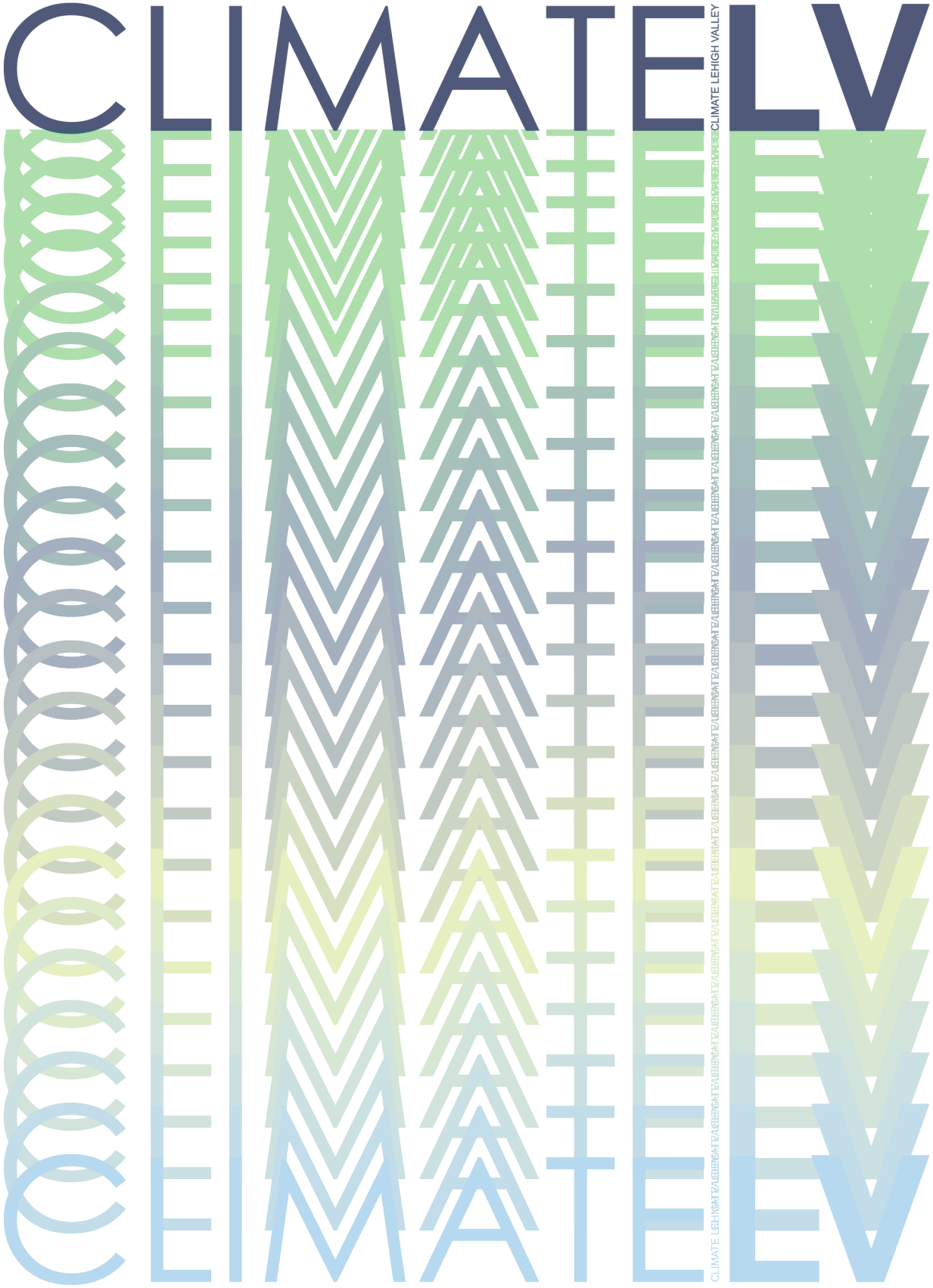
CLIMATE LV



LVPC Lehigh Valley Planning Commission

LVTS Lehigh Valley Transportation Study

A Regional Climate Action Assessment

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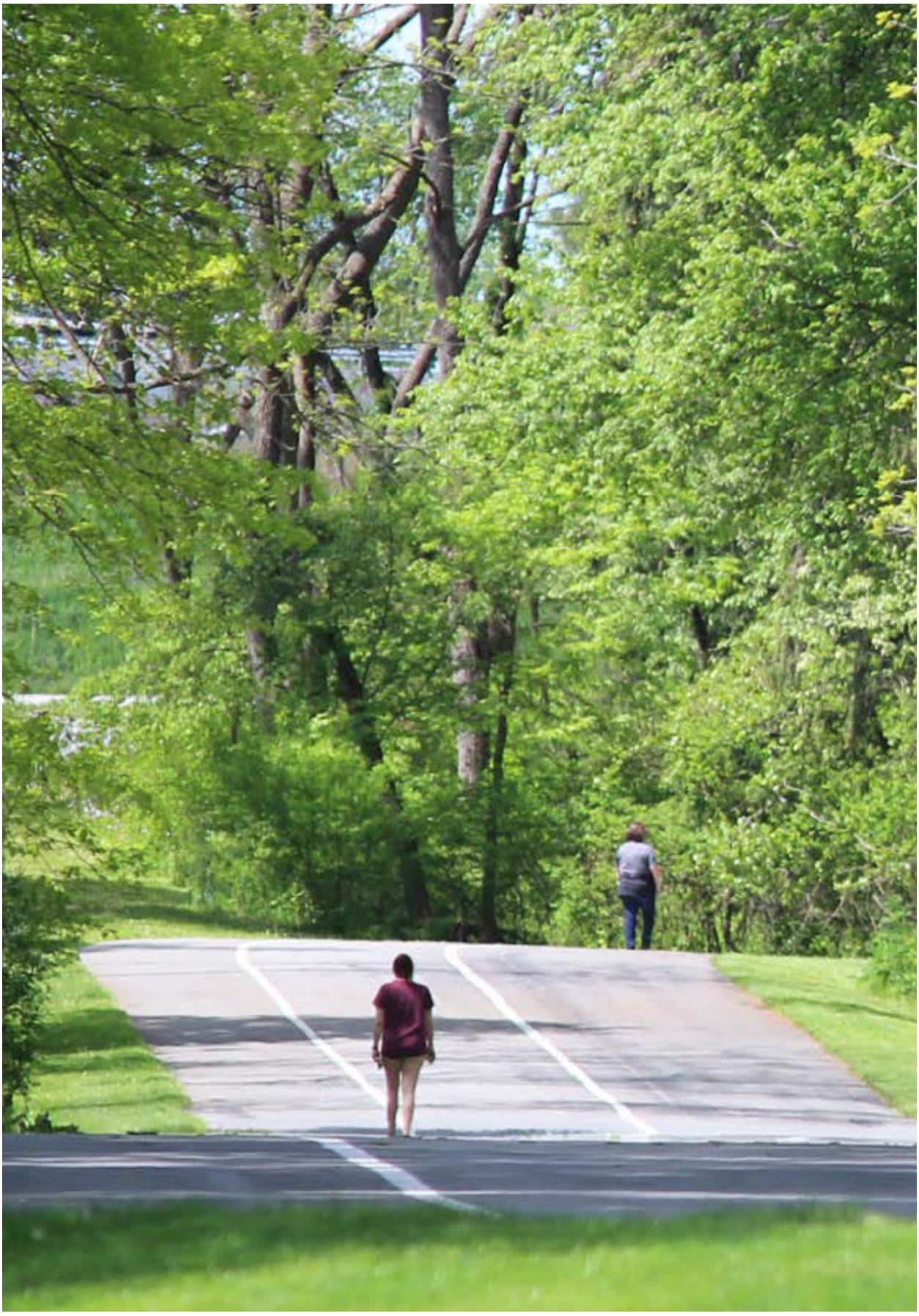

Bob Rodale Cycling + Fitness Park

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Introduction

The Lehigh Valley Planning Commission (LVPC) has a long history of planning for and promoting the protection of the natural environment. The LVPC's sister organization, the Lehigh Valley Transportation Study (LVTS), for decades has focused on reducing transportation-related emissions, protecting endangered species, floodplains and other environmental assets, as a means to improving safety. As the region grows, striking a balance of development while protecting the environment becomes increasingly critical to maintaining the region's high quality of life. Through numerous studies, plans and model regulations, the LVPC supports and reinforces the importance of environmental and climate resiliency throughout Lehigh and Northampton counties.

Climate change presents an unprecedented challenge to global environments, including posing a serious threat to the Lehigh Valley. Over the last decade, the region has experienced more intense storms, higher rainfall amounts, increased flooding, less snow and rising temperatures. We can expect these trends to continue with an increase in severity and frequency. Climate change mitigation and adaptation to these impacts will affect nearly every aspect of the Lehigh Valley's economy, health and natural environment.

