

ENVISION 2070

Mobility in a Sustainable Pittsburgh

September 2021



Acknowledgments

The 2070 Mobility Vision Plan is neither new nor novel. It is a compilation of collective community wisdom, forethought, and resolve. Plan by plan, idea by idea, Pittsburghers have been building this Vision for years. It includes the work and wisdom of countless residents, stakeholders, and city builders both past and present. We are grateful for the contributions, both new and old, as we work towards a sustainable, equitable, and accessible mobility future.

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Letter from the Director

Dear Neighbors,

You have been thinking about how to improve transportation in Pittsburgh for generations. Some of the ideas have been big and audacious – monorails looping through the City or aerial gondolas gliding above it. Some have been seemingly small, but perhaps even more impactful, like safe crosswalks or restored steps. Some ideas, like fast transit to the airport, have been discussed for decades while others, like autonomous urban deliveries, are very new considerations.

This 2070 Mobility Vision Plan culled through hundreds of ideas generated over the years through scores of planning processes and projects. Engagement throughout this planning process reiterated many of these ideas and generated new ones. This Plan arranged these many disparate ideas into one cohesive system of systems with layers of connectivity from the national to the neighborhood level.

It may be tempting to dismiss this plan as fantastical or overly ambitious, but that would be a mistake. Fifty years is a long time, and a lot will change.

A century ago, Pittsburgh was a very different place. The Pittsburghers of that era would have thought a highway trenched through the Lower Hill or slashing across the North Side impossible. Residents a half century ago likely would have doubted Pittsburgh's trolleys would ever be idled and the steel mills shuttered. Even just two years ago, most of us would never have believed that most of the business of school and work would be done at kitchen tables rather than office towers and classrooms.

Change will happen. This 2070 Mobility Vision Plan is a roadmap to give that change purpose and direction. It looks back to plan forward and sets a path towards a more equitable and less divided system for future generations.

Sincerely,



Karina Ricks,

Director, Department of Mobility and Infrastructure



2070 Mobility Vision Plan

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The 2070 Mobility Vision Plan is an opportunity for bold and proactive thinking about the future of Pittsburgh to identify the connections and policies we need to ensure that, in a growing city, all residents will have the physical mobility they need to reach the economic mobility they seek.





1 INTRODUCTION

2070 Mobility Vision Plan

The 2070 Mobility Vision Plan dares to dream. It reaches both forward and back, integrating numerous separate community-led plans, existing assets, and past wisdom into one cohesive vision for infrastructure and mobility.

It is bold – proposing policies and projects to address the imperatives of our time: equity, climate, and economic growth. And it is achievable – strategically targeting investments over time to build a future in which all, and the planet, can thrive.

More than most cities, transportation infrastructure defines Pittsburgh's iconic image. The bridges, inclines, and steps are part of the City's DNA and constant reminders of the tenacity and innovation that built and sustain it. Infrastructure can also divide as neighborhoods are cleaved by highways and struggle to reconnect to opportunity. Legacy infrastructure, the scale of which is both enormous and complex, of a once-wealthy city is deteriorating with deferred maintenance and in some locations struggling to maintain its footing in the face of more and severe climate events. Pittsburgh has changed a lot over

the last fifty years and change over the next fifty will be equally profound.

This Plan serves as a strategic roadmap to maintain past investments, address current disparities, and meet future mobility challenges. It is a long-range framework to connect our people and neighborhoods to each other, the region, and the world. It pursues the ambitious mission to provide all users the physical mobility they need to reach the economic mobility they seek. It charts a course to make small incremental progress to achieve large scale change and improvement. Through specific project, policy, and process recommendations, the Plan will move Pittsburgh closer to core goals that also align with foundational values.

This Plan is neither new nor novel. It is a compilation of collective community wisdom, forethought, and resolve. Plan by plan, idea by idea, Pittsburghers have been building this Vision for years. This Plan extracts from dozens of separate plans – neighborhood plans, modal plans, development plans, and regional plans – and meshes them together into a cohesive system and strategy. This Plan reflects the work and wisdom of countless residents, stakeholders, and city builders both past and present. It also incorporates new ideas, innovations, and imperatives. Importantly, it provides a trajectory for action.



Capturing the Communal Vision

Over the past fifty years there have been a lot of plans. From ambitious, almost science fiction visions of sky buses and magnetic trains to local neighborhood plans for safe crossings and better streets. Network plans, area plans, corridor plans, project plans – this Plan is a compilation of individual plans into a holistic and legible system.

The project team reviewed dozens of recent and past plans, scoured city archives and news feeds, and mined the collective wisdom of residents and stakeholders – drawing out projects, policies, and programs vital to inform this Vision. From May 2019 to January 2020, stakeholders and residents brought forward more ideas – some new, some old – through more than 900 individual comments and points of input. Participants reviewed a consolidated draft project list during a series of virtual meetings in June 2020.

2020 was a difficult year. Changing travel during the COVID-19 pandemic, demonstrations against racial injustice, and dramatic environmental catastrophes resulting from climate change cast fresh light on the goals and imperatives of this Plan and a clearer lens through which to see the projects, policies, and processes contained within.

The result is a vision that is responsive to the needs and objectives of today yet flexible enough to adapt to the unknowable future. This Vision is a framework for investment and decision making. It provides a vision for a connected, equitable, and sustainable city with livable and living streets.





Six principles guide this Plan

1. Adapt the infrastructure of the past for the needs of the future.

Long time 'burghers often refer to Pittsburgh as being laid out by a mountain goat. City streets once designed for horses and trolleys have adapted to move and store motor vehicles and are not always the most welcoming to pedestrians. These same streets will need to move the mobility of the future. While much may change – connected vehicles, electric devices, and maybe flying taxis – the foundation of pedestrians will remain the same. The Vision guides street design and operation to use the assets of the past to optimize for mobility of the future.

2. Anticipate and direct technology for good.

Pittsburgh is a city of innovation. In 1885, George Westinghouse transformed electricity (literally). In 1953, Jonas Salk developed a vaccine that would eradicate polio. In 1982, Scott Fahlman introduced the world to the emoticon. Pittsburgh continues to lead the world with artificial intelligence, robotics, medical, and educational innovation. While Pittsburgh embraces its role as a real - world proving ground, it must also be a real world leader in directing mobility technology toward a more equitable, inclusive, and sustainable future.

Smartphones have changed how we move, shop, and pay. Older modes of transportation will find new life as bicycles get an electric boost, workhorse barges share the rivers with water buses, and gondolas (aerial ropeway transit) rise above it all to help (re)connect neighborhoods

and centers. Shared mobility will serve more trips reducing the need for private vehicles and electrification promises to keep us moving with fewer environmental impacts. The future will bring more changes still. This framework will help guide decision making to ensure an efficient, sustainable system for all.

3. Recognize and respond to the reality – and urgency – of climate change.

Climate change requires that we make big changes – and fast. This Vision provides for a city that is easy to move around on foot, bike, and micromobility. It prioritizes the movement of mass transit and protects dense economic centers from congestion. Green infrastructure and transportation electrification are cornerstones of this Vision. The Plan enables and optimizes sustainable infill development on stable ground while protecting fragile slopes and mitigating flood-prone areas. Street design promotes safety, low-stress travel, and quality street environments.

4. Promote affordable housing and access to quality jobs through equitable mobility.

Transportation is the second (and sometimes first) highest household cost after housing. Transportation is also the key to job access and economic mobility. Housing affordability and mobility affordability are inextricably linked. This Vision is rooted in an imperative for equitable mobility. It is based on the principle that walking (or rolling) is foundational to the transportation system and that nothing moves people (and the

economy) more efficiently than mass transit. It insists that shared mobility serves all and is easy and intuitive to use. It promotes compact development that puts the needs of daily life within a 15-minute neighborhood. It connects within and between these neighborhoods, linking them to the region and the world.

5. Advance mobility justice to redress the infrastructure racism of the past.

Transportation is a human right. Achieving an equitable city requires equitable transportation access. This requires an overall completeness and quality of the transportation network in addition to the availability of safe, efficient, affordable, and dignified mobility choices. This Plan provides strategies for increasing access, eliminating mobility insecurity, and reknitting communities fragmented and isolated by highways and rail. It provides an equity-driven lens for infrastructure investment and maintenance to bring all neighborhoods to a good state of repair. The Vision provides for dignified travel for all, irrespective of income, race, or ability. It turns a bright light on the injustices of the past so we can clearly see the choices we must make for a fairer future.

6. Integrate the system of systems and find new frameworks for funding.

State roads, county transit, local streets, railroad bridges, regional trails, private parking, and interstitial sidewalks. Multiple authorities and multiple governance structures overlap to create a confusing system. Arcane funding structures are inadequate and shrinking even while new burdens challenge the transportation system. This Vision calls for more integration and coordination to deliver a system of systems that works for all and a modernization of funding structures to fairly charge for use of the system and reinvest appropriate to impacts.



Pittsburgh's Department of Mobility and Infrastructure

The City of Pittsburgh's Department of Mobility and Infrastructure (DOMI) was legislatively created in 2017 and administratively functional at the initiation of the 2018 budget year.

Inspired by research findings on the influence of transportation on equity, DOMI takes as its mission: to provide the physical mobility necessary to enable the social and economic mobility of the people of Pittsburgh through the management, design, improvement, and operation of the public right-of-way (ROW).

DOMI is responsible for the management, operation, design, and construction of the public ROW in the City of Pittsburgh in order to provide a safe and efficient system accessible to all. This includes almost 1,200 miles of city streets, 612 signalized intersections, 446 bridges, 19 tunnels, more than 800 sets of public steps, 130 miles of bike(+) network, over 850,000 street signs, and approximately 44,000 streetlights, among many other assets.

Comprised (in 2020) of 97 budgeted full-time city-funded and grant or partnership-funded staff, DOMI is organized into three principal bureaus and four divisions, in addition to the Office of the Director.

- Policy, Planning, and Permitting Bureau, led by the Assistant Director, develops forward-looking mobility and network plans for areas and corridors through engagement and collaboration with residents and local stakeholders. The Bureau reviews private development plans and associated potential transportation impacts and sets strategic mobility and management policy with a focus on equity. The ROW Permitting and Enforcement Division within the Bureau reviews, permits, coordinates, and inspects private and utility activities in the public ROW.
- Project Design and Delivery Bureau, led by the Chief Engineer, designs and manages construction of tens of millions of dollars of

capital improvements to city infrastructure each year including streets, bridges, and trails and provides engineering expertise for slope movement and flood mitigation. The Paving Division within the Bureau completes asphalt resurfacing for many miles of streets each year.

- Traffic Operations Bureau, led by the Municipal Traffic Engineer, is responsible for safe and efficient travel in our mobility system for all modes of travel. In addition to engineering signal operations and street designs that accommodate all users, the Bureau oversees the Sign and Paint Division, which maintains all signs and pavement markings, and the Signal Division, which maintains signal equipment and communication networks and calibrates their operation.

City Mobility Network



~1,200 miles
city streets



612
signalized
intersections



800
sets of
public steps



446
bridges



130 miles
bike(+) network



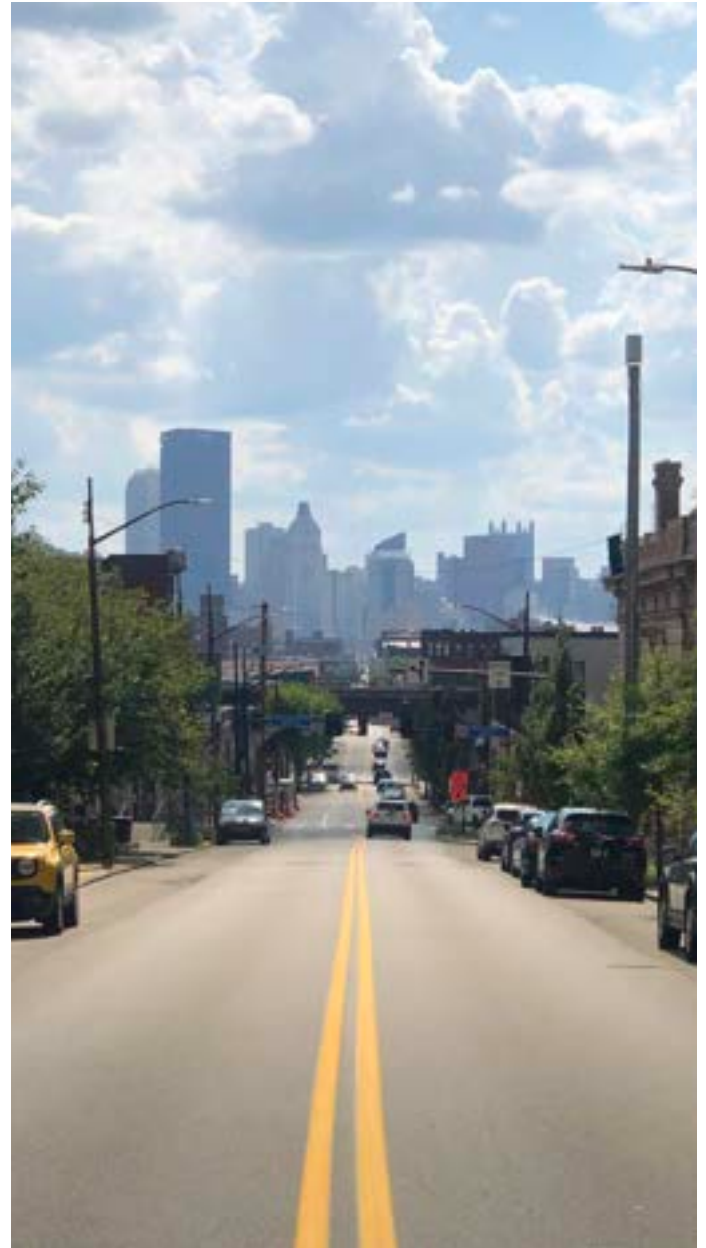
850,000+
street signs



44,000
street lights

2070 Measures of Success

- No one dies or is seriously injured traveling on city streets.
- Every resident can access fresh fruits and vegetables within 15 minutes travel of home (without requiring a private vehicle).
- All trips less than one mile are easy and enjoyable to walk, roll, or bike.
- No household must spend more than 40 percent of income on basic housing and transportation mobility.
- The design, maintenance, and operation of city streets reflects the values of our community.





A transportation history of the City of Bridges

Iron City

Regionally and nationally, Pittsburgh was valued for its strategic location at the juncture of three rivers – the Allegheny, Monongahela, and Ohio – which allowed it to connect and serve as a gateway to the expanding frontier and between New England, New York, and Appalachia. Railroads, constructed of locally mined and produced materials, fueled the City's growth and also complemented and augmented the City's extensive river-based logistics network.

In the 1830s, construction began on the City's first railroads. Three decades later, Pittsburgh was connected to the east, north, and west by the Baltimore and Ohio, Pittsburgh, Lake Erie, and Pennsylvania railroads. Additional rail lines were constructed from Pittsburgh to the bituminous coal and oil fields and sources of timber in the Allegheny Plateau. Barge transport was ideal for heavy shipments of steel and coal to the far reaches of the greater Ohio and Mississippi watersheds. By the turn of the 20th century, Pittsburgh had more freight passing through it than any other city in the country.

While railroads connected Pittsburgh to its regional neighbors, the City's internal transportation network also expanded to support population growth. In 1859, the City's first public transit system, Citizens Passenger Railway, was constructed to connect Downtown and Lawrenceville making it easier for residents to live in a neighborhood other than the one in which they worked.

The City's challenging topography demanded unique solutions. In the late 1860s, German immigrants built an incline on Mt. Washington



Mon Wharf Landing in the early 1900s



1931 streetcar



1965 streetcar

that was so successful that sixteen more were constructed by various entities by 1900. These inclines enabled residents in neighborhoods such as Mt. Washington, Bellevue, Perry Hilltop, the South Side Slopes, the Hill District, and Troy Hill to commute from their hilltop homes to the low-lying riverfront mills. By the 1890s, the inclines operated in coordination with more than fifty



Map of Pittsburgh railways including trolley lines

electric streetcar lines that accessed all corners of the City and connected residents far beyond the neighborhoods in which they lived.

The first of the City's more than 800 sets of public steps were constructed in 1911 to provide increased access to the rivers and steel mills from hilltop neighborhoods. They remain an integral part of our transportation network.

