# Lab 21 Response: Building a Green City

## Part 1: Directions for Planning Your Green City

1. Work individually or in groups as determined by your instructor.
2. Design a green city (i.e., one that is **sustainable**, has elements of **self-sufficiency**, reflects **environmental justice**, and is **resilient**) using the principles and knowledge introduced in your environmental science course. The **parameters for the city** are as follows:
	1. Assume the city has an area of roughly **8km by 8km** (5 miles by 5 miles) and a population of **100,000 people**. This is similar in size and population to Boulder, Colorado.
	2. The actual geographic location is not determined – you get to choose the location. This means that you decide which ecoregion you want your community to be a part of.
3. Before you begin the design, do some **research on the ecoregion** you selected. Check with your instructor or the library for a research guide to assist you. Address the following characteristics of your ecoregion:
	1. What are the **geographic features** in the area, such as rivers, lakes, oceans, mountains, etc.?
	2. What are the **ecological features** (i.e., abiotic factors such as climate, soil, etc.) and biotic factors, such as types of plants and animals?
	3. How might these geographic and ecological features provide **opportunities** or **challenges**? For example, coastal areas provide opportunities for outdoor recreation and offshore wind farms, desert regions provide the opportunity to harness solar energy, and prairies provide the opportunity to develop agriculture due to fertile soil. On the other hand, desert regions have challenges due to limited water supplies and poor soils, while prairies and coasts must contend with the potential for devastating storms that can damage property and cause widespread flooding.
4. Develop a set of 3–4 **guiding principles** that will help you make design decisions throughout your project. Your principles should be inspired by the core values of sustainability, self-sufficiency, environmental justice, and resiliency, but written in your own words. Think of them as your city’s mission statement — the foundation your design will be built upon. A guiding principle can encompass a couple core values (like housing that addresses sustainability and environmental justice).
5. **Plan**a green city that reflects your guiding principles and that is appropriate for the ecoregion you selected. Your plan *must*include:
	1. Housing/residential areas
	2. Food sources and production areas
	3. Energy sources: transportation, electricity, and heating
	4. Transportation system
	5. Water utilities: drinking water and wastewater treatment centers
	6. Waste disposal/management
	7. Economic vitality that supports the city (businesses and services)
	8. Public services (schools, hospitals, police and fire departments)
	9. Recreational opportunities
6. For each of the nine aspects of your plan, identify how your design decisions reflect your guiding principles and are suited to the ecoregion. For example, perhaps your housing design incorporates resilience to weather events such as flooding, reflects environmental justice by providing integrated housing that includes people of all socioeconomic groups, and is sustainable due to the incorporation of elements such as rainwater harvesting systems and solar panels installed on the roofs.
7. Your community does not have to be entirely self-sufficient, but it does have to make a concerted effort to provide for its own needs. *Remember that you will live and work in this community, so develop a place that you would be willing and proud to live in*.
8. At some point over the course of this project you may be required to conference with your instructor to ensure you are on the right track. *This step will be required for the long-term project.*
9. Calculate the ecological footprint for yourself as a resident in this city. Use the calculator on the [Global Footprint Network](http://www.footprintcalculator.org).

## Part 2: Directions on Creating the Design of Your Green City

1. **Sketch** out your **city layout** **and features** as a **map** on a **poster board** (24” x 36”). Alternatively, generate your map on a **PowerPoint slide** of similar dimensions. Take time to clearly illustrate your city, identifying all sectors, including **labels or a legend**. Include the scale of your map as a **scale bar** and draw or place items to scale on your layout.
2. Along with your poster, submit the following information as a **report** (typed) to explain the design of your community:
	1. The eco-region:
		1. Describe the **geographical** features and **ecological** characteristics of your community.
		2. Discuss the **opportunities** provided or **challenges** presented by these geographic and ecological features.
	2. The design:
		1. Discuss the guiding principles you adopted and applied in designing your city.
		2. For *each* of the nine components of your plan—housing, food production, energy, transportation, water, waste management, economic base, public services, and recreation options—**describe** the **key features** of your design and **explain** how your design decisions reflect your guiding principles and are suited to the ecoregion.
		3. **Discuss the rationale behind the spatial layout of your community.**
	3. Reflections:
		1. Report your ecological footprint calculation as a resident of this city. Provide information about the size of your ecological footprint, the size of your carbon footprint, the number of Earths that would be required if everyone lived like you, and your personal Earth overshoot day. Discuss your results.
		2. Describe what it is like to live in your city. Discuss how it is similar to or different from the community in which you live today.
		3. Could you apply any of the ideas from this city you designed to your current home or community? Discuss specific ideas and explain how they might be applied.
3. Alternatively, or in addition, your instructor might ask you to prepare a **presentation** to share your city design with the class. *This step is highly recommended for long-term projects.*
4. Use and cite a minimum of four credible sources (besides your textbook; if working in a group, provide two more sources for each additional group member) that helped you with this lab. Use the CSE or APA citation style as directed by your instructor. *Provide documentation on your use of the Library Research Guide or databases. This may include screenshots of your search results as requested by your instructor*.