Climate change planning is critical for Lehigh and Northampton counties and each of the 62 local municipalities. Initial climate action planning efforts are underway for Allentown, Bethlehem and Easton, which represent a significant portion of the existing urban environment and "carbon footprint" associated with buildings and public infrastructure. Gaining a complete understanding of each community's impact on climate change is a significant technical and financial undertaking. Greenhouse gas inventories, or GHG's, identify emissions that amplify the "greenhouse effect" in the atmosphere to trigger global warming. These emissions are associated with the burning of fossil fuels (oil, natural gas and coal) for heating, transportation, manufacturing and electricity generation, among other uses. A complete greenhouse gas inventory needs to identify the emissions under the control of the local government (heating and lighting buildings, fleet vehicles, providing utilities and municipal services), the purchase of electricity, steam, heat or cooling by municipalities and from emissions not directly under government control, such as employee commuting. Once greenhouse gas emissions are defined, a climate action plan defines the specific actions the local government can take to mitigate the emissions. Many local governments may not possess the technical or financial means to accomplish a greenhouse gas inventory or climate action plan. This is where climate action planning at the county and Lehigh Valley scale can benefit each local government within the region. A first step in the process is to establish a regional foundation in climate action planning that already exists through the various plans adopted by the LVPC, LVTS and Lehigh and Northampton counties.

The LVPC's existing plans explicitly address climate change through policies and actions. More broadly, however, the LVPC and LVTS plans promote principles of smart growth, economic savings, natural resource protection, green infrastructure and sustainability, among others, that further reinforce climate change mitigation and adaptation.