The Era of Auto-centric Development

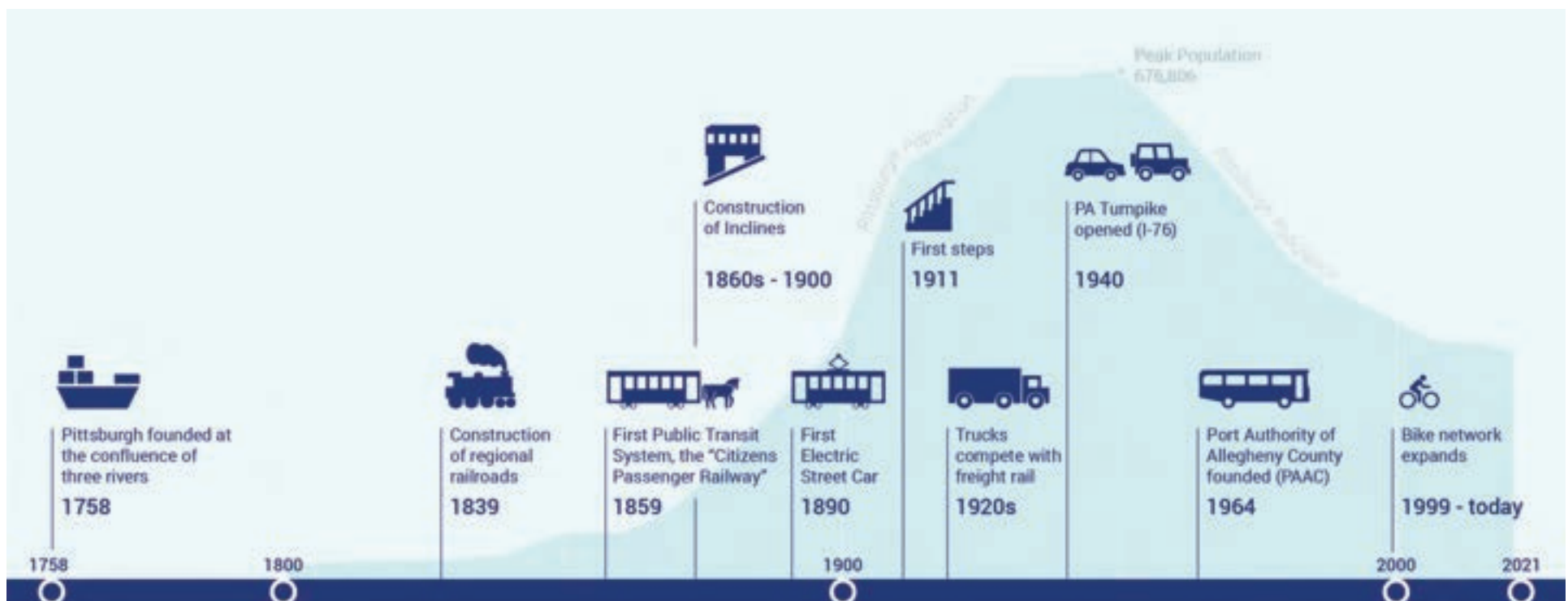
In the 1920s, urban centers across the country began to see populations decline and shift for a myriad of reasons. First, macroeconomic changes undermined the country's manufacturing sector and caused significant urban job losses and economic hardship in the aftermath of World War II. Second, government policies such as the GI Bill, those associated with urban renewal, the Federal-Aid Highway Act of 1944, and the National Housing Act of 1934 undermined investment in urban neighborhoods and incentivized a suburban lifestyle for working, middle class white residents. Lastly, diverse urban neighborhoods were known

to be at the center of the often-tense movements that were challenging the nation to reevaluate political, social, and cultural norms.

In their discomfort with and fear of these changes, many white residents chose to leave their urban neighborhoods and moved en masse to nearby auto-oriented suburbs. More private automobiles and fewer residents meant that intercity public transit ridership declined. In Pittsburgh, the bus, inclines, and streetcar systems were run by 33 different companies competing with each other, which further accelerated the systems' decline as they fought for what ridership remained. In 1964, Port Authority Transit, now the Port Authority

of Allegheny County (PAAC or Port Authority), acquired these companies and consolidated service.

As early as 1938, the federal government began preparing to invest heavily in building the national highway system. In keeping with this rising national support for highway construction, the Pennsylvania Turnpike Commission was created in 1937 to construct, finance, operate, and maintain a new cross-state route that was to be built on top of the old South Pennsylvania Railroad. In 1940, the Pennsylvania Turnpike opened as a toll road, linking Pittsburgh with Philadelphia and forming the foundation for what would later





1942 cartoon depicting the "Pittsburgh Traffic Jungle"

become the Interstate Highway System. One of the most transformative auto-centric initiatives was a federally funded project that rationalized the demolition of aging industrial buildings to make way for Fort Pitt Park, the Fort Pitt Tunnel, and the Fort Pitt and Fort Duquesne bridges. The project, not fully completed until the early 1970s, linked the City's historic center to the interstate highway system and connected the rapidly growing suburbs of the South Hills to jobs Downtown and in Oakland.



1959 newspaper clipping envisioning the future city

The increase in private automobile ownership and suburban populations brought greater regional access but also interrupted, undermined, and fragmented local street networks that helped people connect between neighborhoods. Within the city limits, wide limited-access roads that were designed for higher speeds were constructed to move commuters quickly to and from Downtown. These same roads also bypassed, segregated, and isolated neighbors and neighborhoods from each other. Streetscape development also favored vehicles over pedestrians and other public use.

The Transportation Network Today

The City's sidewalk network is deteriorating in many locations and has critical gaps in others. The condition of our more than 800 sets of public steps, which are considered an extension of the sidewalk network, varies by set. Some would certainly be more heavily used should they receive necessary upgrades. The scope and scale of maintaining these assets (many of which are decades old, if not older) so they can continue to provide critical connections is a tremendous undertaking. However, DOMI considers a complete sidewalk network a non-negotiable part of our future and will continue to make equitable investments to make incremental progress towards this goal.

With help from our advocacy partners, the City's bicycle and trail network has grown by nearly 95 miles since 1999. Many more are planned to come online over the next ten years as part of our recently adopted Bike(+) Plan, which aims to provide safe, affordable, sustainable, and joyful travel options for people of all ages and abilities. Bike lanes, neighborways, and trails provide connections across the City and region, through neighborhoods, between transit hubs and employment centers, and ultimately to cities as far as Washington, D.C. and Cleveland, Ohio.

In the City and across the region, public transit is primarily in the form of bus service with the exceptions being the light rail (or the "T") that travels from the South Hills to North Shore via Downtown and the two remaining inclines. While bus routes connect Downtown with many neighborhoods across the City, the hub and spoke system with Downtown as the hub means there are limited connections between and among

neighborhoods. As such, many residents rely on private automobiles to make such trips. In addition to Port Authority transit service, surrounding counties, such as Westmoreland and Beaver, provide regional bus service to the City. Even still, the majority of regional trips to Downtown, Oakland, and other employment centers are auto based.

Over the past two decades, Pittsburgh has been reevaluating ways to rebalance investment in the City's transportation network. There has been much talk about high-capacity transit to Pittsburgh International Airport or repurposing of the Allegheny Valley Railroad tracks in the Strip District, Lawrenceville, Highland Park, and communities east. These large-scale regional transit improvements would be costly and complex by nature but would introduce comfortable, sustainable, and efficient alternatives to auto-based trips.

Pittsburgh's mobility system has never been static or conventional – it has evolved again and again to match the constraints of the landscape and demands of the times. From the public steps to inclines, streetcars, light rail, and buses, Pittsburgh has never been afraid to embrace the promise of new technologies. It has also had the wisdom to hold on to some of our oldest mobility solutions that still serve our residents well and are part of the City's identity. Through all of the changes in Pittsburgh's economy and culture, the City's unique geographic features and spirit of innovation have continued to necessitate diverse and ever-evolving modes of transportation to keep our people and goods moving.



How does this Plan relate to other past and ongoing plans?

There are a series of other long-range planning efforts either underway or recently completed for both the City and region that will influence mobility and land use patterns for many years to come. As such, the project list for this Plan was developed in coordination with these plans and representative staff to ensure consistency.

SmartMoves for a Changing Region (Southwestern Pennsylvania Commission, 2019)

The Southwestern Pennsylvania Commissions (SPC), the 10-county regional land use and transportation planning entity, adopted its long-range transportation plan in June 2019. It prioritizes programs and projects that advance the regional vision of a world-class, safe, well-maintained, and integrated transportation system that provides mobility for all, enables resilient communities, and supports a globally competitive economy. The plan recommends expenditures of more than \$35 billion for the region's transportation priorities over the next 25 years as well as a series of projects that are not yet fiscally constrained.

NEXTransit (Port Authority, 2021)

This community-driven process developed a transit priority list for the next 25 years that focuses on equity, accessibility, economic and social mobility, safety, resiliency, and accountability. Priority projects of the plan include improvements to existing transit infrastructure, the evaluation of new or restored transit corridors, the introduction of new transit hubs, and fleet modernization, among other changes that are responsive to evolving technology, climate change, and land use patterns.



ForgingPGH (Pittsburgh Department of City Planning, ongoing)

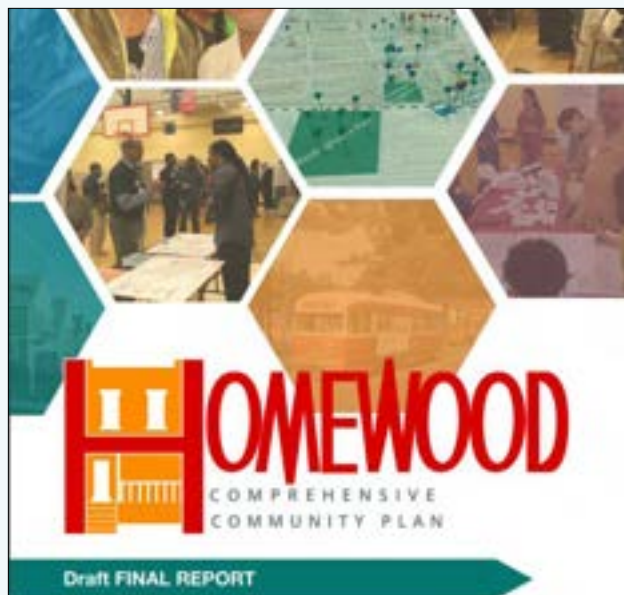
The City of Pittsburgh, through its Department of City Planning (DCP), is currently preparing the City's first ever comprehensive plan. With a horizon year of 2040, the plan will evaluate how employment and population growth under different land use scenarios will affect equitable access to housing, mobility options, jobs, goods and services, and recreational opportunities, among others. At this time, the land use scenarios for *ForgingPGH* are still in development. Ultimately, a preferred alternative will identify where projected growth is likely to be concentrated. Evaluated alternatives will include a series of land use scenarios that will likely range from larger centers to more 15-minute neighborhoods. Future mobility investment will be made to coincide with changes in land use and will also focus on improvements that reduce both short and longer auto-based trips and increase transportation options regardless as to which alternative is ultimately identified as the preferred.

City Steps Plan (DOMI, 2019)

Pittsburgh has more than 800 sets of public steps, most of which were originally constructed decades ago. In order to ensure equitable distribution of limited resources, DOMI developed a systematic methodology to prioritize which sets of steps should be repaired and rebuilt. Inputs include spatial analysis, public input, and field visits. The analysis allowed prioritization of investment based on structural need but also the connectivity that individual sets of steps provide and the populations they serve to ensure equitable distribution of resources.

Neighborhood Plans (DCP, multiple years)

There are several neighborhood plans that have been adopted or are in progress, including Homewood, Hazelwood, Manchester-Chateau, Uptown / West Oakland, the Hill District, and Oakland. All of these plans highlight the need for pedestrian and bicycle improvements and increased access to transit, among other investment priorities. They also identify a few large-scale projects that would remove or completely transform transportation infrastructure to help restore neighborhood cohesion and reduce fragmentation and isolation. Examples include State Route (SR) 65 and Boulevard of the Allies.



Bike(+) Plan (DOMI, 2020)

The City's first bike plan in 20 years serves as the framework to make travel by bicycle or other small mobility modes safe, easy, and joyful for all users regardless of age or ability. The plan calls for approximately 120 miles and 25 miles of new or upgraded on-street bike facilities and trails, respectively, over the next 10 years.

Pedestrian Safety Action Plan (DOMI, 2021)

DOMI considers a complete sidewalk network to be a non-negotiable component of our transportation network and we are actively working towards achieving this goal. The plan was developed through a collaborative effort by DOMI, the Federal Highway Administration, stakeholders, and the public. Based on a detailed analysis of local crash data, the plan identifies high risk locations with critical pedestrian safety issues. It also identifies specific actions that DOMI will undertake to improve areas with identified concerns and issues as well as metrics for monitoring progress over time.

Complete Streets Design Guidelines (DOMI, pending release)

In November 2016, the City adopted its Complete Streets policy and DOMI is finalizing its first Complete Streets Design Guidelines, which will help reinforce our commitment to equitable mobility investment. Complete Streets policies and standards have been adopted by more than 500 municipalities across the United States and are intended to put all transportation modes on equal footing to ensure a safer and more equitable transportation network for all users.

Downtown Pittsburgh Mobility Plan (Pittsburgh Downtown Partnership, 2021)

The *Downtown Pittsburgh Mobility Plan* was designed to make the Downtown area easier to navigate for all who work in, live in, and visit the Golden Triangle. The plan identifies nine high-priority impact areas for investment that will help ensure that Downtown continues to be a vibrant economic, cultural, and transportation hub for the region. This includes improving pedestrian, bike(+), and transit access; (re)connecting to the river and within Downtown; and the reimagining of Smithfield Street.

Avenues of Hope Initiative (Urban Redevelopment Authority, 2020+)

In October 2020, the Mayor and Urban Redevelopment Authority formally launched the *Avenues of Hope Initiative* to reprioritize business district investments in diverse city neighborhoods. Using a place-based and people-first approach, the initiative will work to redevelop seven mixed-use business corridors in largely Black neighborhoods so they are transit oriented, pedestrian friendly, and supportive of existing small businesses and residents and also pay homage to Black arts and culture. DOMI will assess and develop a unique strategy for each corridor, identifying the near- and far-term investments and improvements necessary to improve safety and enhance access and connectivity to support local business strength and vitality.



A few of the business corridors included in the *Avenues of Hope Initiative*

How is this Plan organized?

Policies

Key framing policies will guide the projects and processes undertaken and further efforts to meet Department goals and the principles identified for this Plan.

Project Scales

The Plan then outlines projects and activities to pursue at a number of scales from the national (connecting Pittsburgh to the world) to the hyper local (design approaches for individual street elements).

Connecting to the World. Pittsburgh's growth and viability depends on connections to major cities and world markets. This section describes the necessary infrastructure to connect Pittsburgh to major cities that are generally considered too far for most users to drive comfortably but close enough that a trip to the airport does not offer considerable time savings.

Connecting to the Region. Pittsburgh has long been the region's economic and cultural hub. This section will outline a series of projects and processes that will help ensure that residents, workers, and tourists can connect to, through, and within the region in a safe, comfortable, and efficient way regardless of mode.

Connecting Centers. Pittsburgh is known for its many neighborhoods, each with its own unique character. As Pittsburgh grows, we anticipate existing employment and commercial centers to continue to grow and new centers to emerge. This section explores ways to increase the ease by which trips are made between and among centers to support continued economic vitality and reduce drive alone trips between these locations.

Connecting within Districts. For this Plan, districts are defined as areas that have some but not extensive commercial activity and are surrounded by residential land use. This section explores ways to increase the ease by which people move within a given district by foot, bike, transit, or other small mobility modes with the goal of creating self-sufficient 15-minute neighborhoods.

Managing the Street. Streets and the public ROW are the building blocks of cities. They provide space for water conveyance and potentially infiltration, communication systems, and electric infrastructure. They are the front door of businesses and the address of residences. Curbsides are places of access, arrival, and departure. Sidewalks and travel lanes need to efficiently move all users and people of all abilities. This section outlines strategies for sustainable and future-forward management of the ROW.

