



Circular Baguio City

Bringing the circular economy to Baguio City's Mobility System

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About this publication

In today's world, the vast majority of economies are linear. Linear economies follow a "take, make, waste" model: resources are extracted from the environment (take), used as inputs for infrastructure, buildings, and production (make), then discarded after their use period (waste). Linear economies are linked to a range of negative impacts in cities, including rising carbon emissions, biodiversity loss, and waste management challenges. In contrast, a more circular economy goes hand in hand with resilience, climate action, and biodiversity conservation, while also offering cities the tools to support social equity, local job creation, public health, and community wealth.

Transitioning from a linear to a circular economy requires creativity, flexibility, and cross-sectoral collaboration on the part of governments, businesses, and communities. Knowing where to start—and how to move forward—often poses challenges for cities embarking on their circular economy transitions.

As part of the Circle Lab for Cities Program, Circle Economy, ICLEI – Local Governments for Sustainability, the Ellen MacArthur Foundation, and Metabolic are leveraging their combined expertise to offer tools and methodologies to guide the circular transition of cities worldwide. This publication captures the learnings of Baguio City using these tools.

Meeting Baguio City

Baguio City is a landlocked and highly urbanized city located in the island of Luzon, within the highlands of the Cordillera Ranges. Its geographic location is at 16.411999° N and 120.59834° E. Baguio has a total land area of 57.49 square kilometers at an elevation of 1,400 meters above sea level. The city's population was at 366,358 in 2020. As to its land cover: 9.81% is declared as watershed and protected forest; 1.41% as parks and recreation areas; 11.04% are open spaces; and the rest are settlement areas.

Baguio City is popular for its pine forests, rich cultural background, as well as for its temperate climate. It is referred to as the "Summer Capital of the Philippines" and the "City of Pines."

The City is 206 kilometres away from Manila, which takes about four hours to drive. It serves as the gateway to other municipalities in the Cordillera Region.

As the only highly urbanized city in the region, it has evolved to become the regional seat of government, a business and financial center, a tourism hub, an educational center, and home to one of the country's most profitable Economic Zones. The city has a P179,484 GDP per capita in Cordillera Administrative Region.

The Baguio City Economic Zone (BCEZ) caters to 44 locators who produce textiles, apparels, electronics, plastic products and others. Production output in the BCEZ accounts for the bulk of the Cordillera's total exports.



Being the Summer Capital of the Philippines, it remains to be among the top 14 destinations in the country. It is also among the top 20 destinations for Meetings, Incentives, Conventions and Exhibition (MICE). The City received close to 1.7 M tourists at 8-10% growth trend, accounting for 70% of arrivals in the region, with tourism receipts amounting to Php 8.1 billion in 2019.

Baguio City's sustainability challenges

Baguio City is confronted with a new economic reality, one in which resource constraints and increasing impacts of climate change and natural disasters are a detriment for growth. Convergent economic and environmental challenges have had dramatic impacts on the community, hampering the City's continued progress. The City will need to be more responsive to the rising demand for food, housing, electricity, and water, as well as to adopt strategies to mitigate the impact of adverse events.

The COVID-19 crisis has negatively affected public utility vehicle operations, business activities, and employment. It also had a significant impact on low-income daily wage earners and impoverished families.

The crisis also put on spotlight long-standing socio-economic and environmental issues. In a 2019 urban carrying capacity study, the following sectors were identified as the challenge areas because of having reached their carrying capacity: road density, green cover, land for settlement, liquid waste, solid waste, forest cover, open spaces, and water supply.

One of the most pressing urban challenges experienced now in the City is traffic congestion and vehicle volume increase resulting from increasing tourist arrivals and car modal share (CLUP-Baguio City, 2010-2020). The challenges in limiting the volume of vehicles on the road are further exacerbated by the inadequacy of infrastructure and services for public transportation and non-motorized transport, and the travel demand of private vehicle trips entering the city and within the city. Currently, private cars have the highest percentage of vehicle volume (but not necessarily carrying the most passenger volume) on Baguio City roads, which put immense pressure on the city's road carrying capacity. The high carbon emissions coming from the transport sector contributes to GHG emissions and poses a health risk to the public. Increasing volume of vehicles also contribute to increasing pollution and urban heat in the city. While most residents opt for walking and public transport, many visitors tend to bring their own vehicles, further exacerbating the problem.

The city's geographic location is also a challenge because Baguio serves as the gateway to the lowland and highland provinces in northern Luzon.



Baguio City's existing sustainability commitments and targets

The city's goal is to create a sustainable and enabling environment that will promote economic stability and ensure the general well-being of its citizens. For mobility, Baguio City has committed to reducing in-city vehicle GHG emissions by 30% by 2025 and 50% by 2030.

