



Connections 2050
PLAN for **GREATER PHILADELPHIA**
Policy Manual

Board-Adopted Version | September 2021



PA

NJ

MD

DE

New York City

Bucks

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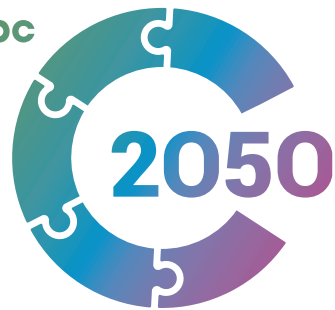
Wilmington

Baltimore

Washington, DC

THE DELAWARE VALLEY REGIONAL PLANNING COMMISSION (DVRPC) is the federally designated Metropolitan Planning Organization (MPO) for the nine-county Greater Philadelphia region. **DVRPC IS CHARGED WITH DEVELOPING A LONG-RANGE TRANSPORTATION PLAN THAT GETS UPDATED EVERY FOUR YEARS.** See the *Connections 2050 Process and Analysis Manual* for more information on the Plan’s development, outreach, analysis, and financial plan details.

dvrpc



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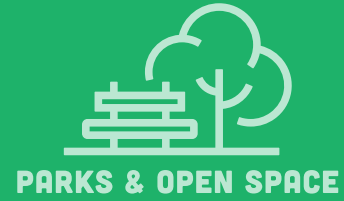
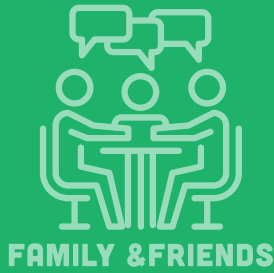
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TRANSPORTATION Connects Us



INTRODUCTION

2050 looms as a milestone year, when a number of major regional, national, and global goals hope to be achieved. These goals include a regional Vision Zero target of no deaths or serious injuries from transportation, net zero carbon emissions in the U.S., and United Nations' goals of building truly sustainable societies and no one exposed to unhealthy levels of fine particulate matter (PM_{2.5}).

There are substantial challenges facing Greater Philadelphia today, before even considering the extensive progress needed to achieve the above goals. Many of these challenges have come to the fore as the *Connections 2050* Plan was developed during an unprecedented period with a global pandemic, Black Lives Matter social justice protests, and events such as wildfires in California and Australia, and deep freeze from winter storm Uri in Texas that clearly show planet Earth is in a climate emergency.

An MPO's long-range plan must contain a vision for the orderly growth and development of the region and a fiscally constrained financial plan for how the region intends to invest reasonably anticipated transportation revenue.

While DVRPC is charged primarily with planning for transportation infrastructure, the Plan is broader than that in recognition that transportation is both affected by and affects other areas, including land use and communities, the economy, and the environment. Several efforts inform the Plan's

development through a review of current conditions, consideration of trends and forces shaping the region, and public outreach.

- ➔ The *Tracking Progress* regional indicator website measures how the region is performing relative to the Plan's goals and identifies regional strengths and weaknesses.
- ➔ Scenario planning considers how uncertainties associated with key forces shaping the region—such as digital technologies, rising inequality, and climate change—could play out in different ways. This range of plausible futures is used to help identify key strategies that can better achieve the vision.
- ➔ Broad input and support of regional planning partners, stakeholder groups, and residents. Information gathered through public visioning workshops, community conversations, DVRPC's committees, and a survey shaped the vision.

- ➔ A series of public and stakeholder strategy workshops informed the recommendations to achieve the vision

The VISION for 2050

The *Connections 2050* Plan is built on principles of **equity**, **sustainability**, and **resiliency**, which are applied to its four focus areas: the environment, communities, the economy, and multimodal transportation.

Plan PRINCIPLES

The following sections provide background information about the Plan's overarching principles.

EQUITY



The Plan advances Title VI of the Civil Rights Act and Environmental Justice (EJ) principles. Title VI of the Civil Rights Act states that “no person in the United States, shall, on the grounds of race, color, or national origin be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance.” EJ is defined by the federal government as, “identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States.”

The Black Lives Matter protests highlighted the continued importance for every sector to meaningfully implement equity-based and anti-racism policies. **The Plan aims to remove barriers and protect Civil Rights for the most vulnerable people, reduce poverty,**

increase economic mobility, and support racially and socioeconomically integrated communities. The January 6, 2021 attack on the Federal Capitol building and challenges to election results showed the fragility of our democratic system. In response, the Plan renews commitment to public outreach and participatory planning to hear more voices in the development of communities that we live in, and to increase everyone's access to the transportation infrastructure needed for all of our daily activities.

SUSTAINABILITY



The long-term sustainability of human civilization requires rapid and significant global reduction in greenhouse gas (GHG) emissions. GHGs trap heat in the atmosphere, causing climate change. The main source of regional GHG emissions is the burning of fossil fuels (primarily gasoline, natural gas, and heating oil) to move our cars, trucks, and buses, provide heat for industrial operations, and to generate the electricity used to heat, cool, and light our buildings and power our electric equipment. Other sources of GHG emissions include methane from agriculture and natural gas system leakages, oil refining, some industrial processes, and clearing land for buildings and roads. The planet will continue to warm with increasing atmospheric GHG levels. The amount and rate of climate change that will take place over the remainder of this century and into the next depends on the success or failure of global efforts to reduce GHG emissions. Lower emissions ensure less severe long-term impacts, while higher emissions will lead to an increasingly untenable future. **The Plan calls for reduction of GHG**

emissions to a net zero level by 2050 through renewable energy, energy management, the electrification of buildings and vehicles, and improving transit and nonmotorized travel options.

RESILIENCY



Even the most concerted global action to reduce emissions will have little impact on the climate change that will take place over the course of the coming decades due to the emissions which have already occurred, which means the region will need to become more resilient. **The climate the region experiences today will shift, exposing the region and its residents to new dangers and heightened risks.** Greater Philadelphia can expect increased episodes of extreme heat, more freeze-thaw cycles, fewer but more intense precipitation events, and sea-level rise in the coming decades. These changes are likely to amplify coastal, river and stream, and other inland flooding; harm coastal and inland ecosystems; disrupt fishing and farming; and increase human health risks. **Responding to these changes may require difficult actions to harden our communities and their infrastructure systems or move them out of harm's way.**

Plan FOCUS AREAS

The following provides background information on the focus areas, and a summary of what is in the Plan.

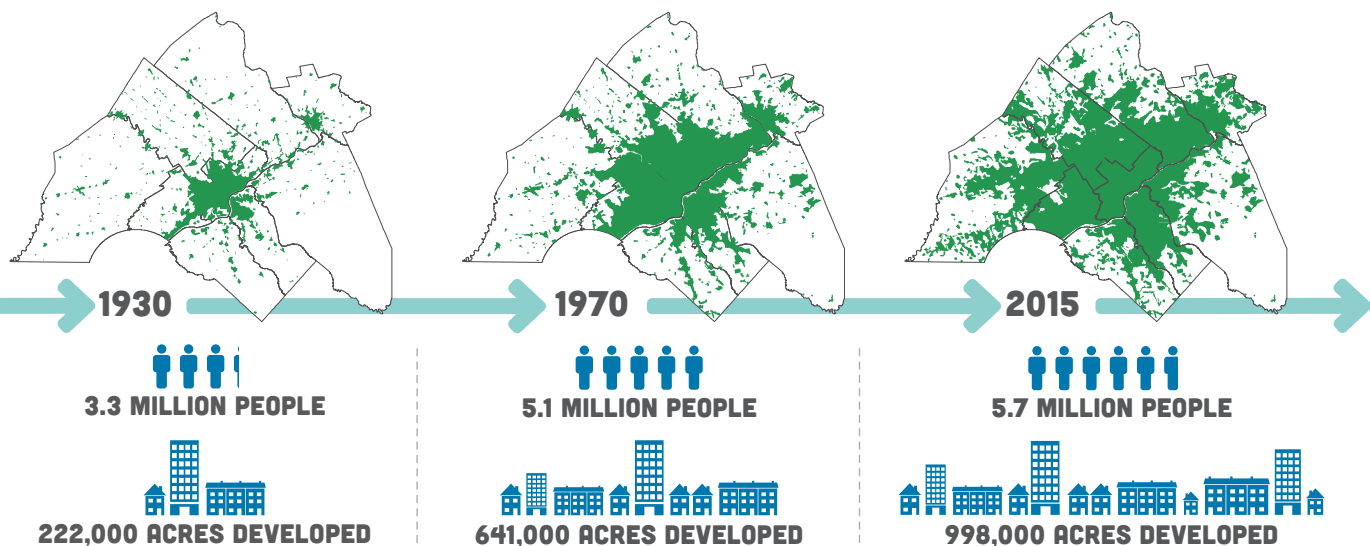
The ENVIRONMENT



Greater Philadelphia has shown a major commitment to protecting the environment by being a national leader in land preservation, with nearly 633,000 acres permanently protected. Despite this, 357,000 acres were developed between 1970 and 2015, an average of 22 acres each day over this 45-year period. This ongoing disappearance of open space negatively impacts air and water quality, the agricultural economy, wildlife habitat, outdoor recreation opportunities, and the region's character and quality of life.

The region does not meet federal National Ambient Air Quality Standards (NAAQS) for ground-level ozone and has only recently attained the standard for PM_{2.5}. Ozone forms when nitrogen oxides (NO_x) and volatile organic compounds (VOCs) combine in the presence of sunlight. NO_x emissions are mostly associated with power generation and transportation, while VOCs can come from a number of petroleum-based chemicals. PM_{2.5} pollution is made of tiny drops of liquid or particles that come from a variety of sources, such as diesel engines, power generation, or forest fires. Ground-level ozone and PM_{2.5} pollution are linked to a range of health problems—including breathing disorders, heart disease, and even premature death—that are especially problematic for the elderly, the very young, and people with cardiovascular diseases. **DVRPC is federally required to conduct an air quality conformity analysis to ensure the Plan's investments are consistent with the Clean Air**

EXTENT OF REGIONAL DEVELOPMENT 1930–2015



 | 2021

Act of 1990 and its subsequent amendments and state implementation plans for achieving the NAAQS. The continued protection and enhancement of natural amenities, air and water quality, open space, and farmland is a regional priority.

COMMUNITIES



The region's population is expected to grow by 440,000 people, or 7.6 percent, and employment by 445,000 jobs, or 14.6 percent (half of this growth accounts for the return of jobs lost during the pandemic), between 2020 and 2050. This growth can be sustainably accommodated by building

walkable communities and investing in more than 135 Plan Centers, in smaller Centers as identified in county and local plans, or as infill and redevelopment in the region's existing developed areas (see Land Use Vision map on page 37).

Centers are the cornerstone of *Connections 2050*. They are neighborhoods, districts, or downtowns that serve as focal points in the regional landscape and reinforce a sense of community for local residents. Centers provide a framework for efficient provision of water, sewer, and transportation infrastructure. Concentrating growth in and around Centers can preserve open space; reduce strains on our natural resources; and create inclusive, healthy, and walkable communities that offer a better quality of life for all residents.

MULTIMODAL TRANSPORTATION



The Plan adopts the Vision Zero planning philosophy, which aims to end fatal and serious injury crashes by protecting all roadway users through equitable engineering, education, and enforcement, while prioritizing speed control. Vision Zero recognizes that traffic deaths are not accidents; they are preventable incidents that can be systematically mitigated to eliminate the risk of a life-altering event on our regional roadway network. DVRPC facilitates coordination among county and municipal partners, state DOT's, and FHWA to bring data-driven safety improvements to both local and state roads. The region's data-driven *Transportation Safety Analysis and Plan* (TSAP) focuses on key regional emphasis areas for reducing roadway crashes, injuries, and fatalities. It is a living document that guides effective collaboration and coordination among safety professionals and stakeholders to address various road-user issues, including: intersection safety, impaired driving, roadway departure crashes, and pedestrian and bicyclist safety.

Protecting people from traffic crashes while using alternate modes is critical. **Walking, biking, and transit provide healthy and environmentally friendly transportation accessible to a wide range of users for a variety of trip purposes.** These modes are ideal for a Centers-based development pattern, offer

safer travel options and other health benefits, and can reduce congestion, GHG emissions, and air pollution. One effort that embodies the push to promote alternate modes is the 800-mile multi-use 'Circuit Trails' network. Today, 355 miles of this network are complete, with an additional 82 miles in design or under construction. When fully constructed, the Circuit Trails will connect urban, suburban, and rural communities with dedicated rights-of-ways separated from vehicular traffic.

The Plan also encourages deploying emerging technologies that can provide safety and mobility benefits. Transportation networking companies, bike-, e-bike, and e-scooter sharing, and highly automated vehicles (HAVs) all offer new ways of getting around and suggest a larger role for the private market in transportation services. Transportation systems management and operations (TSMO) applies multimodal, cross-jurisdictional services and projects to improve transportation network operations, security, safety, and reliability. DVRPC's TSMO Plan recommends viewing transportation as an integrated network, using technology and innovation to support TSMO strategies, obtain accurate real-time network conditions, promote cooperation among regional transportation and emergency management partners to proactively manage planned and unplanned events and to provide timely and accurate travel information to customers so they can make informed mobility decisions.

The **ECONOMY**



Until about 50 years ago, manufacturing had long dominated the economy of both the city and the suburbs, accounting for almost 60 percent of the region's jobs. As traditional heavy manufacturing employment declined with globalization, the region's economy has transitioned to more knowledge-based and digital industries. However, these jobs require a different set of skills than many workers in the region have. *Connections 2050* reiterates the goals and strategies embodied in *Growing Greater Philadelphia*, accepted by the U.S. Economic Development Administration as the regional Comprehensive Economic Development Strategy (CEDS). The regional CEDS was created and is maintained under the direction of a committee of state, county, city, and regional economic development and planning professionals. Through the regional CEDS process, **DVRPC is actively engaged in regional efforts to accelerate the transition to a more environmentally friendly economy, enhance workforce skills, and support inclusive growth.**

While the Plan focuses on creating more walkable, bikeable, and transit-oriented communities, there will still need to be more investment in roads and highways that prioritize higher-speed vehicle movement to increase access to high quality job opportunities, reduce congestion and commute time, and facilitate trade and connections to the national and global economy. The Plan stresses the importance of context-sensitive approaches, where transportation facilities

respond to their surrounding land uses, in the design and construction of facilities in these corridors

Strategies to **ACHIEVE** the **VISION**

Strategies to achieve the vision include policies, projects, actions, decision-making and other processes, education and outreach, and collaboration and partnerships. Fifteen high-level key strategies were identified from the feedback in the strategy workshops. These strategies aim to be consistent with the Plan's overarching principles and are aligned with the Plan's four focus areas, along with a set based on regional planning practices.

TRANSPORTATION Investments

The financial plan for investing in transportation infrastructure is developed to support the vision by:

- ➔ Forecasting reasonably anticipated revenue.
- ➔ Assessing an aspirational vision for transportation infrastructure across project categories: preservation for existing road and transit facilities and assets, operational improvements for existing facilities, expanding and improving bike and pedestrian infrastructure, expanding road and transit networks to address new growth, and other investment needs.
- ➔ Allocating reasonably anticipated revenue to project categories based on Plan policy and goals to ensure fiscal constraint.

➔ Evaluating and selecting Major Regional Projects within project categories; and

➔ Identifying local options to close the funding gap.

The financial plan is developed in close coordination with two federally required DVRPC programs: the Transportation Improvement Program (TIP) and the Congestion Management Process (CMP). The TIP is the regionally agreed upon list of priority transportation projects over a four-year period. The TIP contains a multimodal list of all projects that intend to use federal funds, along with all non-federally funded projects that are regionally significant for air quality conformity, with estimated costs and purposes. The Plan lists only the large-scale major regional projects that can advance within current funding projections. The hundreds of other projects in the TIP are consistent with and a part of the Plan.

The CMP's guiding principle is that transportation investments should support the Plan's land use goals and policies. It identifies and prioritizes the region's congested corridors and multimodal design and technology strategies to mitigate congestion. Regulations require projects that add single-occupancy vehicle capacity to be consistent with the CMP in order to be eligible for federal funding. These projects must include supplemental strategies to get the most long-term value. The CMP defines procedures for all federally funded major capacity-adding road projects, whether in congested corridors or not. Additionally, the CMP provides information about the performance of the regional transportation system and identifies inexpensive strategies appropriate almost everywhere to minimize congestion and enhance the mobility of people and goods.

TAKING ACTION

Ultimately the Plan is about transportation infrastructure. Infrastructure underpins our society and our economy and makes much of what we do possible. In order for the transportation network to continue to serve the region's residents and its economy, we must find the means to invest to modernize and improve the condition of our infrastructure, and we must coordinate across public and private sectors to make the necessary safety, information, multimodal, and reliability improvements needed for the digital age. At the same time, climate change and shifting ideologies around equity are joining with the Digital Revolution to drive change and reshape the region's economy, along with its environment, land use and communities, and the transportation network. DVRPC and its partners look forward to being a part of the dialogue and doing our part in making all these areas more equitable, sustainable, and resilient.

A major focus going forward will be to incorporate the Plan's strategies into projects and investments undertaken throughout the nine-county region and to ensure that decision-making is consistent with the Plan's vision and goals. **Many of the strategy recommendations contained within the Plan are for the region, and go beyond what DVRPC and its planning partners can do on their own. As a result, it is critical to continue to coordinate and build partnerships across the public and private sectors, as well as at the individual level to help implement the Plan. ▶**

Current CONDITIONS & TRENDS

To better understand what type of future we want, it helps to have a good idea of where we are as a region in the present day. The *Connections 2050* Plan uses quantitative indicators to comprehend where we are now and to track progress in achieving the vision and goals. The Plan's visioning outreach identified key regional values and concerns. The Plan was developed during a turbulent period due to the Covid-19 pandemic and Black Lives Matter protests, which are greatly shaping current conditions and trends, as well as the values and concerns that were expressed during the outreach. This section further explores each of these topics.

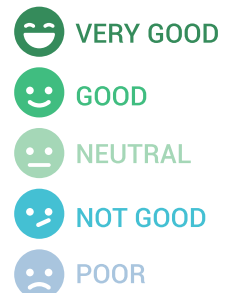
TRACKING PROGRESS Indicators


DVRPC utilizes meaningful, reliable, and easy-to-replicate data to track progress toward achieving the Plan's goals. Indicator data is compiled and presented in an interactive dashboard on the *Tracking Progress* website*. This data is used to better understand where the region is at a given time period, identify successful programs, align DVRPC's planning and implementation activities, and inform regional strategies.

*<https://dvrpc.org/TrackingProgress/>

The region's most positive trends in *Tracking Progress* are in bridge conditions, air quality, greenhouse gas emission reductions, housing activity, innovation, job growth, land consumption, and population growth. *Tracking Progress* identifies concerning regional trends around income disparities, pavement conditions, exported goods, roadway safety, and water quality. The Plan has adopted a regional Vision Zero goal to improve roadway safety, has elevated equity as an overarching Plan principle, continues to focus on achieving a state-of-good repair (SGR) for transportation infrastructure, and on expanding access to opportunity. ▶

TRACKING PROGRESS DASHBOARD





As part of identifying the regional vision, public outreach for developing the *Connections 2050* Plan asked participants to share what they value most about the region and what their concerns about the future are. The values and concerns heard in this dialogue reinforce the Plan's vision, principles, goals, and focus areas.

REGIONAL VALUES

Different aspects of quality of life and built environment, such as affordability, walkable and bikeable communities, vibrant neighborhoods, feeling of community, and sense of place.

Cultural amenities, entertainment venues, and history and historic sites.

Proximity to other places, access to mountains, beaches, and easily getting around the region and easy to get to places outside the region.

Multimodal transportation network, especially bike/pedestrian infrastructure, and transit service.

Diverse population, communities, and landscapes.

Green & open spaces, and parks & recreation.

The region's economy, including the education and medical sectors, and access to opportunity.



and **CONCERNS**

Environmental degradation, including air & water pollution, litter, and loss of tree canopy; and the impacts of climate change.

Aging infrastructure and lack of transportation funding.

Inequality, and inequitable development patterns, including lack of transit access for lower income and Black and Brown neighborhoods.

Sprawling development patterns contributing to automobile reliance and loss of open space, green space, farmland, and natural areas.

Rising cost of living, including increasing costs of housing.

Traffic congestion.

Regional economic decline over the last several decades and recovery from the pandemic recession in the near term.

Access to education, jobs, and training; and lack of school funding.

Viability of transit.

Quality of life, including public health, communities and neighborhoods, and crime and personal safety.

Government, leadership, civics, political will, and taxes.

Transportation safety, including lack of safe bicycle facilities.

COVID-19

The Coronavirus Disease 2019 (Covid-19) is a deadly, highly-infectious disease unlike anything the modern world has seen. The Covid-19 virus is primarily transmitted person-to-person through respiratory droplets that form through breathing, talking, sneezing, or coughing.

The pandemic has had a heavy human toll, with disproportionate impacts to Black, Latinx, and older adult populations. While older individuals have elevated risks due to compromised immune systems, the legacy of racism, exclusion, and environmental factors—urban heat islands, air and water pollution—along with economic, health, and social disparities in Black, Indigenous, and People of Color (BIPOC) communities are all being laid bare by Covid-19. There has also been a disturbing and unacceptable rise in racist attacks on Asian-Americans during the pandemic, with more than 2,500 incidents reported, with countless more unreported, across the U.S. between March and September 2020¹.

Surges in Covid-19 cases have overwhelmed hospitals and caused postponement of other needed health services. The pandemic has also reduced focus on the opioid epidemic. Long-term health concerns for Covid-19 survivors are still not well understood. The good news is that multiple vaccines have been authorized for distribution, giving hope of building herd immunity to the

virus in the near term, although fears and misinformation have slowed their distribution and prolonged the pandemic.

