



Building a Greenway: A Case Study
A Case Study that makes students the decision-makers in a hypothetical planning scenario.
These materials are part of EPA Report #EPA/600/R-16/006.

Key Words/Vocabulary (all vocabulary can be found at the end in a Glossary)

active transportation	alternative transportation	biodiversity	buffering
case study	community cohesion	conservation	connectivity
ecosystem services	greenspaces	greenway	habitat
health outcomes	inbreeding	mitigation	
neighborhood connectivity		patch (habitat)	preservation
public hearing	restoration	siting	social capital
sustainability plan	urbanization	vector borne diseases	

Case Study Synopsis

In this hypothetical case study, funding to complete a pilot section of a greenway has been granted to a city Parks and Recreation Department. The proposed pilot section is being presented to the city council for review and approval. The section proposal was drafted by the Parks and Recreation Department and was selected to meet the goals of the Department. They used a number of maps from EnviroAtlas, a web-based decision support tool, to help them determine their pilot section; these are included in the proposal. The Parks and Recreation Department goals include the following:

- Improve access to and use of parks and green spaces,
- Enhance habitat for biota,
- Encourage physical activity and recreational opportunities, particularly for aging populations.

As a concerned citizen, you are asked to review the case and weigh in on the selection of a pilot section for the greenway at an upcoming public hearing. For the hearing, you must be prepared to support your stance on whether the proposed pilot section is the best option. *If the instructor assigns you a particular role, form your stance based on the assigned role.*

Introduction, EnviroAtlas

EnviroAtlas is a collection of interactive tools and resources that allows people to explore the many benefits people receive from nature (e.g., clean water), often referred to as ecosystem services. Though critically important to human well-being, ecosystem services are

often overlooked. Using EnviroAtlas, many types of users can access, view, and analyze diverse information to better understand how various decisions can affect an array of ecological and human health outcomes. EnviroAtlas is intended to be used by a wide range of audiences, including planners, educators, students, researchers, and decision-makers from all levels of government.

In this case study, the Parks and Recreation Department used multiple maps from the EnviroAtlas interactive map to make the case for their chosen pilot section. Visit the website at <http://www.epa.gov/enviroatlas>.

Canton Greenway Case Study

The Canton Parks and Recreation Department recently received an EPA Sustainability grant to implement the creation of the Canton Greenway, a network of trails connecting destinations in the city, which was proposed in the Canton 2025 Sustainability Plan. The overarching goals of the Sustainability Plan are to support equal access to resources, conservation of open space, and economic development. The major access points to the greenway have been predefined and the network of trails will connect these points (Figure 1). While the grant money received is not enough to complete the greenway in its entirety, it is enough to complete a pilot section. The Parks and Recreation Department has developed, and is ready to submit, a proposal for the location of a pilot section of the greenway for approval at an upcoming city council meeting. **As an active member of the community, you need to review the proposal and decide whether you support or oppose the selected location of the proposed pilot section.**

“Conserved land in the form of linear greenways has the potential to connect habitats and protect sensitive natural features while simultaneously providing a setting for recreational or utilitarian physical activity and the alleviation of psychological and social stressors.”
(Coutts, 2010, p 10)

Greenways first came into use in the U.S. in the 1800’s in the form of linear parks and open space in urban areas (Flink, C.A., 1993). Providing routes for movement is the defining feature of a greenway (Searns, R.M., 1995). While originally implementation of greenways focused on aesthetics and beautification (Searns, R.M., 1995), the greenway approach has evolved to be more multi-purpose to meet infrastructure needs for alternative transportation and water management, provide resources for outdoor education, address habitat needs for wildlife, and provide hazard mitigation and buffering services (Flink, C.A.1993; Searns R.M., 1995). Greenways provide a number of benefits including health promotion, economic incentives, and landscape preservation. Greenways are more than just parks; they represent an opportunity to provide balance in the provision of ecosystem services and the public demands for the use of such services.

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Image 1: Greenway in Atlanta, GA. Photo credit: Riley Perszyk.