In fact, the counties, along with the LVPC and LVTS, took a leadership role in preparing for climate change in 2014 when, using a U.S. Housing and Urban Development Grant, participated

with a consortium of 16 government, quasi-government and non-profit organizations from around the region to set policy needed to build sustainable communities. The Policies and Actions in the *Climate + Energy Element* would become the climate change foundation for *FutureLV: The Regional Plan*, the Lehigh and Northampton counties' *Livable Landscapes* plans and the *Walk/Roll LV Active Transportation* plan to follow. The American Planning Association (APA) Policy Guide on Planning & Climate Change was extensively used to inform LVPC and LVTS policy identified within the *Climate + Energy Element*. To more broadly evaluate the respective plans for climate action, we've gone back to the APA guide to fully extract the direct climate implications of LVPC, LVTS and county policy expressed in the four documents adopted after the *Climate + Energy Element* set the standard.

Climate action is a continuous thread through foundational plans of the LVPC, LVTS and Lehigh and Northampton counties. The plans include:

Climate + Energy Element — The LVPC's *Climate + Energy Element* (2014) provides an overview of climate change and energy use and projects their impacts on Pennsylvania's water resources, aquatic ecosystems, forests, agriculture, human health and the economy. Climate change can have far-reaching effects, both positive and negative, on plant and animal ecosystems, biodiversity and various aspects of society, including human health, where people can live, the types of crops that can be grown and the economy. Within this element, the American Planning Association (APA) *Policy Guide on Planning and Climate Change* was utilized in the development of goals, policies and actions that can be effective in helping the region mitigate and adapt to climate change. The 10 overarching *Climate + Energy Element* goals that served as the foundation for the four future plans are:

- Protect, conserve and enhance natural ecosystems to provide long-term resilience to climate change.
- Protect public infrastructure from potentially harmful impacts associated with climate change.
- Protect residents, property and critical facilities from natural hazards as evolving over time due to climate change.
- Create a land use pattern that helps to mitigate climate change impacts through a compact urban development area, mixed land uses, higher densities in urban areas and through preserving land for agricultural and environmental purposes.
- Provide building and site design practices that help to mitigate climate change impacts.
- Reduce Lehigh Valley greenhouse gas emissions from residents, government and businesses.
- Promote energy efficiency and natural resource conservation within existing and new buildings and land development.
- Encourage alternatives to automobile use, both motorized and non-motorized.
- Support the diversification of energy sources.
- Advocate increased energy conservation and efficiency awareness.

FutureLV: The Regional Plan*,* combining the state-mandated regional comprehensive plan with the federal-mandated Long-Range Transportation Plan, sets the vision and direction to

525 **Goals, Policies, Actions + Strategies from the four plans relate to climate action**

Percentage of plan associated to an American Planning Association Climate Change Policy

74% *Lehigh County Livable Landscapes*

83% *Northampton County Livable Landscapes*

86% *FutureLV: The Regional Plan*

100% *Walk/RollLV: Active Transportation Plan*

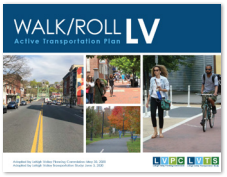
carry the Lehigh Valley to 2045 and beyond. This plan provides a blueprint for managing future growth, making the most of our assets, and promoting a region where everyone has access to health, opportunity and a livable neighborhood. It also represents the investment strategy for our transportation infrastructure to meet current and future needs, manage transportation-related emissions, improve transportation infrastructure resiliency and create options for non-automobile trips.

Walk/RollLV: Active Transportation Plan also works in partnership within the broader structure of the Long Range Transportation Plan in coordinating public transit, trail, sidewalk, bikeway and roadway systems to create a seamless regional transportation network that is safe and convenient. This plan promotes a multimodal transportation network that helps to achieve the region's health, safety, mobility, air quality, quality of life, recreation, tourism and environmental goals.

Livable Landscapes – A Park, Recreation, Open Space, Agricultural, and Historic Lands Plan for Lehigh County and Livable Landscapes – An Open Space Plan for Northampton County guides the conservation, restoration and enhancements of the counties' open space, cultural and natural resources.

Each of these plans contain a framework which broadly builds climate action throughout their many Goals, Policies and Actions. While it is not always explicitly defined as related to climate action, many of the plan's outcomes and overarching goals encourage climate mitigation and adaptation techniques throughout the region. To identify the full breadth of climate policy and action incorporated within these plans, each of them were analyzed for their relationship to the recommended climate strategies in the American Planning Association's (APA) Policy Guide on Planning & Climate Change. The APA Climate policies are organized into sectors that include local roles, land use, transportation, energy, green development, natural resources, economic development, hazards management, public health and public infrastructure. Under each of the plan's broadly defined goals, 86% of *FutureLV: The Regional Plan*, 74% of Lehigh County's *Livable Landscapes*