Managing Change

Over the next fifty years, some things are reasonably foreseeable. We will still need quality sidewalks, there will still be competition for street space, transit will still run, and the majority of existing streets will still be the very same streets used by past generations. Many things, however, will change. New opportunities will arise, new stresses will emerge, new technology and mobility services will be introduced, new materials and products developed, and new travel preferences and patterns will result. This chapter outlines a framework for evaluating new conditions and technologies, guiding them for the greatest public good.

Implementation and Adaptation

The final chapter addresses how the Plan's vision, policies, projects, and processes can be translated into reality through partnerships and adaptation as conditions on the ground and funding mechanisms change. The chapter acknowledges that future generations will likely also have to further augment how decisions are made regarding transportation investment due to unforeseen issues and those we are in the earlier stages of accounting for, such as climate change, future pandemics, and technological advancements that will continue to impact the way that we work, move, and deliver goods.

This Plan will both help guide the ongoing maintenance of existing assets and the implementation of new connections and mobility options that will strengthen our neighborhoods, city, and region. This enhanced network will provide equitable and sustainable access to jobs, housing, education, goods and services, and recreational opportunities.





2 FRAMING POLICIES

This Plan is built around key framing policies. They serve to guide the projects and processes undertaken and further efforts to meet both Department goals as well as the principles identified for this Plan.

- 1 Make meaningful changes to promote equity in infrastructure and mobility.
- 2 Support, pursue, and adopt fair and sustainable funding structures.
- 3 Dramatically reduce transportation-related carbon emissions and prepare for climate change.
- 4 Recognize and organize the mobility system of systems, including the movement of people, goods, and information.
- 5 Actively and effectively manage streets for public benefit.
- 6 Proactively guide and manage mobility innovation and technology to solve real problems and serve community values.

Policy 1: Make meaningful changes to promote equity in infrastructure and mobility.

Deliberately apply an equity lens to design, manage, and prioritize projects and investments.

Equity will be at the forefront when making mobility investments now and far into the future. This means being intentional about spending in disadvantaged and otherwise marginalized communities. This requires that we acknowledge the disproportionate impacts and burdens that past investments have caused in certain

neighborhoods and actively work towards reconciling the poor decisions of generations past.

This Plan calls for (re)investing in these communities to provide safe, comfortable connections to jobs, education, transit, goods and services, and recreational resources. This will mean assuring that travel costs and times are minimized for those who most need access to jobs, and also recognizing the power of transportation investments to accelerate gentrification and displacement.

The City is committed to designing and implementing equitable decision-making processes, anti-displacement policies, and equity transfer tools. DOMI will use a place-based equity index in project selection. It will engage with “edge users” (those commonly facing the greatest barriers and challenges) to design projects to move toward universal mobility. It will actively manage private services and investments to include a targeted cross-subsidy of enhanced mobility to underserved areas and populations.

Protect and restore urban neighborhoods.

The expansion of the interstate highway system provided unprecedented connectivity for car owners across the country. Unfortunately, the urban highway system also resulted in unprecedented harm. It bulldozed entire neighborhoods, opting for routes selected through a thinly veiled racist and xenophobic strategy. These projects undermined the social, economic,

and cultural capital that had been built up through generations and set a course of inequity that persists today.

This Vision not only rejects projects that tear down, fragment, or isolate neighborhoods but proposes and prioritizes investments to reknit communities and restore neighborhoods that have been unjustly burdened. Projects will (re) connect neighborhoods across imposed barriers of highway infrastructure and natural barriers of waterways and topography. It prioritizes space for efficient mass transit to move regional commuters through urban neighborhoods with less impact to local communities and people of color. New modes of shared, mass mobility provide affordable and low-emission alternatives that reduce the car burden and their inequitable impacts, and also helps preserve and enhance existing neighborhoods.



Policy 2: Support, pursue, and adopt fair and sustainable funding structures.

Fairly allocate mobility investments and dispel the “user-pays” myth.

For decades, transportation funding favored private automobile travel and accommodation above all others. This is, in part, a legacy of a “user pays” myth in which Americans have been taught that the motor vehicle fuel tax funds the entirety of transportation investments. This has never been true.

In the 1960’s, road user fees covered 70 percent of highway construction, maintenance, and operations. Today, the gas tax covers less than 50 percent. The balance of road funding comes from taxes and fees paid by every American taxpayer, regardless as to whether they have the luxury of traveling by automobile¹. While much is made of subsidies for transit and public dollars spent on bicycle and pedestrian infrastructure, in fact, motorists are subsidized by a factor of three to one over these more sustainable, equitable modes.

Despite the large public subsidy, the largest share of transportation investment is allocated to roadway space and systems predominantly utilized by private motorists. Over the next fifty years, the City will increase the proportion of investment dedicated to use by all taxpaying residents, such as sidewalks, transit, slow lanes, and livable streets.

Support and pursue a sustainable structure for infrastructure funding.

While the gas tax does not fully cover highway expenses, it remains a major – but diminishing – funding source. This is particularly true in the Commonwealth of Pennsylvania where the liquid fuels tax comprises 70 percent of transportation

revenues. With the necessary introduction of more fuel efficient and electric vehicles and alternative mobility modes, the gap between liquid fuels revenues and needed transportation expenditures will continue to grow. An alternative funding structure must be found in order to maintain and enhance the transportation and mobility infrastructure that underpins life and economy in the Commonwealth and the City.

In 2021, the Pennsylvania Transportation Revenue Options Commission published its final report² recommending a shift away from fuel-based funding and toward a mileage based user-fee. While this shift helps bridge the growing gap between revenue generated and maintenance needed, inequities remain in disproportionate highway and infrastructure investment in comparison to that associated with more equitable modes and assets, such as sidewalks, bicycle facilities, trails, local streets, and transit.

Use price to manage limited resources and reinvest in efficient and equitable mobility improvements.

Pittsburgh has 1,200 center line miles of public street, and, in general, there will not be more. To efficiently move the city of the future, existing streets must be managed for maximum person mobility. Automobile movement requires an amount of space that is inefficient compared to other modes. In an urban context, a ten-foot wide vehicle travel lane can move 600 to 800 motor vehicles – typically 600 to 1,000 people – per hour. That same ten feet of space can move 7,500 people per hour on bicycles or small mobility devices, 9,000 people per hour as a sidewalk,

or more than 10,000 people per hour on a dedicated transitway. Future Pittsburgh will work with state and federal partners to explore pricing models that capture the economic and social impacts of auto congestion and reinvest associated impact fees into alternative modes such as transit.

Motor vehicle parking consumes roughly one sixth of ROW space. Pittsburgh has been a national leader in performance-based parking. This practice will continue and expand to optimize curbside access for a variety of modes and needs. The Pittsburgh Parking Authority (PPA or Parking Authority) will become a “Mobility Authority,” reinvesting revenues to support not only motor vehicle access and accommodation but also quality facilities and services for pedestrians, transit, bicycles, and micromobility.

The City will pursue strategies to cross-subsidize mobility across all modes to pursue the most efficient and sustainable means of travel to support a strong and equitable economy. Implementation of a universal basic mobility program will provide a vital foundation for the economic success of all residents.

Footnotes:

1. Who Pays for Roads? Frontier Group and U.S. PIRG Education Fund. Spring 2015. <https://uspirg.org/sites/pirg/files/reports/Who%20Pays%20for%20Roads%20vUS.pdf>
2. Final Report and Strategic Funding Proposal. Pennsylvania Transportation Revenue Options Commission (TROC). July 30, 2021. <https://www.penndot.gov/about-us/funding/Documents/TROC-Final-Report.pdf>

Policy 3: Dramatically reduce transportation-related carbon emissions and prepare for climate change.

Provide abundant convenient, affordable, and enjoyable alternatives to private vehicle use.

It is only in recent years that Pittsburgh has become an auto-centric city. Not long ago, Pittsburgh was crisscrossed by trolleys and walking to work was more common than driving. Today's adults still remember their grade school years when youth commonly and safely bicycled to a friend's houses or the local convenience store. In a time when Pittsburgh had twice as many residents, it had half as many vehicles....and thrived.

The City needs to restore the quality of life that was once common by providing abundant shared, low-emission alternatives to drive alone trips. Building off the City's 2016 Complete Streets policy, the next fifty years of transportation planning in Pittsburgh will focus on increasing



electric and human-powered multimodal options. It will align with land use policy to put the needs of daily life within an easy 15-minute trip from home and make it most enjoyable to travel by walking, rolling, or biking. The City will broaden the availability and diversity of shared mobility services and also expand and improve the network of safe and protected travel lanes for these modes.

Create a decision-making framework for climate change adaptation.

Pittsburgh is experiencing the impacts of climate change; impacts that will continue and increase in intensity over the next fifty years. Land movement, flooding, and extreme weather events in all seasons will continue to compromise infrastructure in many locations across the City. Pittsburgh, like peer cities around the globe, will be forced to make painful and difficult decisions about which infrastructure to protect and preserve, which to adapt and modernize to the new climate reality, and which to let go.

These tough choices are best made through methodical forethought rather than reactionary responses to immediate emergencies and threats.



The City must craft a clear-eyed framework for strategic investment and sensitive, but deliberate, deconstruction and removal. To establish budgeting priorities that are not simply reactionary, an equitable framework must be created that considers a wide range of social, economic, and environmental factors. Such decisions, while painful, are prudent and necessary to be good stewards of the City's legacy and builders of the future.

Policy 4: Recognize and organize the mobility system of systems, including the movement of people, goods, and information.

Adapt systems to respond to the modern polycentric city.

Pittsburgh is a polycentric city with a hub and spoke mobility system. Major streets and transit corridors flow in and out of Downtown but connections between the City's ninety distinct neighborhoods are few and challenging. The COVID-19 pandemic forced many residents to stay closer to home and subsequently highlighted the number and diversity of non-commute trips that people regularly make and the difficulty of traveling to even adjacent neighborhoods without a car.

This Plan identifies projects and strategies to provide safe and comfortable connections between and among economic centers that will be supplemented by a dense network of local connections to residential areas improving the efficiency of non-auto based trips between neighborhoods. Going forward, DOMI's transportation performance indicators will prioritize daily trips rather than only commute trips.

Coordinate transportation and land use to protect existing residents while welcoming necessary new growth.

Pittsburgh has the infrastructure assets to move 700,000 people. These assets are currently being supported by the approximately 300,000 residents

that remain. Growth is necessary in order to maintain what is, much less expand and improve what could be.

Transportation and land use must proceed hand in hand. Gentrification and displacement are key concerns for the City. Mitigating these concerns while expanding the economic base can help pay for improvements and enhance quality of life. This can best be achieved when household transportation costs are reduced and access to jobs and services are increased.

Reliable, affordable, efficient, and dignified mobility, such as the projects outlined in NEXTransit, should be introduced and expanded in neighborhoods where housing is affordable and also in those where housing opportunity needs to be increased. DOMI will coordinate with DCP to increase housing density where high-frequency transit is available and expand last-mile connections with smaller mobility options to areas of lower density and transit service.

DOMI will work with DCP's Office of Zoning to require more proactive participation from the development community in improving mobility systems and services, concurrent with increased development or reutilization. Such investments may include transit and mobility subsidies to residents and workers of new developments, enhancements to local or area bicycle or pedestrian networks, and passenger amenities and facilities to support the electrification of the shared mobility network to name a few.

Cultivate an urban freight system responsive to context and change.

Mobility networks not only move people to goods but also move goods to people. Pittsburgh's rivers and rails historically were the principal modes of movement, later transitioning to trucks, some of which are uncomfortably large for streets originally designed for horse and buggy. E-commerce and on-demand lifestyles have led to a huge increase in personal deliveries and commensurate increases in trips and traffic. Unmanned aerial and terrestrial drones are beginning to be used for personal deliveries. More changes to freight and delivery trends are expected in the future.

Pittsburgh needs to establish clear policies for managing commercial freight movement through and within the City as well as personal goods



delivery to residences and businesses. Promoting efficient movement on water and rail will lower emissions and street congestion currently associated with truck transport.

Urban freight villages and regional freight hubs facilitate the transfer of goods from larger, bulkier long-haul vehicles to smaller vehicles and devices that are less impactful in an urban environment. These 'last mile' vehicles can range from small vans to cargo bikes and electric-assist truck tricycles. As former warehouse, wholesale, and industrial districts transition to mixed and residential uses, truck route plans must also be redefined to preserve the movement of goods while also protecting the health and promoting safety of all users.

DOMI will develop policy to encourage the use of smaller vehicles for urban freight deliveries and to ensure that new technologies, such as delivery drones and terrestrial robots, can safely and seamlessly coexist with the many other users of the public ROW. The successful implementation of this approach depends upon the strategic siting of regional freight hubs near high-capacity mobility corridors. In addition, these hubs must be accessible by various transportation modes for potential employees and should be located and designed so they do not adversely affect the fabric of existing neighborhoods, particularly those where we are working to redress issues of equity. DOMI will work to improve connections to support rail and water freight corridors and ports and also to maintain urban freight and truck route plans that are appropriate and responsive to changing land uses, demands, and technological opportunities.

Recognize the role of streets as literal information highways and proactively manage for equity, inclusion, and community protection.

Look above or below most public streets and you will see that the public ROW serves more than just people and goods movement. Water, sewer, electric, and gas service lines also rely on street networks and connections – as do communication and information systems. In a world that increasingly demands more internet connectivity and transfers more data by cellular and fiber communications, the management of streets for the movement of information is equally important as moving people and goods.

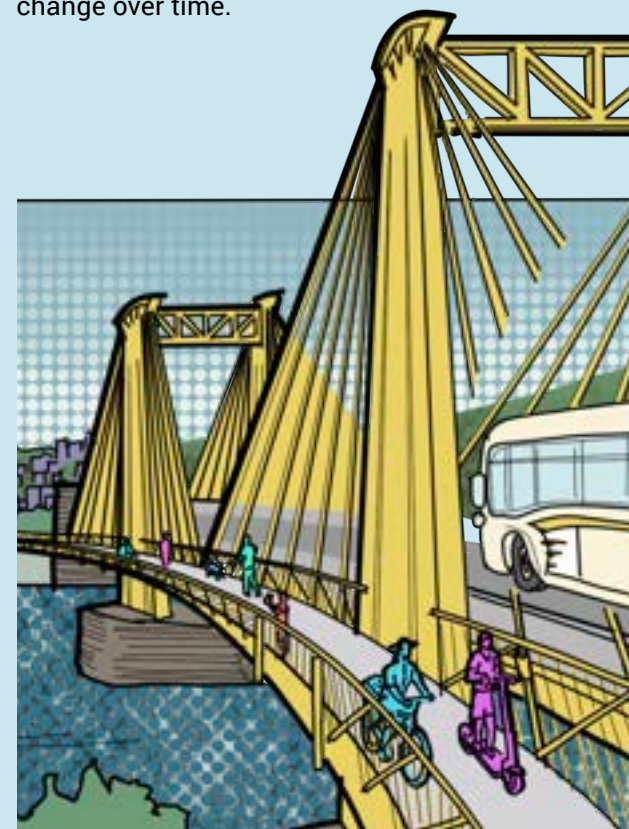
DOMI and the City must develop clear, consistent, and strong policies that accommodate telecommunications systems that promote digital equity and preserve community health and aesthetics. DOMI must be active in collaborating with private industry and innovators in developing a connected digital network in addition to a connected mobility network.

Expand the trail network through partnerships with rail and utility ROW owners.

Despite challenging topography, the Pittsburgh region has an extensive trail network. Connecting the missing links in this network will open up recreational and commuting opportunities within and between different parts of the City and region. Former, underutilized, and existing rail and utility

corridors present an excellent opportunity to increase trail connections because of their existing dedicated alignments, which in some instances follow topography that could be considered more favorable for widespread use than others (e.g., along riverbanks as opposed to steep slopes).

Moving forward, the City will continue to pursue active transportation use easements within rail and utility corridors to help move us closer to a fully connected trail network. New opportunities for improved connections may also present themselves as rail and utility providers needs change over time.



Policy 5: Actively and effectively manage streets to maximize public benefit.

Create people-centered streets.

For the last century, cities have devoted the majority of the public ROW to moving and storing cars. Over the next half-century, Pittsburgh will rebalance this equation, converting more space for pedestrians, green infrastructure, bicycle and micromobility travel, and dedicated transit lanes.