Low carbon initiatives are now about to be implemented citywide through the updating of the comprehensive land use, zoning, and transportation plans. The city will now embark on an ambitious catalytic project that will transform its urban development framework by developing six growth development nodes around its peri-urban areas which will serve as transport and commercial hubs. Multi-modal mobility will be implemented, which allows green and blue redevelopment initiatives that will make the inner city area more walkable and inclusive. Mass transportation through “modern jeepneys” and trams are being planned for implementation. Bicycle lanes and road sharing are likewise given priority. The city has numerous rivers and creeks and these are being considered as another redevelopment space, where they will become part of the micro-mobility and parks network.

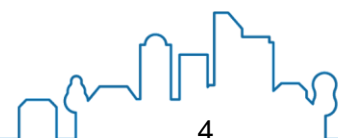
The Local Public Transport Route Plan (LPTRP) for the city is already on its second and last reading at the City Council before its eventual approval. The plan embodies the modernization of public transport where old vehicles that are at least 15-years old shall be decommissioned and exchanged for Euro 4-compliant or electric vehicles.

The city is also one of the pilot cities for Low-Carbon Urban Transport with the UNDP which will test the viability of electric vehicles for mass transportation.

The city has partnered with private groups to prepare its smart mobility plan, which envisions a transportation system that promotes and encourages the use of alternative modes of travel, reducing dependencies on private automobiles. This plan intends to lead to a congestion-free and pedestrian-friendly city, increase community cohesion, and a more urban, vibrant, and sustainable city. Baguio aims to promote a balance on travel efficiency and quality of life, continued economic growth, and a healthy environment.

Baguio City's existing circular practices

A circular city is one that promotes a just transition from a linear to a circular economy across the urban space, through multiple city functions and departments and in collaboration with residents, businesses, and the research community. In practice, this means shifting away from the linear economy's “take, make, waste” model and moving to an economic system where the value and utility of infrastructure, products, components, materials, and nutrients are maintained for as long as possible. In a circular city, material loops are closed, meaning that existing materials are repeatedly cycled instead of becoming waste; resource extraction is also minimized.



Circular City Actions Framework

The Circular City Actions Framework can be used by local governments and city-based circular economy practitioners at any stage of their city’s circular economy transition to advance systemic approaches toward a more sustainable and circular economy. The framework is structured into five complementary R strategies:



Rethink: Redesign systems to lay the foundation for circular activities and enable the transition to a circular economy



Regenerate: Harmonize with nature by promoting infrastructure, production systems, and sourcing that allows natural ecosystems to thrive



Reduce: Do better with less by using and supporting infrastructure, processes, and products that are designed to minimize material, water, and energy use and waste generation from production to end of use



Reuse: Use longer and more often by extending and intensifying the use of existing resources, products, spaces, and infrastructure



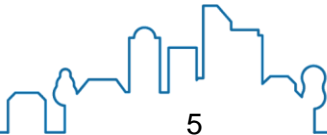
Recover: Eliminate waste by maximizing the recovery of resources at the end of the use phase so that they can be reintroduced into production processes.

Rethink

Baguio City’s Local Public Transport Route Plan (LPTRP) mission is to guide interventions that result in public welfare. Apart from decommissioning old public vehicles for being unroadworthy and more polluting, it is also aimed to identify, create, or modify routes to satisfy the needs of the riding public. It will decongest routes and provide more to the under supplied ones. As part of the Smart Transportation and Mobility Master Plan, green walks and bike routes will be included, which will help in e-governance and serve as a guideline to have a liveable and healthy city with a faster, safer, and convenient transport system.

Regenerate

Led by the Department of Environment and Natural Resources (DENR), the National Greening Program (NGP) was implemented in the city in 2011, followed by the Enhanced-NGP in 2015. These programs allowed the City Government of Baguio, along with its connected offices and agencies, to plant tree seedlings in selected designated reforestation areas of the city from public lands and forests to military reservations and urban greening activities. Clearing and weeding operations were done to avoid compromise of growth of the planted seedlings/trees. With the forest covering about 23% of the city’s territory, the city is planning measures to provide incentives to landowners to maintain trees in their property, or to buy back private lands



to be reclassified as tree parks and be included into the Baguio City's green walks and bike route areas.

Reduce

Being Philippines' summer capital with an increasing trend of tourist and motorist arrival in Baguio City, a number coding scheme has been implemented to reduce emission and volume of vehicles in the city on a daily basis. On designated areas and streets, on weekdays from 7am to 7pm, cars are not allowed the entry if the plate number is ending in 1&2 (Monday), 3&4 (Tuesday), 5&6 (Wednesday), 7&8 (Thursday), and 9&0 (Friday). Further, in Baguio City's Session Road, the main thoroughfare and the commercial centre, entry of tricycles and motorbikes are not allowed as indiscriminate parking and undisciplined motorists cause safety concerns and impede mobility of the general public. Every Sunday, the session road is closed to motorists for the residents and tourists alike to enjoy the area without traffic and pollution.