Climate Action Policy Themes

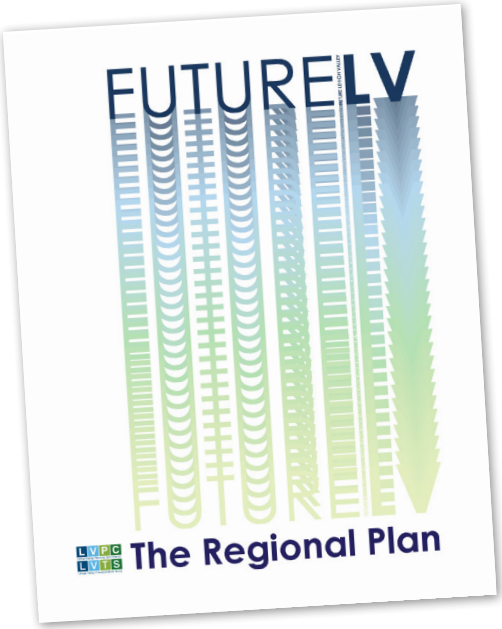


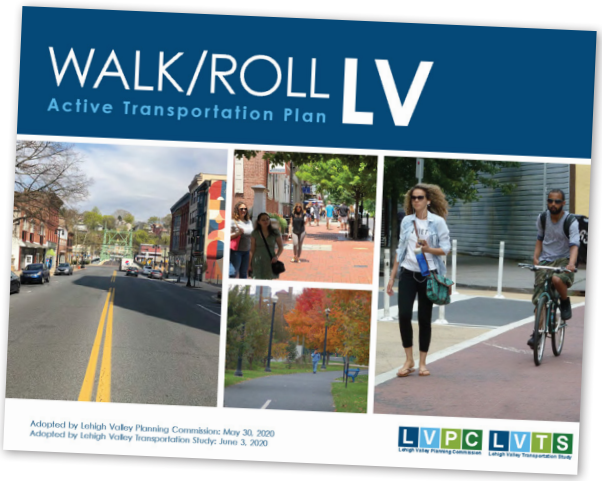
Plan, 83% of Northampton County's *Livable Landscapes Plan* and 100% of *Walk/RollLV* is associated with an APA Climate Change Policy. In total, 525 Goals, Policies, Actions and Strategies from the four different plans relate to climate action.

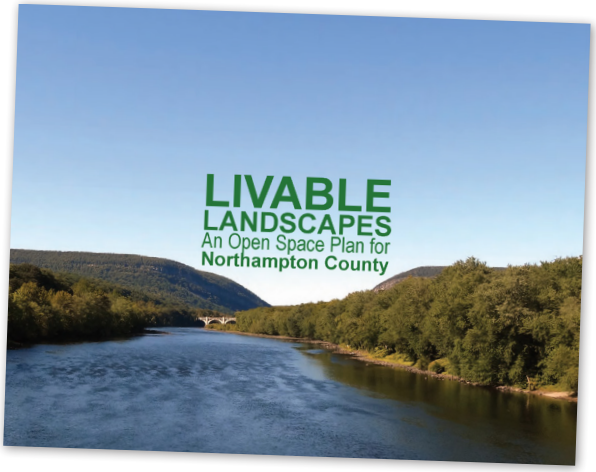
The APA policies most represented in the combined analysis of the four plans were natural asset protection, green infrastructure, a compact development form, agricultural land uses and practices, and local street network and design. These are all foundation concepts of Climate Action. The most represented APA policies in the four plans combined are shown in the included figure as the largest phrases in the word cloud. The APA Climate Change Policies that associated with a Goal, Policy or Action from the plans are displayed, with the size of the phrase depicting its relative number of occurrences.

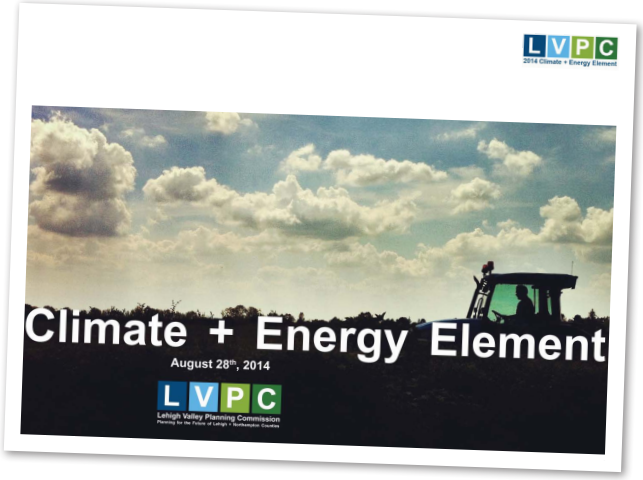
The results of each individual plan's climate analysis produced a distinct set of APA policies that were the most represented within each plan. In reality, all of the Lehigh Valley plans had elements of virtually all of the APA Policies, but to better quantify the climate action content in the regional plans, we chose to focus on the top five APA Policies represented by the Goals, Policies or Actions covered in each of these four plans. Collectively across the four plans, a total of 11 APA Policies were among the top five as associated to the Goals, Policies or Actions of the plans. We've listed those below, along with the Lehigh Valley plans in which those policies served as an underpinning foundation for the plan. As the regional plan that sets the vision and direction for the Lehigh Valley through 2045 and beyond, *FutureLV* is represented within every APA climate policy listed.

Policy Assessment









Natural Asset Protection

FutureLV, Lehigh County Livable Landscapes, Northampton County Livable Landscapes

Protecting important natural assets such as open space, wetlands and forests, is essential because they enhance long-term resilience to climate change impacts and serve as “carbon sinks” to sequester carbon from the atmosphere. *FutureLV: The Regional Plan* holds a ‘conservation first’ perspective that values High Conservation Priority Natural Resource Areas over other land use recommendations. Lehigh and Northampton counties’ Livable Landscapes plans recognize the many benefits of an open space network and promote the protection of natural areas, working farms, scenic resources, and vibrant communities interconnected with parks, greenways and trails. Ideas or recommendations related to natural asset protection were the most identified throughout *FutureLV* and reinforced in 27 of its Policies, Actions or Land Use Plans. Policies1.3 and 3.1 of *FutureLV* reinforce the Lehigh Valley’s commitment to conserving and preserving priority natural, historic, cultural, scenic, and agricultural assets for environmental and recreational benefits. Goal 1 in both Lehigh and Northampton counties’ *Livable Landscapes* plans specifically aims to conserve, restore and enhance natural resources, and include policies that implement Lehigh and Northampton counties’ commitment to preserving and protecting high conservation priority natural resource areas, wetlands, woodlands, core habitats and waterways.