Green areas have been shown to have a number of benefits including positive health outcomes stemming from the provision of ecosystem services. These green areas can provide places for recreation and engagement with nature, as well as filter air and water pollution, while minimizing impacts from natural hazards such as floods and heat waves. Through services like these, greenways have the potential to impact a number of health outcomes including obesity, birth outcomes, mental health and longevity (Jackson L.E. et al., 2013). Increasing neighborhood connectivity and access to destinations can have a positive impact on active transportation, such as bike commuting, and aid people in achieving recommended physical activity targets. A recent study on the potential benefits of a greenway development in Ireland demonstrated that increasing physical activity rates by 10% could have a significant impact on preventing incidence of diseases like heart disease and type 2 diabetes in populations near a greenway (Dallat M.A.T., et al, 2013).

Implementing greenway systems also aids in the preservation and restoration of natural ecosystems. Greenways have the potential for both urban and rural land conservation as well the promotion of habitat connectivity and biodiversity. The fragmentation of habitats has become a significant issue for many species. As development and urbanization take place, habitats that were once expansive and linked are decreasing in patch size and connectivity, causing negative impacts ranging from decreased genetic diversity and increased inbreeding to increased transmission of vector borne diseases (i.e. the spread of Lyme Disease via ticks). Maintaining and creating connections among core habitat areas with natural corridors are critical for retaining biodiversity. Greenways can serve not only as

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habitat themselves, but also as corridors that can link habitat patches of various sizes and improve species mobility across areas.

Despite the many benefits, the costs associated with the construction and maintenance of greenways can be significant. Land costs, infrastructure, and safety features all impact the bottom line. However, as an amenity, park systems have the potential to add value in a number of ways including: property value, tourism, direct use, health, community cohesion, clean water, and clean air. Multiple studies have shown that greenways can have a positive or neutral impact on property values, with most of the positive value being captured within 500 -2,000 ft of the greenway (Nicholls, S. and Crompton, J.L., 2005; Campbell, H.S. Jr. and Munroe, J.K., 2007; and Lindsey, G., 2004). Property values and associated tax revenue serve as a motivator for commercial, residential, and recreational siting within a community. While not considered income like property or sales tax revenue, factors such as social capital, health promotion, and environmental buffering can result in savings for both communities and individuals.

Scenario Overview

Canton is a mid-sized urban city in the United States. As of the most recent U.S. Census, approximately 300,000 people live within the city boundary and the population has been slowly, but steadily declining since the mid-1960's. The majority of residents identify as white (43%) or Hispanic (39%) and 32% of those over the age of 25 have at least a Bachelor's degree. The population is gradually aging with a 5% increase from the last U.S. Census for those identified as being over 70 years of age. Canton is known throughout the region for its cultural and performing arts center, architectural design, and Green State College. The city has a number of parks and green spaces, particularly near the rivers and lakes.

As a part of the city planning cycle, a 2025 Sustainability Plan was developed and approved in 2010. Multiple city departments and offices played a role in the plan's development, including the Mayor's Office, the Economic Development Department, the Office of Planning and Community Development, and the Parks and Recreation Department. Upon the completion of a sustainability assessment in 2009, the city developed a series of goals to guide the planning process toward balancing development and conservation. Based on this assessment and identified goals, Canton's primary areas of interest in the 2025 Sustainability Plan became land use planning and design, economic development, and community health and wellness. Within each of these areas, a number of priorities were established (Table 1).

TABLE 1: Canton 2025 Sustainability Plan Areas of Interest and Priorities (adapted from ICLEI Sustainability Planning Toolkit)

<p>Land Use Planning and Design</p>	<ul style="list-style-type: none"> ▪ Zone to promote mixed-use land uses ▪ Review City policy and planning framework to ensure that City infrastructure and development planning is centered more on pedestrian and active transportation ▪ Reduce greenhouse gas emissions ▪ Reduce ecological footprint (focus on reducing consumption and waste)
<p>Economic Development</p>	<ul style="list-style-type: none"> ▪ Strengthen City - Community Partnerships with business, academic and non-profit sectors ▪ Partner with community-based business development organizations to focus on business skills development and training for artists, young people, and newcomers ▪ Meet with developers and the community to discuss and remedy any potential barriers which would discourage the reuse and reclamation of existing buildings and/or brownfield sites
<p>Community Health and Wellness</p>	<ul style="list-style-type: none"> ▪ Increase accessibility to services ▪ Work in partnership with community based organizations to develop community gardens ▪ Ensure community safety and security ▪ Improve health and well-being through active lifestyles