Reuse

The city reuses some of its idle or abandoned infrastructure by turning it into parks as part of its urban greening program, mobility campaign and a healthy environment. For motor vehicles to maintain their road worthiness, it is required to have a motor vehicle inspection certificate as well as regular emission testing for air quality and having a low carbon energy input.

Recover

The city is currently drafting a Hazardous Waste Management Program that will include reuse, repair, and remanufacturing of vehicle components. This may include the decommissioned public vehicles affected by the LPTRP. There are establishments that facilitate the reuse and recovery of vehicle parts but these are still unregulated.



Identifying circular economy entry points for Baguio City

Circular development principles can be applied to a wide range of thematic areas at the local level. Often, local governments start their circular development journey with one or two priority thematic areas to make the case for the circular economy and simplify action planning. A number of considerations can guide this selection, such as the potential environmental and socio-economic impacts that could result from actions in the selected priority thematic area. Also interesting to consider are aspects related to readiness and governance: are there existing initiatives or business ideas already planned or underway that would contribute to more circularity in the thematic area? Does the city have agency over actions that could support the circular transition of the thematic area? In how far would the circular transition of the thematic area contribute to achieving other strategic goals of the city and region?

The city's data overview



Selecting a priority thematic area

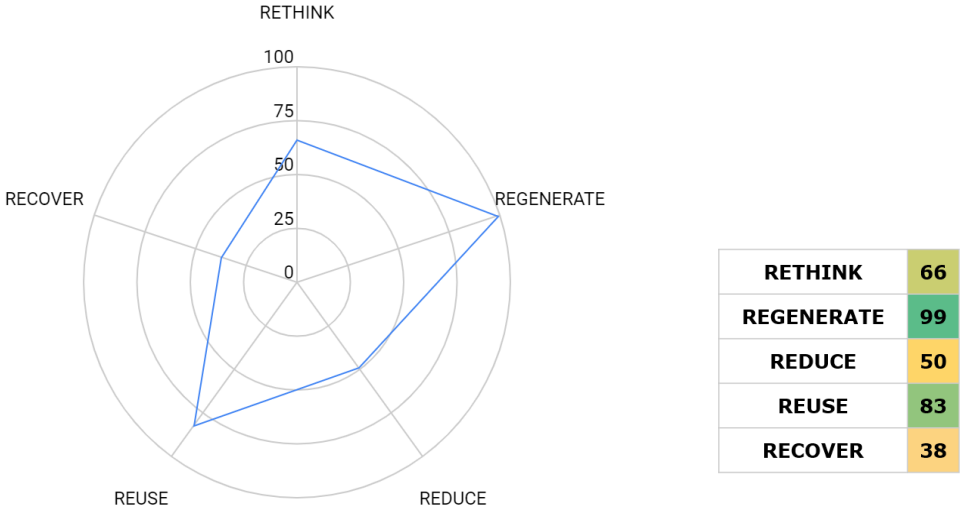
Traffic congestion, increasing vehicle volume and tourism is one of the primary concerns that helped breached the city's carrying capacity. Baguio City is a signatory to the Cities Race to Zero campaign to set its fair share emission reduction of 50% by 2030 and net-zero by 2050. Addressing the mobility issue will accelerate benefits in social, economic, and environmental thematic areas.



Identifying interventions to transform the Mobility System

Circular Mobility System baseline

Although there are some policies and initiatives in place, Baguio City's Smart Mobility Master Plan and Local Public Transport Route Plan is yet to be fully implemented. As the summer capital of the country, there is a strong challenge to maintain and expand its forest cover and open spaces, controlling the volume of vehicles and tourists contributing to economic development whilst maintaining the same road capacity.



Opportunities for action

The full implementation of the smart mobility master plan and LPTRP will create an instrument that will feed into other plans, programs, and activities of the city – Local Climate Change Action Plan, GHG Emissions Inventory, Low Carbon Urban Transport System, among others.

Baguio City also plans to engage other local governments that have best practices on mobility to adopt and implement in the city. Some of these are available the solutions explorer:

- Reduce: [Low-emission zones in Taiwan](#)
[Paris' logistics hotels and inner-city green freight](#)
[Dynamic road use in Copenhagen and Barcelona](#)
- Recover: [Battery recycling in Salzgitter](#)
- Rethink: Reversing car-centric mobility in São Paulo



Lessons learned

The Circular Cities Action Framework and Ganbatte Cities helped in zeroing-in to mobility systems as its entry point in Baguio City's transition towards a circular economy. In one of the activities of the program, there is a realization of the lack of documentation of the city's initiatives and the silo thinking among city departments. This enacted the city leaders to formalize the sharing of data and information and to create a knowledge management.

The ease of information movement with political and executive support is seen to catapult Baguio City to attain its commitment in aligning its fair share of the Paris Agreement's goal of 1.5 °C. Letting the city breath and stepping below the carrying capacity where people are thriving with a good quality of life, education, and health is a path the city is hoping to take.