Vehicles do not drive the economy, people do. More space for people means more space for commerce, more space for valuable placemaking, and more space for a healthy populace. The City will continue to pursue opportunities to convert street space from space-consumptive auto orientation towards economically and ecologically productive uses, such as outdoor dining and seating, community parklets and greenery, stormwater management to mitigate the effects of increasingly intense storm events, and more street trees for the host of benefits they provide.

The City will share street space more equitably among the many modes demanding movement. Pursuing strategies such as “super blocks,” slow streets, and modal priority designations of street segments and corridors will become increasingly important tactics and management tools. This includes the development of performance indicators that assess the use of public space more holistically.

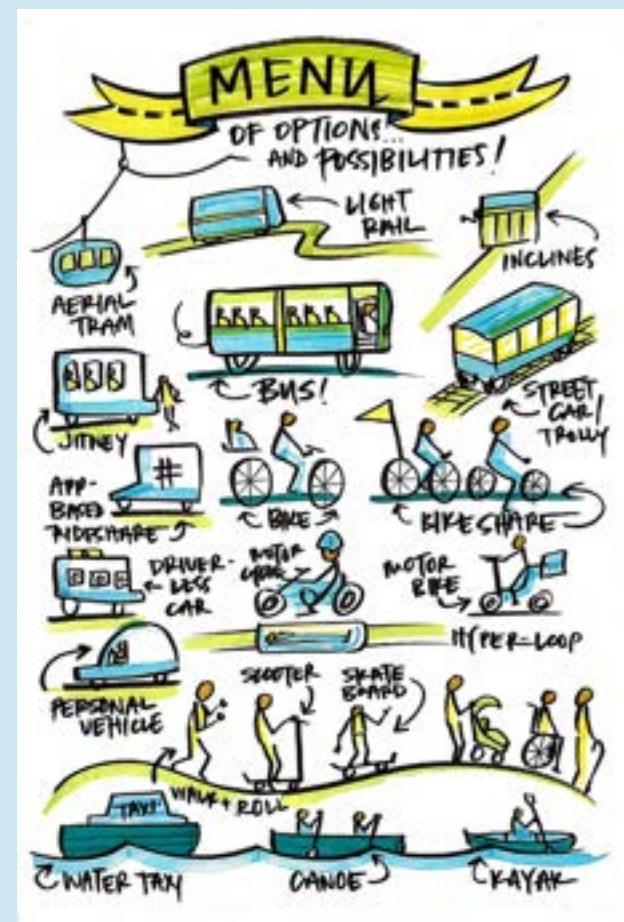
Promote and expand integrated, shared mobility systems.

Private automobiles are idle more than 90 percent of the time. Although bicycles, mopeds, scooters, and other modes can be the optimal choice for different trips during different seasons, few households are fortunate enough to own multiple kinds of mobility devices.

Shared fleets not only optimize the use of vehicles and devices but also reduce the sum total number of such devices that must be accommodated on city streets. Publicly accessible mobility fleets, such as bike-, ride-, and scooter-share, make these travel options available to more residents, workers, and visitors. Shared use lowers individual costs while increasing mobility resiliency.

Shared mobility services must be integrated into a single, seamless mobility system that is easy to use and available to the vast majority of the public. This integration provides more flexible travel options as people can more easily combine modes to make the most efficient use of the overall system. This may include taking a bike to transit or a scooter to the grocery store but a shared ride home with multiple bags of groceries in tow.

The City must provide clear policies and strong oversight of Mobility as a Service to ensure it is equitable, affordable, and accessible. It must be additive to and supportive of transit as it is the single most efficient and vital form of urban travel. The City must carefully monitor performance and guide the appropriate deployment of new vehicle forms and services to best serve the greater good.



Optimize the use of limited parking resources through operations and price.

While much in this Plan has been designed to help rebalance private auto travel with other efficient and more equitable travel modes, driving is and will remain an important mode to accommodate. Given the excessive space consumption of motor vehicles relative to other forms of urban mobility, it is important, however, to minimize the amount of urban space dedicated to cars and efficiently manage and optimize the space that does exist to ensure continued access and accommodation for all users.

At present, it is estimated that there are between five and eight parking spaces for each automobile in Pittsburgh during peak demand. Despite the fact that a single car can only occupy one parking space at any given time, that car will likely have a parking space at home and often another at work; a space at the grocery store, bank, school, and doctor's office.

This abundance of parking – often free to the user but heavily subsidized by the public – presents an uneven challenge to the use of alternative modes like walking or transit. Appropriate pricing and management can ensure efficient use of a greatly reduced quantity of parking spaces and encourage more efficient and sustainable travel choices.

Effective parking management will require collaboration with the Parking Authority, DCP and other city departments, City Council, and private parking providers. City policy over the next decade must aggressively pursue, encourage, and require shared parking and transportation demand management. Performance based pricing must be more broadly used to right-size parking supply and open up valuable space for critically needed housing and other uses.

The City must reform the current commercial parking tax in favor of a more equitable user fee and one that presents fewer artificial barriers to opening up more private parking supply for public use. These impact fees should be reinvested into alternative mobility to the benefit of all users, including drivers. Shared parking, parking maximums, and incentives to pay into a mobility fund in lieu of minimum parking provisions must be expanded in the very near term to promote high-value development, increase equity, and reduce transportation-related greenhouse gas (GHG) emissions.

Actively manage the curb and respond to fast-changing demand.

The curbside of the street is one of the most valuable pieces of real estate in any city. Demand for curbside space is high and increasing. Not only are curbsides used for metered and residential vehicle parking, but they are also in demand for passenger pick up and drop off, loading and deliveries, bicycle and micromobility parking, and, increasingly, public electric charging for vehicles and devices.

Effective and optimal management of the curb is essential to keep corridors moving and increase access to the destinations of daily life. DOMI

will develop a curbside asset management program that allows for flexibility in use of the curb and moves toward real-time programming of curb space. In partnership with the Parking Authority, the City will actively manage the curb – principally through the mechanism of pricing rather than ticketing – to manage even short duration demands to optimize this valuable space. Technology systems for monitoring and management are critical tools for near real-time responsiveness to demands that often change by hour, day, and season.

Utilize road pricing and managed lanes to optimize capacity.

Dedicated lanes for special-purpose or high-occupancy modes such as transit, high-occupancy vehicles, electric vehicles (EVs), and autonomous vehicles are another important tool for optimizing mobility for people and economy. Such managed lanes reflect policy priorities and can incentivize a shift to more sustainable transportation modes. With the potential deployment of AVs, managed lanes are important considerations to ensure they can move smoothly to final destinations.

Managed lanes, used in conjunction with roadway pricing, is an approach that has been used successfully in cities around the world to manage traffic demand, incentivize carpooling, and provide dedicated space for public transit. The City is committed to pursuing equitable road pricing and managed lane policies, especially when fees are reinvested in public transit and other efficient and sustainable shared mobility services. Further study is needed to determine which pricing type would be most effective in Pittsburgh.

Policy 6: Proactively guide and manage mobility innovation and technology to solve real problems and serve community values.

Support the development, demonstration, and deployment of new mobility technologies in service to City goals and the Pittsburgh Principles.

Pittsburgh is the birthplace of many mobility innovations and has been a testbed for their evolution for quite some time. With a strong local innovation economy, new mobility demonstrations and deployments are both expected and welcomed provided that they help to address real problems and needs in the City, shrink rather than expand the equity gap, and align with civic values. Proposed testing, demonstration, and deployments are to be evaluated against DOMI's five fundamental goals and structured to align with the Pittsburgh Principles for shared and autonomous mobility.

Pilots and demonstrations are an excellent way to gain real-world local experience and develop appropriate policies prior to unfettered launch. Pilots and demonstrations must be designed in partnership with public stakeholders who are essential to clear definition of performance criteria and metrics of success.

The City must take an active role in permitting, tracking, and evaluating new innovations. Success for all in this arena requires open and authentic cooperation from private sector innovators and service providers. It also requires the City to be nimble in ever-evolving policy development and transparency with the public and partners.

Pittsburgh Principles (for shared + autonomous mobility)

New mobility services and technology should be developed and deployed to serve these Principles:

1. Prioritize people over vehicles.
2. Build 15-minute neighborhoods.
3. Strengthen public transit.
4. Share streets, vehicles, and trips.
5. Empower people to shape policies.
6. Address missing mobility gaps.
7. Provide fair user fees.
8. Open data to serve public benefit.
9. Integrate the system and the region.
10. If it is not for all, it is not for us.

Provide and / or manage public ROW for digital equity and networked mobility.

Data is the new mobility. The COVID-19 pandemic highlighted in stark relief the vitality of high capacity and reliable internet connectivity. Demand for transmission of data and communications will only grow with connected vehicles, connected infrastructure, and connected

systems. Public ROW, traffic control devices, streetlights, and other street infrastructure assets can and should become the arterials for moving data and information in addition to people and goods.

DOMI will work with the City's Department of Innovation and Performance to develop a master plan for a networked city, defining the role public streets will play in its implementation. DOMI will establish clear guidelines for the aesthetic and equitable deployment of each successive generation of telecommunication technologies to protect human health and quality of life.

Broadly deploy EV charging infrastructure to support the transition to cleaner mobility.

Record breaking heat, drought, floods, and storms are becoming more common. In Pittsburgh, the effects of global climate change have manifested as unprecedented land movement, increased flood events, and extremes of heat and cold. Rapid and dramatic reductions in carbon emissions are imperative, not over the next fifty years, but within the next ten.

Electrification of the transportation sector is critical. To achieve this, the City will install EV charging at public facilities and incentivize or require EV charging in private developments and commercial garages. The City will work in partnership with electric utilities to resolve regulatory barriers to the provision of public charging stations. Street design will pursue

future-ready elements capable of accommodating high-capacity underground electrical transmission and opportunities for induction charging.

Mobility hubs distributed across the City will provide plug-in opportunities for all shapes of shared urban mobility as well as public charging infrastructure for mobile phones, powered wheelchairs, and other public needs. In cooperation with DCP, the Parking Authority, and private industry, DOMI will identify optimum locations for fast charging of shared-ride fleets to facilitate the electrification of both human-operated and autonomous driving system rideshare. The City will establish equity requirements ensuring that charging infrastructure is appropriately sited in all neighborhoods across the City.



Encourage and enable new forms of micromobility.

In 2020, 20 percent of motor vehicle trips in Pittsburgh were less than one mile in distance; 40 percent were less than two miles. The abundance of short distance vehicle trips unduly burdens streets, neighborhoods, and longer-distance travelers. These trips can be easily accomplished by much lower-emission, low-cost, and low-impact micromobility modes if these modes are ubiquitously available, affordable, safe, and broadly accessible.

Shared and electric micromobility modes, such as bicycles, scooters, e-bikes, tricycles, and cargo bikes, have broad utility today, but they can and must improve. The City must continue to press the industry to iterate on the form of these devices to accommodate a wider array of users and use cases. Micromobility must iterate to serve persons with disabilities, adults traveling with school-aged children, and / or carrying two or more bags or packages.

Mobility as a Service providers must make service available through a common, easy to use platform. The City, Port Authority, and others must work toward “fare integration” to ensure these devices can extend transit as last-mile connections. To accomplish this, the City and Commonwealth must set nimble regulatory frameworks to enable and effectively manage iterations in both form and service provision, always with an eye toward safety and equitable distribution, service, and pricing.

Anticipate the unknown.

Imagine if in 1890, Pittsburgh (and the world) had known the impact the motor car would have on the City, nation, and planet. When Karl Benz first patented his “motorwagen” in 1886, or Henry Ford put the Model T into mass production in 1908, the car was considered a novelty at best. The world did not anticipate the transformation it would enable.

Technology innovation is accelerating exponentially. Fifty years ago, Pittsburghers could not have imagined a city without trolleys. Today, they cannot imagine a city without cell phones and GPS. Tomorrow....who knows?

Pittsburgh must examine each mobility innovation – autonomous vehicles, micromobility, the Internet of Things, and others– as if it has the same transformative possibility as the motor car. The City must establish appropriate guiderails to ensure that, while we welcome the opportunity of new technology, we also provide safeguards to ensure it is deployed according to City values for equity, community, and sustainability.

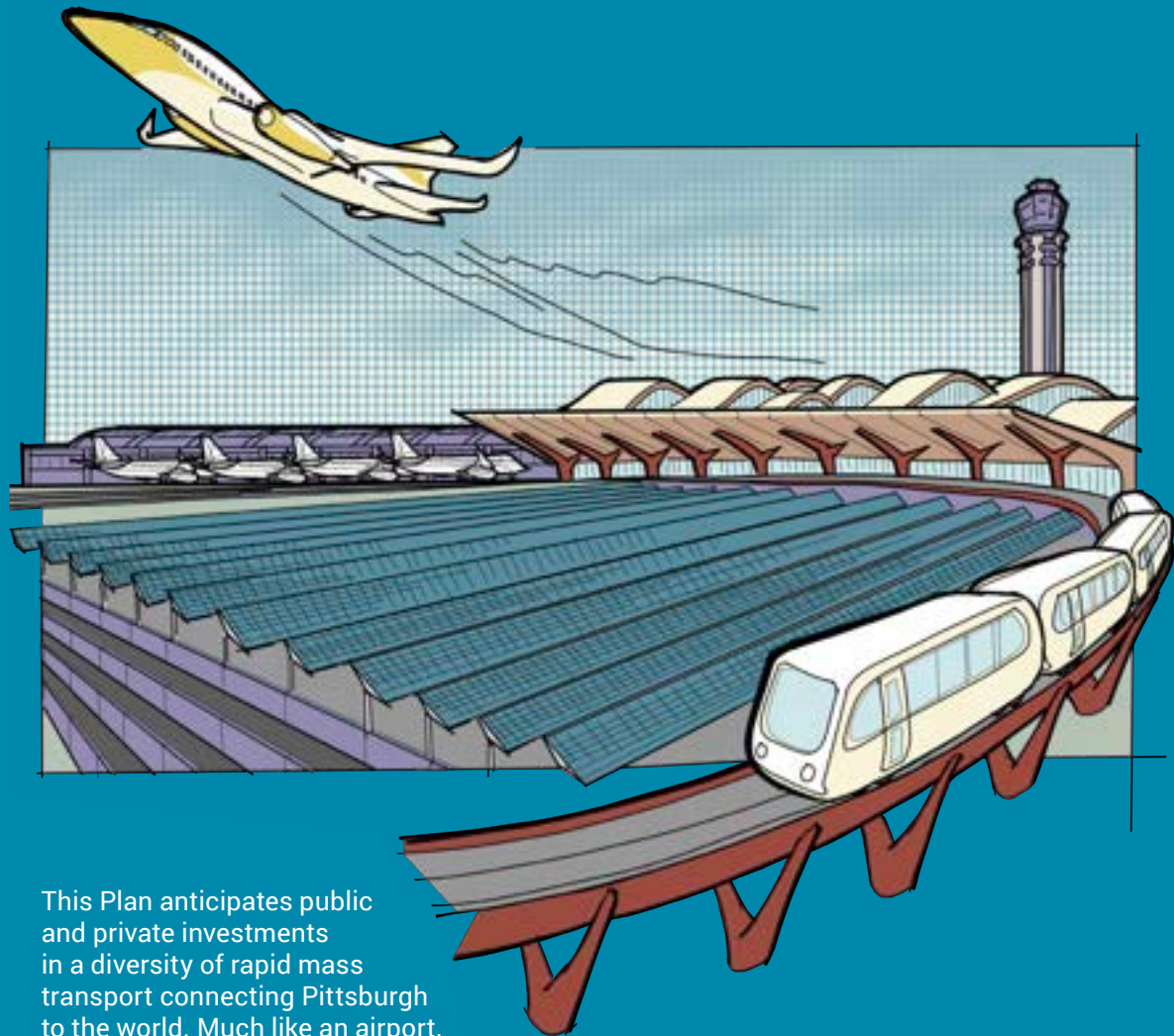


3 PROJECTS & PROCESS

Connecting to the World

Unlike the East Coast megaregion that stretches from Boston, Massachusetts to Richmond, Virginia, Pittsburgh is set apart from other major cities and economies in an interstitial area between the East Coast, Appalachia, and Midwest.