Compact Development Form

FutureLV, Lehigh County Livable Landscapes, Northampton County Livable Landscapes

Through sustainability, smart growth and the promotion of walkable neighborhoods, planners have recognized the many advantages of a more compact development form. Increased density helps lower greenhouse gas emissions associated with buildings and transportation networks by reducing vehicle miles traveled. The increased density of a compact development form helps preserve land for agricultural, forestry and environmental uses. *FutureLV* includes 16 Policies, Actions or Special Sections related to the idea of creating a more compact development form. At the heart of *FutureLV* is a "Center and Corridors" concept that directs virtually all new development to the 57 activity Centers where people live, work and shop in the Lehigh Valley, and the transportation Corridors that connect them. An increased density in Centers and Corridors will increase activity and vibrancy within the communities, while also enhancing the region's resiliency to climate change. For example, under Lehigh and Northampton counties' *Livable Landscapes* Goal 6, implementation strategies include ensuring land acquired for open space is not converted to other uses.

FutureLV: The Regional Plan Historic Corridor Revitalization Concept of Hanover Avenue, Allentown.

Agricultural Land Uses and Practices

FutureLV, Lehigh County Livable Landscapes, Northampton County Livable Landscapes

With the Lehigh Valley's extensive agricultural economy, farming is key to the region's identity and environment. Agricultural land uses and associated practices, such as conservation tillage, managing livestock waste and forest preservation, represent important carbon sequestration opportunities. Additionally, agricultural land creates a strong market for local foods and products that reduce how far food must be transported to the dining table, which consequently reduces greenhouse gas emissions. *FutureLV* includes 19 Policies, Actions or Special Sections related to agricultural land uses and practices, and eight are related to local food climate initiatives. The actions in *FutureLV* Policies 3.3 and 4.4 encourage the preservation of farmland to provide open space and support agriculture as an essential component of the regional economy and rural character. Lehigh and Northampton Counties' *Livable Landscapes Plan* Goal 4 is to preserve farmland and farming to meet food production, economic and open space needs. Its policies encourage the purchase of agricultural easements in areas recommended for farmland preservation and the implementation of best management practices on farms.

Lehigh County Farmland.

The Protection of Agricultural Lands from Urban/Suburban Encroachment

FutureLV, Lehigh County Livable Landscapes, Northampton County Livable Landscapes

Protecting agricultural lands from urban and suburban encroachment by development will minimize the conversion of farmland and woodland, increases carbon sequestration opportunities, supports the local economy and retains rural character. In total, ideas of protecting agricultural lands from urban/suburban encroachment were found in Lehigh and Northampton counties' *Livable Landscapes plans* Goals, Policies or Actions. Specific policies in Goal 5 aim to reduce impacts of development in rural communities to retain the rural character of the Counties, as well as Goal 4, which includes protecting agricultural uses from residential development and non-farm activities that interfere with normal farming practices. Within *FutureLV*, Policy 1.1 aims to preserve natural areas and farmland by managing growth and development to enhance and strengthen cities, boroughs, suburbs and rural communities.

Northampton County Farmland.

Green Infrastructure

FutureLV, Lehigh County Livable Landscapes, Northampton County Livable Landscapes

Green infrastructure refers to an interconnected network of open spaces and natural areas, often used to manage stormwater and improve water quality. Examples include urban forests, parks, green roofs, natural drainage systems and low impact development. When communities utilize and enhance their natural environmental assets as an integral part of their infrastructure, they can reduce their impact on climate change and increase their ability to adapt to changes that may occur. Lehigh and Northampton counties' *Livable Landscapes* includes many Goals, Policies and Actions that emphasize green infrastructure improvements throughout Lehigh and Northampton counties. Specifically, Goal 3 promotes the conservation, restoration and enhancement of a greenways and blueways network, and Policies under Goal 1 emphasize the preservation of floodplains and riparian buffers to maintain their environmental value. Within *FutureLV*, the Canal Trail Concept specifically employs green infrastructure as an important part of reducing environmental impacts from stormwater and development. For example, constructing wetlands and rain gardens will help to clean and manage future stormwater, creating new habitats and improving the beauty of communities.

FutureLV: The Regional Plan Canal Trail Concept of Delaware & Lehigh National Heritage Corridor Trail – Eastside.

