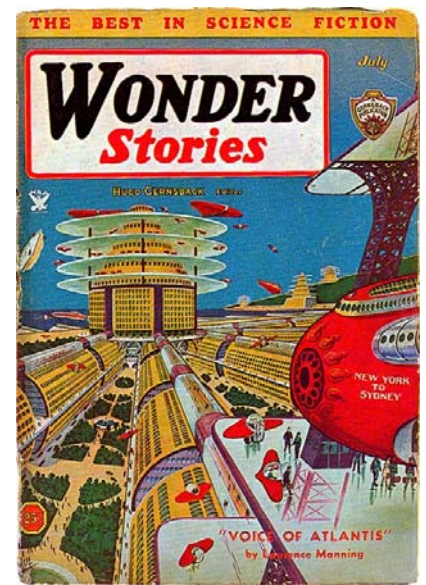
presented the tall building as a sort of fetish item giving the consumer a token of these edifices that were so fundamentally the product of mass labor and concentrated capitalism. Views of these cities were almost always from the air. These angles avoided the drudgery of the ground and elevated the viewer into a higher future. Caught up with the vertical fantasy Moses King and his illustrators began to add fanciful, futuristic urban scenes to his collections of profiles of notable buildings. Entitled "King's Dream of New York" these renderings were added to the tourist guides creating a futuristic momentum between the existing buildings and their ultimate evolution. The real and the imaginary imperceptibly merge in this vertical sublime fantasia.⁹

In novels and short stories, as well, this vision of the future metropolis circulated widely during this era evolving into more futuristic visions. From the late 1920's to the early 1960's pulp magazines and paperback books such as *Electrical Experimenter*, *Amazing Stories*, *Science Wonder Stories*, *Science & Mechanics* and *Forecast and Fantastic Adventures* defined the world of the future for a generation. Frank R. Paul was one of the most visionary and prolific illustrators of this period.¹⁰ Trained as an architect his cities and technology are brightly coloured and highly detailed. The early illustrations generally depicted streets in the sky. Later illustrations show many types of transportation: vehicles on wires, in tubes, monorails, rockets, and helicopters.¹¹

The fantastic illustrations burned themselves into popular consciousness and influenced films such as Fritz Lang's: *Metropolis* (1926) and live on in contemporary films such as



Moses King. King's Views of New York. 1915.



Frank R. Paul. Wonder Stories Cover. 1 July 1939.



Fritz Lang. Film Still from *Metropolis* (1926).

Bladerunner, 2046 and I Robot.

These images developed an idea of transparent spaces and gravity defying structures far in advance of their application in architecture. Velo-city takes the typology of these science fiction images to create a space for cycling that is light, transparent and delicately weaves through the city.

Futurama

After 1939 the optimism of the actuality of these science fiction worlds shifted to a more pragmatic economic consumerism. The General Motors Pavilion at the 1939 New York World's Fair called "Futurama" marked the automobiles inevitability as the dominant mode of transportation for the rest of the century.

Futurama consisted of a scale-model that included a "City of Tomorrow" and a network of interconnecting fourteen-lane superhighways. Moving along these highways were ten thousand model cars guided by a future computer system that would prevent collisions. Visitors were seated in a "carry-go-round" consisting of 552 plush chairs, which moved slowly around the sides of the diorama as simulated night fell and the sun rose again. Visitors to the pavilion left wearing a button stating "I Have Seen the Future."

The Futurama exhibit was a sophisticated campaign to represent a vision of the future driven by narratives of progress, civic duty and manifest destiny. The utopian presentation promised only better days ahead. Visitors were presented a future that promised abundant sunshine, fresh air,



Futurama Button. 1939. New York World's Fair.



Norman Bel Geddes – Futurama. 1939. New York World's Fair.



Norman Bel Geddes – Futurama. 1939. New York World's Fair.

and fine green parkways that would integrate seamlessly with dazzling skyscrapers and seven lane highways.¹²

These futuristic views of the automobile city were not only fabricated by the automotive industry. Architects of the era developed urban schemes that accepted the manifest destiny of the private automobile as a given. Le Corbusier's Radiant City, Ludwig Hilberseimer's La Gran Ciudad, Frank Lloyd Wright's Broadacre City, and Jellicoe's Motopia were all urban schemes based on the automobile as the primary mobility system.

Although the velo-city project shares the typology of highway infrastructure with these utopian projects it has one fundamental difference. Velo-city is an active mobility system rather than a passive one. In this sense all modern passive mobility solutions act as antecedents for the velo-city proposal. These modern transit systems all have one thing in common. They assume that people are goods to be moved that people should be taken for a ride. Velo-city assumes that people want to take responsibility for their own mobility and want to be in control of their movements. Architecture is an aesthetic and functional experience that is understood through the relationship between our bodies and space. Without freedom of movement and mobility within our urban spaces there is no potential for architecture. Using the precedents of elevated modern infrastructure, science fiction mobility tubes and the humble bicycle Velo-city presents a different solution for modern mobility and is presented as a way to allow for mass transit while retaining our physical relationship to our cities.



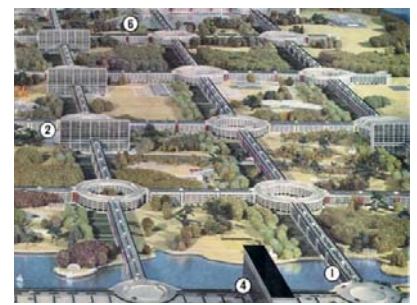
Ville Radieuse. Le Corbusier. 1924



Ludwig Hilberseimer's Progetto per una città di grattacieli, 1924



Frank Lloyd Wright. Broadacre City. 1932.



G.A. Jellicoe. Motopia. 1961.



Velo-city.

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EndNotes:

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2 Brennan, Joseph. **Beach Pneumatic**. Chapter 2.

3 Hernandez, Paul. **Visionary Designs in Transportation Engineering**.

4 Wells, H.G. **The Wheels of Chance**.

5 Wells, H.G. **A Modern Utopia**.

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7 Norcliffe, Glenn. **The Ride to Modernity: The Bicycle in Canada, 1869 – 1900**. p.172.

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