

Engineering the Future: Traptonion

1. Introduction

Hello and Welcome to Traptonion! This city located in Singapore is 302 years old. Home to one of the world's cleanest urban areas, it brings equality, affordable housing, clean energy, safety, good education, and entertainment for all ages. This city of six million people is known for green energy, modern green architecture, and unique laws. Relax on beautiful Lazarus Beach and fish, swim, visit, and eat.

2. A Closer Look

Traptonion has a high level of cleanliness, citywide healthcare, unique, innovative and futuristic designs everywhere you go!

Environment

Traptonion has tropical weather and it is the greenest city in Asia and Singapore, a small island but 100% urbanized. Traptonion had major problems with industrial pollution, limited freshwater resources, seasonal smoke, haze, and forest fires.



- trees reduce heat during summer and spring, vine walls can prevent the heat from going towards your house
- Before Wildlife had no place to call home but now that people have thought of them it is making a win, win for both of us.
- People and Cities have reinvented environmental open spaces. We've knocked away train tracks that let out pollution and waste in the air, made a clean, friendly environment bridge and walk, bike paths. Cities transforming a parking place with recycling waste materials that got turned into a sitting bike parking space for a safe environment.

Industry & jobs

Traptonion residents have lots of job options like marketing and advertising, engineering, art and fashion, customer service, manufacturing warehouses and many more. In circular economies, marketing is used as a tool to explore circularity opportunities.

Infrastructure

1. Transportation

Passenger and freight activity has more than doubled in 100 years. Traptonion has different modes of transportation like high-speed rail, BikeShares, bicycling and walking paths, and solar and electric powered bikes and scooters.

There is an MRTJ (Mass Rapid Transit Jakarta) which is the fastest transportation. Riding electric bikes is a good choice to have a low impact on the environment, enjoy the greenery and help your body stay healthy. The subway trains travel all around the city but when getting to a desired neighborhood, biking or walking will be the best option.



3. Energy

Traptonion heavily relies on clean energy to power the city.

- solar panels.
- Windmills.
- When a power outage happens we can use energy storages that were collected from the solar panel and windmill.
- Wave farms are large collections of floating devices that resist ocean waves to produce power. Wave energy converters produce power.

4. Agriculture

Traptonion is taking a lead in becoming a green city and it was very effective to prevent global warming from growing. We grow our food by having farms in buildings and homes. Civil engineers planned the crops on top of the roof of buildings and houses. Crops consist of Rambutans, Mangosteens, leafy vegetables like Bok Choy and Phuay Leng.

City Services

1. Education

Teachers will take students all across the world on VR field trips to see how other countries run different systems.

VR

For all the students that learn visually, we have different VR programs. In the program for healthcare, students will learn how to do CPR. In the simulation we will have characters with different health problems, the student will learn how to treat different wounds.

Another program is engineering; your teacher gives you a challenge. Your team talks about problems and solutions; they are put in a simulation that recreates the problem. Problems like climate change, deforestation, pollution. Students build a city using their solutions, once they build their city they can see which solutions work better.

2. Modern Green Architecture

Every building must have plants on it to make sure all of the carbon dioxide is absorbed and that none escapes.

3. Unique Laws on Sustainability

- No Leaving trash on the ground in the public park
- Items must be made to be reused
- Must have greenery on building
- No plastics used for clothing

Entertainment

Traptonion offers botanic gardens, Marina bay sands, Traptonion zoo, orchard road, Traptonion flier, hotels, Chinatown and more. Everyday there are different events for people to gather and participate. Dance studios have a mix of old and new dances for anyone of any age to learn. Museums show the history of how the world was like before we built Traptonion, like how bad pollution, weather changes and other problems were.

Health & Recreation

Advanced technology helps people stay healthy.