Spring 2020 lockdowns led to significant declines in vehicle miles traveled (VMT) and transit ridership, while regional trail use surged. After the lockdowns were lifted, VMT rebounded quicker than transit ridership, though it still declined nationally by 13 percent in 2020 compared to 2019. Covid-19 has shown how quickly urban areas can adapt to change, such as closing roads to vehicles to increase recreational space in dense neighborhoods, and repurposing parking spaces to expand outdoor dining areas for restaurants. These changes haven't been welcomed by everyone, particularly essential workers whose need to get to work or deliver goods were made harder.

Many analysts speculate that post-pandemic there will be more working from home, and some degree of transition away from transit and shared mobility toward personal vehicles. **Once the pandemic is over, there is a major opportunity to reset travel patterns and behaviors**—by continuing to give street space to parklets, eating areas, and bike and pedestrian uses—and use recovery investments to create a more equitable, resilient, and sustainable society.

¹Zijia Eleanor Song and Jennifer Vázquez, "Study Shows Rise of Hate Crimes, Violence Against Asian Americans During the Pandemic," NBC New York, February 11, 2021, www.nbcnewyork.com/news/local/crime-and-courts/study-shows-rise-of-hate-crimes-violence-against-asian-americans-in-nyc-during-covid/2883215/

BLACK LIVES MATTER Protests

Following the killings of Breonna Taylor, Ahmaud Arbery, and finally George Floyd in the summer of 2020, the U.S. and the Greater Philadelphia region erupted into protests demanding racial and social justice. These protests were largely supported by Black Lives Matter (BLM), an organization that has sought to combat and counter acts of violence against Black communities since 2013.

Transportation is not innocent in the systematic racism that has oppressed and disenfranchised BIPOC communities. In many areas, Interstates and highways were aligned in a manner that cut off Black neighborhoods from the wider community; transit systems were segregated through the 1950s; and aggressive police presence and harmful policies like 'stop and frisk' made public transit dangerous for Black and Brown communities to use. To this day, BIPOC people continue to feel unwelcome in certain public spaces; studies show taxis avoid picking up and dropping off in BIPOC neighborhoods; and there is often a lack of meaningful community engagement when planning transportation projects in low-income and marginalized communities. **It is clear that the transportation sector has a long way to go to make up for past transgressions and current shortcomings if it is going to equitably serve everyone.**

Ending racism and building an equitable society requires giving voice to disadvantaged Black, Brown, Latinx, and other marginalized communities. **BLM advocates urge undertaking difficult dialogue about the causes of community disinvestment, structural racism, environmental injustice, and unequal wealth distribution.** Even then, conversations about radical changes to transportation infrastructure should incorporate infrastructure basics in BIPOC communities to mitigate the disparities caused by racist legacies. Such measures include installing green infrastructure and ensuring appropriate drainage, reducing urban heat island disparities, improving air quality, upgrading underground utilities, creating accessible curbs and crossings, and installing adequate amenities and shade by adding bus shelters and tree canopy. **Truly transformative transportation projects must be developed through a collaborative process that incorporates the experiences of disenfranchised people.**

Alternate SCENARIOS & FORECASTS

A good long-range plan considers how key trends and forces may shape the region in the future. Scenario planning envisions a range of plausible futures which can be used to inform the Plan's vision, test the effectiveness of potential strategies, and guide decision-making. As part of developing the long-range plan, DVRPC is required to adopt an official forecast of population and employment through the Plan's horizon year to guide its planning activities.

DISPATCHES from **ALTERNATE FUTURES**

DVRPC and the Futures Working Group (FWG) collaborated on a scenario planning effort to understand how different forces and decisions we collectively make today could shape the future. The resulting scenarios are extreme, but plausible, futures built around an axis of uncertainty based on three driving forces shaping Greater Philadelphia:

Rising Inequality - The result of increasing wealth concentration between the rich and poor along with a shrinking middle class, including more inequality between regions as 'superstar' regions extract wealth from less successful areas in the digital economy.

Climate Change - Is expected to increase the region's precipitation levels through more intense storms, though with fewer precipitation events; sea level rise causing more coastal and nuisance flooding; rising temperatures with more variability; and more freeze-thaw cycles.

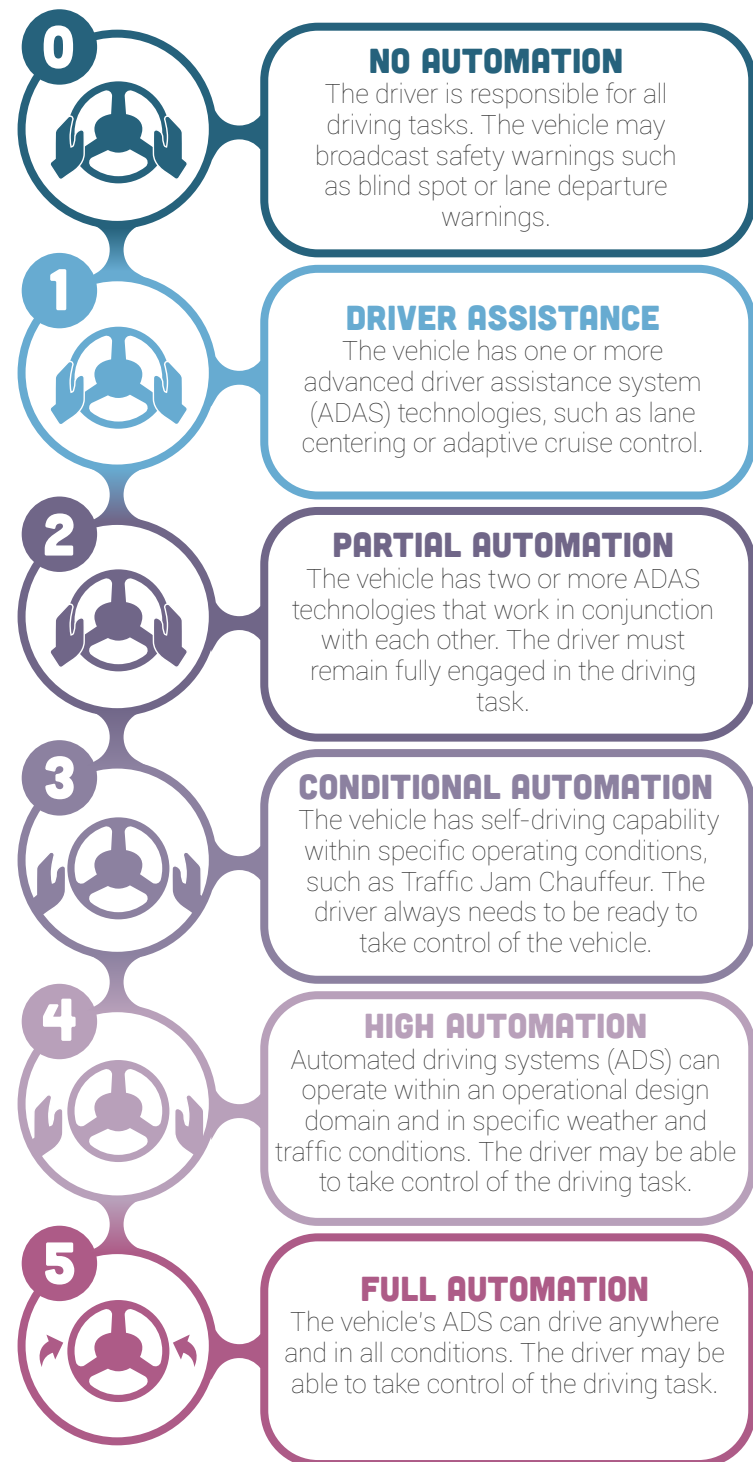
The Digital Revolution - Began with the emergence of computers, digital data storage, and the Internet, which have collectively shifted how humans communicate; changed the primary function of the economy from product manufacturing to information; and enabled software, automation, robotics, and outsourcing to replace low-skill jobs with high-skill ones.

Each scenario's story is told through a series of news articles from the future set around key topic areas of land use, transportation funding, transportation technology, the environment, the economy, equity, and demographics. ▶

FUTURE FORCES	SCENARIO	2020S HEADLINES	2030S HEADLINES	2040S HEADLINES
Incremental Technology and Deference to Market Forces	<p>Delayed Expectations Climate change, sharp political swings, ongoing civil discord, and a slowdown in innovation lead to a lack of direction and economic stagnation.</p>	<ul style="list-style-type: none"> - Climate Refugees Compound - Crisis on Southern Border - Congress Narrowly Passes Transportation Legislation, Shifts Funding Mechanism to VMT Fees - Following Fatal Passive Hacking Crash, Autodrive is the Latest Self-Driving Car Company to Shut Down Operations 	<ul style="list-style-type: none"> - Hedge Funds Become World's Largest Landlord - Gig Economy All That's Left? - Calls for Seed Banks to Be Opened to Curb Big Ag Impacts 	<ul style="list-style-type: none"> - 2040 Census: Greater Philadelphia Population Declines Amid Undercount, Hurricane, and Pandemic Concerns - Expectations Remain Delayed as Climate Solutions Remain Out of Reach
Incremental Technology and High Collective Action on Equity and Climate Change	<p>People Power Grassroots democracy gives citizens more input into the development of their communities and the economy, while readily available technologies are deployed to fight climate change.</p>	<ul style="list-style-type: none"> - Antitrust Suit Brought against Amazon - Aging Population Straining Universal Healthcare Programs - Federal Officials Investigate Truck Platoon-Related Crash on PA Turnpike 	<ul style="list-style-type: none"> - Extreme Weather Tipping Point for Decentralized Energy - Supreme Court Invalidates Single-Family Zoning - Transit Renaissance Continues as New SEPTA Regional Rail Line Opens 	<ul style="list-style-type: none"> - 2040 Census: Greater Philadelphia Still Growing Slowly - Community Organization Gives People Power
Transformative Technology and Deference to Market Forces	<p>Technology in the Driver's Seat Markets drive economic growth through Big Data, algorithms, and innovation.</p>	<ul style="list-style-type: none"> - Ready or Not, the Automated Vehicle Race Arrives in Philly Area - Digital Lives Not so Democratic after All - Eco-Suburban Housing Markets Are Heating up, but Are They Sustainable? 	<ul style="list-style-type: none"> - The Impacts of Congestion Pricing One Decade In - Ubiquitous Cryptocurrency Undermining the U.S. Dollar - American Bumblebee Officially Extinct 	<ul style="list-style-type: none"> - 2040 Census: Greater Philadelphia Growth Shifts to the Suburbs - Best of the Underground Press in 2041: <ul style="list-style-type: none"> - Not Just an Internet Thing: Sorting Also Happening in our Communities - It's a Bird, It's a Plane, It's a... Flying Taxi? - Algorithms and Big Data Put Technology in the Driver's Seat - Little Progress in Slowing Climate Change, Despite Technological Advances
Transformative Technology and High Collective Action on Equity and Climate Change	<p>Inclusive Tech A collaborative, networked, open source economy of abundance emerges from societal efforts to make technological advances more sustainable and equitable.</p>	<ul style="list-style-type: none"> - End of the Road for Brick-and-Mortar Retail? - Major Legislation Gives Hope Against Climate Change - Robotic 'Road Butlers' Coming to Crash-Prone North Philly 	<ul style="list-style-type: none"> - Payment for Personal Data Adds to Welfare State - Push for Programmable Roads as Carbon Tax Dwindles - Opinion: It's Time to Admit the Office Market Isn't Coming Back 	<ul style="list-style-type: none"> - 2040 Census: Greater Philadelphia Growth Still Driven by Foreign Immigration - Open Source, Inclusive Tech Allowing Everyone to Design Their Community

Preparing for EMERGING TRANSPORTATION TECHNOLOGIES

Preparing Greater Philadelphia for Highly Automated Vehicles utilizes the Dispatches scenarios to consider how HAVs could be deployed in the region. Automated vehicles (AVs) use on-board hardware and software to assist drivers or perform driving tasks. The Society of Automotive Engineers has identified different levels of vehicle automation. This is important, because most people often think immediately of the highest level of self-driving capability, though there will likely be a long transition period between current AV capabilities and full self-driving technology deployment. There will also likely be a long transition period before HAVs comprise the majority of the vehicle fleet. While Level 4 HAVs are beginning to appear on roads in the U.S. and around the world, Level 5 HAVs may still be decades away.



FUTURE FORCES	HAV SCENARIO	TRANSPORTATION VISION	HAV DEPLOYMENT	HAV DEPLOYMENT OUTCOMES
Incremental Technology and Deference to Market Forces	<p>Delayed Expectations HAV development stalls due to stagnant economy, worsening climate change, and technological shortcomings.</p>	No compelling vision for the future emerges, and the system muddles along without significant changes even as infrastructure conditions deteriorate.	While ADAS technologies become ubiquitous in the vehicle fleet, crashes and fatalities remain stubbornly high as warnings get tuned out.	Without HAV deployment, the status quo vehicle ownership model remains in place. There are only limited improvements to safety and access to opportunity.
Incremental Technology and High Collective Action on Equity and Climate Change	<p>People Power The Federal government advances truck platooning, connected vehicles, and automated shuttles.</p>	Focus on expanding bike, pedestrian, and transit systems.	Automated middle-mile goods movement takes off. Slow-moving automated shuttles expand transit service in suburban areas and integrate with existing transit networks. They also improve high-definition mapping for when Level 4 HAVs are deployed.	The slow roll out of HAVs allows for more trial and error, time to build public acceptance, development of public-private partnerships, and lets the industry address safety concerns in order to create a better final product.
Transformative Technology and Deference to Market Forces	<p>Technology in the Driver's Seat Level 4 HAVs roll out on the region's roads before most communities are ready.</p>	A private-market administered, HAV-based mobility-as-a-service (MaaS) network emerges.	Level 4 HAVs operate within an operational design domain (ODD) focused on limited-access facilities and suburban arterials, promoting a new round of suburban sprawl.	MaaS company subscriptions limit integration with other transportation options. While ODDs expand over time, Level 5 capabilities are not achieved by 2050. As gridlock worsens, HAVs begin to be disrupted by aerial passenger drones.
Transformative Technology and High Collective Action on Equity and Climate Change	<p>Inclusive Tech Open source principles and federal investments in quantum computing and artificial general intelligence bring about a wide variety of Level 5 HAVs in the mid-2030s.</p>	Create a nonprofit, integrated, multimodal MaaS network.	Federal innovation policy is geared to increasing the sustainability, equity, and safety of new technology leading to a wide variety of automated vehicles, which bear little resemblance to conventional human-driven cars, hitting the road.	These different modes and vehicle types are incorporated into a public and non-profit managed, open source MaaS network. Thanks to a focus on Vision Zero, safety culture has taken root across society, spreading well beyond the transportation sector.

NETWORKING TRANSPORTATION

Beyond HAVs, there are a number of transportation technologies converging to shape the future of transportation.

Connected vehicles (CVs) use licensed wireless and cellular networks, satellites, the Internet, and telematics to enable real-time communications between cars, trucks, buses, motorcycles, bicyclists, pedestrians, and infrastructure to enhance safety.

Electric vehicles (EVs), also called Plug-in Electric Vehicles (PEVs), are powered by an electric motor using electrical energy stored in batteries that are recharged by plugging into the electric grid. EVs include plug-in hybrid electric vehicles (PHEVs)—which have a supplementary internal combustion engine—and battery electric vehicles (BEVs), also known as all-electric vehicles (AEVs).

Shared mobility providers offer service through digital networks, which are typically accessed through a smartphone app that uses real-time data to match supply and demand. Different types of shared mobility include bikesharing, including electric bicycle (e-bike) options, electric-scooter (e-scooter), carsharing, courier networking services (offering on-demand delivery of goods, groceries, and take-out food), and transportation network companies (TNCs).

Digital communications technologies offer real-time information and communications through a variety of digital devices and automated data collection systems, which are critical to enabling shared mobility. They also support travel routing and navigation tools and apps, such as Google Maps, INRIX, Waze, and SEPTA and NJ TRANSIT apps. These tools can optimize trips based on travel time, cost, available modal options, and identify the quickest and most direct route. They can route people and vehicles away from congested facilities and onto less congested ones, reducing travel time and congestion. Though, these routes sometimes inappropriately go through residential neighborhoods.

Digital technologies enable transportation agencies to manage road and transit networks in real time. A variety of other applications can gain new efficiencies through dynamic carpooling, freight apps that allow small trucking carriers to transact directly with shippers, multimodal apps and mobility-as-a-service (MaaS) aggregators that provide multimodal real-time travel and cost information, parking apps that provide space availability, person-to-person rentals, taxi apps that operate within the taxi medallion framework, and easier payment options for all the above.

The combination of these new and emerging modes and digital technologies is to integrate them all together into a MaaS network. MaaS could change the current transportation model from vehicle ownership to individual rides and monthly subscriptions as the main way to pay for mobility. Each trip is made using the best available mode using real-time travel information, found through an app that simplifies payment across service providers.

Level 4 HAVs may be used as shared mobility robotaxis within defined ODDs and automated shuttles could be either hailed on demand or operate fixed route service within MaaS services, if they are able to operate without a safety driver. Level 5 HAVs could greatly strengthen the potential for MaaS, but their capabilities may generate strong consumer interest in owning their own HAV.

Ultimately, these technologies will be beneficial only if deployed in a manner that is consistent with the Plan's vision and goals. That is, **they should improve safety, reduce dependence on vehicles and vehicle ownership, increase the efficiency—including the energy-efficiency—of the transportation network, improve first- and last-mile transit connections, and expand everyone's access to opportunity.**



POPULATION and EMPLOYMENT FORECASTS

The pandemic has impacted existing regional trends around an aging population and slowing birth rates, while international immigration, long the primary source of regional population growth, has declined significantly. Change in domestic movement in or out of the region is less certain.

Given these trends, the region is projected to see moderate levels of **population growth in the coming decades, with a forecast increase of 7.6 percent, or 440,000, more people from 2020 to 2050.** The highest absolute growth is in Chester and Montgomery counties, and the highest growth rates are in Chester and Gloucester counties. Many of the new households formed in the future will likely have just a single person or couple without kids living in them. Around 20 percent of the population is projected to be over 65 in 2050, compared to 13 percent in 2020. Empty nesters looking to downsize and benefit from more communal living have been increasingly willing to rent.

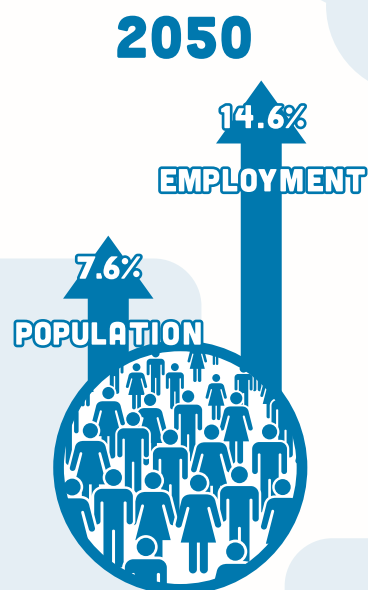
The region experienced strong employment growth in the 2010s before the pandemic led to record unemployment

applications, peaking at nearly 7 million in early April 2020. At that time, the nation's unemployment rate hit 14.7 percent after being just 3.5 percent in February 2020. While many experts initially forecasted a long recession, high household savings levels—as consumers have been social distancing and less able to spend money—and a fast rising stock market suggest a potential strong post-pandemic economic recovery. Even so, it's not clear that the economic recovery will equitably benefit all income groups.

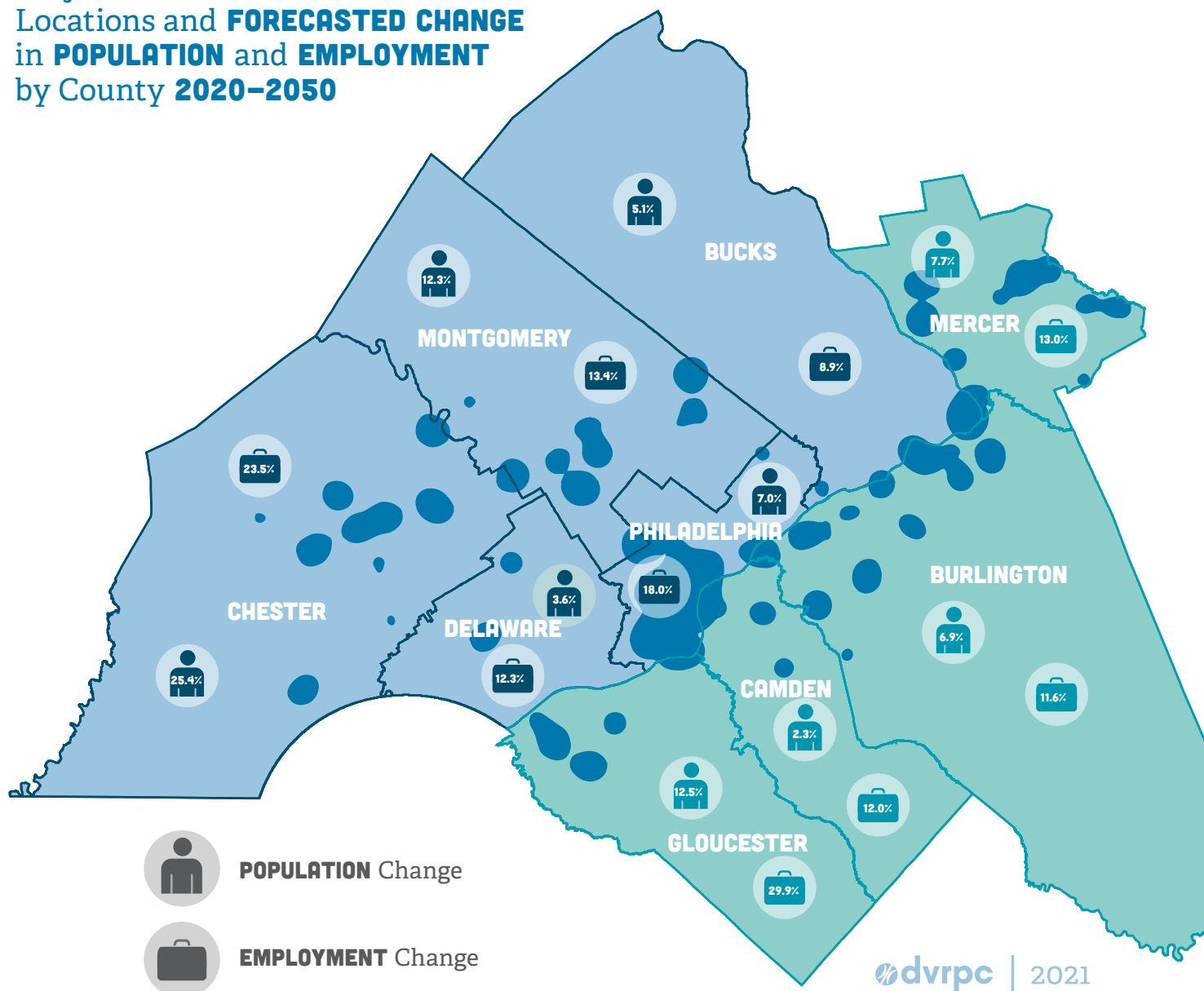
The region's employment is forecast to increase by 14.6 percent, or 445,000, jobs from 2020 to

2050. More than half of the forecasted jobs growth accounts for a rebound from low employment levels during the pandemic, with steady growth after the recovery. The sectors that grow post-pandemic are likely to be different from what existed pre-Covid. Increasing e-commerce during the pandemic has spurred demand for light industrial warehouse space, with an estimated 92 million square feet currently proposed or under development in the region.

