Urbanization of Curitiba

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(Map of Brazil, n.d.)

City of Curitiba

(Curitiba, Best Organised City in Brazil, n.d.)

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Background

- Capital & largest city in the state of Parana.
- Single municipality
- “Curitiba Metropolitan Area”
  - Comprised of 26 municipalities
- Airports and universities
- Host city for the 2014 Fifa World Cup
- Culturally aware
  - Holds yearly festivals and celebrations- traditions of immigrants
  - Has museums, memorials, and is artistically developed/designed.
- One of the most sustainable cities in the world.

(Curitiba, n.d.)
Picture credit: (Jhosimar, n.d.)

Who is behind Curitiba's success?

Portrait of Jaime Lerner (Volvo environment prize, 2004).

- Collective effort; **Jaime Lerner** main influence.
- Served as Curitiba mayor(3x), governor(2x).
- Led the urban revolution that made Curitiba like no other city during its time.
- Won numerous international awards: the environment, peace, technology and transportation, and improvement of quality of human life.
- Nominated among the 25 most influential thinkers in the world by Time magazine in 2011.
- Designed buildings and structures for other cities throughout Brazil.

(Jaime Lerner, n.d.)

Projects and Programs

Credit where credit is due:

- Civil Engineer Nicolau Kluppel
  - Working since 1950 to improve Curitiba.
  - In charge of parks and recycling in the city for many years.
  - Credited with the design of the Green Exchange.

  (Kennedy, 2015)
- Jaime Lerner
  - Main architect and urban planner of the city's blueprint itself.
  - Political power and strong will allowed him to transform Curitiba.
- "Trash that is not trash"
  - One of the main slogans used for the creation of many sustainable projects.
- "Urban Acupuncture"
  - Projects completed in an exceptionally short amount of time.
  - Certain focus points and goals added to process of normal development.

  (TED, 2008)

Pedestrian Mall

(Rtaylorsmith, 2014)

- One of Jaime Lerner's first improvements to the city, and Brazil's first pedestrian mall.
- Wanted people, rather than cars, using the streets.
- Had to act fast:
  - Pedestrian walk and aligning shops were built within 72 hours.
  - Started Friday night, and ended Monday night.

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Local Conflicts of Pedestrian Mall

- Angry motorists and bus drivers threatened to continue using this street, regardless.
- Lerner set out rolls of paper along the walk, encouraging children to come and paint.
- Decided that keeping shops closed at night was an ineffective use, so the mall stayed open 24/7.
    - Daytime would have certain stores open.
    - Nighttime would have other stores open.

(Rtaylorsmith, 2014)

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(Pedestrian road to shop, 2014)

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Bus System

- The center lanes are dedicated to busses only.
- Passengers pay bus fare in advance
- Stations are convenient, well-designed, & attractive tubes as the bus stops.
- 75 percent of Curitiba's inhabitants use this mode of transport daily.
    - No traffic congestion as observed in most other cities.

Trinary Road Spine Development (Rocha, 2015).

