



Development Planning Suggestions for Tagbilaran City

Nathaniel von Einsiedel

Principal Urban Planner, CONCEP Inc.

Fellow, United Architects of the Philippines (UAP)

Fellow Emeritus, Philippine Institute of Environmental Planners (PIEP)

Presentation Outline

Looking at the trees / addressing critical issues . . .

1. Flooding / Water & Sanitation
2. Traffic
3. Solid Waste

Appreciating the forest / ensuring sustainable urban development . . .

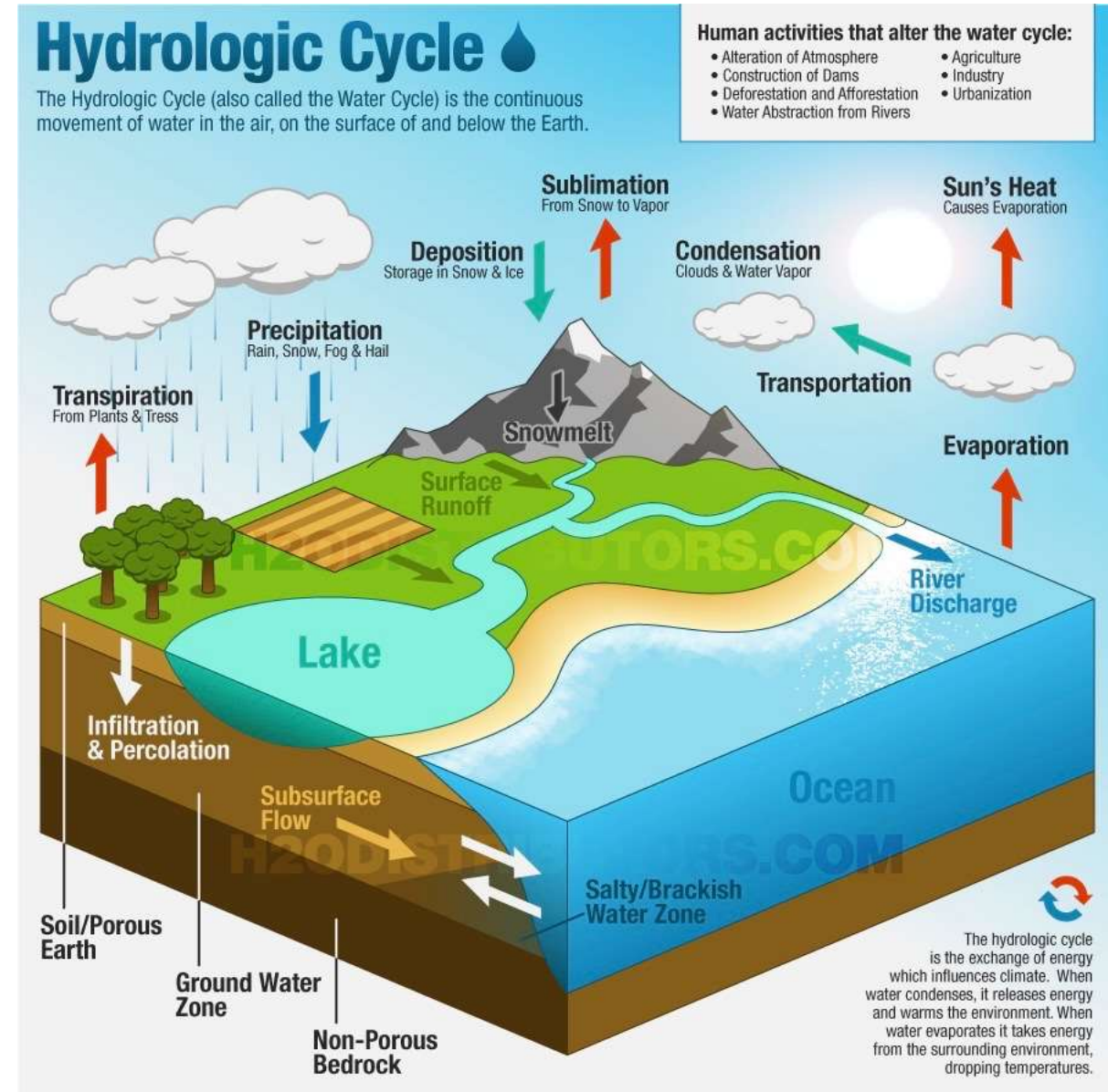
To share insights on an **urban growth management plan** that can:

- achieve the vision of the LGU;
- address the critical issues of rapid population growth and urbanization; and
- attain sustainable development goals in the face of a climate-defined future.

Looking at the trees /
Addressing critical issues and concerns

01. Flooding / Water & Sanitation

- ✓ Floods are part of the Earth's **natural hydrological cycle**, which maintains an overall balance between water in the air, on the surface, and in the ground.
- ✓ Sometimes the **hydrological cycle gets out of balance**, sending more water to an area than it can normally handle. The result is a flood.
- ✓ Rivers, creeks and lakes will periodically **overflow their banks** and inundate adjacent land areas. These areas – known as **floodplains** – will temporarily store this excess water.
- ✓ **Flood damages** occur only when human beings interfere with the natural flooding process by:
 - altering the watercourse
 - developing areas in the upper watershed
 - building in the floodplain itself



Traditional solution to flood problems



✓ The **traditional solution** to flood problems is to construct structural protection structures, eg floodways.



✓ Despite tremendous expenditure for these structural projects, **economic losses** have continued to increase year after year.

Alternative solutions (incorporating land use management)

1. Floodplain Management



- ✓ The basic goal IS NOT TO PROHIBIT development in floodplains, but rather to GUIDE development in floodplain areas in such a way as **to greatly lessen the economic losses and social disruption caused by flooding events.**
- ✓ Floodplain management basically means delineating the 100-year base floodway and its tributaries and preventing construction within these areas.

The BENEFITS are:

- ✓ **Natural flood and erosion control** – provides floodwater storage; reduces flood velocities and flood peaks; curbs sedimentation; filters nutrients and refreshes aquifers

- ✓ **Biological resources and functions** – supports a high rate of plant growth; maintains biodiversity and integrity of ecosystems; provides good habitat for fish and wildlife.
- ✓ **Societal resources and functions** – enhances agricultural lands by sediment deposits; provides open space to restore or enhance forest lands, or for recreational opportunities, or simple enjoyment of their aesthetic beauty.

The natural processes of floodplains cost far less money than it would take to build facilities to correct floods, stormwater, water quality, and other community problems.



Alternative solutions (incorporating land use management)

2. Stormwater Management



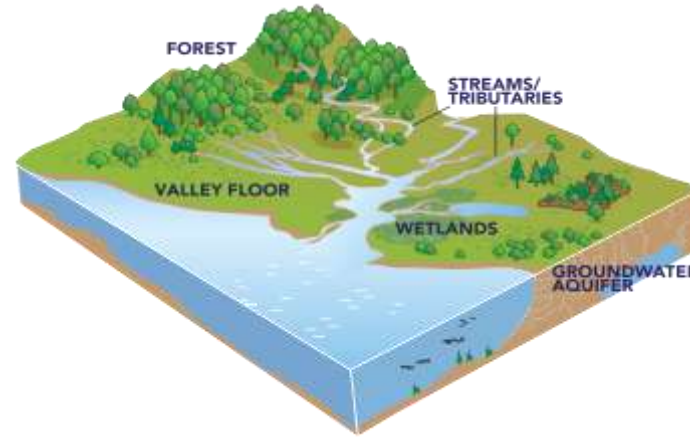
- ✓ Stormwater management is the **process of controlling the rainwater** that runs off primarily from impervious surfaces like streets, parking lots, driveways, and rooftops.
- ✓ Rural areas are typically comprised of pervious areas, such as farmlands, pastures, and forests. These areas **absorb and infiltrate the rainfall** and generate a small amount of runoff.
- ✓ Urban areas typically **contain a large percentage of impervious surfaces**, such as pavements and rooftops. The quantity of runoffs from these areas quickly overwhelms creeks and rivers, causing channel erosion, localized flooding, and property damage.