Future growth across the region will ultimately be the result of larger trends and forces, public policies ranging from local zoning to federal programs, and individual decisions. With limited revenue available to improve transportation infrastructure, the Plan will focus investments on projects that best meet the needs of the region.



Projected **FUTURE DEVELOPMENT**
Locations and **FORECASTED CHANGE**
in **POPULATION** and **EMPLOYMENT**
by County **2020–2050**



POPULATION Change



EMPLOYMENT Change



AREA with Projected **HIGH-LEVEL**
of **DEVELOPMENT ACTIVITY**

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Areas projecting high-levels of future development were identified through residential and commercial development pipeline data for all nine counties, which informed the population and employment forecasts.

VISIONING – What We Heard

“Extensive car-free corridors and downtowns, dramatically increased spending on street trees and parks; so none of these things will be rare; thus hopefully limiting risks of gentrification...”

“Legalization of multi-family housing in all areas of the region.”

“Seamless automated private and public transport to provide access from anywhere to anywhere, to both reduce GHG emissions and to improve access to jobs and work for people in underserved neighborhoods.”

“To be the region looked upon by the nation as the definitive leader in social change, technological transition, urban and suburban environmental quality.”

“Black women have [the] same quality access to jobs, housing, healthcare, and education as white men.”

“More economic growth and opportunity for all residents,

greater investment in transit and open space,

fewer structural incentives favoring auto-centricity / sprawl.”

“A welcoming community where people from a variety of backgrounds and with a variety of belief systems can live in harmony with mutual respect in an environmentally and economically sustainable way.”

“We build on our strengths — diversity, quality of life, a great place to live and visit, pharma, higher ed, technology ... , good place for all ages, affordability, attracting new companies and many more small vibrant businesses representing the diversity of our region.”

“An economy that has a goal of making society better, not individuals wealthier.”

All quotes on this page come directly from participants in the Plan's visioning outreach.

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VISION for 2050

At the heart of a long-range plan is a broadly shared vision for where we collectively want the region to be in 30 years, which is generated through wide and far-reaching public input. The *Connections 2050* vision is: An **EQUITABLE, RESILIENT,** and **SUSTAINABLE** Greater Philadelphia region that:

Preserves and restores the natural **ENVIRONMENT.**

Develops inclusive, healthy, and walkable **COMMUNITIES.**

Maintains a safe, multimodal **TRANSPORTATION NETWORK** that serves everyone.

Grows an innovative and connected **ECONOMY** with broadly shared prosperity.

The Plan's focus areas are the environment, land use and community, the economy, and transportation. These are the most prominent topical themes in the 2050 visioning outreach. Each one is also highly relevant to DVRPC's work and mission. Equity, resilience, and sustainability are Plan principles, the most prominent policy-oriented themes from the 2050 visioning outreach and the lenses through which the Plan's focus areas are viewed.

The Greater Philadelphia region is committed to...



EQUITY - the just and fair structuring of society where everyone can participate, prosper, and reach their full potential; including extensive, restorative, and accessible civic dialogue and engagement that gives everyone a meaningful voice in public decision-making processes, with a particular focus on communities that have historically been marginalized and disenfranchised.



RESILIENCY - includes planning in advance so as to minimize the vulnerability of people and infrastructure to hazards and emerging threats such as extreme weather, pandemics, recessions, and other shocks to economic, environmental, transportation, and land use systems; and the ability to manage and recover quickly from these threats and hazards when they do happen.



SUSTAINABILITY - the ability to meet present needs without compromising the ability of future generations to meet their needs, particularly in making policy and investment decisions that stand the test of time by incorporating environmental, economic, and social considerations.



Develops inclusive, healthy, and walkable **COMMUNITIES.**



Preserves and restores the natural **ENVIRONMENT.**





Maintains a safe, multimodal **TRANSPORTATION NETWORK** that serves everyone.

Grows an innovative and connected **ECONOMY** with broadly shared prosperity.

This regional **VISION IS INTENTIONALLY BROAD AND EXTENDS OUTSIDE DVRPC'S TRADITIONAL SCOPE** and programs. Achieving **THE VISION WILL REQUIRE substantial INDIVIDUAL AND COLLECTIVE ACTIONS, AND EFFORTS** that go well **BEYOND THE STATUS QUO** and will need to reach past what DVRPC and its planning partners can do on their own. The following section highlights the goals for each of the Plan's focus areas and how they relate back to the principles. While each individual goal is only listed once, they are often applicable to more than one focus area. The next section identifies key strategy recommendations for achieving the vision and goals.

PRESERVE and RESTORE the NATURAL ENVIRONMENT

Parks, natural areas, and farmland improve air and water quality, reduce stormwater runoff, enhance health and well-being, provide wildlife habitat and biodiversity, boost property value, and increase access to healthy, locally-produced food. Within the built environment, studies have shown many benefits to people when they are surrounded by trees and vegetation in their communities and the buildings where they spend their time. These include reduced stress and blood pressure, increased cognitive function, mental stamina and focus that improves worker productivity and learning outcomes, lowered crime rates, and better moods². Goals for preserving and protecting the natural environment include:



Permanently protecting one million acres of open space by the year 2040 focused on the region's critical greenspace network and conservation focus areas.



Reducing greenhouse gas emissions to net zero by the year 2050 and preparing communities for the impacts of climate change.



Decreasing air and water pollution.



Increasing local food production, distribution, and access.



Bringing nature and ecological functions back into developed communities to enhance livability and well being, reduce flooding risks, and mitigate the heat island effect.

An **EQUITABLE ENVIRONMENT** provides clean water, clean air, and a healthy ecosystem for current and future generations, along with easy access to parks, recreation, and open space—with a focus on improving access for communities most lacking in natural amenities.



² Terrapin Bright Green. *The Economics of Biophilia: Why Designing with Nature in Mind Makes Economic Sense* (New York, NY: Terrapin Bright Green, 2012) www.terrapinbrightgreen.com/wp-content/uploads/2012/06/The-Economics-of-Biophilia_Terrapin-Bright-Green-2012e.pdf.

A **RESILIENT ENVIRONMENT** is prepared for new risks from extreme heat, more freeze-thaw cycles, more intense precipitation events, and rising sea-levels. Environmental resiliency efforts do not place undue burdens on historically marginalized and disenfranchised communities.

A **SUSTAINABLE ENVIRONMENT** reduces greenhouse gas emissions and maintains a healthy level of greenhouse gases in the atmosphere over time. Sustainability efforts do not place undue burdens on historically marginalized and disenfranchised communities.

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DEVELOP INCLUSIVE, HEALTHY, and WALKABLE COMMUNITIES

Connections 2050 envisions developing new and supporting existing places that are affordable and inclusive, provide multimodal and active transportation, and have safe and easy access to parks and open space. These are communities where walking, biking, and transit can help meet daily activity and fitness recommendations, which provides health benefits, and improves social cohesion. They are places where affordable housing is available to all families across the income spectrum. Housing is a central issue for equity, key to public health—as it provides a place to access basic needs and have familial and social interactions—and critical to making the regional economy an attractive location. The Plan sets the following goals for developing inclusive, healthy, and walkable communities:



Preserve existing and build more accessible and affordable housing, reducing how much of a household's income is spent on combined housing and transportation costs.



Foster racially and socioeconomically integrated neighborhoods, and advance EJ for all the region's inhabitants.



Invest in community schools and amenities such as parks, trails, sidewalks, bicycle lanes, pedestrian plazas, and open space.



Focus growth in mixed-use, walkable Plan Centers across the region, and promote vibrant main streets and downtowns and live/work opportunities.



Preserve historic and cultural resources.

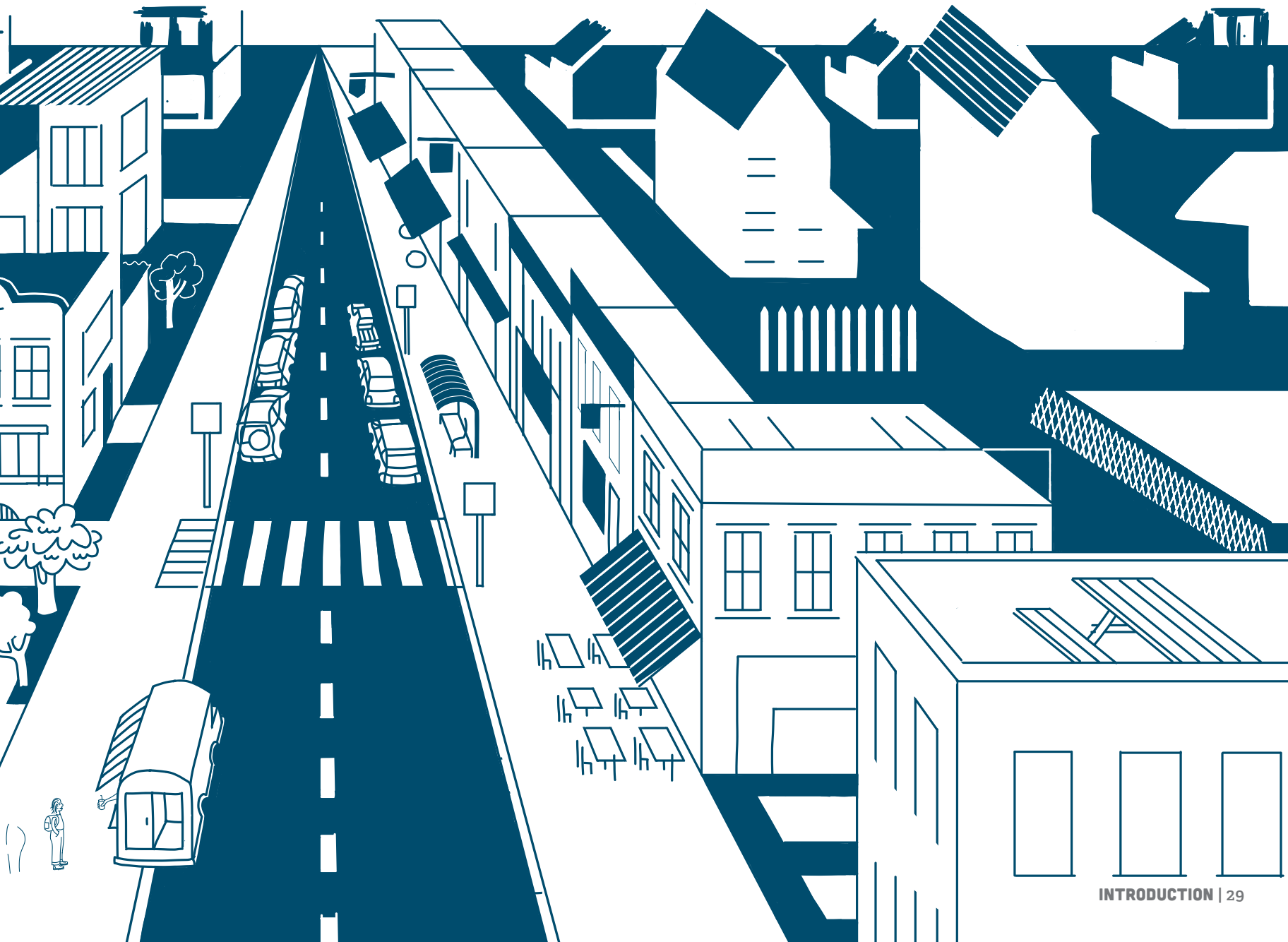
EQUITABLE COMMUNITIES are affordable, socioeconomically integrated, safe, accessible, and built for all ages, from eight to eighty. They offer easy access to parks, grocery stores, transit, and jobs; and accommodate growth without displacing the existing population.



RESILIENT COMMUNITIES are places with strong social, physical, and economic resources that help residents weather adversity, return quickly to normal life and avoid adverse impacts from extreme weather events, economic downturns, and other disruptions.

SUSTAINABLE COMMUNITIES use centers-based development patterns to make efficient use of infrastructure and enable growth with less consumption of energy, land, and other resources.

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Maintain a **SAFE, MULTIMODAL TRANSPORTATION NETWORK** that Serves **EVERYONE**

Greater Philadelphia has an enviable transportation network with major highways, an extensive transit system, expansive walking and biking facilities, and an international airport. However, many aging transportation facilities will need to be reconstructed and modernized in the coming decades. Additional investment is needed to deploy emerging technologies. The region's transportation agencies will need to do more with constrained funding and find ways to generate new revenue. Goals for maintaining a safe, multimodal transportation network that serves everyone and expands access to opportunity:



Rebuild and modernize the region's transportation assets to achieve and maintain an SGR, including full Americans with Disabilities Act (ADA) accessibility.



Achieve Vision Zero—no fatalities or serious injuries from traffic crashes by 2050.



Integrate existing and emerging transportation modes into an accessible, multimodal MaaS network, which collects real-time data, and uses it to plan and pay for travel using the best option available. Transit, walking, and biking—including the Circuit Trail system—are integral components of this network.



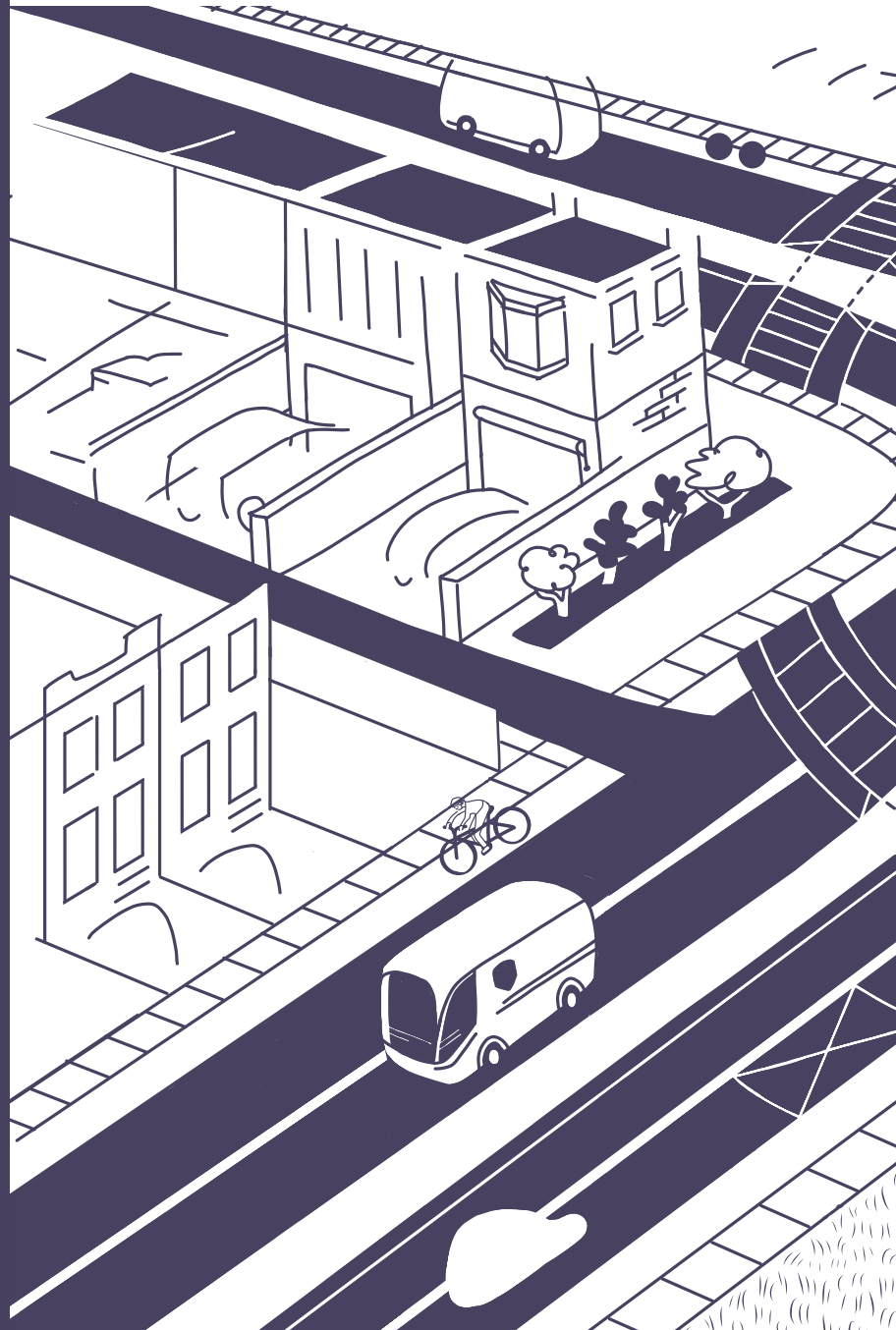
Increase mobility and reliability, while reducing congestion and vehicle miles traveled.



Strengthen transportation network security and cybersecurity.

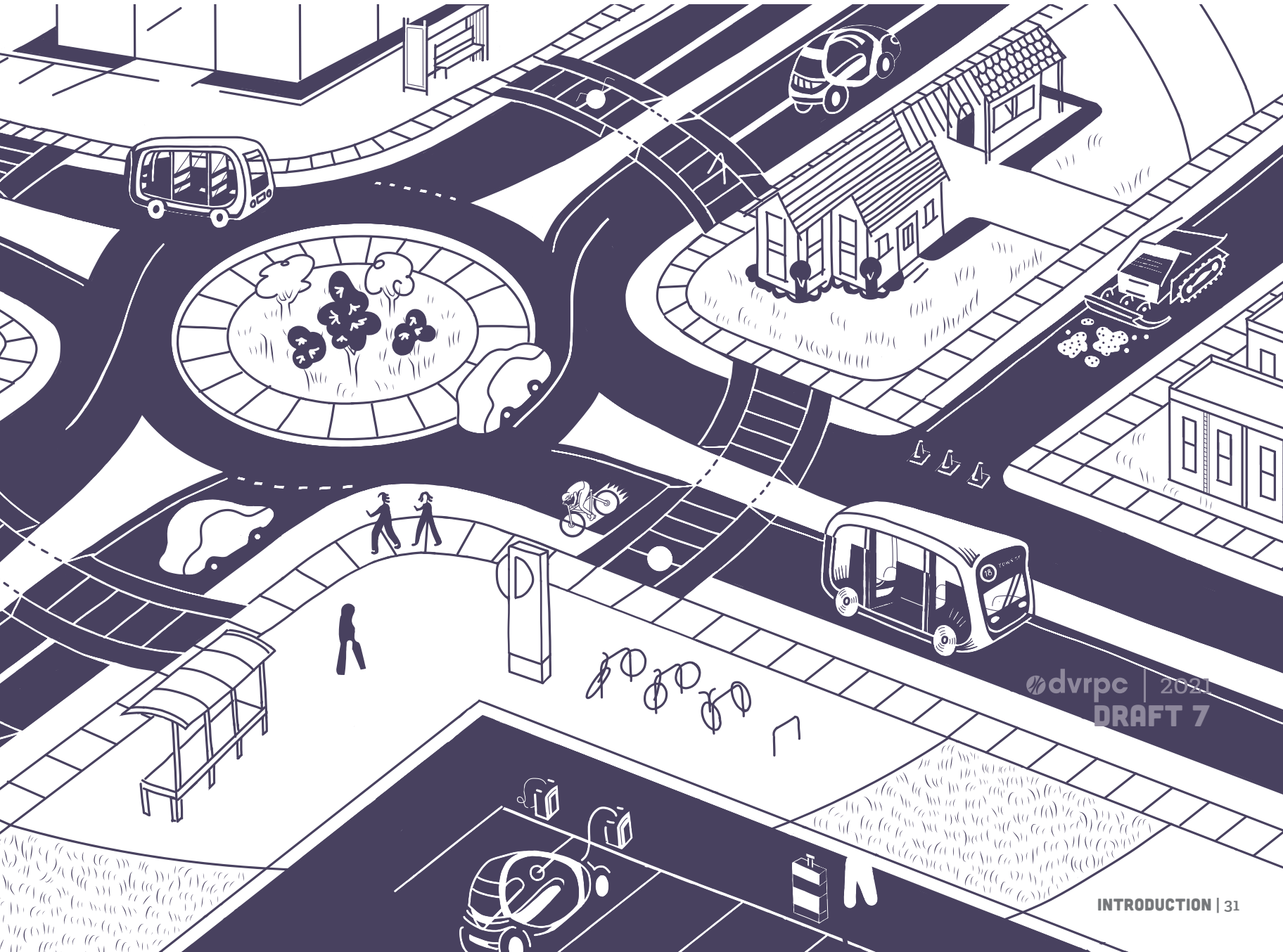
EQUITABLE TRANSPORTATION NETWORKS

increase everyone's safety and access to affordable transportation, along with the jobs, services, and opportunity that come with it. They prioritize communities that have been historically marginalized and individuals who are the most vulnerable.