Integration of Land Use Planning and Transportation

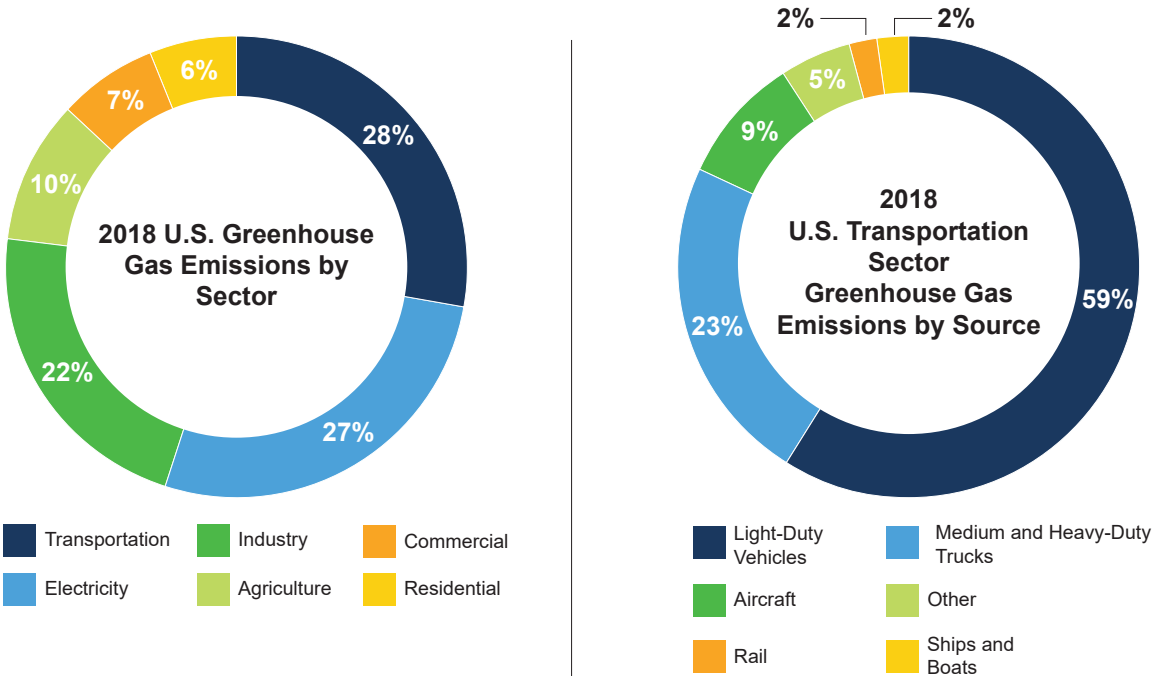
FutureLV, Northampton County Livable Landscapes, Lehigh County Livable Landscapes, Walk/RollLV

Incorporating planning for transit, bicycle and pedestrian networks within local and regional comprehensive planning can encourage development patterns that support multimodal transportation networks, complete streets and reduced trip lengths, as well as preserving open space, agricultural land and providing convenient trail networks. Through supportive land use-transportation decisions, the ability for residents to choose non-automobile travel modes for their trips reduces the amount of greenhouse gas emissions from vehicles. By closely integrating the planning for land uses and all forms of transportation, communities can make these transportation choices more realistic and desirable for residents. Within the APA Transportation and Land Use sectors, ideas relating to the integration of transportation with land use planning were found in many *Walk/RollLV* Recommendations and Strategies. Specifically, the recommendation within *Walk/RollLV* of Pedestrian-Supportive Land Use Regulation and Development Review includes how land use regulation and the development review processes strongly influence the pedestrian-friendliness of the region. In Lehigh and Northampton Counties' Livable Landscapes Plan, Goal 2 specifically aims to provide and maintain an exemplary park, trail and recreation system. Goal 2 includes policies that support using existing linear corridors for bicycle and pedestrian facilities, as well as encouraging trail linkage to create a network connecting residential areas, schools, parks, town centers, employment areas and other transportation facilities. Within *FutureLV*, Policy 2.1 supports the development of a mixed-transportation network that supports a more compact development pattern, optimizes roadway capacity and encourages alternative travel options. A mixed-transportation network and the creation of a compact development form coordinate land use and transportation decisions.

Local Street Network and Design

FutureLV, Walk/RollLV

Local street networks and complete streets encourage active transportation and provide easy connections to a variety of destinations that enable transportation choice, increased mobility, and a reduction in greenhouse gas emissions. Mixed-transportation corridors are designed to accommodate all users and multiple transportation modes, including walking and biking. Street design that includes right-of-way for existing or future transit options, pedestrian-friendly sidewalks, bicycle lanes and appropriate bike and pedestrian accommodation, plus safe pedestrian and bicycle crossings, encourage the reduced use of vehicles for short and long trips, and increase multimodal traffic capacity. By reducing the number and length of automobile trips, greenhouse gas emissions can be reduced. Climate action concepts related to local street networks were the most identified throughout *Walk/Roll LV* and reinforced in forty-two of its Strategies or Recommendations. A specific Recommendation within Chapter 6 of *Walk/Roll LV* supports complete streets and context-sensitive bicycle and pedestrian supportive design. Within *FutureLV*, Policy 2.3 encourages enhanced transit connections to improve mobility, and its Actions aim to enhance public transit service and pedestrian and bicycle facilities along corridors.



Source: United States Environmental Protection Agency

Transportation emissions do not include emissions from non-transportation mobile sources such as agriculture and construction equipment. “Other” sources include buses, motorcycles, pipelines and lubricants.