- ✓ **Stormwater runoff can transport pollutants** such as motor oil, animal waste and household cleaners from impervious surfaces, and dump them into rivers and other water bodies with no treatment.
- ✓ More frequent and intense rainfall have shown to overcome the design capacity of most municipal drainage systems that **cause flash floods** or greater flows of contaminants into waterways.
- ✓ Thus, researchers and practitioners are exploring how to **incorporate future climate scenarios into the design of stormwater control mechanisms (SCM)** to ensure that they function well into the future.



Designing stormwater control mechanisms (SCM)

- ✓ Researchers and practitioners have started to examine the impacts of climate change on **SCM performance at the site and watershed scales** to enhance resilience.
- ✓ **Nature based solutions (NBS)**, in particular, are now recognized by the stormwater management community as a means to help mitigate the expected increases in surface runoff and flooding caused by climate change.
- ✓ **Green stormwater infrastructure** is now considered an integral component of adaptation planning, which includes permeable pavements, bioretention ponds, green roofs and walls, rainwater harvesting systems, rain gardens, grassed drainage swales, and constructed wetlands.



Examples of Land Management-Oriented Approaches to Flooding and Water/Sanitation Management

- ✓ Australia's Water Sensitive Urban Design (WSUD)
- ✓ USA's Low Impact Development (LID)
- ✓ UK's Sustainable Drainage System (SuDS)
- ✓ China's Sponge Cities Program



Common features of the 4 examples of Stormwater Management Systems



- ✓ Objective of addressing the interrelated issues of: a) water scarcity; b) flooding; and c) water pollution
- ✓ Mimicking natural location-specific hydrologic regime
- ✓ Adaption of nature based solutions (NBS)
- ✓ Use of multifunctional landscapes
- ✓ Emphasis on reducing impervious surfaces
- ✓ Integrates urban water cycle management with urban planning and design

02. Traffic

Development of satellite urban centers to deconcentrate and decentralize development opportunities

- ✓ Get a Google Earth map and demarcate the city's built-up and undeveloped areas, existing roads, and disaster-prone areas.
- ✓ Using the map, assess the development trends, define the city's developable lands, taking into account disaster-prone and environmentally critical areas, land ownership structure, and possible future roads.