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- Telehealth professionals
- Nano-bots
- Telemedicine
- Drones that deliver medication
- Personal health sensors
- Bio-printing
- Companion robot technician
- Telemedicine nurse

3. The Problem

In the past there was a linear economy of take, make, use and throw away, producing tons of waste. It produced millions of tons of waste each year that could have been used to make new products. About 7.7 millions of waste was generated, the amount to fill 15,000 olympic size swimming pools. Surprisingly, Singapore was the 52nd worst city with air pollution. Of the 2 billion tons of waste, 12% is plastic, 44% of food and organic matter, and 17% of paper & cardboard scraps. Of all the waste that is generated only 13.5% is recycled, 5.5% of composting, 11% of incineration, 33% of open dump, and 25% of landfill.

The linear economy was **destroying** the planet.

- 80% of household items were used only once per month.
- 60% of air pollution was caused by urban road transport.
- 5 million tons of plastic ended up in the oceans
- 40% of urban solid waste was created.
- 60% greenhouse emissions were created by cities like Traptionion.
- 70% of the world's electricity being used in the city came from fossil fuels

Solutions to the Problem

Today, Traptionion has new and improved ways to reuse materials and reduce waste. We use the circular economy system.

Designing and Planning a Circular Economy

- Cradle to Cradle(C2C)-end of life for a product can be used to either be reused or

returned to nature.

- Digital Technology Ideas
 - a. Digital watermark carries lots of information; packaging type, material and usage
 - b. QR code Identify a product and save, share, and analyze data throughout the life cycle. Consumer good packaging, that can detect and decode by a standard high resolution camera on waste sorting line.
 - c. Digital Apps are used to help businesses get information about materials, resources and products; age, quality, cost, and location
- 4. Business Leadership and Support
 - people can come together in one place to talk about new ideas.

Mining the City: Reusing Materials

Teams of engineers save and reuse previously used to build, a solution of 100% waste diverted from landfills.

Principle 1: Designing Out Waste and Pollution

- reuse previously used to build

Principle 2: Keeping Products and Materials in Use

- 100% waste diverted from the landfill

Principle 3: Regenerating natural systems

- *By reusing old materials, the city does not have the mine nature for new materials.*

RRMM (Recycling Raw Materials Machine)

- Recycles raw materials like plastic, glass, and metal.
- Other materials can be reused for buildings/concrete.
- Three separated door ways for different type of materials
- Operated by Waste Management Engineers to see if RRMM is working properly



“CMM” (Cutting Materials Machine)

- Cut clothes into pieces so we can use that material for our buildings.
- Cuts hard materials like Steel, Iron, Aluminum.
- Heating rooms to make steel, Iron, Aluminum easier to cut then sent cooling room.

Circular Food System

Traptonion found a way for food to be designed for nature to thrive, rather than nature used to produce food. The Food Resource and Opportunity Group (FROG) came together and made solutions like, new packaging, different selections and sources, and rethinking product ideas.

Diverse ingredients

Planting a variety of crops makes food supplies more resistant to disease or shocks, like a potato famine,

Lower Impact Plants and Animals

Switching from high impact animal protein to lower impact plant protein

Principle 1: Designing Out Waste and Pollution

-reduces greenhouse gas emissions by 40%

Principle 3: Regenerating natural systems

-reduces biodiversity loss by 5%

Benefits:

- Can reduce waste.
- Makes new materials for buildings, daily life items, cars, etc.

Downfalls

- Costs money to start.
- Takes up lots of space.

Engineers and Architects

Many scientists and engineers worked together to make Traptonion a magnificent city.

- Materials science engineers researched and created special polymers or materials.
- Agronomists helped with the crop production and managing soil. They studied plants and soil to develop better cultivation, planting and harvesting techniques.
- Environmental engineers helped manage the city with recycling, waste disposal, public

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health, air pollution control, and climate change.

- Landscape architects helped design public parks, gardens, residential areas, schools and public spaces.

5. Conclusion

Traptonion has put the linear economy in the trash and made our new Circular economy!

Coming to Traptonion, you will have one of the best experiences you will ever have.

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