While the completion of the Canton Greenway is part of the 2025 Sustainability Plan, it has been difficult to gain approval for funding and maintenance in the city’s annual budget. Some parties feel that the Greenway is not worth the time and financial investment as its completion is anticipated to take the better part of a decade. Others support the concept of developing a Greenway but challenge the idea that existing funds should be used to support the project.

In hopes of creating momentum, the Parks and Recreation Department was able to secure a small grant to begin work on a pilot section of the planned greenway network. The entrances for the greenway network have already been chosen based on land parcels that are already owned by the city (Figure 1). Given the locations of these access points, a pilot section proposal in line with the amount of funds awarded has been drafted.

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Because of time constraints on the grant, a decision must be made quickly and a special city council meeting has been declared. A public hearing for the proposal is scheduled for 7 days prior to this city council meeting to gather community feedback on the selected pilot section.

As an active member in your community, you plan to attend the hearing and have reviewed available materials to inform your opinion of the proposed pilot section of the Greenway.

Questions from the Reading

Use information from the case study text to answer the following questions **on a separate sheet of paper** or to be submitted virtually (check with your instructor):

1. What are overarching goals of the Canton Sustainability Plan?
2. What are some benefits/services provided by green spaces?
3. How are greenways important for preserving natural ecosystems?

The Proposal - Canton Greenway Pilot Section

There are five major access points to the greenway that have been predefined. The completed network of trails will connect these points. The pilot section of the greenway could run between any of these points. However, because of their interests and concerns, as well as available funds, the Parks and Recreation Department has chosen a trail route that runs between points 1 and 4 to be the pilot section (Figure 1).

When selecting the pilot route from trail heads 1 to 4, the Parks and Recreation Department was most concerned with improving access to parks (Figure 3) and improving the connectivity of existing habitat patches (Figure 4). They used maps from EnviroAtlas to develop a proposal for the pilot section that addressed their concerns.

Review the attached map set, which contains the maps the Parks and Recreation Department used to make their case. Answer the worksheet questions and consider the maps from the point of view of the Parks and Recreation Department.

- Why is each map important to making the case for the Parks and Recreation Department?
- If you were assigned a different role, consider the maps from your assigned point of view.
 - Do these maps help make your case as well? How?
 - What other information do you need to support your point of view?

Student Task—complete this after completing the “Understanding Maps” worksheet

The public hearing to discuss the proposed pilot section of the Greenway is rapidly approaching. **Your primary objective is to ensure that the pilot section of the greenway is completed in the best location.** In preparation for the meeting, you identify the most important issue(s) in selecting a site, review the proposal materials, formulate an opinion on whether you support the proposed site, and defend your decision using the available information.