BRT- Bus Rapid Transit

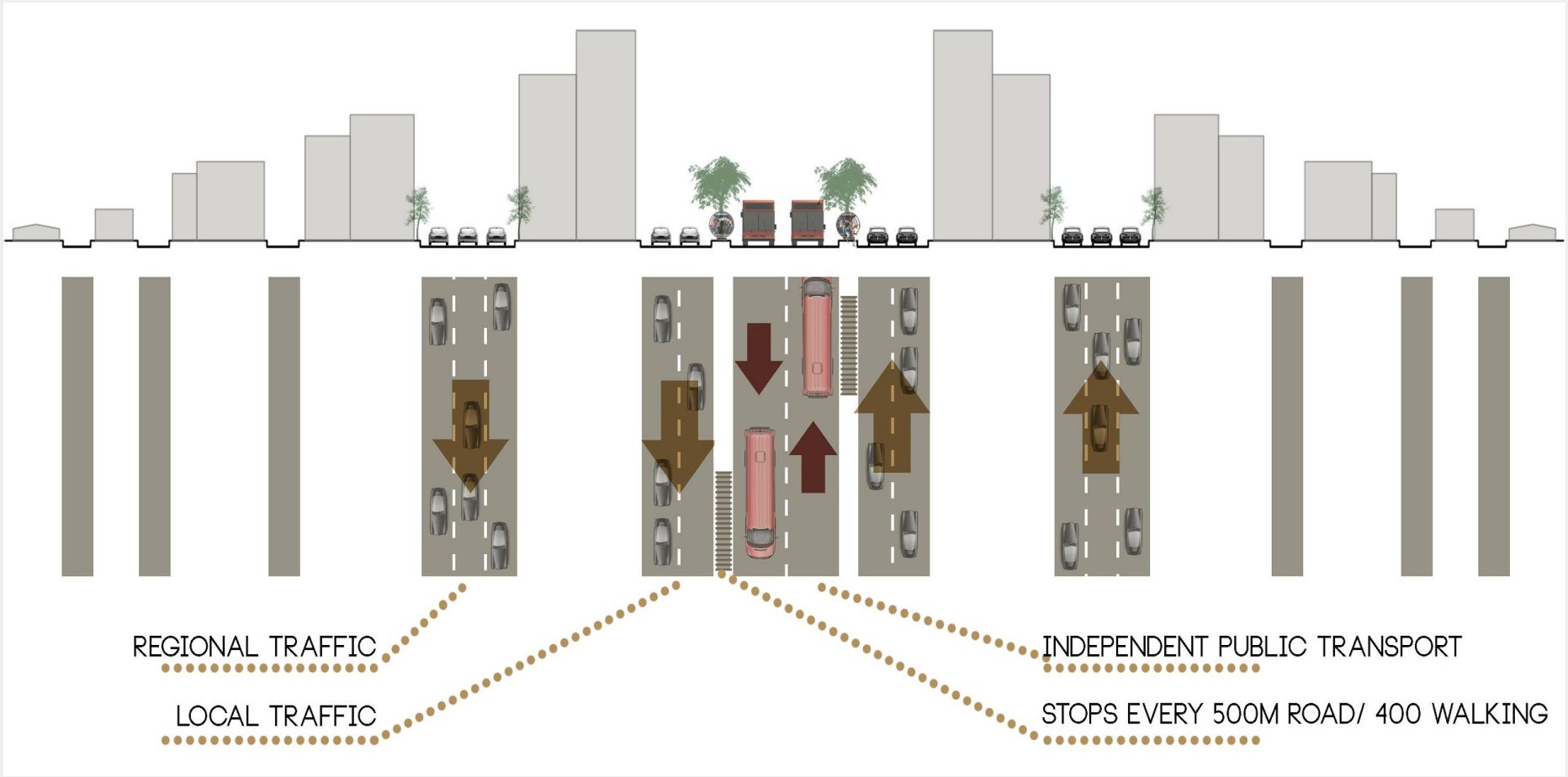
Picture: (Australian Cowboy, 2010)

- Opened in 1974; 1st of its kind
- Bi-articulated busses
  - Carry around four thousand passengers a day.
  - Have wide, double-doored entrances; quick passenger load/unload.
- Bus companies are paid by their mileage, not by the number of passengers they board.
  - Less popular routes are well-serviced
  - Busses do not fight over routes with the most passengers.
- Much lower air pollution index than other cities in Brazil from less residents using private transportation

(Rtaylorsmith, 2014)

Bus rapid transit station (Ortiz, 2013).

Curitiba's City Layout



(Trinary Road Section, n.d.)