Transportation Demand Management and Systems Strategies

FutureLV, Walk/RollLV

For more efficient use of transportation resources and the reduction in vehicle miles traveled, transportation demand management strategies can be implemented locally and regionally. Transportation demand management strategies focus on changing travel behavior, including trip length, travel mode, time of day, etc. to reduce the number of vehicle trips and increase mobility options. *Walk/RollLV* includes 13 Strategies or Recommendations that focus on transportation demand management. A specific Policy and Program Recommendation within *Walk/RollLV* establishes a regional transportation demand management (TDM) program aimed at reducing single-occupancy vehicle travel and encouraging sustainable modes. Within *FutureLV*, an Action with Policy 2.2 aims to enhance incident management strategies, along with an action within Policy 5.1 that supports the implementation of complete streets and traffic-calming measures.

Daily Vehicle Miles Traveled in the Lehigh Valley

9.3 MILLION
in 1990

14.8 MILLION
in 2019

59%
in less than 30 years

Transportation Facility Siting and Community Design

FutureLV, Walk/RollLV

For the region to benefit from complete and highly connected streets, it is essential for community design and development review processes to secure rights-of-way and require transportation facilities that support public transit, bicycle and pedestrian networks in neighborhoods, communities and regions. Without transit, bicycle and pedestrian routes from a resident's neighborhood to a desired destination, travel will almost certainly involve a vehicle and therefore increase greenhouse gas emissions. *Walk/RollLV* includes 34 Strategies or Recommendations related to pedestrian facility design and transportation infrastructure siting that support highly connected streets. Specifically, Pedestrian Network Recommendations include design recommendations such as Connected, Accessible and Comfortable Sidewalks, Safe and Frequent Crossings and Pedestrian-Supportive Roadway Operations. In *FutureLV*, an Action under Policy 4.4 supports the connection of regional trails to Centers, Corridors and historic assets.

Image from *Walk/RollLV.*

Creation of Multimodal Transportation Corridors

FutureLV

Centers and Corridors are great places for the region to grow because they can support a variety of land uses, housing types and transportation options in one space. Multimodal transportation Corridors connect residential neighborhoods to social, cultural, and economic opportunities. Mixed-transportation corridor concepts within *FutureLV* support vehicles, walkers, rollers, bicyclists and public transit in one safe, quality space. Establishing and strengthening these routes can reduce vehicle congestion and create alternatives for travelers that lower greenhouse gas emissions as residents are encouraged to use alternatives to personal vehicles. *FutureLV* includes 13 Policies, Actions or Special Sections that emphasize multimodal transportation corridor improvements. Specifically, Policy 2.1 encourages development of a mixed-transportation network to support a more compact development pattern, optimize roadway capacity and encourage alternative travel options.

FutureLV: The Regional Plan MacArthur Road Concept in Whitehall Township.

Infill Development and Redevelopment

FutureLV

A land use policy that promotes infill development and redevelopment of existing neighborhoods accommodates new residents and expanding businesses within current infrastructure. The preservation of historic structures and the adaptive reuse of buildings preserves open spaces and carbon sinks, while reducing sprawl. In total, ideas of infill and redevelopment were found in 16 *FutureLV* Policies, Actions, or Special Sections. Policy 5.4's Actions emphasize these ideas and promote development that complements the unique history, environment, culture and needs of the Valley. When paired with good design, the creation of a compact development form, through the usage of infill development and redevelopment, can be a key tool that adds value to existing assets and protects the region's quality of life, while alleviating development pressure on farmlands and natural resource areas.

FutureLV: The Regional Plan Shopping Mall Redevelopment Concept of Whitehall Mall at MacArthur Road and Grape Street in Whitehall Township.

Conclusion

While these main climate themes are at the forefront of *FutureLV*, Lehigh and Northampton counties' *Livable Landscapes plans* and *Walk/RollLV* climate action, there are many facets in which the regional and county plans increase climate resiliency across the Lehigh Valley. The Lehigh Valley Planning Commission, along with Lehigh and Northampton counties, have recognized the increased threat climate change poses to the region. Through the regional and county open space plans for the Lehigh Valley, climate action that fosters new growth, the protection of natural resources and active transportation networks is strongly embedded throughout its Goals, Policies and Actions.