RESILIENT TRANSPORTATION NETWORKS provide real-time data to both individuals and operators in order to enhance efficiency and pinpoint problems before they become disruptive; have options to enable choices among different modes; and harden or move infrastructure at risk from climate change to maintain operations over the long-run.

SUSTAINABLE TRANSPORTATION NETWORKS reduce auto dependence to optimize the safe movement of people and goods in space- and energy-efficient ways—particularly walking, biking, and transit—and use renewable and alternative fuels and clean technologies to reduce emissions.



GROW an INNOVATIVE and CONNECTED ECONOMY

Greater Philadelphia is home to major educational, healthcare, and nonprofit institutions that can incubate new technologies and business startups. The region is well positioned in the Northeast Corridor, with more than 100 million people living within 500 miles. However, the region's economy faces challenges from climate change, rising inequality, and the Digital Revolution, which creates both opportunities and uncertainty about the future of work and the economy. Goals to grow an innovative economy with broadly shared prosperity include:



Foster a high-skilled workforce, expand entrepreneurialism, innovation, new business formation and growth, and support key economic sectors.



Expand the circular* and sharing** economies, cooperatives and worker-owned firms and support independent contractors.



Assist with the post-pandemic recovery and growth of small businesses and local business districts.



Improve global connections—facilitate goods movement and aviation, support the Federal Railroad Administration's (FRA) Northeast Corridor (NEC) Future plan, and expand broadband, wi-fi, and 5G cellular infrastructure.

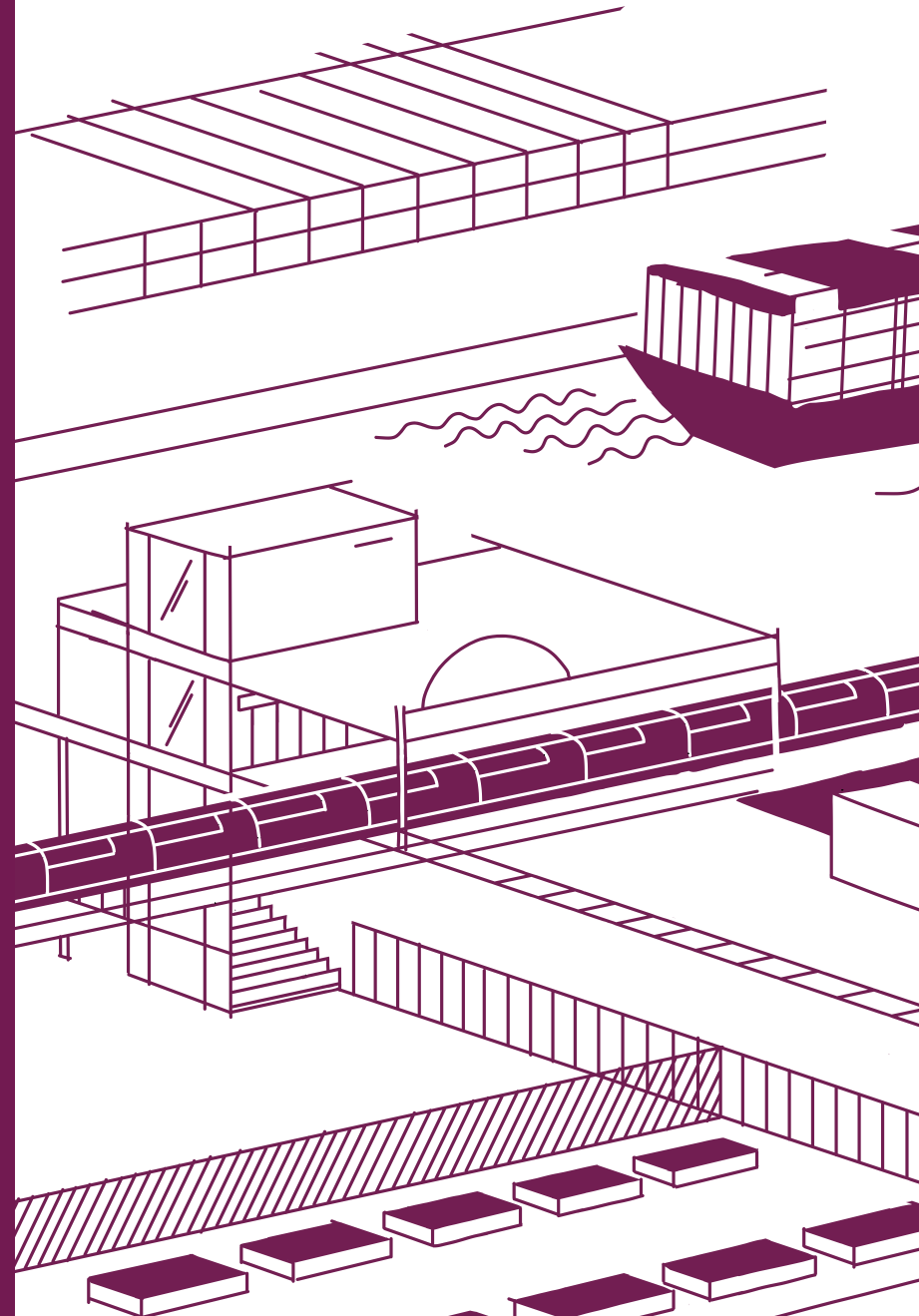


Reduce poverty, the wealth gap, and improve school quality for all residents.

**The circular economy continually reuses resources to eliminate waste.*

***The sharing economy allocates resources on demand between organizations and individuals through the Internet.*

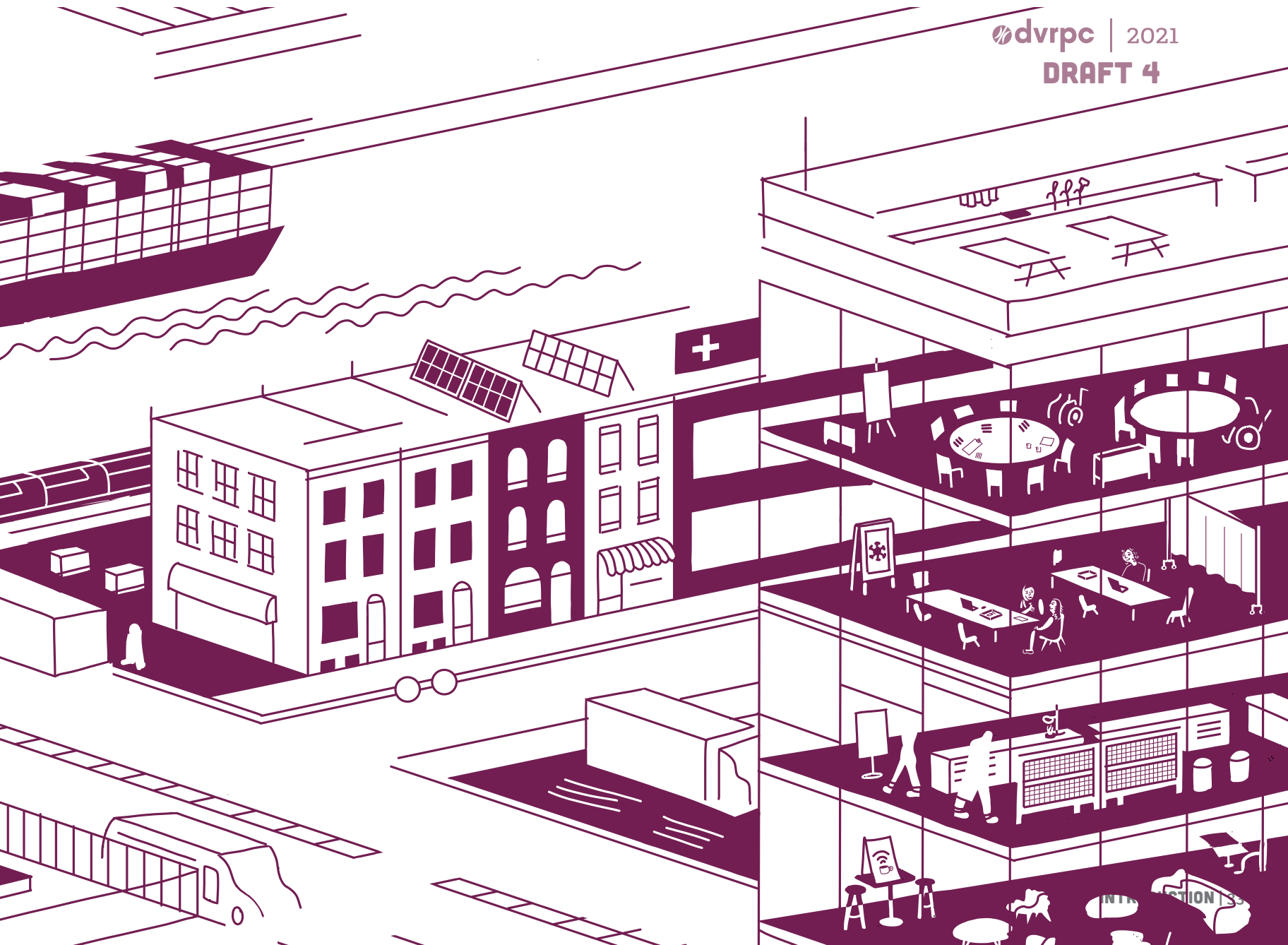
EQUITABLE ECONOMIES expand economic mobility by providing all students access to good schools, attracting and creating more good-paying jobs, and increasing access to capital for everyone. They place additional focus on expanding opportunity in communities that have been historically marginalized and denied access to good jobs.



RESILIENT ECONOMIES have the ability to withstand economic shocks, recover quickly from them when they do happen, or avoid them altogether.

SUSTAINABLE ECONOMIES are energy efficient, generate clean energy, and reduce the need to consume energy, which saves money, protects the environment, and provides other benefits—such as less need to drive or more comfort in well-insulated buildings.

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Strategies to ACHIEVE THE VISION














Recommended strategies were informed by a series of public ‘strategy workshops’ and represent a focus on equity, sustainability, and resiliency. These strategies recognize the need for a more equitable society and inclusive decision-making so that actions taken to combat climate change reduce existing inequities. They support each of the Plan’s focus areas—the environment, communities, transportation, and the economy—with a fifth set of strategies developed under a regional planning rubric. Regional planning strategies use the *Dispatches* scenarios to consider contingent action across a range of futures, and ensure decision-making supports the Plan’s principles, vision, and goals.

The table on the following page ties together the strategies with the Plan’s overarching principles, focus areas, and goals contained in the vision. These strategies are intended to shape the hundreds of projects in the TIP, especially the pipeline of future projects as they move into it. Implementing these strategies will also require building partnerships and other collaborative efforts across a wide range of public and private actors—including federal, state, and local governments, transit agencies, social services providers, real estate developers, major employers, funders, and

individual citizens. While none of the strategies are specific to public health, nearly all of them can positively benefit individual health and well-being from protecting open space, to greening communities, to a more active transportation network, to improved education and access to economic opportunity. The strategies are numbered for organization purposes, and this is not intended to indicate any sort of prioritization. Under nearly each key strategy is a checklist of more specific strategy recommendations. ▶

Key STRATEGIES Related to PLAN PRINCIPLES, FOCUS AREAS, and GOALS

 EQUITY —  RESILIENCY —  SUSTAINABILITY

<p>Strategies ENVIRONMENT</p> <p>Goals</p>	<p>1 PRESERVE OPEN SPACE and FOCUS GROWTH in CENTERS</p> 	<p>2 REDUCE GREENHOUSE GAS EMISSIONS and IMPROVE AIR QUALITY</p> 	<p>3 EXPAND NATURE in the Built Environment, IMPROVE WATER QUALITY, AND ADAPT TO CLIMATE CHANGE</p> 
<p>Strategies COMMUNITIES</p> <p>Goals</p>	<p>4 UPLIFT EVERY VOICE to BUILD INCLUSIVE COMMUNITIES that Develop WITHOUT DISPLACEMENT</p> 	<p>5 DESIGN NEW and CELEBRATE HISTORIC High-Quality, WALKABLE, NEIGHBORHOODS</p> 	<p>Increase the SUPPLY and VARIETY of AFFORDABLE HOUSING Options and SUPPORT an AGING POPULATION</p> 
<p>Strategies TRANSPORTATION</p> <p>Goals</p>	<p>7 MAINTAIN EXISTING Transportation INFRASTRUCTURE and Facilitate the EQUITABLE DEPLOYMENT of NEW MODES and TECHNOLOGIES</p> 	<p>8 SAFELY ACCOMMODATE TRANSIT, WALKING, and BIKING, and TRANSPORTATION NETWORK USERS of ALL ABILITIES</p> 	<p>9 PROMOTE EQUITABLE ACCESS to OPPORTUNITY</p> 
<p>Strategies ECONOMY</p> <p>Goals</p>	<p>10 BOLSTER CONNECTIONS to the GLOBAL ECONOMY and ACCESS to COMMUNICATIONS TECHNOLOGIES</p> 	<p>11 EXPAND KEY ECONOMIC SECTORS</p> 	<p>12 SUPPORT SMALL BUSINESSES, ENTREPRENEURSHIP, and LIFELONG LEARNING</p> 
<p>Strategies REGIONAL PLANNING</p> <p>All Goals</p>	<p>13 BE PREPARED to ADAPT to a RANGE of PLAUSIBLE FUTURES 14 DECISION-MAKING that SUPPORTS the REGIONAL VISION 15 Take INDIVIDUAL and MUNICIPAL ACTIONS</p> 		

PRESERVE OPEN SPACE and FOCUS GROWTH in CENTERS

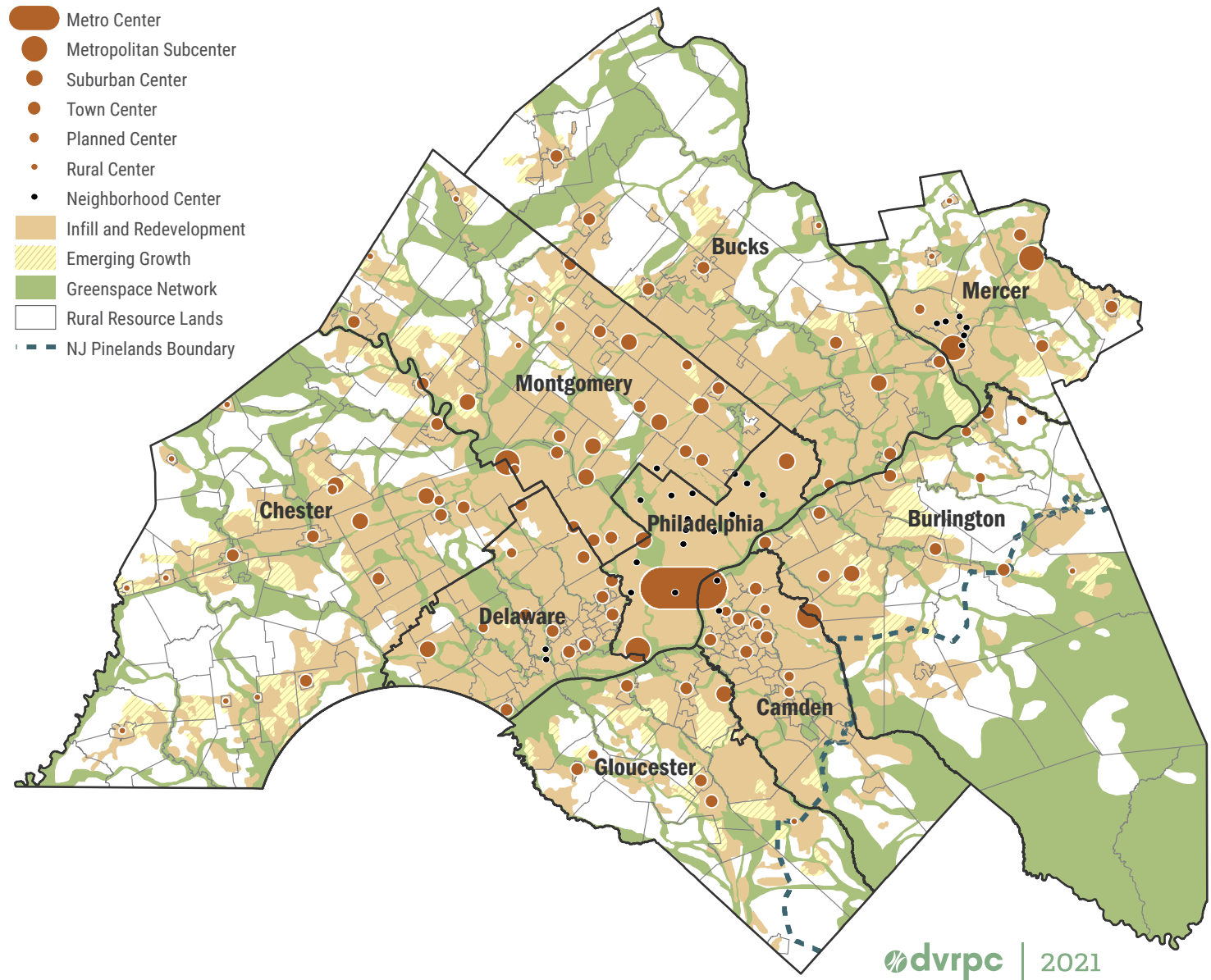
Forests, farmland, and other natural areas are indispensable to our region and its residents. However, these lands have been rapidly and steadily declining for the past 70 years. To combat these trends, the region must continue to both protect open space and pursue a Centers-based development strategy. Centers are our region's existing and emerging walkable, higher density, mixed-use communities. Focusing growth in existing Centers, or building new Centers, **will reduce development pressure on open space lands, bring households and jobs closer together, save money on infrastructure provision, and make walking, biking, and transit more feasible.**

The *Connections 2050* Land Use Vision map illustrates this "two-pronged" approach to growth management at the regional scale. This map divides the region into: Infill and Redevelopment areas, Emerging Growth areas, Rural Resource Lands, and the Greenspace Network, which are in turn overlaid by more than 135 Centers. This vision aims to create a healthy, accessible, and sustainable environment, where key natural resource areas and agricultural lands are protected, open space is provided in an interconnected and distributed network, and most growth naturally gravitates toward Centers due to the economic and cultural advantages, mobility options, high quality of life, and inclusive opportunities they provide. More investment is needed at all levels of government to meet the region's goal of one million acres of protected open space by 2040.

Checklist:

- Preserve and protect undeveloped lands through acquisitions and conservation easements.
- Protect open space during the development process through transfer of development rights (TDR) programs and conservation design techniques.
- Enact and implement local open space funding programs.
- Promote infill and redevelopment in Plan Centers and other locations with multimodal transportation access by allowing for increased density in zoning codes, or through density bonuses, inclusionary zoning, or community land trusts.
- Update municipal zoning and subdivision and land development ordinances, and consider financial incentives to require or encourage transit-oriented development (TOD) and traditional neighborhood design (TND).
- Integrate parks and high-quality public spaces into existing and emerging Centers.