Pittsburgh's future growth and prosperity relies on connections to other markets for both people and goods. As globalization accelerates and economies become increasingly interconnected, it is more important than ever for people to have access to convenient, efficient, reliable, and fast connections to other major metropolitan areas that are just beyond the preferred driving distance but close enough that flying does not always represent considerable time savings.



This Plan anticipates public and private investments in a diversity of rapid mass transport connecting Pittsburgh to the world. Much like an airport, these high-speed terrestrial connections need a terminal in the urban core that allows national and international passengers and freight to arrive, connect, and integrate into the City's mobility network.

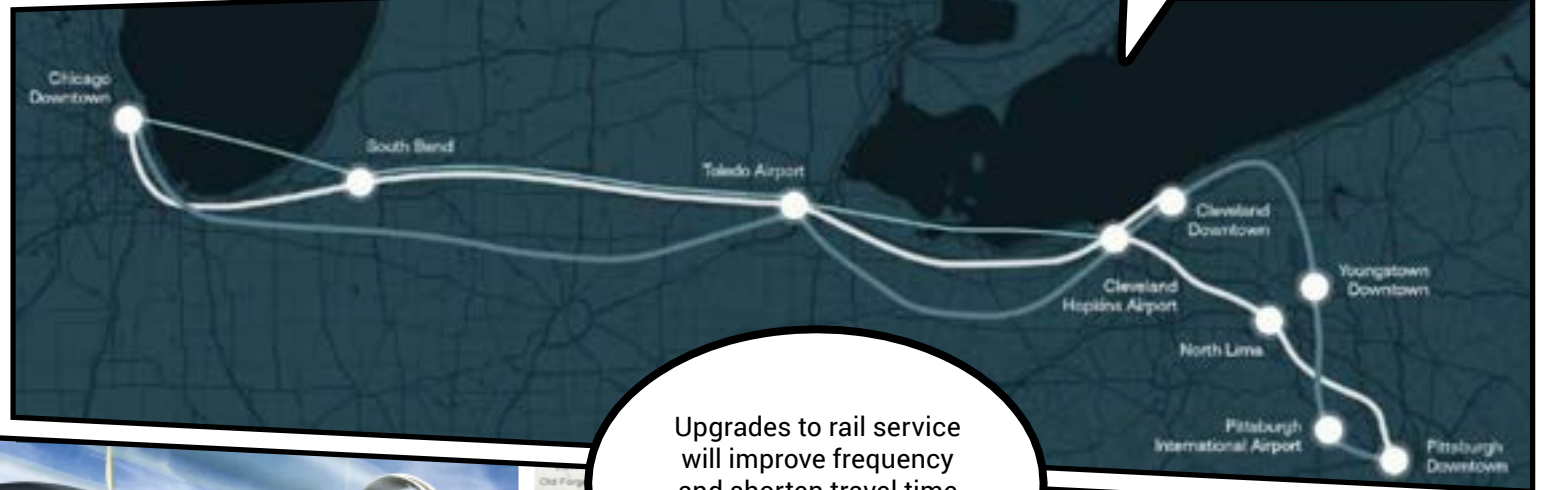
Past and ongoing plans connecting to the world...



The Mid-Ohio Regional Planning Commission envisions connecting Pittsburgh and Chicago O'Hare international airports (by way of Columbus, Ohio) in about an hour.

Hyperloop Transportation Technology envisions a trip from downtown Pittsburgh with stops in Columbus and Toledo, Ohio en route to Chicago.

The Pennsylvania Turnpike Commission is exploring the feasibility of connecting Pittsburgh and Philadelphia in a 20-minute tube trip.



Upgrades to rail service will improve frequency and shorten travel time to Philadelphia and Washington, D.C.

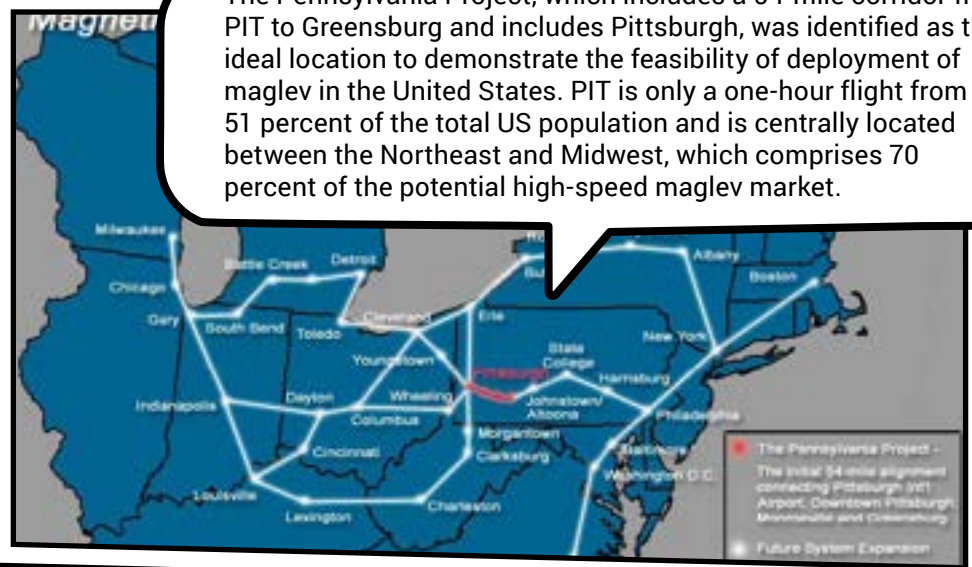


Past and ongoing plans connecting to the world...

Starting in 2025, a sleek new airport terminal at PIT will welcome the world to Pittsburgh, introducing new opportunities for future connections to the City.



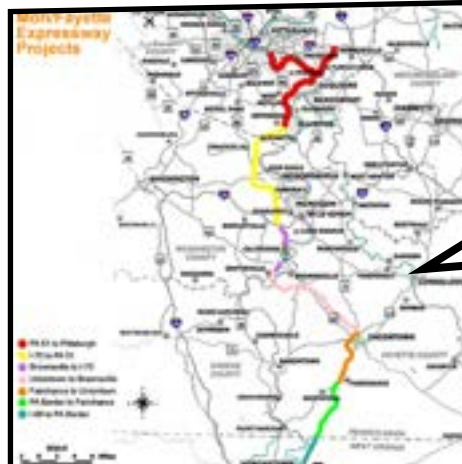
The Pennsylvania Project, which includes a 54-mile corridor from PIT to Greensburg and includes Pittsburgh, was identified as the ideal location to demonstrate the feasibility of deployment of maglev in the United States. PIT is only a one-hour flight from 51 percent of the total US population and is centrally located between the Northeast and Midwest, which comprises 70 percent of the potential high-speed maglev market.



A conceptual rendering shows the downtown maglev station above Cross Town Boulevard, which would provide connections to existing bus and light rail connections.



An imagined future Pittsburgh prominently features a HyperLoop speeding travelers on a 47-minute trip to Chicago over a greener Pittsburgh that features sustainable, futuristic architecture - a sign of the City's continued innovation and prosperity.



A series of Mon/Fayette Expressway Projects have and will continue to improve connections between Pittsburgh, Brownsville, Uniontown, and Morgantown, West Virginia.



Projects

High-Capacity Transit Connection to the Airport

Pittsburgh International Airport is the primary gateway from Pittsburgh to the world. In order to fully capitalize on the connections the airport provides, the final leg of the journey into the heart of Pittsburgh must become faster and more convenient. Currently, there is no dedicated transit corridor to the airport; a connection that has long been envisioned by residents and workers alike. The lack of a dedicated corridor, especially during periods of traffic congestion, greatly hinders Pittsburgh's economic competitiveness.

The introduction of a high-capacity transit connection would significantly decrease travel time and psychological distance between the airport and City. The distance, topography, and width of existing ROW corridors will make this a challenging and costly endeavor but an essential one if greater Pittsburgh is going to continue to thrive and grow. Several potential corridors have been proposed over the years by a wide range of parties. The implementation of such service is a priority of this Plan, *NEXTransit*, and Pittsburgh International Airport.

Upgrade and Increase Frequency on Existing Intercity Rail Corridors

Pittsburgh has Amtrak service to Chicago via Cleveland and connections to Washington, D.C., Philadelphia, and other cities along the Northeast Corridor. The existing service, however, is significantly slower than driving and most routes have only one train per day in either direction. While the City does not have jurisdiction over Amtrak's infrastructure or operational investments, it is in a position to advocate for such

improvements and emphasize the importance of quality national passenger rail to emerging economies like Pittsburgh. Well before 2070, the City anticipates service frequency will at least double on these existing lines. Although the mountainous terrain and many curves along these routes pose a challenge to high-speed rail, the City will continue to advocate for track upgrades and investments that will improve the speed of travel to cities in the Midwest and Mid-Atlantic.

High-Speed, Terrestrial Intercity Corridors

New modes of high-speed terrestrial travel, such as hyperloop and maglev technology, are emerging. Various public and private coalitions are actively pursuing feasibility studies to connect Pittsburgh to Chicago in about an hour travel time. While it is too early to make a determination on feasibility, this Plan promotes continued exploration of potential corridors, alignments,



and routes to multiple destinations. Similar technologies could provide connections north to Erie, Buffalo, and Toronto making Pittsburgh once again an economic crossroad.

Vertical Takeoff and Landing Aircraft Corridors + Terminals

Vertical takeoff and landing (VTOL) aircraft travel is being advanced by the private sector for local and regional passenger air service. Unlike conventional air travel, these vehicles can make their final arrival or initial departure without an extensive runway. They have small propellers, are either autonomous or remotely operated, and in many ways could be considered people-carrying drones.

Far from being a science fiction fantasy, these technologies are already demanding space in several cities across the United States. Pittsburgh, too, will need to determine where vertiports can be sited and the regulations that will frame their operations. While most zoning codes currently limit the location of heliports / vertiports due to noise concerns, new quieter, lower-carbon models are in development. The technology is most

appropriate for intra-regional travel, such as to the airport or major centers in surrounding counties.

The City will need to proactively decide which kinds of VTOL will be permitted within the city limits in addition to their flight paths and landing conditions. Among the considerations will be the burdens imposed on communities along flight paths, noise impacts near vertiports, traffic and connectivity to transit service at vertiports, and cost and accessibility of these systems. Updates to the Municipal Code and regulatory systems should be made prior to the arrival of this technology within the city limits.

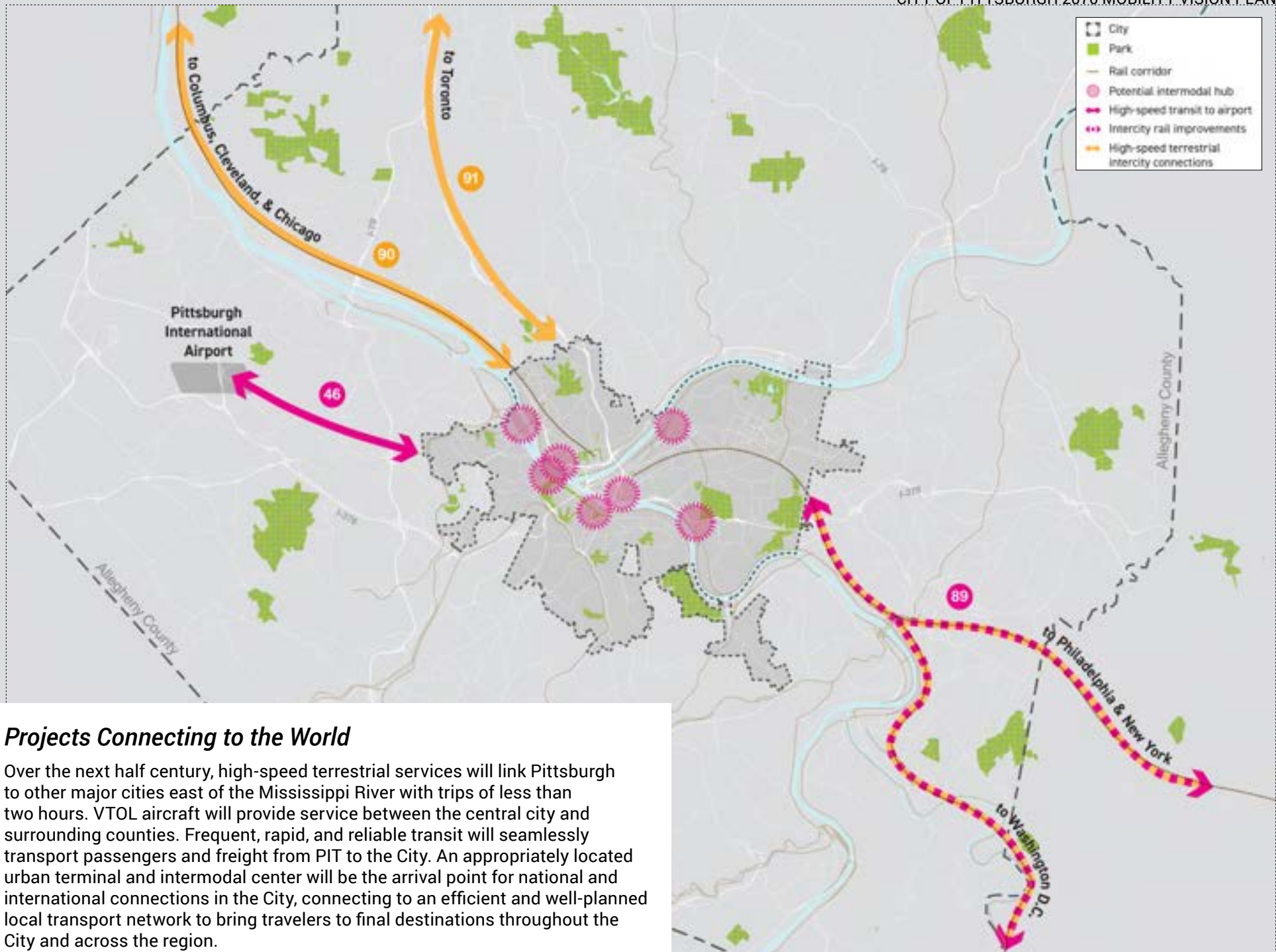
National and Regional Urban Intermodal Terminal

This Plan anticipates the establishment of an intermodal terminal or port to serve as the arrival and departure point for both high-speed terrestrial travel and the principle vertiport for the City. High-speed terrestrial modes typically have only a single stop in the major regions they serve with the terminal being in the center of the urban area. Like an airport, the terminal will serve as the intermodal transfer point where passengers and freight move from the long-haul interurban leg of their journey to regional connections that provide access to destinations across the metropolitan region.

An intermodal terminal such as this would need generous flat terrain and the ability to connect to highways, waterways, regional transit, and trails with minimal congestion and delay. High-speed terrestrial modes must minimize turns in the route while VTOLs are best situated away from



sensitive land uses. These factors make locations along the riverfronts generally preferable. Without identifying a specific site, this Plan recommends that land use policies preserve the opportunity for such a facility on one of several possible viable locations and for city and regional transportation networks to anticipate ready connectivity. This Plan strongly asserts that such a terminal should be located within the urban core rather than an outlying location.



Projects Connecting to the World

Over the next half century, high-speed terrestrial services will link Pittsburgh to other major cities east of the Mississippi River with trips of less than two hours. VTOL aircraft will provide service between the central city and surrounding counties. Frequent, rapid, and reliable transit will seamlessly transport passengers and freight from PIT to the City. An appropriately located urban terminal and intermodal center will be the arrival point for national and international connections in the City, connecting to an efficient and well-planned local transport network to bring travelers to final destinations throughout the City and across the region.

For more additional project information, [click here](#)

Process

Actively engage with public and private partners.

The City is committed to having a seat at the table as new technologies and new intercity connections are planned and implemented. This will require coordination among numerous parties including, but not limited to, the Port Authority, Allegheny County Airport Authority, Pennsylvania Department of Transportation (PennDOT), SPC, adjacent municipalities and counties, and private companies / financiers, as appropriate. During the planning and design phase, the City will be clear about anticipated benefits and potential adverse impacts – either direct or indirect – especially to communities that have historically been displaced, segregated, and / or isolated by past transportation investment.

Work with DCP to identify and protect corridors and potential sites for terminals.