Figure 1. Proposed trail network area in Canton

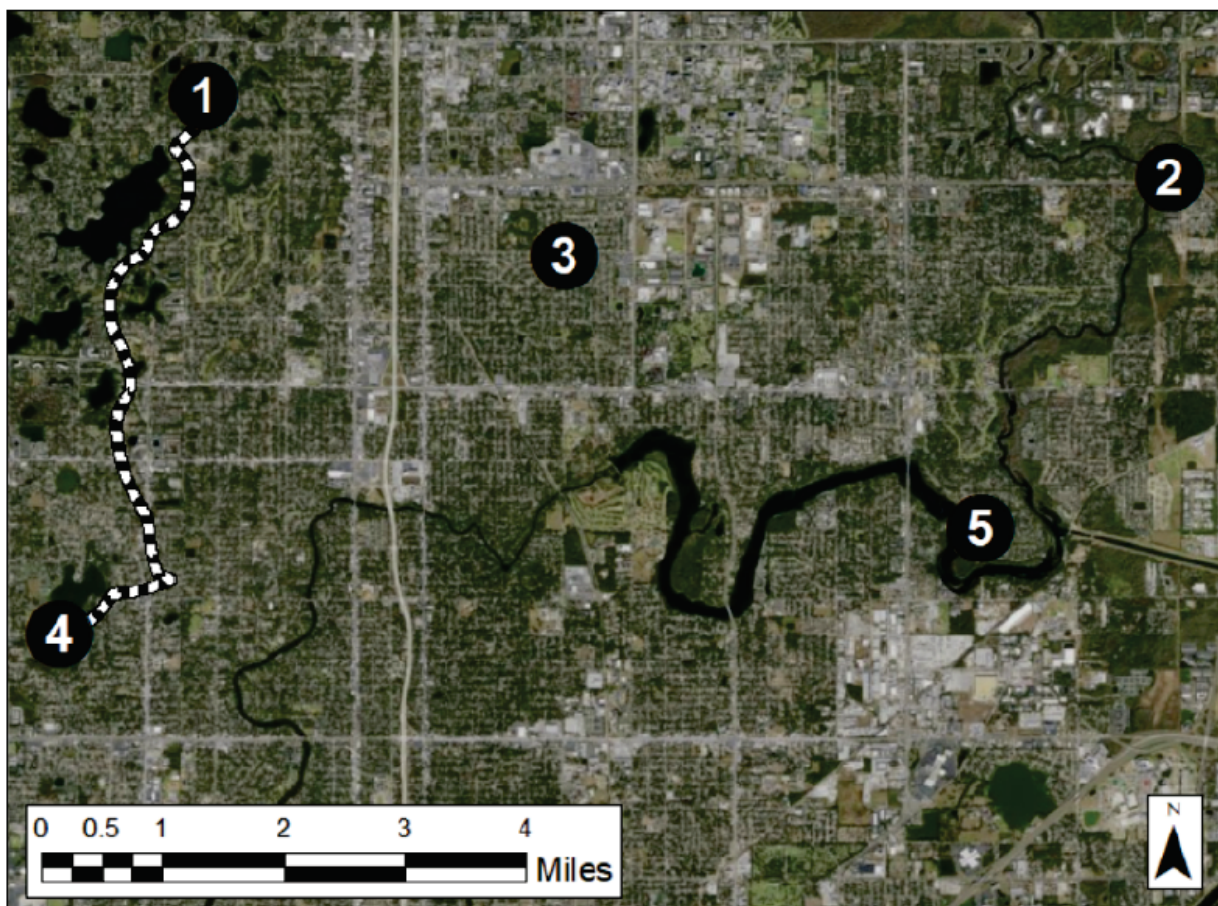


Figure 1 shows the proposed trail network area with numbered trail heads. The pilot route proposed by the Parks and Recreation Department runs from trail head 1 to 4. In this aerial image, waterbodies were identified and appear in light blue, with streams in dark blue.

When considering the case study and the pilot section proposal, keep the following questions in mind:

- What is the situation? What issues are at stake?
- What is the context of the problem? What are the underlying assumptions of the case?
- What key facts should you consider?
- What questions do you have?
- What criteria should you use when selecting a route?

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- What alternatives are available? What are the pros and cons of each alternative?
- What other information, including maps, would be useful to have in making your decision?

The Public Hearing

Now that you are at the hearing, you must present your argument for the chosen route (based on your assigned role). Draft a short paragraph addressing the following questions:

- What route would you recommend — and why?
- What maps support your selection? How?
- What were your primary considerations when selecting your route?
- Are there other routes that you would be willing to consider based on your research?

Group Decision

If you were assigned to a group, each group member should report back on the four questions that are above. Once each group member has presented their rationale for their chosen route, you must attempt to get the group to agree on one route to put forth for the pilot section.

- Were you able to collectively decide on the most favorable route? If no, why not?
- Do you agree with the original pilot section route the Parks and Recreation Department chose? If not, which route did you collectively decide was preferable?
- What were the main factors in your decision?
- What information would have been useful to have available to help make this final decision?