REGIONAL LAND USE VISION



PENNSYLVANIA CENTERS

COUNTY	METROPOLITAN SUBCENTERS	SUBURBAN CENTERS	NEIGHBORHOOD CENTERS	TOWN CENTERS	RURAL CENTERS	PLANNED CENTERS
Bucks	N/A	Oxford Valley	N/A	Bristol Borough, Chalfont Borough, Doylestown Borough, Morrisville, Newtown Borough, Perkasie/ Sellersville, Quakertown, Telford/ Souderton	New Hope Borough	Waterside
Chester	King of Prussia/ Valley Forge	Exton, Great Valley, Uwchlan	N/A	Coatesville, Downingtown Borough, Kennett Square, Malvern, Paoli, Phoenixville, Spring City/Royersford, West Chester	Atglen, Avondale, Elverson, Honeybrook Borough, Oxford Borough, Parkesburg, West Grove	Eagleview, Uptown Worthington
Delaware	International Airport/ Navy Yard/ Sports Complex	Concordville	Chester City: Chester Central Business District, University Crossing	Darby Borough, Havertown, Lansdowne Borough, Marcus Hook, Media, Prospect Park/ Norwood, Ridley Park, Wayne, Swarthmore, 69th Street	N/A	Ellis Preserve, Pond's Edge/ Franklin Station
Montgomery	King of Prussia/ Valley Forge	City Avenue, Fort Washington, Montgomeryville, Plymouth Meeting, Willow Grove/ Horsham, Route 422/ Collegeville	N/A	Ambler Borough, Ardmore, Bridgeport, Bryn Mawr, Conshohocken/ Spring Mill, Glenside/ Keswick, Hatboro Borough, Jenkintown, Lansdale, Narberth, Norristown, Pottstown, Spring City/ Royersford, Telford/ Souderton	Tri-Borough, Boyertown/ Gilbertsville, Harleysville, Skippack Village	Kulpsville, Village at Valley Forge, Willow Grove Naval Air Station
Philadelphia	International Airport/ Navy Yard/ Sports Complex	City Avenue, Far Northeast	Broad & Passyunk, Woodland Avenue, 52nd & Market, Broad & Cecil B. Moore/ Temple, Broad & Lehigh/ Amtrak, Broad & Erie, Kensington/ Richmond, Roxborough/ Manayunk, Germantown, Chestnut Hill/ Mt. Airy, Broad & Olney, Frankford, Cottman & the Boulevard, Fox Chase/ Lawncrest, Mayfair/ Holmesburg	N/A	N/A	N/A

NEW JERSEY CENTERS

COUNTY	METROPOLITAN SUBCENTERS	SUBURBAN CENTERS	NEIGHBORHOOD CENTERS	TOWN CENTERS	RURAL CENTERS	PLANNED CENTERS
Burlington	Cherry Hill/ Mount Laurel/ Marlton	Mount Laurel	N/A	Bordentown, Burlington City, Mount Holly, Palmyra, Pemberton Borough, Riverside, Village of Moorestown	Brown Mills	Columbus, Bordentown Waterfront Community, Old York Village
Camden	Cherry Hill/ Mount Laurel/ Marlton	N/A	Camden City: Fairview, Parkside	Collingswood, Gloucester City, Haddonfield, Haddon Heights, Merchantville, Westmont	N/A	Voorhees/ Lindenwold, The Town Center at Haddon, Haddon Avenue Transit Village, Towne Place at Garden State Park
Gloucester	N/A	Deptford	N/A	Glassboro, Paulsboro, Pitman, Swedesboro, Woodbury	Williamstown	Woolwich Town Center
Mercer	Trenton, Route 1 Corridor	N/A	Trenton: Broad Street/ Chestnut Park, Chambersburg, Wilbur, Top Road, Pennington Village, West End	Hightstown, Princeton, Washington Town Center	Pennington Borough, Hopewell Borough	Ewing Town Center

REDUCE GREENHOUSE GAS EMISSIONS and IMPROVE AIR QUALITY

Achieving a goal of zero net GHG emissions in the region by 2050 is challenging for an economy that is highly dependent on fossil fuels for energy. The region's primary air quality concerns are ground-level ozone and PM_{2.5}, which often come from the same sources as GHGs, so many actions that address climate change also reduce air pollution.

Obtaining zero net GHGs will require a commitment across society, government, and

economic sectors to convert from fossil fuels to low- to no-carbon energy sources; along with substantial advances in technologies that produce and use energy. The two basic strategies are: use less energy through efficiency and conservation, and use low- or no carbon sources of energy, rather than fossil-fuels. A regional electricity supply transformed to zero carbon energy has the potential to be more resilient and less susceptible to fossil fuel supply disruption. Important non-energy-related GHG reduction strategies include maintaining and enhancing forests, urban trees and plants, and soils. Beyond storing carbon, these strategies improve

water quality, provide shade to counter extreme heat, slow flooding, and accommodate wildlife habitat.

Cars, trucks, buses, and other mobile transportation sources emit up to 50 percent of regional NO_x emissions, which contribute to both ozone and PM_{2.5} pollution. More EVs, transit, and walking and biking can help to reduce this pollution. Commercial and residential energy generation and heating account for an additional 25 percent of NO_x emissions. Retrofitting buildings to be more energy efficient reduces emissions, makes those buildings more comfortable, and creates local jobs.



Regional land use, housing, and business development patterns also shape energy use, GHG emissions, and air pollution. Municipalities with **walkable, mixed-use neighborhoods, with good transit**

infrastructure and smaller houses generally use less energy, and produce fewer GHG emissions and air pollution per person.

Checklist:

- Electrify transportation, including municipal fleets, transit buses, school buses, and medium- and heavy-duty vehicles.
- Encourage energy efficiency in government facilities, such as using LEDs for all lighting, as well as electrifying equipment currently using fossil fuels.
- Support carbon pricing to provide a financial incentive to reduce emissions.
- Apply demand management to increase electric grid efficiency, and support improvements to transmission and distribution systems needed to allow for the increased demand for electricity brought on by electrification.
- Support the development of renewable energy sources through supportive renewable energy ordinances and power purchase agreements for solar photovoltaics, wind, and hydroelectric power electricity.
- Decrease motor vehicle emissions through projects and policies that reduce trips, provide for transit, walking, and biking travel options and efficient goods movement, reduce traffic congestion, and support cleaner fuels and emissions standards.
- Provide air quality forecasts to the public and encourage voluntary measures to reduce emissions, particularly on days when pollution is forecasted to violate air quality standards.
- Work with regional partners to reduce air pollution impacts on at-risk populations.
- Work with refineries, port facilities, pipeline operators, and freight railroads to promote safety, clean air, and “freight-as-a-good neighbor” initiatives within facility host communities, on National Highway System (NHS) connector roads, and at key highway-railroad grade crossings and railroad bridges.

EXPAND NATURE in the Built Environment, **IMPROVE WATER QUALITY**, and **ADAPT** to **CLIMATE CHANGE**

Improving water quality and responding to the impacts of climate change are distinct, yet interrelated challenges. Regional water quality is impaired largely due to problems associated with stormwater runoff. In built-up areas, water flows off impervious surfaces washing pollution

into rivers and streams. In addition, the increased volume and velocity of runoff leads to erosion and sedimentation, further degrading water quality. **Climate change is expected to bring more intense precipitation and severe storms**, exacerbating these water quality issues. At the same time, **increased episodes of extreme heat brought on by climate change will introduce new stressors for communities and infrastructure, particularly in densely developed areas that are most impacted by the urban heat island effect.**



Key approaches for improving water quality and managing increased stormwater runoff include protection of large-scale natural areas and smaller-scale strategic greening techniques in built up areas. In natural areas, such as forests, most rainfall soaks into the ground, thereby eliminating stormwater runoff at its source. **In urban and suburban settings where stormwater runoff cannot be avoided, urban greening techniques such as naturalized retention basins, vegetated riparian buffers, street trees, and Green Stormwater Infrastructure (GSI) systems—which includes rain gardens, green roofs, tree**

trenches, stormwater planters and vegetated bioswales—can capture and soak stormwater directly into the ground.

These same techniques also help to ameliorate the impacts of extreme heat. Large forests have a natural cooling effect on the landscape, while street trees, GSI, green roofs, and other types of greening techniques in the built environment all act to ameliorate the worst impacts of the urban heat island effect and mitigate increases in urban air pollution

associated with higher heat.

While nature-based techniques are central to climate change adaptation efforts, other approaches like cooling centers, passive building techniques, raising and hardening infrastructure, preparing to respond to extreme weather disasters, and other adaptive practices in fields like energy, agriculture, and public health will be needed. In the longer-term, some neighborhoods and infrastructure will need to be moved out of harm's way from inland or coastal flooding.

Checklist:

- Protect and restore naturally functioning streams and floodplains through riparian buffers, daylighting buried streams, reestablishing warm season meadows in place of manicured lawns, restoring stream channels, buy-out of flood-prone properties, and related techniques.
- Enact and enforce local ordinances—such as maximum impervious coverage and parking standards—to protect water quality and control stormwater.
- Promote GSI in the development and redevelopment of streets and parcels, and establish stormwater utilities/authorities to fund GSI.
- Promote the planting and maintenance of street trees, and incorporation of other natural elements, particularly in areas with pedestrian traffic.
- Use climate projections, not historical precedents, to plan, maintain, and construct housing, commercial and industrial buildings, bridges, drainage structures, catenary, and rails.
- Continue to evaluate critical transportation and community assets that are vulnerable to climate change, and take steps to minimize risk.
- Develop and implement strategies to prevent and mitigate extreme heat, including increasing shade, targeted assistance programs, warning systems, and cooling centers to protect community members.
- Update floodplain ordinances and building codes and practices to make structures more resilient to unpredictable extreme weather events including flooding and high winds.

UPLIFT EVERY VOICE to BUILD INCLUSIVE COMMUNITIES that Develop WITHOUT DISPLACEMENT

Inclusive communities respect all residents, ensure everyone has full access to resources, promote equal treatment and opportunity for all, work to mitigate and repair past discriminations, engage residents in decision-making, value diversity, and respond quickly to discrimination and other incidents. Two of the biggest keys to forming inclusive communities is to [make sure that everyone has access to safe and healthy housing \(see strategy #6\)](#), and to [create forums where dialogue can be shared between different groups, bringing them together as equals](#).

Public engagement allows stakeholders and residents to learn about issues facing their communities and participate in the creation of plans and projects that will shape their future. Institutional support and leadership is critical to advancing dialogue, finding shared values and building relationships, providing open access to data and information, promoting transparency and equity, mitigating and correcting past harms, and serving as a convener and coordinator for collective action.

There is growing concern that low-income individuals can be priced out of their community as rising interest for development continues. Redevelopment in the region's Centers is a specific Plan goal that generally has positive outcomes, but structural and institutional safeguards are needed to ensure more equitable housing, health,

educational, and economic outcomes for low- and moderate-income individuals and families. At the same time, many other neighborhoods continue to struggle with vacancy, lack of opportunity, and disinvestment. Regardless of where they live, [everyone wants access to jobs, good schools for their kids, and healthier and more vibrant neighborhoods](#). [Individuals should have influence over the decision-making process that affects their community](#), benefit from improvements, have access to resources and services that improve quality of life and fulfill basic needs, have choices about where they live and work, and should not be involuntarily displaced from their preferred neighborhood.

Hold for Vignette Image:
protesters holding signs/megaphones

Identify and Implement Antiracist Policies

Urbanists, planners, and transportation professionals can bring antiracist practice into their work. While urbanists are advocating for cities that are for everyone and open streets for people of all ages, abilities, and backgrounds, across the country Black and Brown people have been harassed and killed in public spaces while they are running, biking, walking, playing, or driving their cars. Planners must acknowledge and respond to marginalized communities' concerns by better understanding how institutions in our communities produce or sustain racial inequity.

In order to advance antiracist policies, we must understand the outcomes of all types of policies: Does a policy help to bring more diverse voices into the decision-making process? Does it expand the ability to participate in democratic processes? Does it shrink the wealth gap? Does it expand access to opportunity for marginalized and disenfranchised communities? Does it deconcentrate poverty? Does it help all people reach their full potential? Policies and processes that do the opposite of any of these things should be reevaluated or discontinued, while seeking other more equitable approaches.

Checklist:

- Identify and support antiracist policies, including taking public health approaches to policing, and improving education, access to jobs, and health investments in historically underserved communities.
- Provide more information to the public about how government works and how to get more involved in it and expand K-12 civic education curriculum.
- Support efforts to make it easier to vote, so that all citizens can participate in our democracy.
- Extend assistance programs and revise zoning and tax policies so that neighborhoods with high-demand for housing can grow and densify without displacing existing residents.
- Provide American Sign Language (ASL) and foreign language translation and interpretation at all public meetings.
- Empower neighborhood groups and residents to form community organizations that guide decision-making and policy development for their communities.

DESIGN NEW and CELEBRATE HISTORIC High-Quality, WALKABLE NEIGHBORHOODS

Well-designed communities promote the health and well-being of their residents and contribute to the economic and environmental sustainability of the region. Community design principles that inform the character of streets, public space, and individual buildings can be used to maintain and enhance existing neighborhoods and guide the development of new communities in Greater Philadelphia. Some of the most important community design principles include [mixing residential and commercial uses](#), [maximizing walkability](#), [orienting buildings](#)

toward streets, preserving and reusing historic buildings, and managing parking. In addition, integrating public facilities into a community's fabric can increase civic engagement and social [cohesion](#). Locating green and open space, schools, and municipal offices where they are accessible by a variety of transportation modes can also reduce sprawl and create more opportunities for walking or biking to schools, libraries, and parks.

Greater Philadelphia has a wealth of historic resources, including historic landmarks, sites, and districts on the national register of historic places, state- and nationally recognized historic



landscapes and cultural heritage areas, sites protected through local historic designations, and countless other historic buildings and cultural resources that lack any formal designation. These assets should be identified, protected, preserved and/or restored to maintain our region's unique identity and sense of place. Without protections

and investment, many of these assets are threatened with disrepair and/or demolition. Local regulations should be predictable and allow for preservation of unique community features while facilitating appropriate growth and change.

Checklist:

- Develop parking standards based on supply and demand, reduce parking minimums, and better manage existing parking resources to allow more room for pedestrian spaces and services.
- Seek adaptive reuse for existing underutilized buildings and design new buildings with potential for adaptive reuse in mind.
- Use streetscaping, public art, creative placemaking strategies, and a mix of programming to animate public spaces, parks, and transportation facilities, and business districts for diverse audiences.
- Identify, document, and formally protect historic sites, buildings, and structures that contribute to community identity and character, and document opportunities for transportation project mitigations.
- Involve local partners, advocates, and the public in creating a long-term strategic vision to develop more parks in underserved areas and prioritize capital investments and maintenance in existing parks.
- Strengthen the role of neighborhood schools as community and social centers by partnering with government agencies, healthcare providers, and nonprofits to provide support services—such as health clinics, employment support, food pantries, English language learning opportunities, and/or financial literacy programs—tailored to community needs.
- Use local land banks, code enforcement, and other means to fight blight, decay, and abandonment.

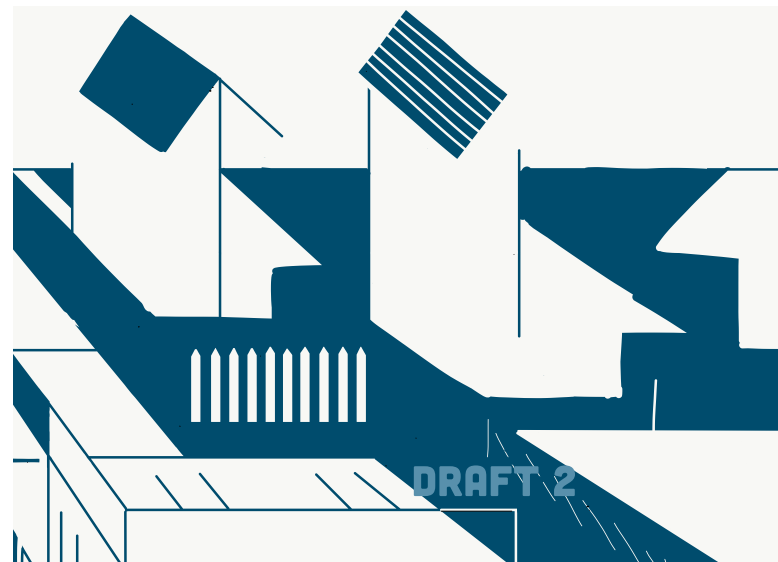
Increase the **SUPPLY AND VARIETY** of **AFFORDABLE HOUSING UNITS** and **SUPPORT AN AGING POPULATION**

Everyone needs access to affordable housing, which provides shelter, safety, privacy, health and wellbeing. People of color and those that are low-income are disproportionately burdened by housing costs and threats of displacement, making housing attainability a central equity issue for our region. **The region must find ways to ensure all households can meet their needs**—including accessible units for people with disabilities and maintaining the greatest possible independence for the region’s growing senior population. Many seniors want to age-in-place where they have forged ties to the community. Age-friendly places enable older adults to engage in social, economic, and civic life, lessening the need for long-term institutional care.

Lack of affordable housing can cause low-income households to sacrifice basic needs like healthy food, medical care, or transportation; and harms the local economy when employers have a hard time attracting and retaining a qualified workforce. The region’s core cities are rowhouse cities, offering a range of adaptable, energy-efficient, medium-density homeownership opportunities. Missing-middle housing includes a variety of smaller unit medium-density building types—duplexes, triplexes, fourplexes, courtyard buildings, and live-work units—that are compatible in scale and form with detached single-family homes, and can increase housing affordability, make neighborhoods more walkable, and support local businesses.

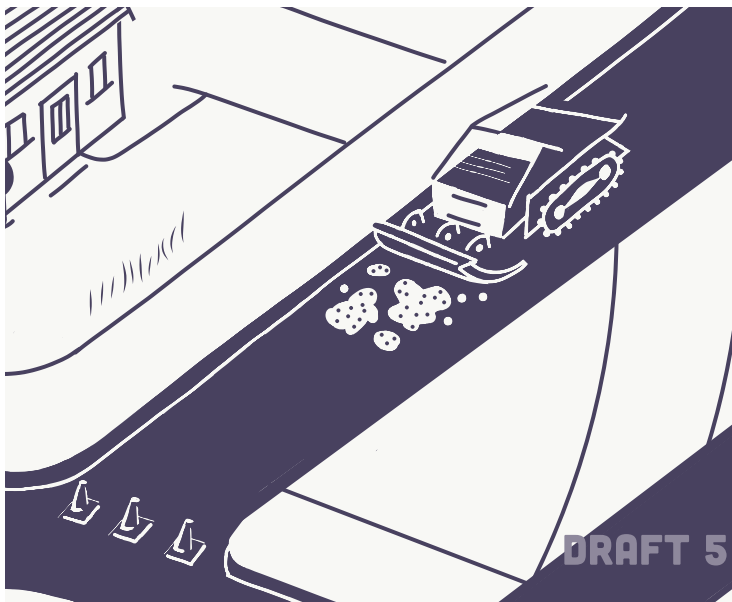
Checklist:

- Incentivize and update zoning to allow for more new affordable alternative housing such as: missing middle housing, co-housing, accessory dwelling units (ADUs), and shared housing.
- Preserve existing dedicated affordable housing; enact home maintenance programs; help households access and afford private market homes; and protect against poor housing conditions and displacement.
- Make communities more age-friendly through age-friendly business programs, universal design standards, and ridesharing partnerships for seniors without smartphones; and by adding sidewalks, bus shelters, benches, access to public restrooms, connected streets, and places to sit and rest.



MAINTAIN EXISTING TRANSPORTATION INFRASTRUCTURE and FACILITATE the **EQUITABLE DEPLOYMENT** of **NEW MODES** and **TECHNOLOGIES**

Reconstructing and modernizing transportation facilities is a top priority, and provides an opportunity to incorporate technology and connectivity between infrastructure, vehicles, and the Internet. Embedded sensors can provide real-time travel data and infrastructure condition data—which can help to better time repairs. TSMO can improve travel time reliability for people and goods movement; provide more transportation options and traveler information; and enhance multimodal transportation safety, security, and traffic incident management (TIM). As more infrastructure and vehicle components are digitized and connected together, cybersecurity will become an integral part of transportation security planning.



Checklist

- Prioritize projects that maintain and modernize the existing transportation network.
- Form an Advanced Mobility Partnership to prepare for CVs, HAVs, and MaaS and work with state DOTs on plans for safe HAV testing and deployment.
- Apply Integrated Corridor Management techniques to proactively manage and operate traffic across modes and jurisdictions.
- Provide real-time travel information across modes and enhance regional multimodal trip planning tools.
- Implement advanced integrated traffic signal and transit management systems.
- Ensure first responders and public safety agencies have the necessary technologies to share interoperable voice, data, and video during an emergency.
- Use TIM to: improve interagency communication and coordination; improve incident detection and verification; quickly and safely respond to and clear traffic incidents; reduce the number of overall major, secondary, and work-zone related traffic incidents; and reduce crashes at signalized intersections.
- Coordinate and cooperate with federal, state, local, and other agencies involved in regional resiliency and transportation security planning; and apply up-to-date cybersecurity strategies to protect transportation infrastructure and personal privacy.

SAFELY ACCOMMODATE WALKING, BIKING, TRANSIT, and TRANSPORTATION Network USERS of ALL ABILITIES

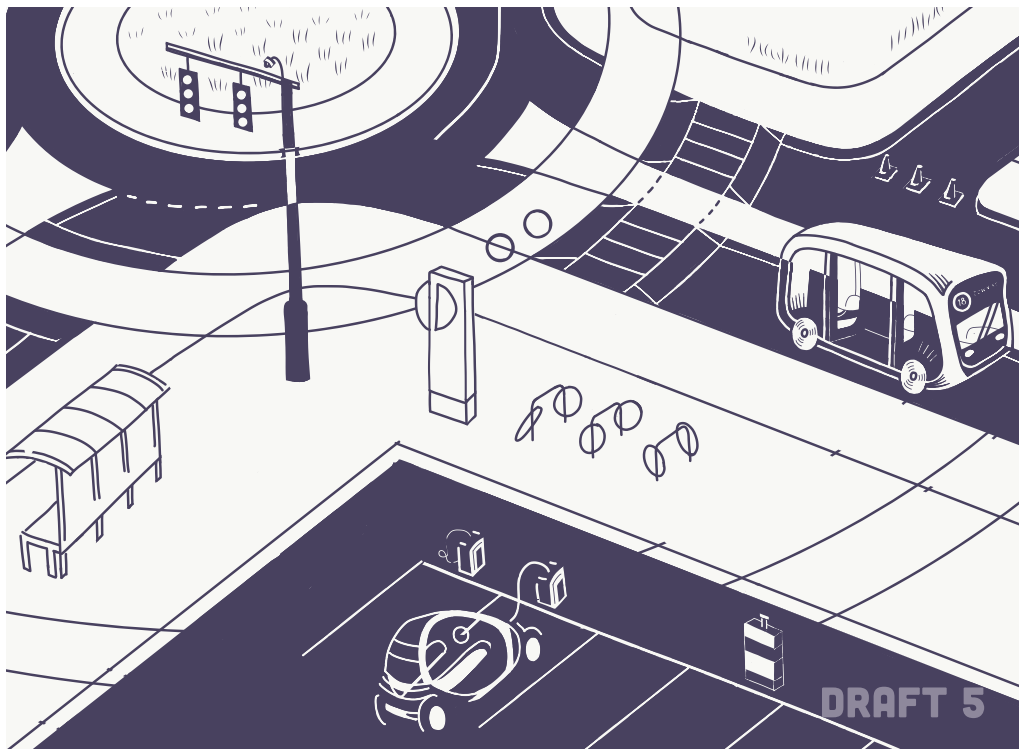
Achieving a more walkable, bikeable, and transit-friendly region requires an emphasis on and investment in supportive infrastructure and engineering solutions, more focused safety enforcement, and the provision of educational programs for cyclists, pedestrians, and drivers. Both states are FHWA Pedestrian and Bicyclist Safety Focus States, so a regional priority is to identify Highway Safety Improvement Program (HSIP) eligible pedestrian and bicyclist safety projects. DVRPC

works with the region's transit agencies to coordinate improvements to transit network operations, expansion, access, and transit-oriented development.