A dedicated corridor would need to be identified to support high-speed terrestrial connections. There are numerous existing corridors that could be suitable for such infrastructure and it is assumed that any new connection would consider existing highway, street, or rail ROW well in advance of proposing a new corridor. Identifying a preferred location for a terminal within the city limits with good connections to other mobility services may be challenging given existing land use patterns in parts of the City where this might be considered.

Planning the location of new stations and terminals is not a straightforward task. Public investments in transportation often catalyzes private investment. It will be important to carefully consider how the siting of new mobility

connections can help advance equitable economic development and mobility goals. Because demand for new development typically increases in areas near proposed terminals, locations where greater density is appropriate should be selected. This careful siting should be bolstered with other policy tools as a bulwark against displacement. The siting of such services within the city limits is an enormous opportunity for the region.

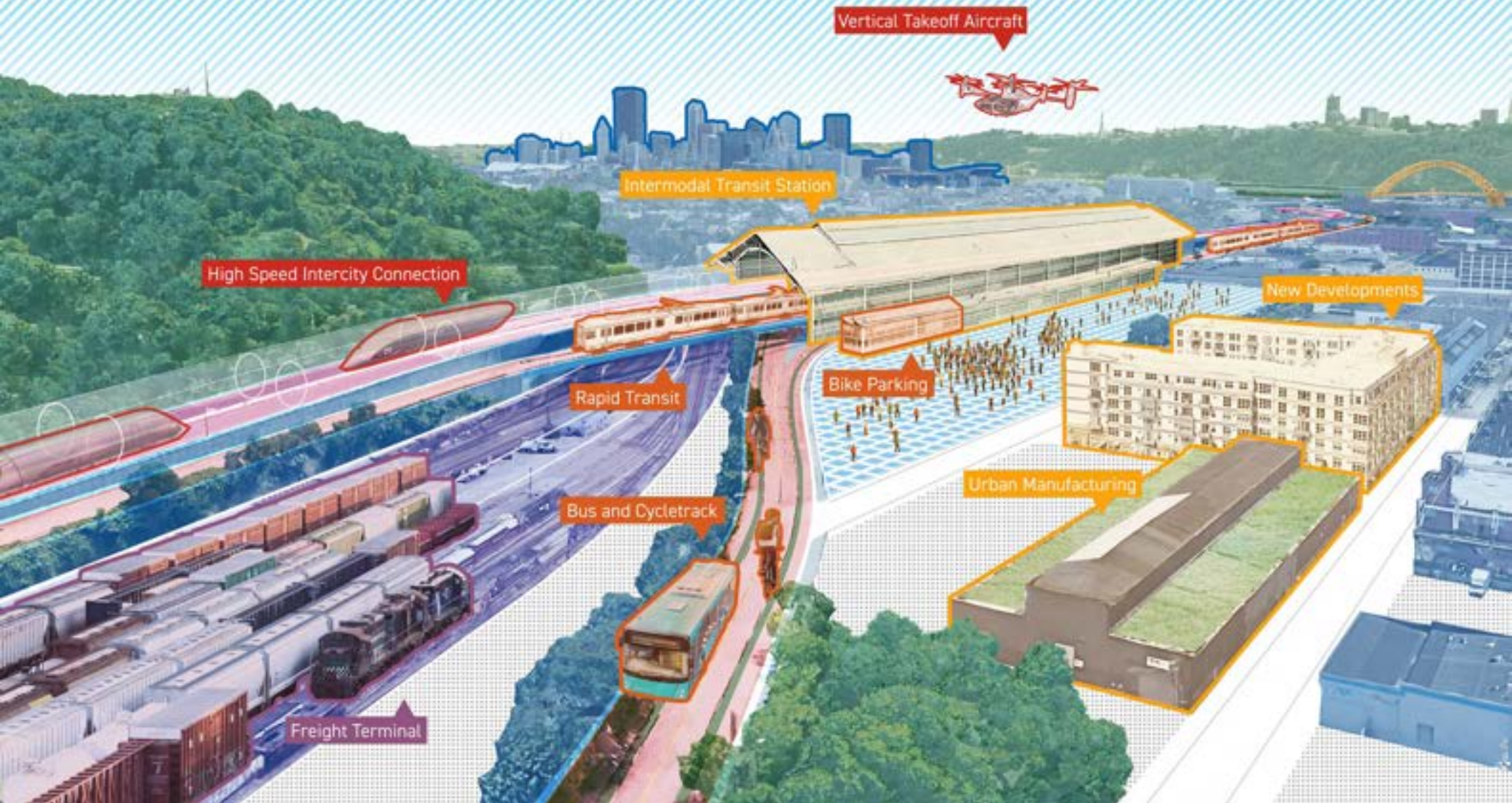
Plan for VTOL flight paths and terminals.

Technology is changing the potential for aerial transportation even faster than what we see on the ground. Lighter, quieter, and less polluting VTOL aircraft continue to evolve. While VTOL growth will be driven by the private sector, Pittsburgh will establish regulations within the city limits that consider how emerging technologies can help advance equitable economic development and mobility goals and minimize adverse impacts. The following categories have been identified at this time.

- **Terminal Locations.** Terminal locations will be carefully considered in order to minimize the impact of noise, air quality, and other adverse impacts in communities surrounding terminals.
- **Flight Paths.** Traditionally, helicopter flight paths are routed over major roadways. Often these same corridors have already created unequal burdens on the communities they pass through. As a result, issues of equity will be considered when increasing existing or the feasibility of alternative routes.
- **Capacity.** As airspace becomes more crowded with passenger VTOLs and drones carrying parcels and freight, priorities will need to be established that may lead to use limits, time restrictions, and more prescriptive flight paths.



Vision for an Urban Terminal



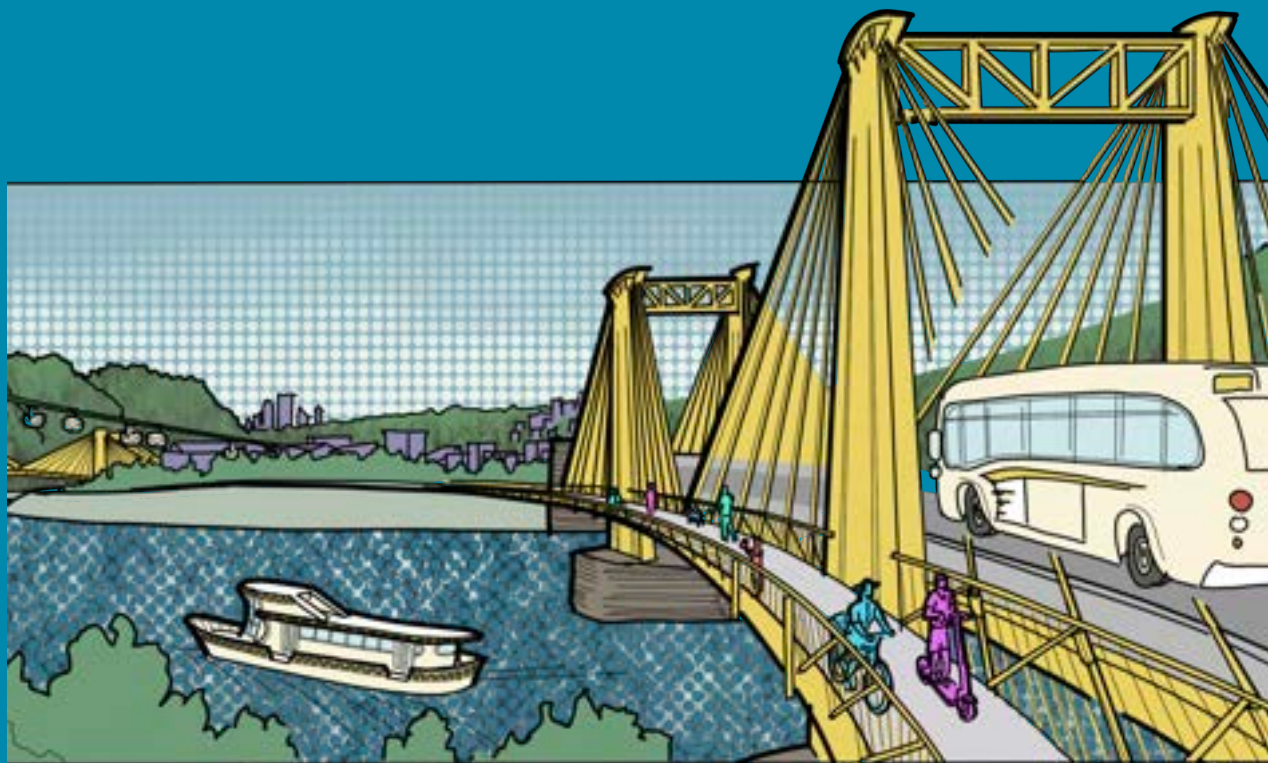
In the near term, the City will need to identify one or more opportunity sites for an urban terminal to serve as the arrival point for high-speed terrestrial transit with very rapid service to other cities of the Midwest and Mid-Atlantic. This terminal will require space for connections via a diversity of modes for passenger and freight distribution across the region.

Connecting to the Region

Pittsburgh relies on the larger region, and the larger region relies on a strong and vital Pittsburgh. Workers, shoppers, fans, and visitors come from across the 10-county metropolitan area and nearby tri-state region for jobs, health care, education, cultural amenities, unique shopping, and just to enjoy the experience that is Pittsburgh.

Similarly, many Pittsburghers travel outside the City on the regular for jobs, goods, and services. Continued growth and revitalization in southwestern Pennsylvania will rely in large part on how easy it is to move in and out of the regional center by a variety of different modes – efficiently, enjoyably, and ecologically.

Commute travel time is the single largest factor in a household's ability to escape poverty. Providing dedicated corridors for rapid transit, completing the regional trail network, and managing congestion within the urban core will decrease travel times and increase travel time reliability for people traveling by transit, car, and active transportation.



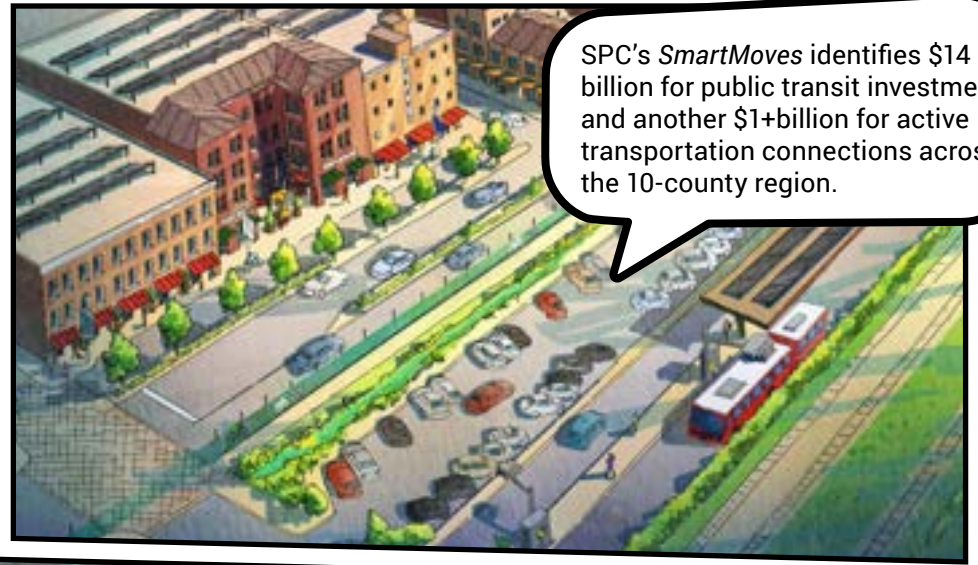
Park-n-ride facilities around the city's edge enable transfers to lower cost, more efficient modes, such as carpooling, high frequency transit, or bicycle connections. Larger-scale improvements like new bridge crossings, highway reclamation, and regional commuter rail are also contemplated as bold moves for a future city.

Past and ongoing plans connecting to the region...

The Port Authority's *NEXTransit* proposes long-term expansion and upgrades to existing transit operations that will make transit more accessible, equitable, reliable, and safe.



SPC's *SmartMoves* identifies \$14 billion for public transit investment and another \$1+ billion for active transportation connections across the 10-county region.



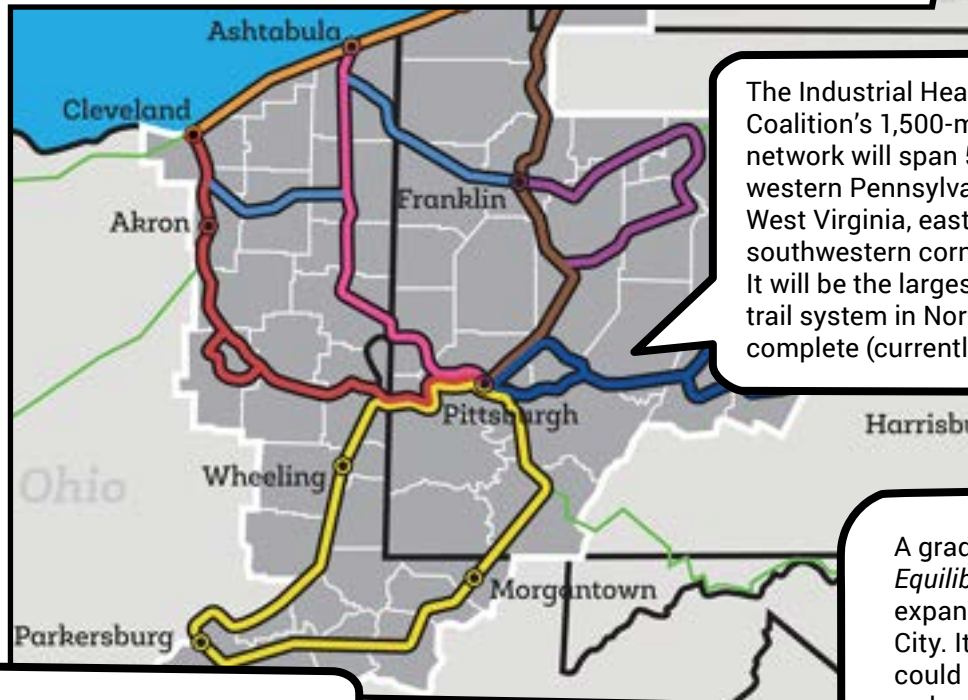
SPC is also looking to advance major trail, transit, and roadway improvements along Second Avenue/Irvine Street in Hazelwood to create a significantly improved multimodal corridor.



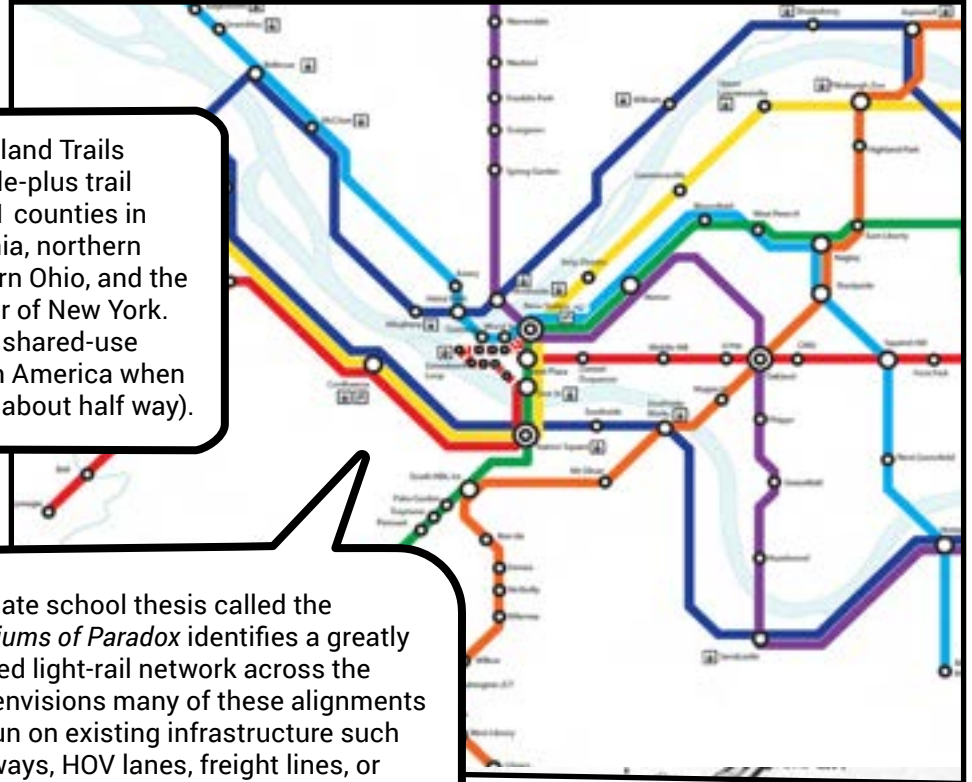
Meanwhile.... along the Allegheny River, the City and numerous non-profit partners are working to advance the long-awaited Allegheny Green Boulevard, which will improve riverfront access, neighborhood connections, and pedestrian opportunities.