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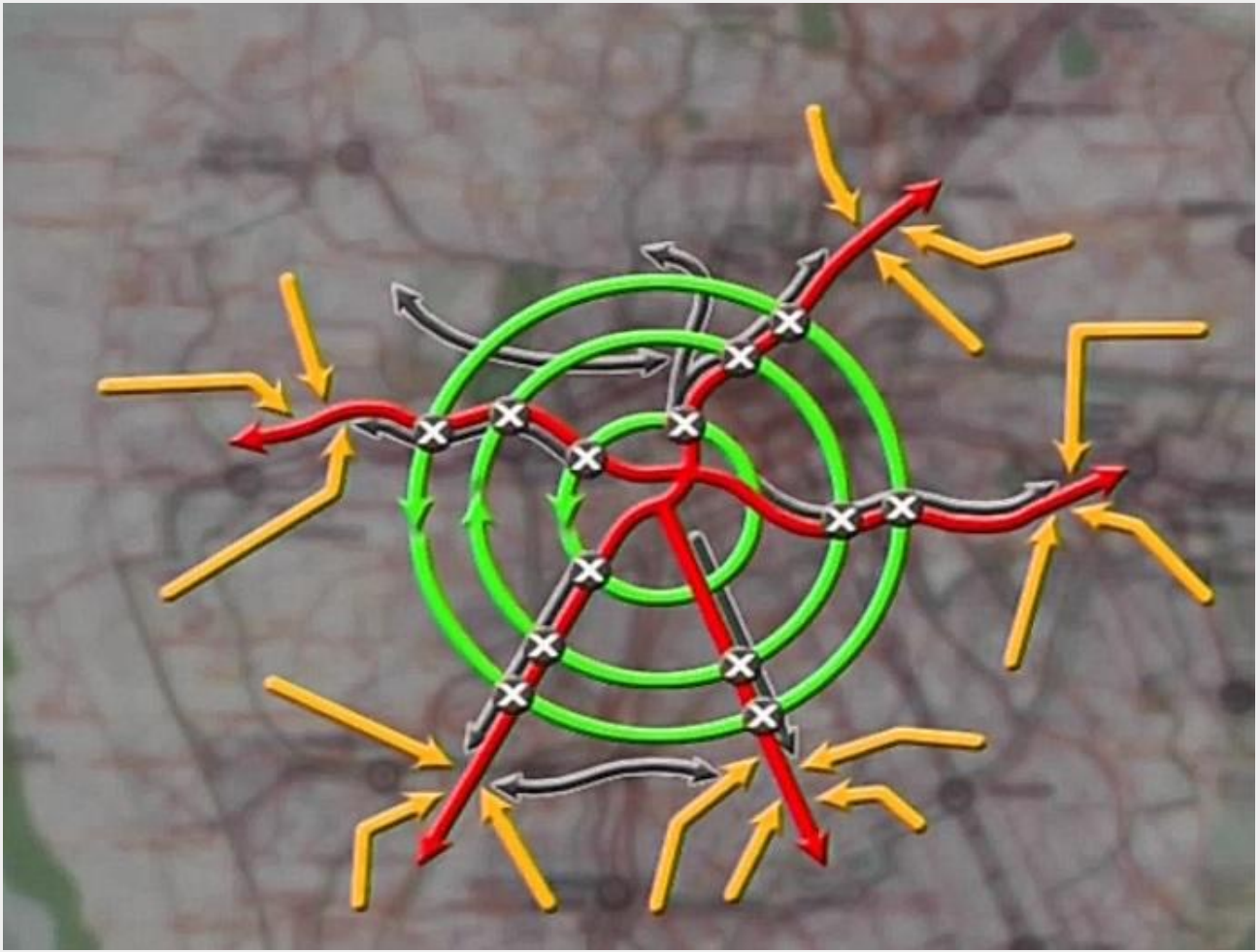

(Rtaylorsmith, 2014)

Bus Color	Purpose
Red	The main mode of transport to and from the city with the least number of stops.
Orange	Bring people from outer settlements to the express bus routes.
Green	Link suburbs within the city to the express bus routes.
Gray	Make more frequent stops and have a wider range of locations that they travel to.
X	Marks the spot where interchanged terminals allow passengers to change busses and go anywhere.

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A Cleaner City

In the city:

- Men sweep streets, sidewalks, and parks.
- Others collect and transport garbage, and operate landfills.
- This helps employ ~10,000 people.

Going even further:

- Public and private schools are required to separate their garbage.
- UVR: recycling plant where employers sort through trash.
- Every last bottle and container is separated and tossed into the appropriate bin.
- This operation employs another couple hundred people.
- Discarded books are placed in a library, free to all visitors.
- Artwork, sculptures, and other unique items are collected for museums.

An estimated 70 percent of the city's garbage is recycled.

(Gratz, 2013)

The Green Exchange

The Green Exchange Program allows people to exchange their accumulated recyclables for certain amenities offered by the city, such as bus tickets and produce.