The forthcoming *Transportation Safety Analysis and Plan* (TSAP) builds on the Vision Zero philosophy through a Safe System Approach, which identifies all the stakeholders that play a role in ensuring crashes don't lead to death or serious injury: users, network designers and managers, as well as vehicle manufacturers, and others. The TSAP is coordinated with the Pennsylvania and New Jersey Strategic Highway Safety Plans, which seek to maximize federal HSIP funds for infrastructure improvements that advance substantive safety goals. The TSAP also promotes appropriate enforcement to improve safety, including building knowledge

for applicable legislative initiatives, supporting relevant professional development for law enforcement staff, and increased use of technology like automated enforcement for red light running and speeding as well as in-vehicle technologies.

There is a major opportunity to work with the private sector to create a MaaS network that increases travel options and reduces reliance on vehicle ownership. Successfully bringing about such a network will require a supportive policy environment that ensures it serves everyone. **Transportation hubs**



are accessible to safe bicycle and pedestrian facilities that provide seamless connections between modes by combining a transit station with carsharing, bikesharing, and TNC and

taxi pick-up and drop-off areas. As shared mobility becomes more commonplace, curbside management and pick-up/drop-off areas will become critical for accessing destinations, including at transit stations.

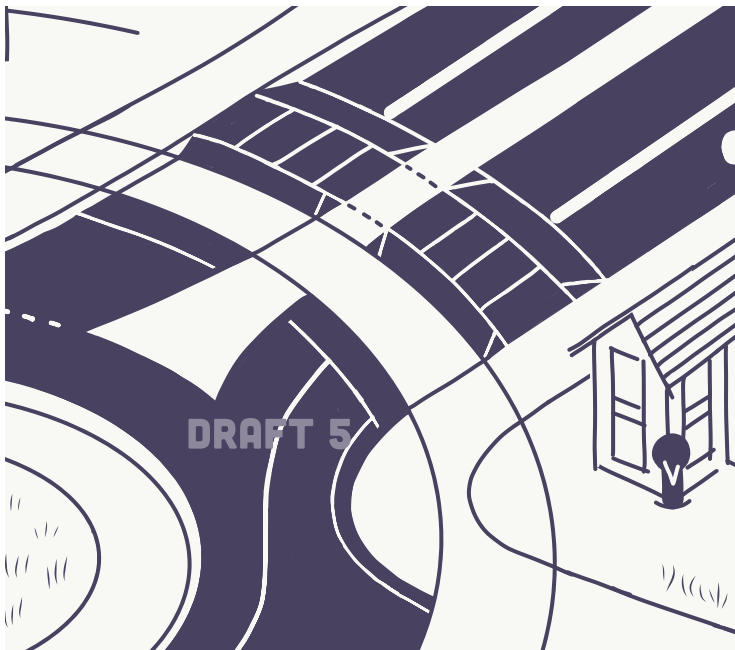
Checklist

- Make transit more attractive, visible, and easy to use, increase service frequency and pursue transit-first strategies—transit signal priority, off-board fare payment, and dedicated bus lanes—in high-ridership locations; and integrate private shared mobility services with transit.
- Offer flexible service that can adapt to changing travel demand following the pandemic, including more service between suburban areas and throughout the day.
- Improve accessibility, adopt a Safe Routes to School program, and consider active transportation options in connecting parks and schools to the community.
- Provide safe facilities for walking and bicycling—including connected sidewalks, complete streets, pedestrian-only zones, protected bike lanes, bike/ped bridges and tunnels, public restrooms, and places to sit or rest—for people of all ages and abilities, and space for goods delivery.
- License private shared mobility services to operate only if they: serve everyone, share data, integrate with transit and other transportation providers, follow curbside regulations, and meet safety standards. Periodically renew licenses only if these requirements are being met.
- Design all projects with system safety principles, and use traffic calming, reduced travel lane widths, roundabouts, road diets, lower speed limits, automated traffic enforcement, and FHWA's proven safety countermeasures to improve safety and operations, slow traffic, and enhance bikeability and walkability.
- Maintain a regional crash database and a web-based crash mapping application for use in identifying high crash locations and to develop local road priority safety networks similar to Philadelphia's Vision Zero high injury network.
- Use government procurement to advance safety and green vehicle technologies such as electric powertrains, lane keeping, and front-end collision avoidance that is also effective for pedestrians.

Promote **EQUITABLE ACCESS** to **OPPORTUNITY**

The region's transportation network should link places where people live and work and be navigable with comfort, safety, and dignity by users of all ages and abilities.

Vulnerable individuals—who are low income, senior, or have physical or mental disabilities—are more acutely affected by infrequent transit service and gaps in infrastructure, such as poor sidewalk connectivity, inaccessible transit stops or vehicles, and disconnected land use planning. Vulnerable populations are more likely to be transit dependent and have unique transportation needs for reaching essential services, including places of employment, grocery stores, schools, medical facilities, recreation and open space areas, senior centers, and centers for the developmentally disabled.



Checklist

- Comply with ADA and Title VI regulations and guidelines.
- Prioritize physical accessibility, information, and safety improvements in: transportation hubs and activity centers that serve significant numbers of vulnerable populations; communities with concentrations of disabled and/or senior populations; and essential service locations, such as hospitals, medical facilities, and senior centers.
- Explore ways to expand transit pass access to vulnerable communities, such as free full-week passes for public school students, discounted passes for low-income customers, and providing free or affordable transfers.
- Improve vulnerable populations' access to broadband and online travel information, including outreach and communications to populations with Limited English Proficiency.
- Prioritize convenience and affordability of fixed-route and paratransit lifeline services and connections to essential services, employment, and last-mile connections.
- Work with shared mobility companies, taxis, and transit agencies to enhance service in low-income and EJ communities, and provide increased accessible-vehicle service.

10 **BOLSTER CONNECTIONS to the GLOBAL ECONOMY and ACCESS to COMMUNICATIONS TECHNOLOGIES**

Economically successful regions have strong connections to the nation and world. With an acceleration of e-commerce, investments are needed in ports and multimodal infrastructure to enhance goods movement through regional and global supply-chains, provide local employment opportunities, and support key regional economic sectors. Broadband access, and the capacity to utilize it and related technologies, is now a basic requirement for participation

in the economy. Broadband deployment, accessibility, and capacity-building efforts must be carried out broadly and equitably.

The region can increase its desirability by **investing in arts, cultural, and recreational amenities; supporting entrepreneurs and innovative thinkers**; improving environmental quality; maintaining the supply of affordable housing; expanding public infrastructure; and support ongoing efforts to make Philadelphia a world-class city and region that is an international destination for businesses, talent, visitors, and immigrants.

Checklist:

- Expand capacity and improve international connections—particularly to Asian and Latin American markets—at PHL.
- Support the implementation of the FRA's NEC Future plan and enhance intercity bus connections.
- Enhance access to critical international gateways including landside improvements at maritime ports and highway connections at PHL.
- Incorporate freight and goods movement in transportation planning with a focus on improving safety and efficiency for all system users.
- Prepare a freight plan to identify and prioritize key infrastructure investments, raise awareness of issues related to changing consumer and industrial development trends, and identify strategies to better manage growth in freight activity.
- Form a Broadband Commission to monitor the technology's evolution; develop local plans and adopt policies for accessible broadband deployment; and to serve as the official entity for public engagement.
- Promote and expand programs to enroll people in low-income broadband plans, and increase outreach and education around digital literacy.

EXPAND KEY ECONOMIC SECTORS

The region has a large and diverse economy that is anchored by a number of key economic sectors. Health services, professional and business services, financial activities, and IT have emerged as principal drivers of the information economy. There are concentrations of cutting-edge biotechnology, higher education, aerospace defense, and creative industries, along with a burgeoning tech startups and alternative and clean energy industry—which is poised for growth as the world responds to climate change. Tourism is increasingly important, given Greater Philadelphia’s role in the nation’s founding and development, the only U.S. World Heritage City, and variety of recreational and cultural opportunities. Other key sectors include energy conservation, specialty and precision manufacturing, performing arts, and food production and distribution. Transferring innovative discoveries from the region’s numerous academic and research institutions to industry partners and commercializing new technologies are important drivers of continued economic growth.



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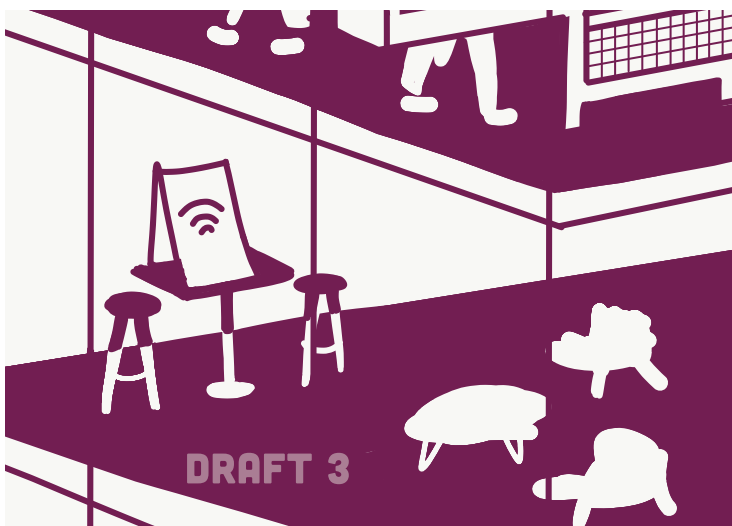
Checklist:

- Encourage business formation and growth by expanding research and development, new technology commercialization, access to capital, and working with academic institutions, business incubators, venture capitalists, and others to attract or create new companies while simultaneously supporting and expanding existing companies.
- Identify and protect key industrial zones, particularly those with multimodal access.
- Continue to promote and secure more attractive wage and business taxes, licensing, and permitting to encourage the attraction, retention, and expansion of businesses in the region.
- Enhance coordination between all food system stakeholders—from private and public sectors, and including sustainable agriculture advocates, hunger relief organizations, farmland preservation coordinators, and economic development agencies—to collaborate on planning activities, supportive land use ordinances, incentive programs, and other food system improvements.
- Incorporate urban agriculture into economic development policies and funding programs.

SUPPORT SMALL BUSINESS, and ENTREPRENEURSHIP, and LIFELONG LEARNING

The past 25 years point to the steady growth of a free agent economy, where large companies contract out many tasks, and employees are more likely to consult or do temporary work. Strengthened by the Internet, this trend suggests a future with fewer traditional 9 to 5 jobs where individuals will need to be more entrepreneurial. Policies should ensure everyone has equal access to land and capital.

In an era of rapid technological change, workers need to continually upgrade their skills. Pathways into specific careers can be created through partnerships between industry and schools that offer specialized training. Small employers need to be connected with workforce training programs. Educational attainment levels can be raised by leveraging higher education resources to increase elementary and secondary school students' motivation and performance, especially in the region's Core Cities and urban areas.



 | 2021

Checklist:

- Create one-stop shops for startups and mentorships between established and emerging business leaders.
- Increase the number of cooperatives and worker-owned businesses.
- Assess available real estate for business development and expansion, such as incubator, accelerator, and coworking space.
- Identify resource linkages between companies, university research centers, and industry associations.
- Promote local hiring and work with employers to incentivize diverse hiring practices.
- Assist minorities, immigrants, veterans and other new entrepreneurs with technical assistance, specialized training, and English as a second language as needed to expand opportunities and create a more inclusive economy.
- Develop portable health and life insurance, retirement, worker disability, vacation, and training benefits programs.
- Work with political leaders and community stakeholders to ensure all school districts receive adequate financial support.

ADAPT to a RANGE of PLAUSIBLE FUTURES

The scenario planning exercise conducted by DVRPC and the Futures Group considers different ways the future could unfold, and then identifies adaptive responses to different futures.

Adaptive strategies can respond to specific challenges of an imagined future, but may be ineffective, unnecessary, or even counterproductive in other futures. Other adaptive strategies may become critical in some scenarios, but

could still be seen as beneficial in other futures. Adaptive strategies aim to make the *Connections 2050 Plan* more resilient. The *Dispatches* scenarios focus on climate change, rising inequality, and technology, and also increase the Plan's consideration of equity, resiliency, and sustainability. Signposts can help to identify which future scenario may be unfolding through the challenges that arise, which can help to indicate which adaptive strategies should be employed. See *Dispatches from Alternate Futures* and *Preparing Greater Philadelphia for Highly Automated Vehicles* for additional signposts for each scenario.

FOCUS AREA		DELAYED EXPECTATIONS	PEOPLE POWER	TECHNOLOGY in the DRIVER'S SEAT	INCLUSIVE TECH
ENVIRONMENT	CHALLENGES	Climate change advances faster than current forecasts and a major hurricane hits the Delaware Valley.	Innovations intended to reduce GHGs don't become market-ready as initially anticipated.	Increasing waste streams, particularly e-waste.	Development is increasingly decentralized and more mobile.
	ADAPTIVE STRATEGIES	Limit development in floodplains; undertake proactive retreats from low-lying areas; focus affordable housing development in high-and-dry areas, consider more aggressive anti-flooding treatments such as China's Sponge City concept or Copenhagen's cloudburst boulevards and floodable parks.	Reduce GHGs with readily available technologies: tax credits for building and vehicle electrification; green building standards and energy efficiency; increased investment in transit, walking, and biking; solar and wind microgrids; land preservation; conservation tillage;	Enact Zero Waste policies, provide resources for self-repair of electronic and digital devices, and build the circular economy so that materials and resources can constantly be reused.	Increase the regional goal for preserved open space and agricultural lands.
COMMUNITIES	CHALLENGES	Housing is increasingly owned and commodified by large, global economic firms, decreasing homeownership rates.	Single-family-only zoning is invalidated.	The increasing presence of digital screens and facial recognition technologies are decreasing the appeal of urban areas and reducing social cohesion.	Commercial office and retail space never recover from the Covid-19 pandemic.

FOCUS AREA		DELAYED EXPECTATIONS	PEOPLE POWER	TECHNOLOGY in the DRIVER'S SEAT	INCLUSIVE TECH
COMMUNITIES	ADAPTIVE STRATEGIES	Consider expanding the supply of nonprofit or publicly owned and subsidized housing stock for low- and middle-income households.	Allow accessory dwelling units and missing middle housing in more zoning districts, and allow the subdivision of single-family homes into multiple units.	Ensure citizens are involved in smart city initiatives and prioritize privacy and social cohesion in high-tech smart city approaches.	Rezone to enable reuse of vacant space for other purposes such as maker workspaces, entertainment, or mixed-income housing; identify potential tax implications and ways to fill any resulting revenue gaps..
	CHALLENGES	Continued shortfall in infrastructure funding and shorter infrastructure lifespans due to climate change.	A push for more sustainable transportation has led to 'travel austerity.'	Private-market shared mobility companies are increasingly owning and operating transportation infrastructure and monopolizing rider data.	A wide variety of vehicles with varying levels of automation and operating speed are competing for limited road space and creating safety issues.
TRANSPORTATION	ADAPTIVE STRATEGIES	Prioritize assets and create plans to decommission assets that cannot be supported in the long-term, particularly those most at risk from climate change, find low cost ways to develop climate-safe and sustainable infrastructure.	Expand transit and multiuse trails and provide discounted passes & credits for riders.	Maintain public stewardship over transportation assets; Balance data collection and privacy.	Promote stronger multi-municipal planning and regional approaches; Build flexible transportation infrastructure, with more space dedicated to transit, walking, and biking; Increase resources dedicated to HAV preparations.
	CHALLENGES	Slow economic growth leads to rising inequality as the wealthiest capture more of the national income and many jobs shift to the gig economy.	There are fears the federal government is overly directing economic activity, crowding out the private market and stunting innovation and entrepreneurship.	Algorithms are increasingly directing much social and economic activity, while a combination of digital technologies is displacing high-paying jobs.	There is a growing abundance of low-cost goods and services, even as technology is displacing jobs.
ECONOMY	ADAPTIVE STRATEGIES	Support efforts to make additional investments in infrastructure, increase worker rights, and use tax policy to more equitably distribute income.	Expand support for small businesses, entrepreneurship, and efforts to commercialize new innovations.	Use binary economics to more equitably distribute capital ownership, and consider providing universal basic incomes. Ensure algorithms and predictive mathematical models do not perpetuate inherent biases in financial, employment, electoral, healthcare, educational, insurance, justice, and other systems.	Support the creation of community jobs programs, and devise strategies to reuse or upcycle materials in order to reduce waste flows.

DECISION MAKING that SUPPORTS the REGIONAL VISION

The *Connections 2050* Plan uses indicators to gauge progress toward regional goals, scenarios to consider alternative futures, and project evaluation criteria and performance-based planning and programming (PBPP) to track transportation network performance and link investments to long-range plan goals. PBPP increases transparency and accountability to better connect investments to outcomes and support decision-making based on the Plan's vision.

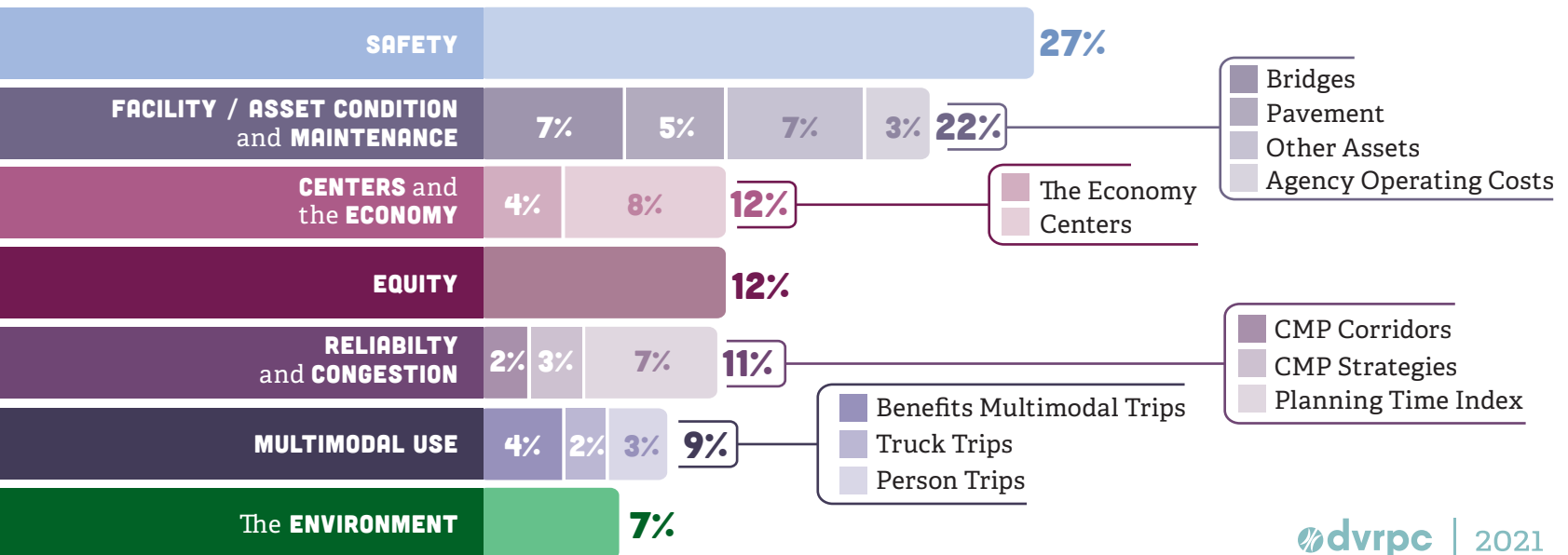
DVRPC's multimodal TIP-LRP Benefit Criteria aims to analyze all types of projects. It screens new road and fixed guideway transit projects to ensure they are primarily located in the Land Use Vision's (see page 35) 'Existing Infill

or Redevelopment' or 'Emerging Growth areas'; and new roadways for consistency with the region's CMP. Those that pass the screening are analyzed with the following criteria:

Safety projects implement FHWA-proven safety countermeasures or other strategies with specific crash reduction factors, address department of transportation (DOT)-identified high-crash locations and crashes in communities of concern; or help meet safety performance measures identified by a Public Transportation Agency Safety Plan.

Facility/Asset Condition and Maintenance projects bring a facility or asset into a SGR, extend the useful life of a facility or asset, or provide reduced operating/maintenance costs.

TIP-LRP Benefit CRITERIA WEIGHING



Centers and the Economy projects are located within a quarter-mile of a Plan or Freight Center, connect two or more Centers, or are located in an above average density area; are located in a municipality that meets U.S. Economic Development Administration funding eligibility requirements; are within a half-mile of a major regional visitor attraction; or are part of an economic development project.

Equity evaluates how the project serves under-represented and marginalized communities and other population groups with additional transportation needs based on location in census tracts with high Indicators of Potential Disadvantage.