Past and ongoing plans connecting to the region...

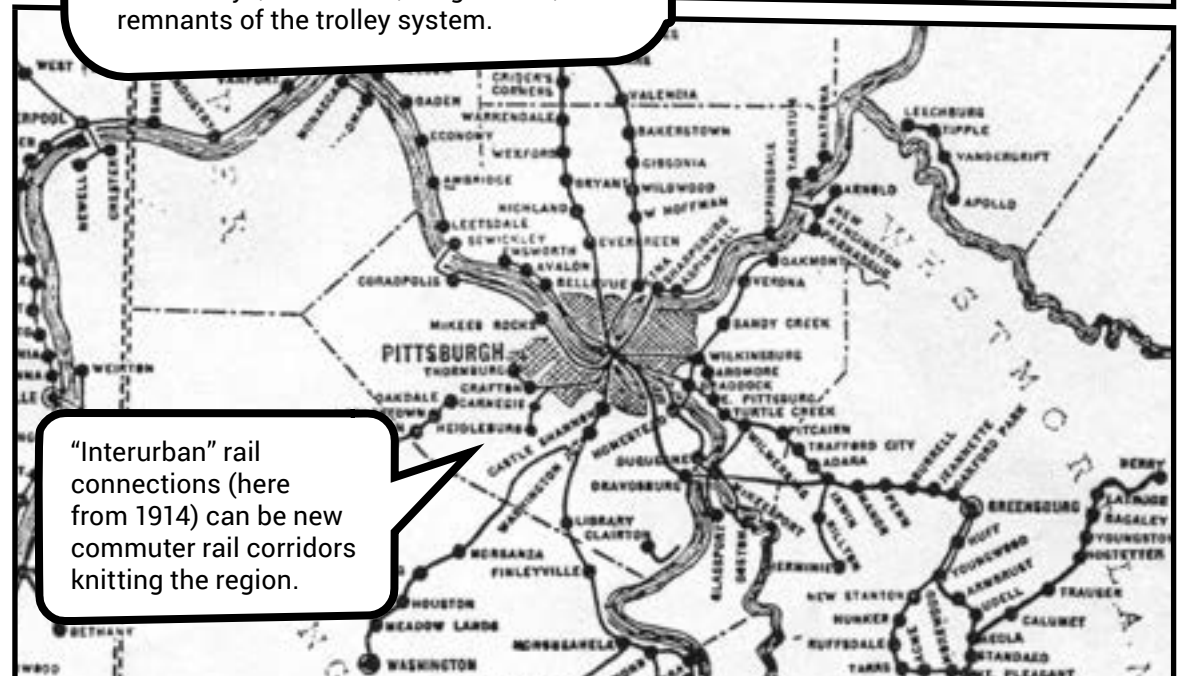


The Industrial Heartland Trails Coalition's 1,500-mile-plus trail network will span 51 counties in western Pennsylvania, northern West Virginia, eastern Ohio, and the southwestern corner of New York. It will be the largest shared-use trail system in North America when complete (currently about half way).



A graduate school thesis called the *Equilibriums of Paradox* identifies a greatly expanded light-rail network across the City. It envisions many of these alignments could run on existing infrastructure such as busways, HOV lanes, freight lines, or remnants of the trolley system.

Completing the Loop is an initiative led by Riverlife to connect and enhance segments of Pittsburgh's riverfronts.



"Interurban" rail connections (here from 1914) can be new commuter rail corridors knitting the region.

Projects

High-Capacity Transit Corridors and Connections

The Pittsburgh metropolitan area is 27th in the nation in terms of size, but according to data from INRIX, it is the 7th most congested. The same report found the Parkway East and West to be the fifth most congested highway in the country. Pittsburgh cannot drive itself to grow. Sustainable growth and inclusive economic opportunity must rely on improved high quality transit.

This Plan, incorporating applicable projects identified in NEXTransit, proposes corridors or in some cases general alignments across the region that would benefit from enhanced high-capacity transit to connect outlying areas to employment centers and other key destinations within the city limits. Improvements may include dedicated transit lanes, shoulder running transit opportunities, transit signal priority, transit stop and station enhancements, and a range of intelligent transportation system improvements to aid movement of this most efficient mode.

Trail Network

Trails are not just for recreation. They are important corridors for job access as well as one of the most affordable and ecological modes of travel (not to mention enjoyable). The exponential increase in electric-assist bicycle and other electric-powered micromobility will increase the viability of trail commuting further still.

While the Pittsburgh region boasts an enviable regional trail network, critical gaps remain. The City and regional partners must find solutions with railroad properties, many of which have underutilized or obsolete rail corridors, and through engineering innovations to complete these links and provide a connected network.

Park-n-Ride | Park-n-Bike

The density in most of the Pittsburgh region is too low to support transit within walking or biking distance of residential areas. While some people will always prefer to commute by automobile, park-n-ride and park-n-bike facilities allow commuters to make just a portion of their trip by private automobile and enable a swift and easy connection to transit, carpool, or trail for the final leg into the dense employment core, which will reduce commute times, traffic congestion, and GHG emissions.



Highway Reclamation

Pittsburgh, and the nation's, shift to auto-mobility came at the expense of many urban neighborhoods. Thriving neighborhoods and vibrant business districts were bulldozed half a century ago to feed the voracious appetite for swifter travel for more and more automobiles. Over the next half century, this Plan envisions maintaining the same level of connectivity to the region but reclaiming old highways as lush urban boulevards. At-grade connections with multiple intersections will better distribute trips and traffic across a larger network rather than congestion and conflict at limited interchanges.

Completing missing connections between SR 28 and Interstate (I) 279 will reduce inappropriate use of local streets for regional transfers between these facilities. Concurrently, such improvements will permit the reconnection of portions of Pittsburgh's North Side cleaved apart by highway construction. Urban design improvements and the highway cap project over I-579 that is currently under construction will reduce the impact of regional highway infrastructure in the Lower Hill.

Congestion Management

If Pittsburgh, Allegheny County, and the region were to grow back even just half the population that has been lost, and if this population relied on the automobile to the same extent today's population does, traffic congestion would be unbearable. No amount of interchange expansion or merge untangling would change the fact that traffic must cross a river and / or go through a tunnel to arrive in the urban core.

The long term success of Pittsburgh and Pittsburghers will rely on managing congestion in the dense employment centers of the region. This Plan anticipates the establishment of congestion pricing zones that will encourage commuters to take advantage of park-n-ride facilities and greatly improved transit and trail connections to minimize drive alone trips in favor of higher occupancy modes. This will also apply to delivery vehicles.

Freight Hubs

Freight hubs and freight villages are logistics centers that allow cargo to be transferred from large long-haul trucks to smaller vehicles that are right-sized for deliveries in urban neighborhoods. Freight hubs are common across Europe and have been implemented in New York City and Seattle. Because Pittsburgh's narrow streets, steep grades, and low bridges were not originally designed with large trucks in mind, the Plan imagines a similar approach here. Smaller less-carbon intensive vehicles will operate more cleanly, efficiently, and safely on busy city streets. Repackaging at freight hubs will reduce overall vehicle miles traveled by consolidating deliveries bound for a particular neighborhood.



The City will encourage the development of freight hubs by requiring smaller delivery vehicles in certain districts and neighborhoods. In addition, the City can proactively plan where freight hubs should be sited. Ideally, this will be in existing industrial areas but also near transit connections to maximize job accessibility.

New and Improved River Crossings

Pittsburgh is a city of rivers and bridges. The region's major rivers pose some barriers to a truly connected region. Over the next half century, this Plan proposes two new river crossings to better connect the region.

While the Allegheny River is bridged eleven times within the jurisdiction of Pittsburgh, the Mon River is crossed at only eight locations. To support continued revitalization of the Mon Valley and South Hills communities, this Plan contemplates an additional multimodal bridge to carry Becks Run Road across the river to connect with Hazelwood Avenue at Irvine Street / Second Avenue. Such a connection would facilitate workforce access to the growing employment center where the J&L steel mill once occupied large swaths of land on either side of the Mon River.

Bicycle and active transportation connections from the South Hills into Downtown are challenged by tunnels and topography, which severely limits the opportunity for alternative and low cost commuting to the core. Although ambitious, perhaps audacious, a non-motorized bridge connection utilizing the piers from the old Wabash rail bridge across the Mon River would provide a pleasant alternative to the more stressful Fort Pitt Bridge side path. A pedestrian / bicycle bridge would not only provide alternative connectivity, but would also present an attractive draw for visitors to enjoy one of Pittsburgh's three rivers.

In the coming years, the West End Bridge over the Ohio River will be rehabilitated. This must include enhanced bicycle and pedestrian accommodations extending into the North Shore to again provide vital trail connectivity and commute opportunities from West End communities.

Regional Commuter Rail

A century ago, Pittsburgh was connected to boroughs and smaller cities throughout southwestern Pennsylvania via an extensive system of interurban railways. These regional rails brought the region closer and extended economic opportunity. While the Pittsburgh population is currently a shadow of its former self that could certainly and quickly change over the next half century.

Pittsburgh and regional partners should lean into the future and preserve what opportunities may exist and not preclude the possibility for future commuter rail to once again provide high capacity, high quality, and environmentally preferable mobility throughout the region.

Swiftly connecting regional workers to city jobs and city workers to opportunities across the region is essential. Major corridors will provide exclusive space for transit operations and / or smart signals that prioritize transit progression. Critical trail gaps are filled and amenity-rich park-n-ride locations facilitate quick and convenient transfer from drive alone auto trips to higher capacity travel for the final leg into the urban core, where congestion management systems are operated. Long term, new river crossings provide even greater regional connectivity for a variety of modes.

For more additional project information, [click here](#)

Process

Collaborate with transit providers and neighboring municipalities to expand park-n-ride and park-n-bike facilities.

The City is planning to expand and implement new park-n-ride and park-n-bike facilities within the city limits; however, there needs to be opportunities for similar facilities to be spread across the greater region as well. The City will work with regional partners to identify and invest in park-n-ride / park-n-bike facilities to capture trips before they enter the most congested parts of the City. DOMI will explore innovative solutions and partnerships such as working with big box retailers that have large parking lots along commuter bus routes or adjacent to trails that are underutilized during peak commute times.

Advocate for increased high-capacity transit investment.

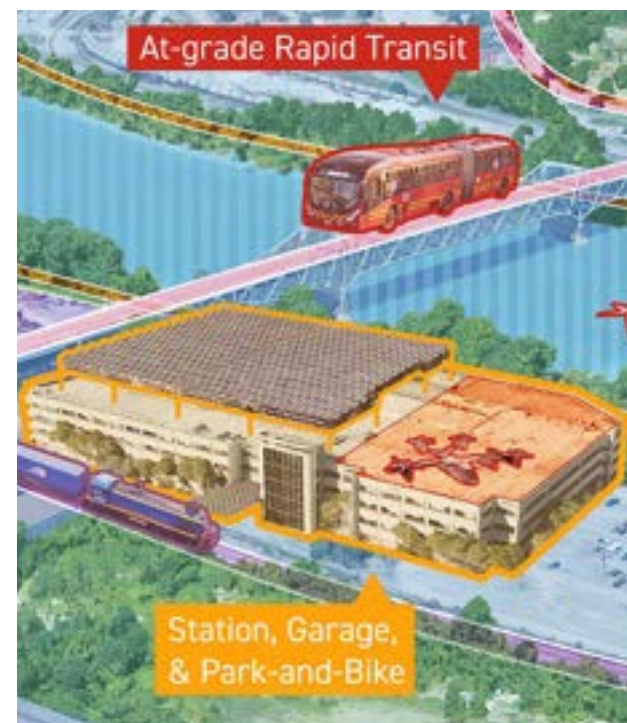
Funding for transit has and will likely continue to be extremely competitive given the considerable need across the country. However, Pittsburgh cannot achieve the ambitious aims of this Plan and *NEXTransit* if the current model persists. The region must commit to an allocation of capital funding that leans toward sustainable modes and rebalances travel incentives. Additionally, a new funding model that is not dependent on the gasoline tax must measure use and impacts to charge the least sustainable and efficient modes to help fund the most sustainable, efficient, and equitable modes.

Actively engage with rail companies.

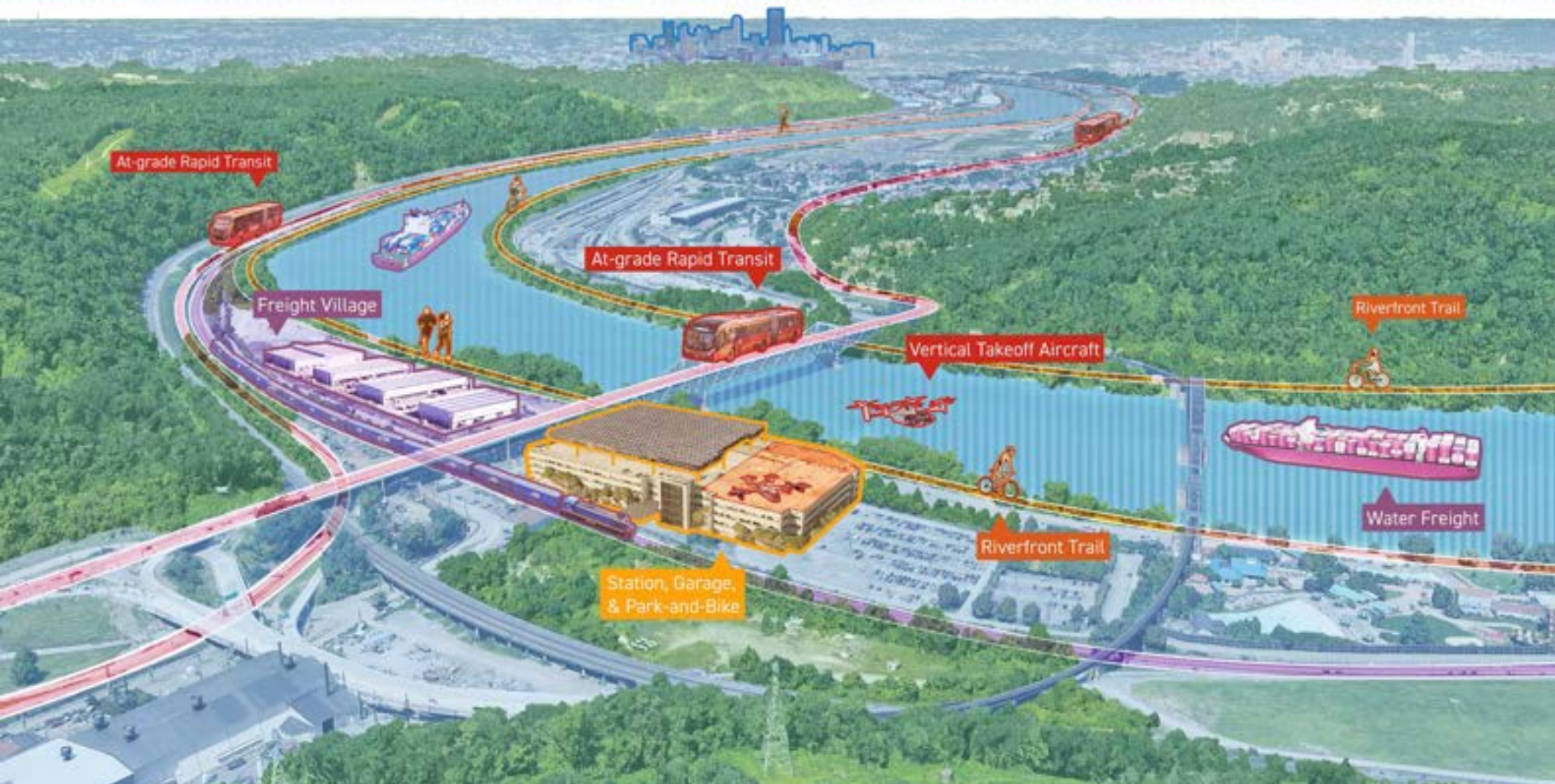
The Pittsburgh region is crisscrossed by freight rail corridors that helped move the iron, coal, and other commodities that were once the bedrock of the City's economy. Some corridors are still in active use while others are candidates for conversion to rails-to-trails, dedicated transit corridors, and / or long-term reintroduction of commuter rail. Some active and still-vital freight operations may have sufficient capacity or ROW to also accommodate other uses. DOMI will continue to work with transit providers, trail advocates, freight rail companies, and other regional partners to identify those rail corridors that are obsolete, those that are good candidates for transit and / or trail use, and those that should be maintained for freight use. This will require coordinated planning followed by a range of actions including railbanking, public access easements, and / or rights of first refusal. Such negotiations are typically challenging and time consuming but may become easier as freight movements change and railroad companies reevaluate their assets.