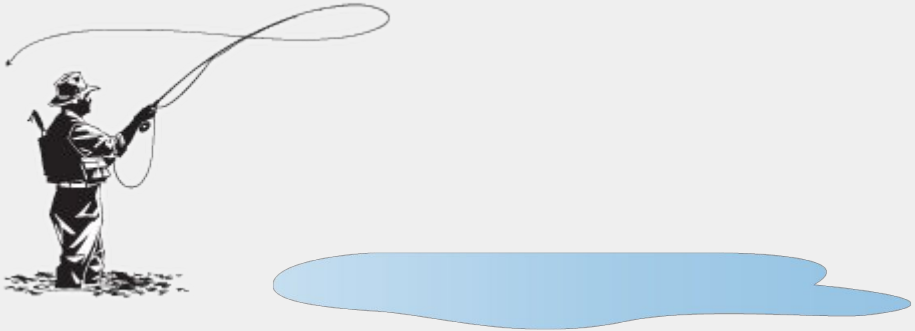
- Began in 1989, when farmers had a difficult time selling their surplus crops.
- City's solution: offer the surplus to low-income families.
- Citizens were encouraged to separate their recyclables.
- Where garbage trucks could not navigate around narrow streets and steep hills, people brought their separated trash right up to the trucks.
- At first, city only offered bus tickets in exchange for bags of trash.
- 4 pounds of recycling garbage = 1 pound of fruits, vegetables and eggs.
- 2 liters of used oil and plastic bottles = 1 kilogram of the same fresh produce.
- The city now also offers books, football and show tickets.

(Gratz, 2013)

Fishing Out the Filth

Stemming off of the previous exchange is another program which is offered to fishermen who spend their time on lakes and bays.

- Lakes and bays were cluttered with garbage.
- If a fisherman caught a fish, he could keep it.
- If he caught garbage, the city would buy it from him.
- On days where fish were not biting, fishermen would go for the garbage instead
- More garbage fished out of the water = cleaner water = more fish for them to catch. (Gratz, 2013)



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“Solution of the Parks”

- Turned previously unusable land within the city into parks.
  - Created spots for leisure.
  - Increased value of surrounding properties.
  - Prevented squatters from creating slums.
- Itachi Nakamura
  - Hired as director of gardening.
  - Later became state secretary for the environment.

Curitiba now has four times the amount of recommended green space per inhabitant.

Environmental Advantages of Parks

- The city experienced persistent flooding.
  - Concreting the river into a canal was too expensive.
  - Turned river banks and surrounding land into parks.
  - This allowed the river to flood over the surrounding parkland.
- How is maintenance of the grass kept up?
  - An inner-city shepherd was hired.
  - Allows sheep and other grass-grazing animals to naturally mow the extensive lawns.

(Journeyman Pictures, 2007)

Overview of Curitiba (Agaxtur Viagens, 2016).

Tanguá Park

Although the quarry was man made, it illustrates another unusable piece of land in the city can be transformed into an attraction for its residents.

(The Quarry at Curitiba's Parque Tanguá, n.d.)

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The Wire Opera House

(D Everything, 2014)

Opera de Arame (Herval, 2007).

Wire Opera House

- Made with steel structures and glass.
- Opened on March 18, 1992 after just 75 days of construction.
- Built on top of an old, flooded rock quarry.
- Now is a popular tourist attraction.

(D Everything, 2014)

(Universidade Livre do Meio Ambiente, n.d.)

UNILIVRE

- Free University of the Environment
- Also built on top of an old quarry.
- Established in 1992.
- Non-profit organization.
- Does not give out degrees.
- Main purpose is to educate people on environmental and ecological issues.

(Lubow, 2007)

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Botanical Garden of Curitiba

(Botanical Garden Architecture, n.d.)

- Transformed from an 11-acre garbage dump.
- Established in 1991.
- Major tourist attraction.
- Also features sculptures and a greenhouse.

(Hill, 2004)

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Curitiba's Rivers

- 6 River Basins
  - Atuba River
  - Belem River
  - Barigui River
  - Passauna River
  - Ribeiro dos Padihas
  - Iguacu River

(Institute for International Urban Development, 2004)

Brazil's Atlantic Forest

- Once covered Brazil with 330 million acres of tropical forest
- High population growth along east coast
  - (Curitiba, Rio de Janeiro, & Sao Paulo) ~70% of Brazil's population
- Increased fragmentation and threatened the endemic species
- $<$ 2% of this biome is being protected

(The Nature Conservancy, 2017)

Biodiversity

Animals

- 2,200 species → birds, mammals, reptiles, and amphibians
- 5% of vertebrates found on Earth
- 200 species of endemic birds
- Hosts 60% of Brazil's threatened animals

(The Nature Conservancy, 2017)

Biodiversity

Plants

- 20,000 species of trees, ferns, mosses, and epiphytes
- 8% of plants found on Earth
- 458 species of trees found within 2.5 acres
- Unevenly aged forest/canopy structure

(The Nature Conservancy, 2017)

Curitiba's Impacts on Atlantic Forest

Birds- study done by universities and agencies

- Looked for evidence of terrestrial bird homogenization through beta diversity along gradients of human altered landscapes (HAL).
  - Natural, Rural, & Urban

- Evidence
  - Rural displayed 50% that of Natural landscape
  - Urban displayed less that 10% that of Natural

- Landscape occupation resembles the notation of homogenization.