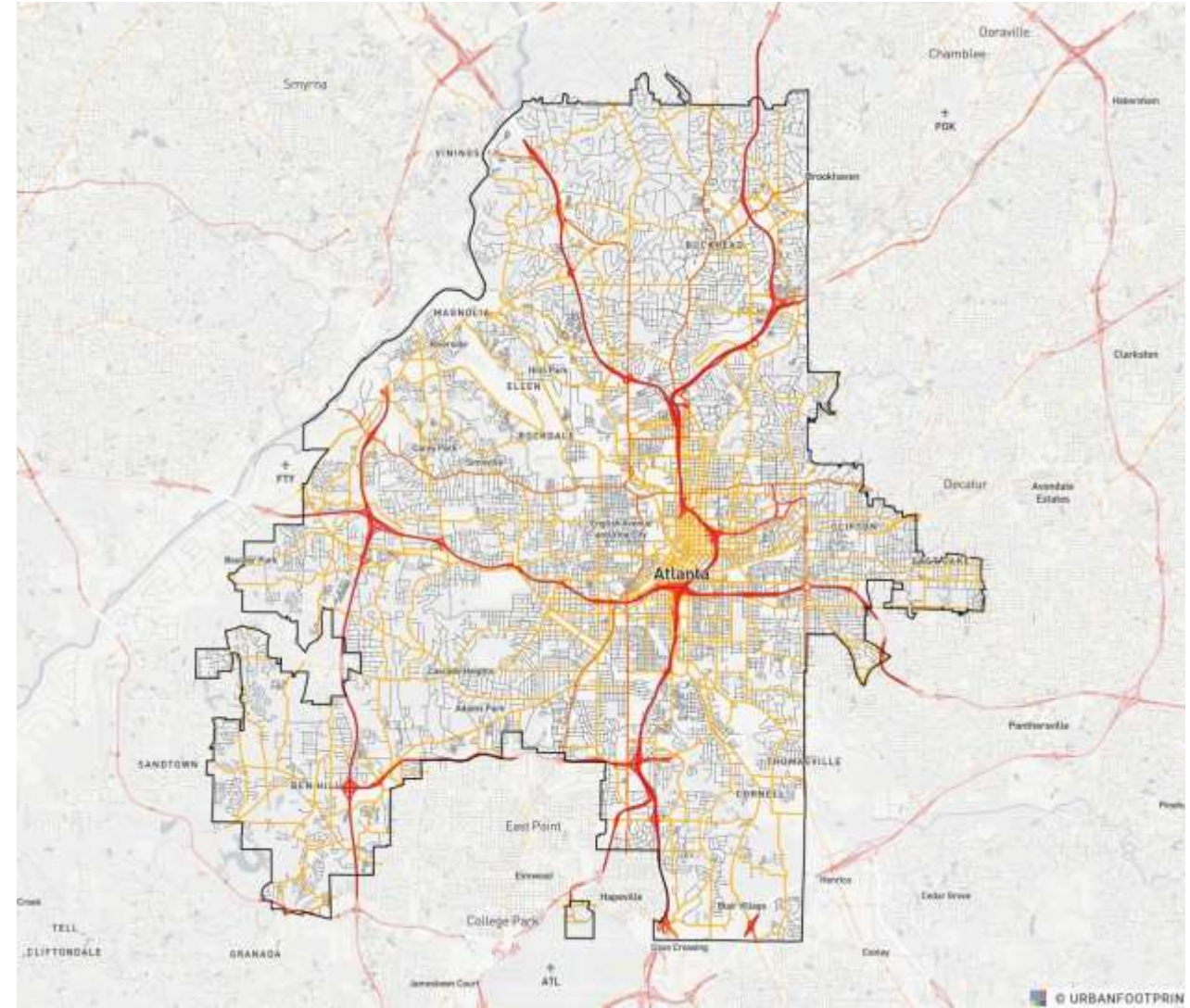




✓ Conduct a parallel study of the existing conditions and trends of metro Tagbilaran's road network and its transportation and traffic conditions, and recommend measures to address problems and concerns.

✓ This study should be correlated with the identification of possible satellite urban centers mentioned above in order to capitalize on the synergy between transport and land use, particularly the principles and practice of **Transit Oriented Development (TOD)**

- ✓ It should also include a recommended network of future collector / secondary roads beyond the CBD that land owners and developers must comply with when they develop their properties.
- ✓ The implementation of the recommended actions should be correlated with the implementation program for the satellite urban centers.
- ✓ It is suggested that the idea of decentralizing Tagbilaran's CBD also consider potential developments outside its boundaries, particularly in Dauis and Baclayon.





- ✓ In consultation with landowners, local chamber of commerce, real estate developers and key stakeholders, identify the potential satellite urban growth centers and ask them what actions would be needed to implement such centers.
- ✓ Formulate a plan and an implementation strategy for each of the identified satellite urban centers, delineating the roles and responsibilities of the development partners concerned.
- ✓ Review and update the city's Investment Incentives Code to support the implementation strategy. It may be necessary to pass a new city ordinance to consolidate private properties to enable an integrated development of the area.