Reliability and Congestion projects are located in a CMP congested corridor, implement a strategy appropriate

for that corridor, are on a road with a high planning time index (PTI), or are on a transit route with low on-time performance.

Multimodal Use considers the total number of people and daily trucks using the facility or asset; and the project's overall benefit to multimodal trip making.

Environmental projects deliver high air quality benefits or incorporate environmentally friendly design principles.

While GHGs aren't able to be measured directly for evaluation, projects that enhance safety, reduce congestion, invest in Centers, expand multimodal options, and improve air quality will all help to lower emissions.

Checklist

- Utilize a PBPP approach to select projects for capital programming based on performance metrics, scenario planning, strategic long-range planning goals, lifecycle investment analyses, system performance and condition data, and consideration of social, environmental, and financial impacts.
- Limit roadway new capacity to appropriate areas, as identified in the CMP, and focus construction of new capacity on missing links, priority bottlenecks, and economic development.
- Seek opportunities to expand access and reconnect neighborhoods that have been separated from the broader community by the construction of transportation facilities.
- Explore opportunities to co-locate energy, communications, and other infrastructure within transportation corridors.
- Preserve existing rail and road right-of-way for future transportation uses.
- Work with state and local governments to determine data needs, and build local government data management and processing capacity.

15

Take MUNICIPAL and INDIVIDUAL ACTIONS

The region's 351 municipalities have home-rule authority to influence land use, provide public services, protect natural and historic resources, and, ultimately, create the places where we live, work, and play. They play a critical role in developing inclusive, healthy, and walkable communities, supporting broadly shared economic growth, providing multimodal transportation and helping to achieve Vision Zero, reducing GHG emissions and adapting to climate change, and protecting the region's natural

resources. DVRPC provides various forms of technical assistance to help local governments address current challenges and prepare for the future. [The Municipal Implementation Toolbox](#) serves as a guide for municipalities and provides resources, case studies, and model/sample ordinances that can be used to implement the *Connections 2050 Plan* within their own jurisdictions. Municipalities should additionally seek opportunities for shared services, multimunicipal planning efforts, local outreach and community-led solutions, and regional cooperation.



In addition to municipal actions, there are many **SIMPLE STEPS** that **EVERYONE** in the region **CAN TAKE TO** help **MAKE THE PLAN** a **REALITY**.

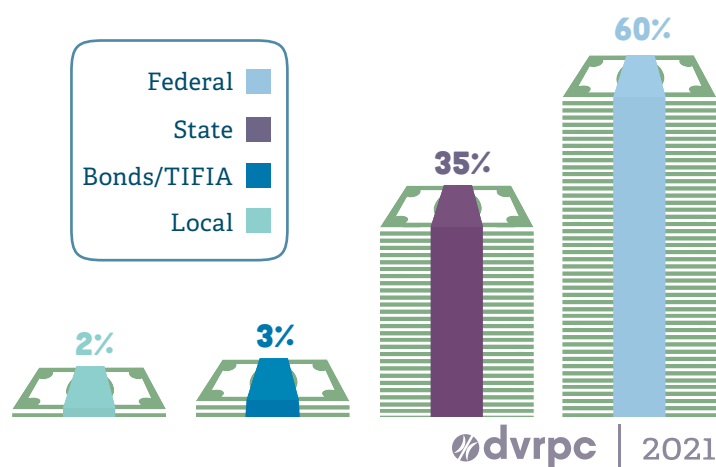
 <p>Reduce Waste, Compost, & Recycle</p>	 <p>Insulate And Seal Your Home</p>	 <p>Avoid Idling</p>	 <p>Use LED Lights</p>	 <p>Buy Local Produce & Eat Less Meat</p>
 <p>Plant Native Trees & Plants</p>	 <p>Visit / Shop In A Center</p>	 <p>Clean Up In Your Community</p>	 <p>Support Mixed-use Development</p>	 <p>Enjoy Local Parks & Trails</p>
 <p>Be Involved In Your Community</p>	 <p>Use Renewable Energy</p>	 <p>Support Local Businesses</p>	 <p>Start A Walking School Bus</p>	 <p>Depave / Use Pervious Pavements</p>
 <p>Practice Anti-racism And Support Equity</p>	 <p>Take Transit, Walk, Or Bike</p>	 <p>Travel Off-peak & Combine Trips</p>	 <p>Organize Play / Open Streets</p>	 <p>Consider A Hybrid Or Electric Vehicle</p>

TRANSPORTATION INVESTMENTS

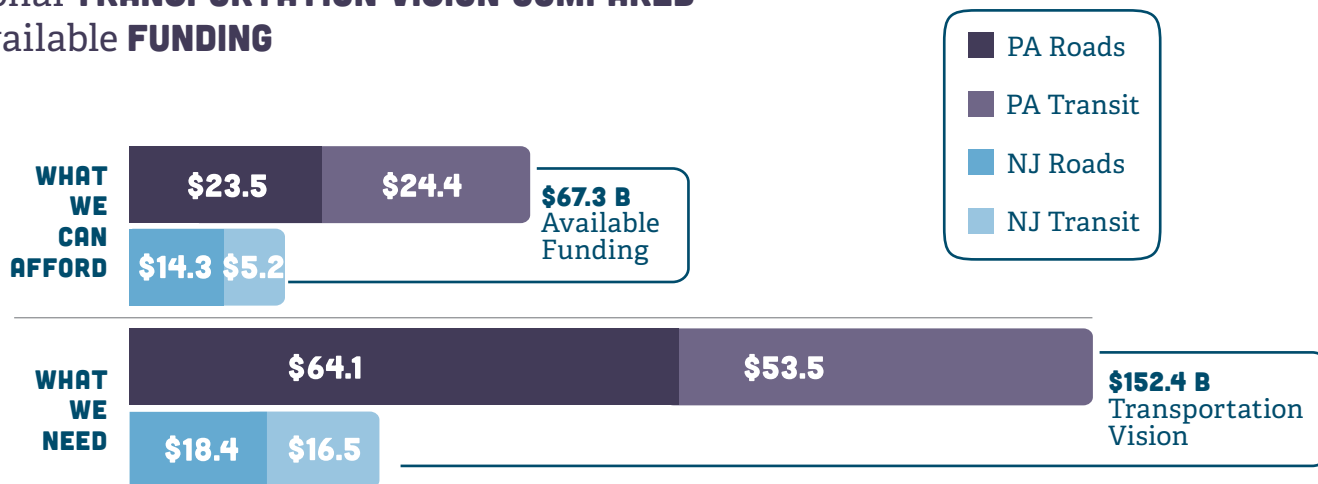
Connections 2050 outlines a strategy for how Greater Philadelphia can make capital investments in transportation infrastructure to help achieve the Plan's vision in the coming decades. The 2050 vision is to achieve and maintain a state-of-good repair (SGR) for all existing transportation infrastructure, achieve a Vision Zero Goal of fatalities or serious injuries from transportation, and integrate modes while increasing biking, walking, and transit to expand options in getting around.

The financial plan contains both an aspirational 'vision plan' for investing in transportation infrastructure and a 'fiscally constrained plan' for what can be afforded given the reasonably anticipated revenue forecast. The vision plan contains an in-depth needs assessment that uses asset management systems to determine what is required to achieve and maintain an SGR for existing infrastructure, improving bike and pedestrian infrastructure, making physical and technological improvements to enhance safety and operations in the transportation network, and limited investment in new facilities. The total estimated cost of the vision plan is \$152 billion. However, the Plan estimates that there will only be \$67.3 billion in total federal, state, and local funding, and borrowing from 2022 to 2050 to pay for the

Regional **TRANSPORTATION FUNDING** by **SOURCE**



Regional **TRANSPORTATION VISION COMPARED** to Available **FUNDING**



All figures in billions of year-of-expenditure dollars.*

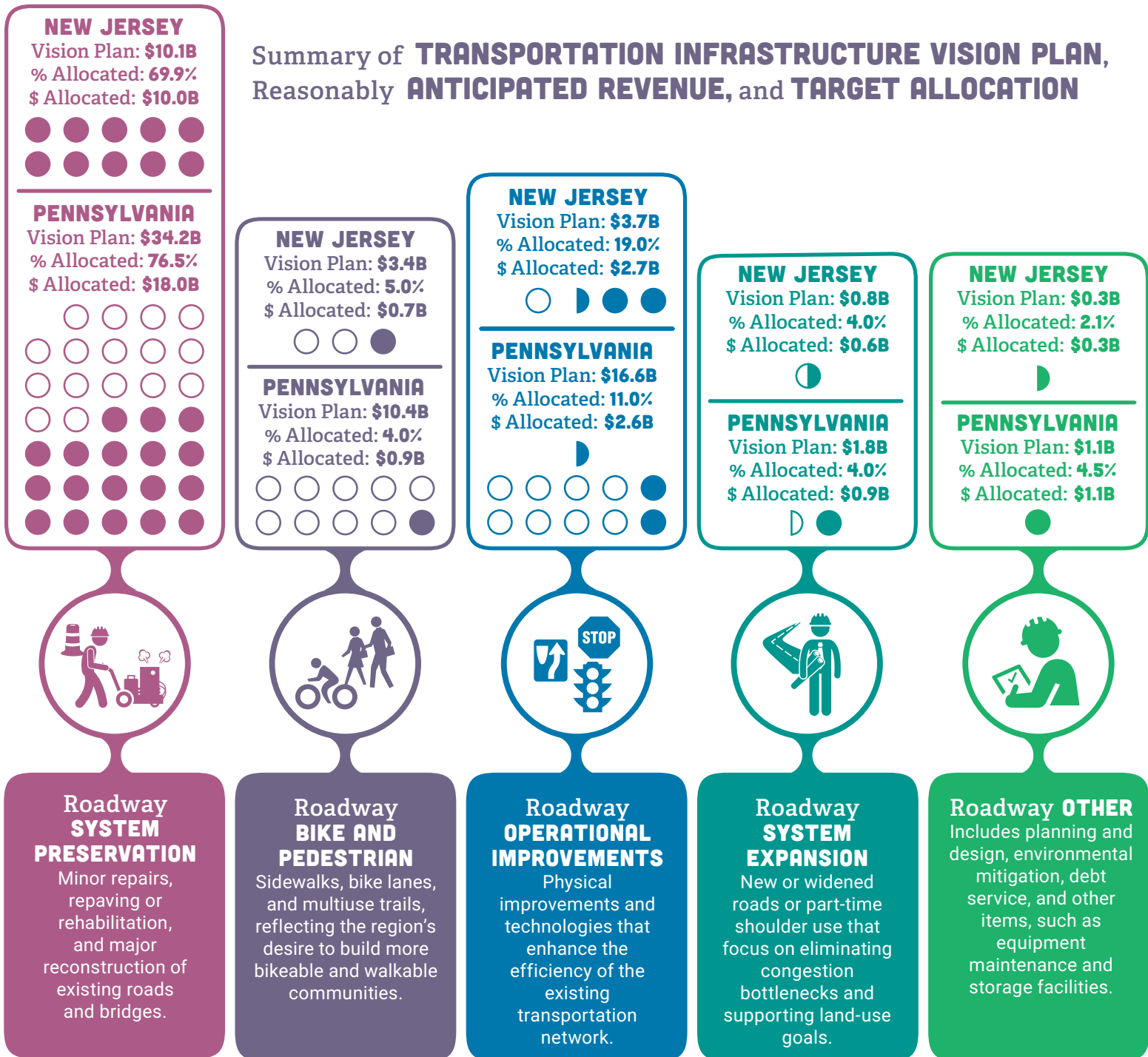
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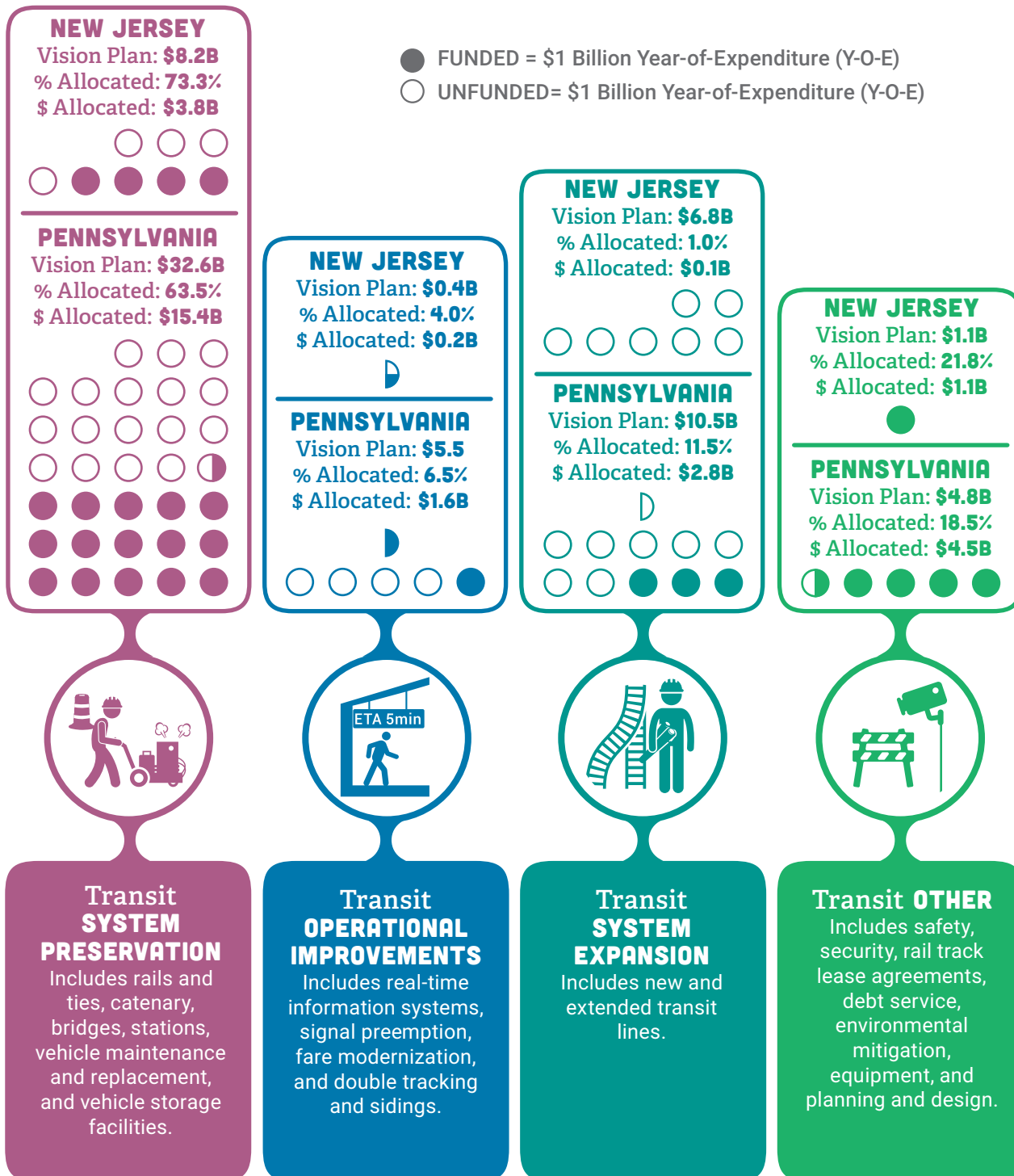
vision. Roadway and transit revenues come to the region as separate budgets, with very limited ability to transfer between them. Federal regulations require all financial plan revenues and project costs be presented in year-of-expenditure (Y-O-E) dollars, which account for the impact of inflation over time. *Connections 2050* forecasts a 3 percent annual inflation rate over the life of the Plan.

Available revenues are allocated to different project categories: system preservation, bike and pedestrian projects, operational improvements, system expansion, and other. Funding within each category is allocated to both major regional projects (MRPs), which are listed in the Plan, and to buckets that will fund hundreds of smaller-scale projects as they are programmed in current and future TIPs. The following pages show how the plan will allocate the \$67.3 billion in revenue across different roadway and transit project categories and MRPs that can be afforded

within this budget. A percentage of total roadway and transit funding for the Pennsylvania and New Jersey subregions is allocated to each project category based on the Plan's vision and goals, policy, and comparative need. *Connections 2050* increases funding allocated to stand alone bike and pedestrian projects, while continuing to focus on SGR with nearly three-quarters of available revenue programmed for road and transit preservation projects. In addition, nearly all road projects in the TIP have some bike or pedestrian improvements that aren't accounted for in this stand alone category. For more information about each MRP, see the interactive MRP webmap, which also includes a list of aspirational projects the region would pursue with additional revenue. The Funded MRP map includes toll authority and other agency's 'externally funded projects', which don't use federal transportation funds but must be accounted for in DVRPC's air quality conformity analysis. ▶

Summary of **TRANSPORTATION INFRASTRUCTURE VISION PLAN**,
Reasonably **ANTICIPATED REVENUE**, and **TARGET ALLOCATION**





FUNDED MAJOR REGIONAL PROJECTS:

ROADWAY PRESERVATION

- 1) I-76 Resurfacing
- 2) PA 309 Sellersville Bypass Resurfacing
- 3) I-476 Resurfacing
- 4) State Road Resurfacing
- 5) US 1 Reconstruction
- 6) US 422 Reconstruction
- 7) 59th Street Bridge over Amtrak
- 8) Belmont Ave. Bridge over Schuylkill
- 9) Falls Road Bridge Preservation
- 10) I-95 Reconstruction in South Philadelphia
- 11) Market St. Bridge over Schuylkill River and CSX
- 12) Darby Road Extension
- 13) Ridge Pike over Norfolk Southern and PA Turnpike
- 14) US 1 Bridge over Wayne Junction
- 15) Wanamaker Ave. Bridge over Darby Creek
- 16) Swanson Street Reconstruction
- 17) US 130 Bridge over Big Timber Creek
- 18) US 47 Bridge over Big Timber Creek
- 19) I-76/I-676 Bridges and Pavement
- 20) Route 73 Bridge over Route 130
- 21) Route 42 Resurfacing
- 22) Lincoln Ave/Chambers St. Bridge over Amtrak & Assunpink Creek
- 23) Route 47 Resurfacing and ADA
- 24) NJ 70 Reconstruction

BIKE AND PEDESTRIAN

- 25) Penn's Landing Access and Community Improvement
- 26) The Circuit Trail Network*

ROADWAY OPERATIONAL IMPROVEMENTS

- 27) 30th St. Station Vehicle Circulation

- 28) District Traffic Management Center
- 29) Eakins Oval Circulation
- 30) I-276 at PA 611 Willow Grove
- 31) I-476 and I-76 Ramp Modifications
- 32) I-76 at PA 23 Matsonford Road
- 33) I-95 and I-476 Interchange
- 34) I-95 Reconstruction - North Philadelphia
- 35) PA 611 ITS
- 36) PA 611-Easton Rd
- 37) Welsh Rd. Bridge Reconstruction and Intersection Improvements
- 38) Ridge Pike Reconstruction
- 39) Sumnertown Pike Corridor Improvements
- 40) US 1 Interchange Improvements at PA 352 & 452
- 41) US 202 Reconstruction and Center Turn Lane
- 42) Vision Zero Safety Improvements
- 43) Second St. / Industrial Highway Complete Street
- 44) NJ 70 Corridor Improvements
- 45) US 130 Corridor Improvements
- 46) Trenton City Traffic Signal Upgrades
- 47) Trenton Station Area Access

ROADWAY SYSTEM EXPANSION

- 48) Belmont Ave at I-76 Interchange
- 49) Henderson Rd. and South Gulph Rd. Widening
- 50) I-476 Active Traffic Management
- 51) I-76 Integrated Corridor Management
- 52) I-95/US 322/Highland Ave. Interchange
- 53) PA 309 Connector Road (Phase 2)
- 54) US 1 Reconstruction and Widening
- 55) US 202 Reconstruction and Widening
- 56) US 30 Coatesville-Downingtown Bypass
- 57) US 322 Reconstruction and Widening
- 58) US 422 Mainline Widening
- 59) I-295 at I-76/NJ 42 Missing Moves
- 60) I-295 Direct Connect

- 61) US 322 Widening
- 62) US 322 Bypass
- 63) NJ 73 Grade-Separated Interchanges