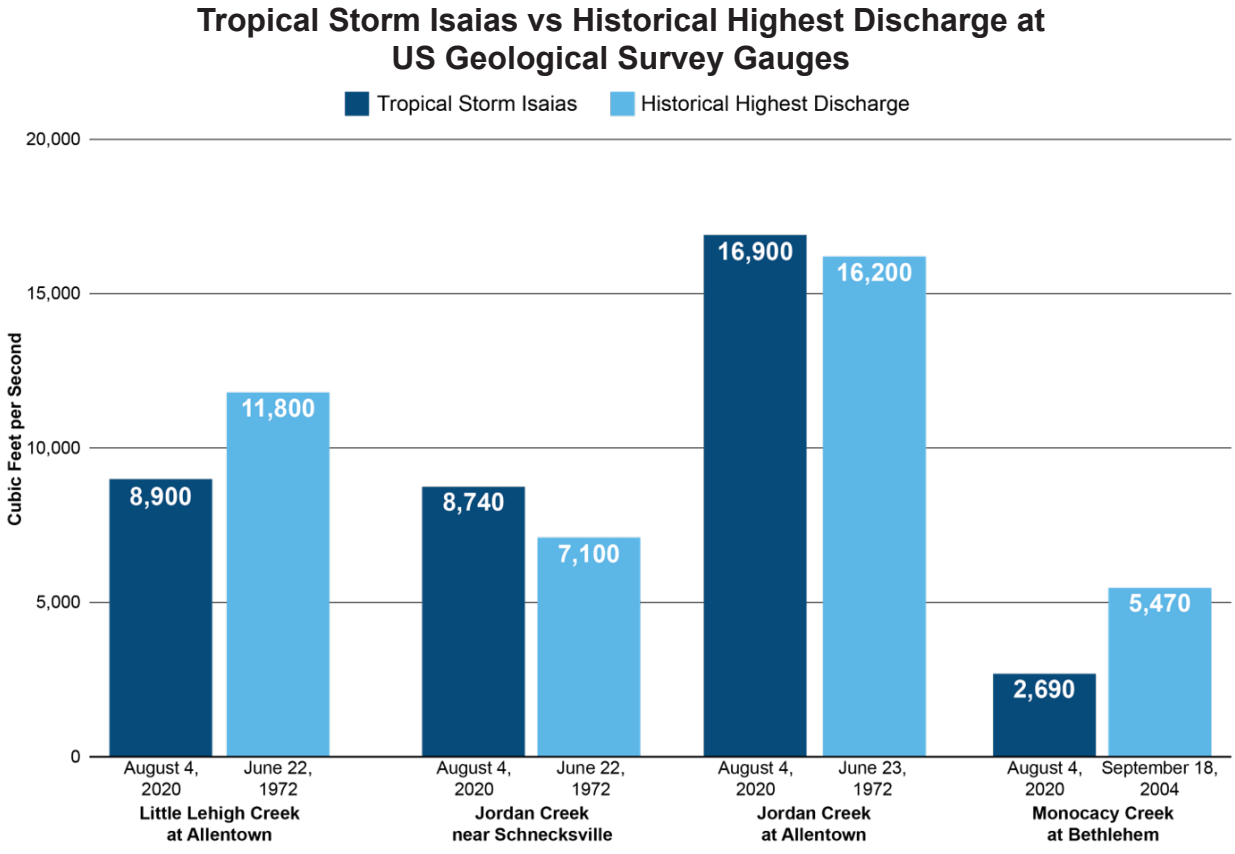
Climate change is having profound impacts on the Lehigh Valley as rising temperatures increase health concerns for sensitive populations, air quality is compromised, water resources and aquatic habitats are threatened, and enhanced natural hazards create risks to persons, property and infrastructure, among many impacts. Beyond the foundational goals, policies and actions established by the regional plans stated above, much more needs to be done. The next step in the process is working on behalf of both counties and the local municipalities to establish a greenhouse gas inventory for the region. Further steps are to create a process to engage Lehigh Valley businesses, residents, academic institutions, local governments,

Monocacy Creek runs through Bethlehem's Colonial Industrial Quarter.

county government and other interested persons in the discussion of the GHG inventory results, and the development of a work program for a regional climate action plan, culminating in the creation of *ClimateLV: The Regional Climate Action Plan* in coordination with our community engagement partners. The good news is the LVPC has already applied to participate with the PA Department of Environmental Protection Local Climate Action Program that starts later this summer and runs through Spring 2022. The program provides technical assistance to create the GHG inventory and subsequent climate action plan. The program works best with a hands-on approach by local partners, and we promise to accomplish that.

There are many other intended next steps as well. The *Lehigh Valley Hazard Mitigation Plan* was adopted in 2018 and is due to be updated by October 2023. The current plan addresses 25 natural and man-made hazards from flooding, droughts, extreme heat and winter storms to utility interruption and infectious diseases and pandemics. Although anticipated impacts of climate change are discussed in the plan, there is much more to do to fully prepare for the increased risks it brings for many hazards. COVID-19 issued a wake-up call, if needed, to be even more diligent in our risk assessments and mitigation actions.

Further, the greenhouse gas inventory has many implications for the Lehigh Valley transportation work program related to ensuring air quality is protected or enhanced with infrastructure improvements. Components of the greenhouse gas inventory can feed directly into the regional transportation air quality model and provide enhancements in our understanding of real impacts and direct policy moving forward.



Brodhead Road and Route 191 in Bethlehem Township.

Water management for the Lehigh Valley requires much greater attention as well. We need to remember no further back than August 2020 to Tropical Storm Isaias on how increased intensity of storm events can have great consequences. Peak storm runoff from Isaias in northwest Lehigh County was the highest ever recorded at local stream gages, leaving behind damage to transportation infrastructure (roads and bridges) in the millions of dollars. We now set aside specific funds in the LVTS Transportation Improvement Program for future storm damages, diverting the dollars away from many other critical transportation needs. We need to update our stormwater management planning to better account for climate change impacts, especially with requirements for green infrastructure components to project designs. We need to extend our stormwater management planning to assist local governments in meeting their ongoing and ever more restrictive obligations to improve stormwater discharge quality through the Municipal Separate Storm Sewer System (MS4) program. We also know we need to invest the same effort for when it doesn't rain—when drought grips the region and impacts agricultural productivity and threatens water supplies for daily needs. As development progresses, it is imperative to focus more fully on the direct relationships between land use decisions and water management using an integrated water management approach. And lest we forget, *FutureLV: The Regional Plan*, which embodies the regional comprehensive plan and the LVTS *Long-Range Transportation Plan*, is on a 4-year update cycle, which begins in 2022. This represents an opportunity to reinforce all these climate efforts in the master plan for the region to help guide the counties and municipalities to mid-century and beyond.

So much to do and all essential to ensure the Lehigh Valley accepts the challenge to get to the forefront of climate action.

Who's in?

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