03. Solid Waste

- Continued population growth, urbanization and increased consumption are leading to rising volumes and complexity of waste.
- This current condition is unsustainable. Sanitary landfills can only accommodate so much waste. More effective approaches are essential.
- We need to rethink how we view and handle what we throw away. One way is **to think like scavengers who mine trash for treasures!**

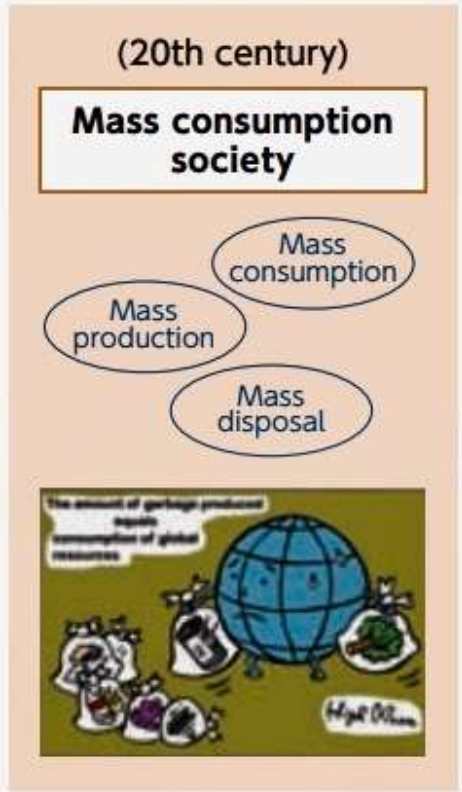




- A shift in perspective: **From dumpsites to resource mines.**
- It redefines trash as valuable assets. It does not stop at segregation and recycling. It involves upcycling, composting, giving life to discards, and minimizing waste at its original source.
- Its about embracing innovation, promoting creativity, and utilizing technology's potential in solving the problem.
- The traditional waste management practices based on the "linear economy" are proving to be severely limited.

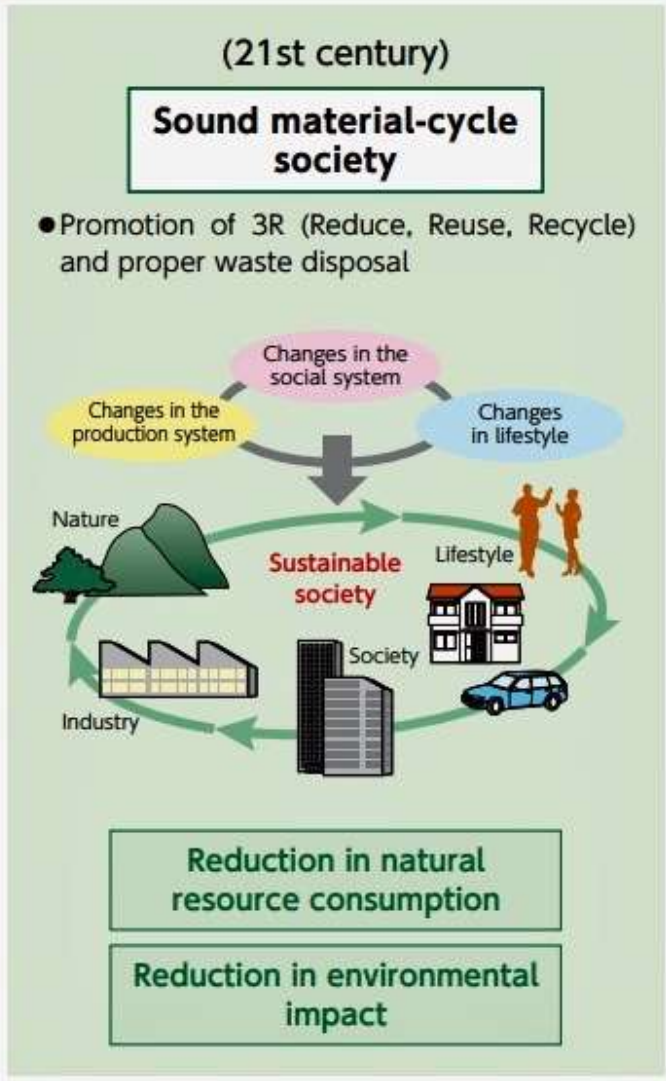
- The shift in perspective is due to the concept of a “**circular economy**” which promotes resource recovery, and minimizes waste generation by ensuring material use within the system for a longer period of time.
- **Innovative solutions** include:
 - ✓ **Advanced recycling technologies** for plastics, such as pyrolysis and chemical upcycling
 - ✓ **Urban mining of electronic gadgets** for valuable metals and rare earth elements, or for refurbishment and reuse
 - ✓ **Biofuel production** – conversion of used cooking oil or agricultural residue into biodiesel or bioethanol