ROADWAY OTHER

- 64) Chester City & Township Sound Walls

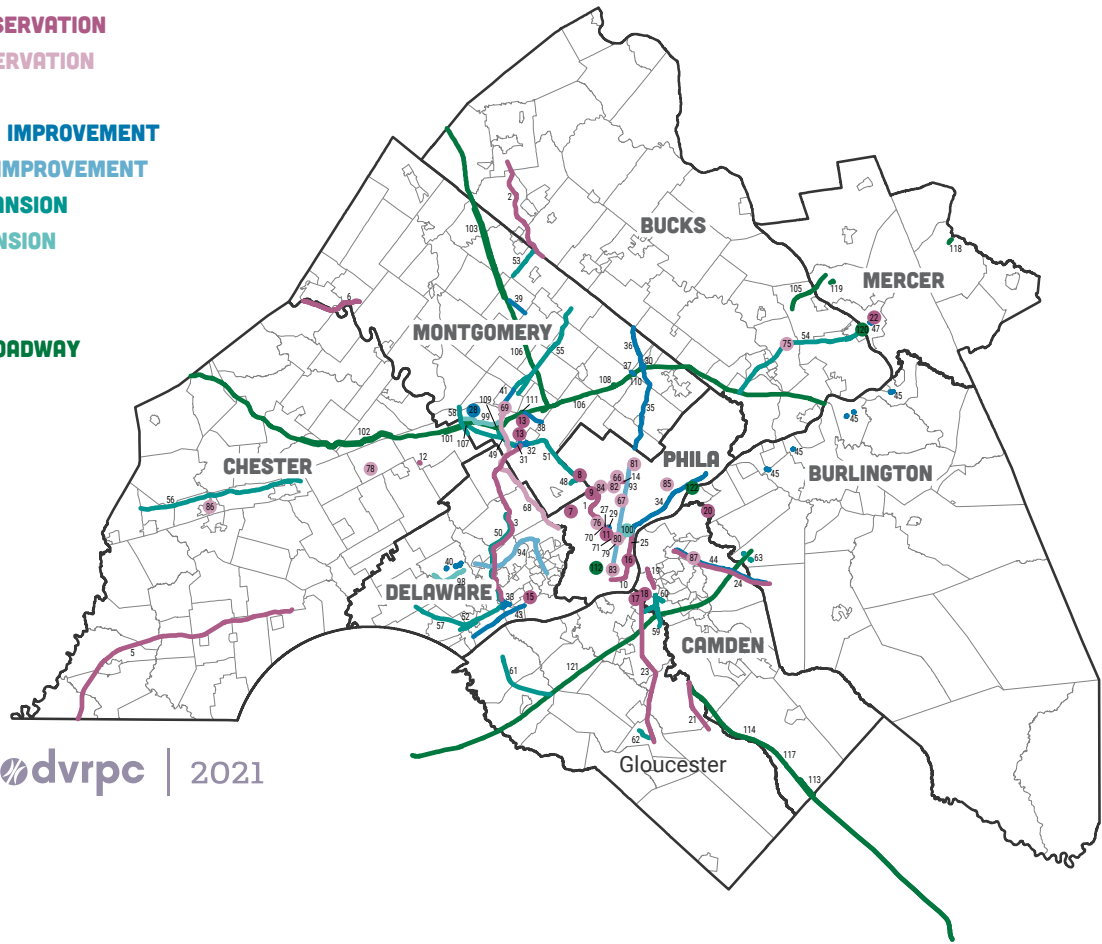
TRANSIT SYSTEM PRESERVATION

- 65) Bus and Trolley Communications System
- 66) Chestnut Hill East Line Bridges
- 67) Chestnut Hill West Line Bridges
- 68) Norristown High Speed Line Tracks
- 69) Norristown High Speed Line Bridges
- 70) Regional Rail Catenary
- 71) Regional Rail Mainline Bridges
- 72) Regional Rail from 30th St to Phil Interlocking
- 73) Trolley Track and Right-of-Way
- 74) Substation Replacements (multiple)
- 75) Woodbourne and Cresheim Valley Substations
- 76) Zoo Interlockings
- 77) SEPTA Transit Vehicle Replacements (Multi-level Cars, Silverliner VIs, Market Frankford Line, Broad Street Line, Norristown High-Speed Line, Buses)
- 78) Frazer Shop and Yard
- 79) Center City Concourse Improvements
- 80) City Hall and 15th Street Stations
- 81) Fern Rock Station Modifications
- 82) Midvale Bus Garage Roof
- 83) Broad Street Line Ventilation at NRG Station
- 84) Regional Rail Station Enhancements
- 85) Transit Station Enhancements
- 86) Amtrak Keystone Corridor Stations
- 87) Atlantic City Line Stations
- 88) NJ TRANSIT Vehicle Replacements (Atlantic City Line Locomotives and Commuter Rail, River Line, NE Corridor Line)
- 89) PATCO Vehicle Replacement
- 90) PATCO Bridges Rehabilitation
- 91) PATCO Station Platform Rehabilitation

- ROADWAY SYSTEM PRESERVATION
- TRANSIT SYSTEM PRESERVATION
- BIKE AND PEDESTRIAN
- ROADWAY OPERATIONAL IMPROVEMENT
- TRANSIT OPERATIONAL IMPROVEMENT
- ROADWAY SYSTEM EXPANSION
- TRANSIT SYSTEM EXPANSION
- ROADWAY OTHER
- TRANSIT OTHER
- EXTERNALLY FUNDED ROADWAY

UNMAPPED PROJECTS

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TRANSIT OPERATIONAL IMPROVEMENTS

- 92) SEPTA Trolley Modernization
- 93) Broad Street Line Signals
- 94) Media/Sharon Hill Lines Positive Train Control
- 95) Norristown Regional Rail Track
- 96) SEPTA Audio Visual Public Address System
- 97) SEPTA Key

TRANSIT SYSTEM EXPANSION

- 98) Elwyn Line Extension
- 99) KOP Rail
- 100) Franklin Square Station

EXTERNALLY FUNDED ROADWAY

- 101) PA Turnpike Reconstruction and Widening
- 102) PA Turnpike Reconstruction and Widening
- 103) PA Turnpike Northeast Extension Reconstruction & Widening
- 104) I-95 and PA Turnpike Interchange
- 105) I-295 Scudder Falls Bridge Replacement
- 106) PA Turnpike All Electronic Tolling
- 107) I-276/I-76 Valley Forge Interchange
- 108) I-276 at Virginia Drive Full Movements
- 109) I-276 at Henderson Road Interchange
- 110) I-276 at Welsh Rd. Interchange
- 111) I-276 at Lafayette St./Ridge Ave.
- 112) South Philadelphia Refinery Redevelopment

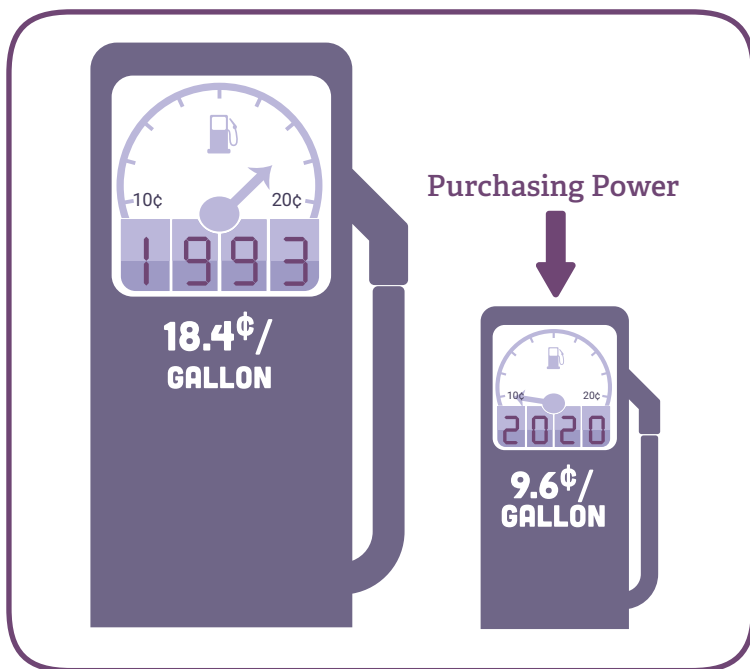
- 113) Atlantic City (AC) Expressway Widening
- 114) AC Expressway Electronic Tolling & ITS Upgrades
- 115) South Jersey Transportation Authority Facility Improvements
- 116) AC Expressway Bridges
- 117) AC Expressway Resurfacing
- 118) Vaughn Drive Connector
- 119) West Trenton Bypass
- 120) Delaware River Joint Toll Bridge Commission All Electronic Tolling
- 121) NJ Turnpike Widening
- 122) Tacony-Palmyra Bridge Rehabilitation

**Project is partially funded.*

FILLING the FUNDING GAP

Additional funding is needed at the federal, state and local levels if the region wants to realize the transportation vision set forth in this Plan. The primary source of the region's transportation funding, taxes on gasoline and petroleum products, have been declining due to more fuel-efficient and alternative-fuel vehicles, and decreased VMT as a result of the pandemic—after more than a decade of flat driving rates

The **EFFECT** of **INFLATION** on the **FEDERAL GAS TAX**



Source, Producer Price Index, Construction Materials Index, 1993-2020

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following the 2007 recession. Inflation since the last federal gas tax increase in 1993 has eaten away nearly 50 percent of its purchasing power. DVRPC will continue to facilitate dialogue around replacements for federal and state gas taxes that are consistent with the Plan's vision and goals. In addition, **DVRPC and its planning partners work to reduce investment needs through project right sizing and application of cost-saving technologies.** Right-sizing seeks efficiencies by resolving transportation problems with more affordable, context sensitive solutions that are supported by surrounding communities and are implementable in a reasonable timeframe. Right-sizing means the DOT will consider reduced-scale alternatives like TSMO before developing more costly alternatives, such as new or widened roadways. If the problem is safety, and not congestion, then the DOT will consider focused solutions to improve safety without increasing capacity—though safety must be the focus of all projects.

The Greater Philadelphia region is very dependent on federal and state funding, and provides very little transportation funding from local sources—particularly for transit capital projects—as compared with peer regions. Local sources are

anticipated to contribute just 2 percent of the region’s funds. Regions with more local funding are better able to build and maintain infrastructure, and have more flexibility to build partnerships and experiment with new technologies to grow their economies. As federal and state partners consider

alternatives and means to increase transportation funding, local leaders must also look for mechanisms to supplement those federal and state funds to provide local and regionally-generated funding to support local and regional priorities.

Potential **FUNDING OPTIONS** for **REPLACING** the **GAS TAX**

 <p>MILEAGE-BASED USER FEES</p> <p>Drivers are charged by the mile for travel on a defined roadway network.</p>	 <p>CARBON TAX</p> <p>Assessed based on the carbon content emitted by the burning of fossil fuels.</p>	 <p>TOLL EXISTING HIGHWAYS</p> <p>A user fee on designated limited access roads and bridges.</p>	 <p>VEHICLE REGISTRATION FEES</p> <p>An annual assessment on vehicle ownership.</p>
 <p>TRADABLE DRIVING CREDITS</p> <p>Each Person receives and allotment of miles each year, those who drive less can sell them to those who drive more.</p>	 <p>COMMERCIAL PROPERTY VMT FEE</p> <p>Connects land use and transportation by applying a location-based fee to commercial real estate based on the annual vehicle miles they generate.</p>	 <p>PARKING PRICING</p> <p>Ensures available on-street parking through demand-based pricing, while making off-street spaces a less expensive alternative and reducing traffic.</p>	 <p>CONGESTION PRICING</p> <p>Sets variable tolls to manage demand for using a facility or entering a specific zone, using revenue generated to provide more transportation options.</p>

Aspirational **TWEETS & NEWS HEADLINES** for **GREATER PHILADELPHIA** in the Year **2050**



Greater Philly wins 'triple crown'
1. [R]anked most equitable
region in nation. 2. Most
entrepreneurial 3. Most livable.



Regional goal of 100% disability
accessible sidewalks, crosswalks,
and transit has been met.



Cooperation across [the]
Greater Philadelphia Region
leads to: increasing equity in
educational outcomes, reduced
income inequality, and soaring
levels of homeownership.



Philadelphia has yet again
reported zero fatalities on its
roadways as a result of [a] huge
shift to walking, biking, and
transit as a part of the region's
strong commitment to safety
and climate change.



In the past 30 years, Black,
Brown and white residents all
turned to green as region
addresses racial bias to seek a
better future and minimise
impacts of climate change."



Greater Philadelphia achieves a
net zero carbon footprint.



Philadelphia metro residents are
happy, healthy, fully employed,
highly educated and lead fulfilling
lives in a clean environment."

*All quotes on this page come
directly from participants in
the Plan's visioning outreach.*

TAKING ACTION

Connections 2050 was developed with input from a broad array of regional stakeholders and the public, and builds consensus with a wide-range of planning partners representing a diverse region with needs that vary across geographic boundaries. It is intended to provide a path forward for a more equitable, resilient, and sustainable future. The Plan focuses on transportation infrastructure. Infrastructure underpins our society and our economy, and delivers many of the things we value. Transportation provides us access to jobs, education, visits with friends and family, nature, open space, and recreational activities, routine and emergency healthcare, and numerous other opportunities.

Improving transportation in the digital age requires strengthening coordination efforts, increasing reliability, implementing safety improvements, providing information about transportation options, and developing flexible services that improve access to essential services and job opportunities. The financial plan aims to achieve the vision by prioritizing the repair of existing infrastructure and making safety improvements, enhancing transit, walking, and biking options, and limiting investment in roadway expansion. To fully achieve the vision, the region must find ways to increase investment in maintaining and improving transportation infrastructure. **Transportation investments often have a much wider benefit than initially expected.** For example, ADA curb cut requirements have made walking accessible for a

variety of users, such as children in strollers or on bicycles; individuals using crutches, canes, or walkers; and travelers with wheeled suitcases. Vision Zero safety investments are likely to similarly yield a wider range of benefits, such as encouraging more multimodal transportation, enhancing community, reducing noise and air pollution, and decreasing GHG emissions.

Transportation does not exist in a vacuum—it both affects and is affected by land use and community design, the economy, and the environment. Centers-based development patterns can reduce the need to travel long distances and make walking, biking and transit more feasible. This can reduce GHG emissions and stimulate the daily in-person encounters

that make life more enjoyable and help to transfer skills and knowledge and promote innovation. Climate change presents major risks to life on Earth. Combating the worst outcomes from climate change and adapting to the levels of change that have already been baked in will require a level of mobilization at a local, regional, national, and international level unlike anything ever seen in history. It will require a massive decarbonization of energy, transportation, and economic systems, and hardening communities and infrastructure or moving them out of harm's way. These investments could reduce existing inequities, but could worsen inequality without a focus on creating more equitable policies and economic outcomes.

In addition to climate change, a range of digital technologies—such as artificial intelligence, robotics, 3D printing, the Internet of Things, and others—are causing deep uncertainty around the future of work and production, trade and goods movement, and the nature of the economy. At the same time, shifting ideologies are calling for the creation of a fairer, more equitable economy with increased access to opportunity for communities that have historically been marginalized. **DVRPC and its partners look forward to being a part of the ongoing dialogue and continuing to do our part to help reshape the economy, the transportation network, communities, and the environment to be more equitable, sustainable, and resilient.**

MOVING FORWARD

Implementation requires making policy, investment, project development and everyday decisions that are consistent with the Plan's vision and goals. Many implementation activities occur through **DVRPC's Annual Work Program, the TIP, and actions taken by planning partners, member governments, stakeholder agencies, and individuals.** The Commission provides an array of services to the region's municipalities, such as the Municipal Implementation Toolbox, the Transportation and Community Development Initiative (TCDI), regional streetlight procurement program, the regional circuit rider for energy efficiency in local government operations, Equity Through Access, and the regional trails program.

Achieving the vision requires building partnerships and the dedicated efforts and cooperation of many actors across the public and private sectors—including federal, state, and local governments, transit agencies, social services providers, real estate developers, major employers, and funders, and individual citizens. The region must also strengthen collaboration within the Northeast and mid-Atlantic megaregions, which we benefit from being connected to.

The Circuit Trails embody the power of building regional partnerships, in this case between private foundations, county governments, state agencies, and the Pennsylvania and New Jersey DOTs. The formal nonprofit body representing this partnership, **the Circuit Trails Coalition, has a goal of completing 500 miles**

of trails by 2025 and completing the buildout of the full network by 2040. As a part of the coalition, DVRPC supports these goals and is investing to make them happen. When fully constructed, the Circuit Trails will be a model for metropolitan trail networks.

DVRPC will continue to serve as a convener and facilitator to bring a wide-range of groups together to help to better understand the region's infrastructure gaps. DVRPC hosts a range of committees consisting of representatives from the public and various professional fields, including the Public Participation Task Force, Regional Technical Committee, Delaware Valley Goods Movement Task Force, Regional Aviation Committee, Transportation Operations Task Force, Central Jersey Transportation Forum, Regional Community and Economic Development Forum, Regional Safety Task Force, Information Resources Exchange Group, Air Quality Partnership, Coastal Zone Management Program, Greater Philadelphia Futures Group, Healthy Communities Task Force, along with the Commission's Board.

The *Connections 2050* Plan contains a bold aspirational vision for investment in transportation infrastructure and improvement in its safety, resiliency, equity, and sustainability. The Plan aims to set the agenda and shape the pipeline of projects coming into the TIP. Planning is an ongoing process, and much more work is needed to obtain this vision. Some examples of the work that is needed include a better understanding of what will need to be done to harden or move infrastructure out of harms' way; finding ways to more quickly reduce greenhouse gas emissions throughout the infrastructure lifespan—including

construction, operations, maintenance, and eventual rehabilitation or decommissioning—as well as changing design standards, undertaking educational outreach, and equitable enforcement actions needed to achieve Vision Zero; bringing more diverse voices into the decision making process to ensure more equitable investments; and preparing for and understanding the potential applications, benefits and risks of digital technologies and emerging transportation technologies. On top of that more funding will be needed. **These are reasons why the Plan is updated every four years. Each update is an opportunity to take stock of changing priorities for the vision, and assess strategies and investment needs to obtain it.**

As the region implements *Connections 2050*, it will be important to determine whether the goals contained in the Plan are being met. The Tracking Progress indicators assess how well we are doing, and identify where further planning is most needed. **DVRPC will also evaluate the Plan's effectiveness in guiding decision-making, which will further inform the next update cycle.**

Your help is needed to advance the principles and goals in *Connections 2050*. Join us in shaping our region's future by participating in public meetings, reviewing our website and publications, submitting comments on our plans and programs, or taking action on any of the individual strategies noted in strategy #15 on page 61.■

Acronyms

ADA Americans with Disabilities Act	IPD Indicators of Potential Disadvantage
ADAS Advanced Driver Assistance System	MaaS Mobility as a Service
ADS Automated Driving System	MPO Metropolitan Planning Organization
ADU Accessory Dwelling Unit	MRP Major Regional Project (in the Plan)
AEV All-Electric Vehicle	NAAQS National Ambient Air Quality Standards
ASL American Sign Language	NEC Northeast Corridor
AV Automated Vehicle	NHS National Highway System
BEV Battery Electric Vehicle	NO_x Nitrogen Oxide (air quality)
BIPOC Black, Indigenous, and People of Color	ODD Operational Design Domain (for HAVs)
BLM Black Lives Matter	PBPP Performance-Based Planning and Programing
CEDS Comprehensive Economic Development Strategy (of DVRPC)	PEV Plug-in Electric Vehicle
CMP Congestion Management Process (of DVRPC)	PHEV Plug-in Hybrid Electric Vehicle
Covid-19 Coronavirus Disease 2019	PHL Philadelphia International Airport
CV Connected Vehicle	PM_{2.5} Fine Particulate Matter (air quality)
DOT Department of Transportation	PTASP Public Transportation Agency Safety Plan
DVRPC Delaware Valley Regional Planning Commission	PTI Planning Time Index
E-Bike Electric Bicycle	SGR State-of-Good Repair
E-Scooter Electric Scooter	TDR Transfer-of-Development Rights
EJ Environmental Justice	TIM Traffic Incident Management
ESL English-as-a-second language	TIP Transportation Improvement Program
EV Electric Vehicle	TNC Transportation Network Company
FRA Federal Railroad Administration	TND Traditional Neighborhood Design
FWG Futures Working Group (of DVRPC)	TOD Transit-Oriented Development
GHG Greenhouse Gas	TSAP Transportation Safety Analysis and Plan (of DVRPC)
GSI Green Stormwater Infrastructure	TSMO Transportation Systems Management and Operations
HAV Highly Automated Vehicle	VMT Vehicle Miles Traveled
HSIP Highway Safety Improvement Program (of U.S. DOT)	VOC Volatile Organic Compound (air quality)
	YOE Year of Expenditure



THE DELAWARE VALLEY REGIONAL PLANNING COMMISSION is the federally designated Metropolitan Planning Organization for the Greater Philadelphia region, established by an Interstate Compact between the Commonwealth of Pennsylvania and the State of New Jersey. Members include Bucks, Chester, Delaware, Montgomery, and Philadelphia counties, plus the City of Chester, in Pennsylvania; and Burlington, Camden, Gloucester, and Mercer counties, plus the cities of Camden and Trenton, in New Jersey.

DVRPC serves strictly as an advisory agency. Any planning or design concepts as prepared by DVRPC are conceptual and may require engineering design and feasibility analysis. Actual authority for carrying out any planning proposals rest solely with the governing bodies of the states, local governments or authorities that have the primary responsibility to own, manage or maintain any transportation facility.

DVRPC'S VISION for the Greater Philadelphia region is a prosperous, innovative, equitable, resilient, and sustainable region that increases mobility choices by investing in a safe and modern transportation system; that protects and preserves our natural resources while creating healthy communities; and that fosters greater opportunities for all.

DVRPC'S MISSION is to achieve this vision by convening the widest array of partners to inform and facilitate data-driven decision making. We are engaged across the region and strive to be leaders and innovators, exploring new ideas and creating best practices.

Title VI Compliance: *DVRPC fully complies with Title VI of the Civil Rights Act of 1964, the Civil Rights Restoration Act of 1987, Executive Order 12898 on Environmental Justice, and related nondiscrimination mandates in all programs and activities. DVRPC's website, www.dvrpc.org, may be translated into multiple languages. Publications and other public documents can usually be made available in alternative languages and formats, if requested. DVRPC's public meetings are always held in ADA-accessible facilities, and held in transit-accessible locations whenever possible. Translation, interpretation, or other auxiliary services can be provided to individuals who submit a request at least seven days prior to a public meeting. Translation and interpretation services for DVRPC's projects, products, and planning processes are available, generally free of charge, by calling (215) 592-1800. All requests will be accommodated to the greatest extent possible. Any person who believes they have been aggrieved by an unlawful discriminatory practice by DVRPC under Title VI has a right to file a formal complaint. Any such complaint must be in writing and filed with DVRPC's Title VI Compliance Manager and/or the appropriate state or federal agency within 180 days of the alleged discriminatory occurrence. For more information on DVRPC's Title VI program or to obtain a Title VI Complaint Form, please visit: www.dvrpc.org/GetInvolved/TitleVI, call (215) 592-1800, or email public_affairs@dvrpc.org.*

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