(Vallejos, M., 2016)

Curitiba's Impacts on Atlantic Forest

Amphibians & Reptiles-

study done in Reserva Natural Morro da Mina Conservation Area

- Study of herpetofauna road kills along Atlantic Forest
- Survey of animal death within 9km stretch of roadway
    - 51 amphibians
    - 23 reptiles

(DaSilva, M., 2007)

How do other cities cope?

- Rio de Janiero (~ 6 million people)
  - Overpopulation = increase in favelas
  - Implemented a program similar to the Green Exchange
- Sao Paolo (~ 12 million people)
  - Toy exchange program
  - Toy guns = comic books
  - Attempts to diminish gun culture

  (Logan, 2015)
- Manaus (~ 2 million people)
  - Igarapes Project: confronts social and environmental problems
  - Solves drainage problems by controlling impact of Negro River
  - Improves life of inhabitants by resettling people affected by flooding

  (Magalhaes, 2005)

Why are other cities not like Curitiba?

- Comes down to good timing and a strong will for change.
- Jaime Lerner brought the sustainable ideas.
- Started at the beginning of the city's development--before adverse effects were difficult to reverse.
- Easier to build toward a sustainable future from scratch.

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Problems Facing Curitiba Today

- Once crystalline rivers; now smell of untreated sewage.
- The bus system is losing passengers everyday.
  - A series of speeding-related bus accidents has deterred riders.
  - Fares are constantly increasing.
  - Curitiba now has a higher per capita ownership of private cars than any city in Brazil.
- Garbage recycling rate has been declining over the last six years.
- Architects planned the master design of the city back in 1965, when the population was 350,000.
  - Today it's almost at two million.

From Urban City → External Sprawl

- Curitiba expanded from a municipality into a metropolitan region, encompassing surrounding towns.

- Dilemmas the city cannot fix by itself:
  - Neighboring towns have refineries that blow smoke on the city line.
  - If new immigrants to the poorer surrounding communities do not recycle, they will fill Curitiba's only landfill even sooner.
  - The city's water supply depends on reservoirs controlled by outside municipalities.

Politics for Planning

- Back then, self-styled experts and urban planners were the majority of the governing system, and it worked.

- With new dilemmas constantly arising, the people in power must succumb to involvement in politics.
  - They must be able to negotiate successfully with other mayors of neighboring towns.
  - Only together can they keep Curitiba's success going, and allow it to influence others.
    (Lubow, 2007)

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(Fernandonande, 2015)

(Buhosbourne, 2013)

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Cost of Living in Curitiba Today

Food	BRL	USD
Basic lunchtime menu (w/ drink) in business district	$24	$7
Combo meal in fast food restaurant (Big Mac Meal or similar)	$23	$7
1 L of whole fat milk	$2.93	$0.87
12 eggs, large	$7	$2.04
1 bottle of red table wine, good quality	$39	$12
2 L of Coca-Cola	$5.97	$1.77
Bread for 2 people for 1 day	$3.10	$0.92

(Expatistan, 2016)

Housing	BRL	USD
Monthly rent for 900 ft² furnished flat in EXPENSIVE area	$2,068	$615
Monthly rent for 900 ft² furnished flat in NORMAL area	$1,476	$439
Utilities 1 month (heating, electricity, gas, etc.) for 2 people in 900 ft² flat	$510	$152
Internet 8 Mbps (1 month)	$92	$27
40’ flat screen TV	$1,530	$455
Microwave (800/900 Watt)	$406	$121

Transportation	BRL	USD
1 gallon of gas	$14.40	$4.28
Monthly ticket public transport	$181	$54
Taxi on a business day (5 miles)	$30	$9

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Average Salaries

Average yearly salary in Curitiba: $105,825 BRL or $31,809 USD

Job (e.g.)	Scale	BRL	USD
Executive/Management	Maximum	$468,000	$140,682
Automotive, Purchasing and inventory	Average	$105,825	$31,809
Engineering, Quality Control	Median	$79,000	$23,748
Media, Broadcasting, Arts, Entertainment	Minimum	$12,000	$3,607

(Salary Explorer, 2015)

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