Increase in environmental impact

Expansion of resource consumption



Examples from other countries:

- ✓ **San Francisco's Zero Waste Initiative** – diverting 80% of solid waste from landfills by 2025 thru composting, anaerobic digestion, extended producer responsibility program
- ✓ **Rwanda's Ban of single-use plastics** coupled with promotion of local organic raw materials such as banana leaves
- ✓ **Japan's Home Appliance Recycling Law / Distribution to Households of Microwave Incinerators for Food Waste**
- ✓ **United Kingdom's** policy on deposit refund scheme for drinking bottles and cans
- ✓ **Singapore's Zero Waste Master Plan (2019)** focuses on waste minimization and recycling
- ✓ **Nepal's** privatization of waste management in cities

Japan's Waste Management Policy since 2000

Challenges:

- ✓ **Public awareness and behavior change** – including public education programs
- ✓ **Policy and regulations** – including incentives for sustainable practices
- ✓ **Economic viability and scalability** – innovations usually have high start-up costs compared to conventional practices

Opportunities:

- ✓ **Education and engagement** – promoting environmental literacy and the “From trash to treasure” mindset among citizens especially the youth
- ✓ **Collaboration and innovation** – partnerships between businesses, policy-makers, academia, and NGOs as well as with neighboring LGUs to scale up innovations and ideas for transformation
- ✓ **Economic incentives and market-based solutions** – such as “pay-as-you-throw” and deposit refund systems, tax exemption on waste-reducing industries

Appreciating the forest /
Ensuring sustainable urban development

How to effectively manage rapid urban growth and its negative effects in the face of a climate-defined future?

Putting everything together: Sustainable urban growth management plan

- ✓ Urbanization can produce both positive and negative effects. To identify sustainable urban growth management solutions, it is necessary to forecast and mitigate conflicts as well as prepare the city for potential shocks.
- ✓ Scenario-based planning, combined with urban growth models, is a good approach in dealing with uncertainties associated with economic, social and environmental outcomes of urban growth.





- ✓ Scenarios assist policy-makers to select strategies by exploring alternative futures, warn people about uncertainties, and help all parties in developing a sound vision and plan of action.
- ✓ Integral to the scenario-based planning approach is the application of sustainability assessment indicators covering 1) land use; 2) transportation; 3) environmental conditions; 4) land use and transport integration; and 5) socioeconomic conditions.
- ✓ The U.N. Sustainable Development Goals (SDG) have indicators that can be adapted to Tagbilaran’s context.



✓ The possible scenarios for Tagbilaran are:

A: Economy Focused Scenario

B: Environment Focused Scenario

C: Balanced Scenario

✓ From the scenarios, key policies can be derived to address future urban growth challenges, which can then be integrated into the city's Executive/ Legislative Agenda (ELA), CLUP, CDP and other relevant local plans.

✓ The approach can help develop urban design guidelines and a local building code that promote a pedestrian-friendly, disaster resilient, and future-ready Tagbilaran.

Conclusion and way forward . . .

Tagbilaran's critical problems appear to be reflective of its high population growth rate and rapid urbanization which are overwhelming the city's capability to manage such growth.

While it is necessary to address these issues to make the city resilient and more livable, it is equally important not to lose focus on its overall sustainability especially in the face of a climate-defined future.

An urban growth management plan can help ensure a more sustainable urban development.

That's it!
I'm ready for questions.

Nathaniel von Einsiedel, PhD

Principal Urban Planner, CONCEP Inc.

Fellow, United Architects of the Philippines (UAP)

Fellow Emeritus, Philippine Institute of Environmental Planners (PIEP)