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Appendix I: Glossary

Active Transportation: Any form of human-powered transportation – such as walking, cycling, using a wheelchair, in-line skating or skateboarding.

Alternative Transportation: Alternative Transportation promotes and encourages the use of alternative modes of transportation (e.g., bicycling, walking, vanpooling, carpooling, riding transit) to get to, from, and around destinations instead of a single occupancy vehicle.

Biodiversity: The variability among living organisms (plants, animals, genetics, habitats) from terrestrial, marine and other aquatic ecosystems, and the ecological complexes of which they are part.

Buffering: Occurs when streamside vegetation filters stormwater and protects stream banks

Case Study: An in-depth examination of a particular situation. It is a method used to focus a very broad field of research on one easily researchable topic.

Community Cohesion: Community cohesion (also called social capital and neighboring) refers to the quantity and quality of interactions among people in a community, as indicated by the degree residents know and care about their neighbors and participate in community activities (Cochrun 1994; LGA 2004; CASE)

Conservation: preservation, protection, or restoration of the natural environment, natural ecosystems, vegetation, and wildlife. Conservation activities include examination, documentation, treatment, and preventive care, supported by research and education.

Connectivity: Connectivity represents the pattern of core areas of potential habitat or cover that allow the movement of organisms across an intact or fragmented landscape. Landscapes with high connectivity allow species to move freely among core areas, while landscapes with low connectivity tend to isolate species within scattered patches of habitat.

Ecosystem Services: Outputs of natural ecological functions or processes that directly or indirectly contribute to human welfare, or have the potential to do so in the future (Boyd and Banzhaf, 2007).

Greenspaces: EnviroAtlas defines green space as all vegetated land, including agriculture, lawns, forests, wetlands, and gardens. Barren land, water, and **impervious** surfaces such as concrete and asphalt are excluded.

Greenway: A greenway is a long, narrow piece of land, where vegetation is encouraged, and is managed for public recreation and active transportation.

Habitat: The home or environment of a plant, animal, or other organism

Health Outcomes: A health outcome is a change in health, or lack of, following some factor or treatment. In the study of ecosystem services, this typically refers to environment-related changes in human health.

Inbreeding: Breeding with close genetic relatives over generations

Impervious: Impervious surfaces are that which do not allow fluid (water) to pass through them; examples include concrete and asphalt.

Mitigation: A human intervention to reduce negative impacts on the climate system; examples include strategies to reduce greenhouse gas sources and emissions restoring coastal wetlands to dampen storm surge.

Neighborhood Connectivity: Neighborhood connectivity refers to the relative ease and directness of getting from one place to another (e.g. from home to school) by road, path, or trail. One way to measure urban connectivity is with the density of street intersections.

Patch (habitat): Refers to an area of distinct habitat type that has a definite shape and is used by species for breeding or survival. The size of a given patch is typically an important consideration when determining habitat quality

Preservation: The protection of cultural property and natural lands through activities that minimize chemical and physical deterioration and damage and that prevent loss of informational content. The primary goal of preservation is to prolong existence.

Public Hearing: A meeting for receiving testimony from the public at-large on a local issue, or proposed government action. Testimony from both sides of an issue is usually recorded for public record and a report summarizing the key points is generated. All levels of government hold public hearings - from city on up to the national level. Hearings may also be

less formal - they may or may not be sponsored by a government body - and may not require that individuals from multiple sides of an issue get time to speak.

Restoration: Return of an ecosystem to a close approximation of its presumed condition prior to disturbance.

Siting: Determining where to position or locate a particular structure.

Social Capital: The sum of social interactions with other humans and connections within a social network; the idea that social networks have value.

Sustainability Plan: A common framework to guide efforts in improving the social equity, environmental, and economic conditions in a government jurisdiction. A sustainability plan ties together a community's goals, strategies, implementation plans, and metrics for improving sustainability.

Urbanization: The concentration of development in relatively small areas (cities and suburbs). The U.S. Census Bureau defines "urban" as referring to areas with more than 1.5 people per acre.

Vector Borne Diseases: Bacterial and viral diseases that are transmitted by a vector, typically mosquitoes, ticks and fleas.

Appendix II: Bibliography

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