Work with DCP to establish a targeted industrial land use policy.

While obsolete freight corridors should be repurposed for transit and / or trails, some are vital for existing and anticipated industrial uses. In collaboration with DCP and regional partners, DOMI will identify which freight corridors and associated industrial districts should be preserved, enhanced, and expanded. In the interest of ensuring that the use of active freight rail corridors are maximized, industrial uses should be preserved and encouraged within proximity to these corridors. This will also minimize the number of long-haul trucks entering the local transportation network.



Vision to Connect to the Region



Over the next half century, the region will enjoy greater access and connectivity between the urban core and surrounding communities through major investment in regional transit service, prioritized transit corridors, convenient and pleasant park-n-ride connections to transit, ride-sharing, and a complete and connected regional trail network and park-n-bike facilities. Freight movement and deliveries will be facilitated through intermodal hubs for final distribution.

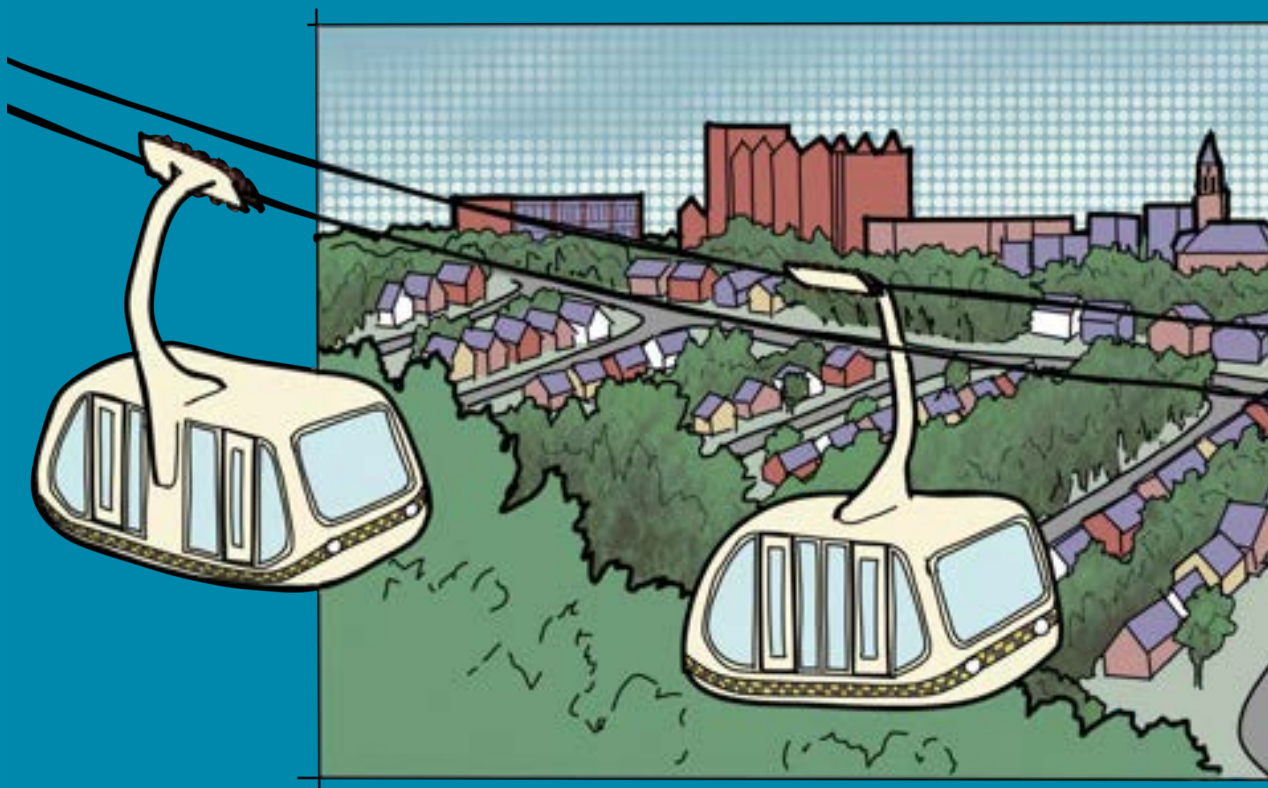
Connecting Centers

Pittsburgh is a polycentric city. While Downtown remains the economic and cultural core and Oakland as the education and institutional center of the region, several other important economic centers are distributed across the City.

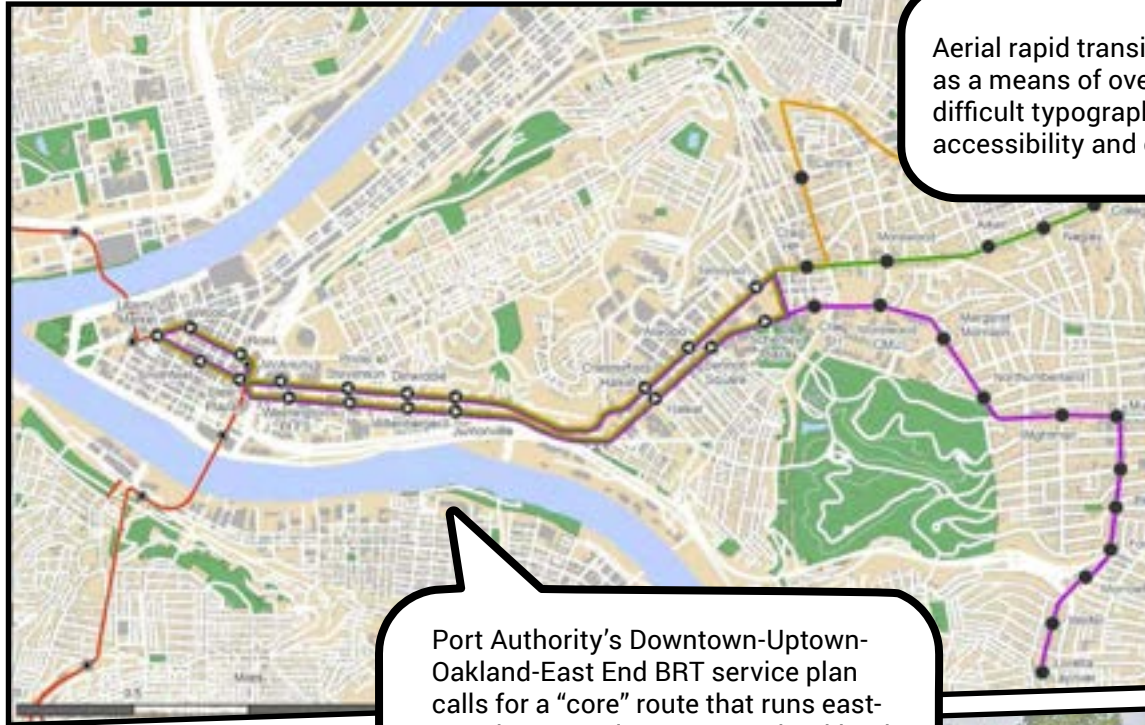
As the residential and employment base grows once again and new industries expand in the already diverse job market, some existing centers will get larger and new centers will emerge.

In part due to topography, and part owed to tradition, Pittsburgh's principal mobility systems – both transit and arterial roadways – are arranged in a hub and spoke configuration with most major corridors converging in the Golden Triangle before turning to destinations elsewhere in the City.

This model is insufficient to equitably serve the constellation of desire lines residents and workers seek between city centers. This Plan calls for multiple overland, aerial, and waterborne connections to facilitate more direct travel between centers and across the spokes of the current system.



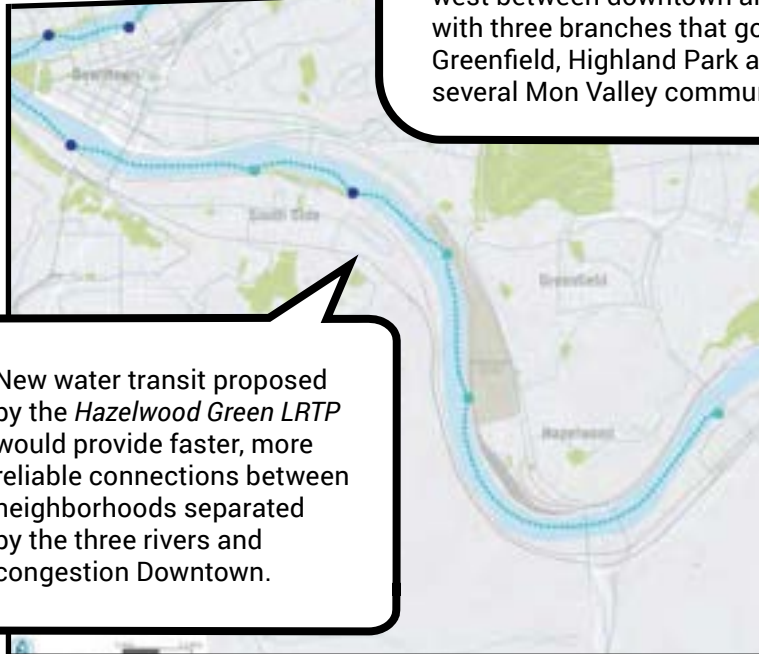
Past and ongoing plans connecting centers...



Aerial rapid transit is envisioned as a means of overcoming difficult typography to improve accessibility and connectivity.



Port Authority's Downtown-Uptown-Oakland-East End BRT service plan calls for a "core" route that runs east-west between downtown and Oakland with three branches that go to Greenfield, Highland Park and through several Mon Valley communities.



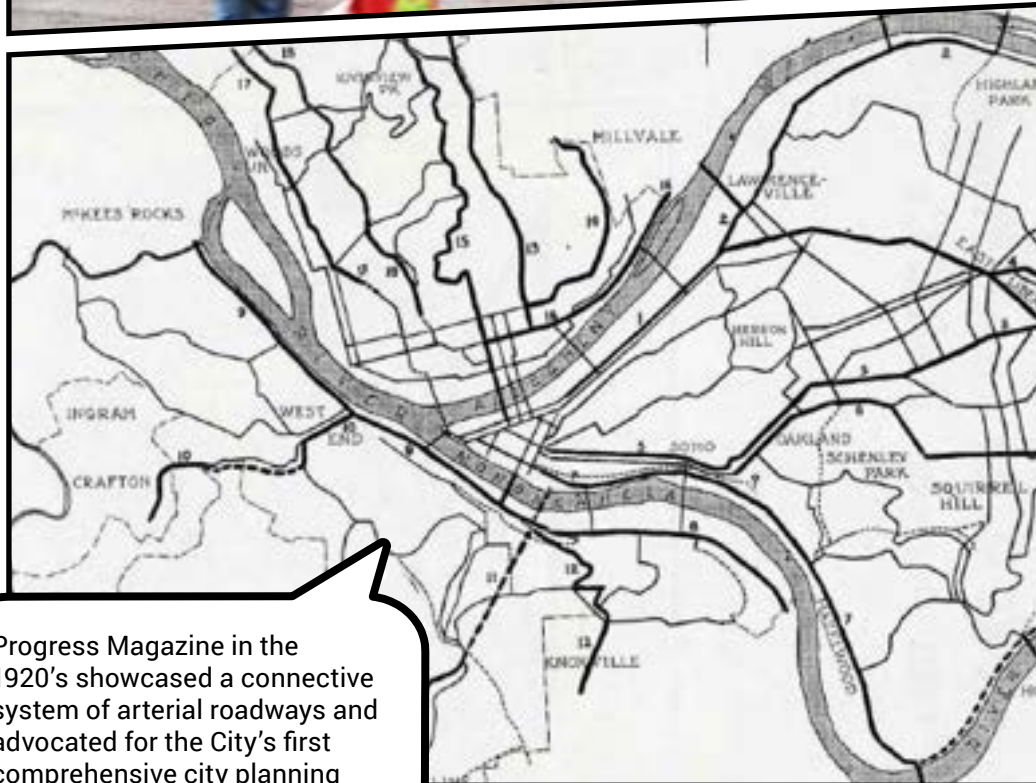
New water transit proposed by the Hazelwood Green LRTP would provide faster, more reliable connections between neighborhoods separated by the three rivers and congestion Downtown.

The Centre Avenue Redevelopment and Design Plan proposes streetscape and placemaking improvements to support new economic activity along this Avenues of Hope corridor.

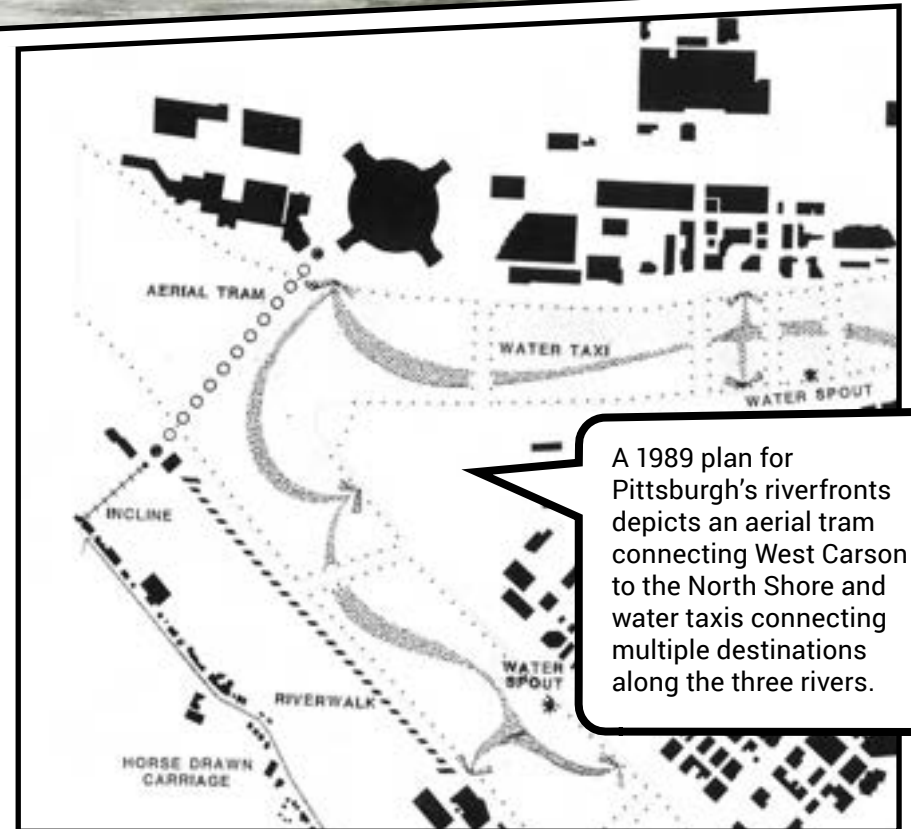


Past and ongoing plans connecting centers...

The Uptown/West Oakland EcoInnovation District Plan envisions transforming the Boulevard of the Allies from a "highway" into a true boulevard and riverfront and riverfront.



Progress Magazine in the 1920's showcased a connective system of arterial roadways and advocated for the City's first comprehensive city planning initiative.



A 1989 plan for Pittsburgh's riverfronts depicts an aerial tram connecting West Carson to the North Shore and water taxis connecting multiple destinations along the three rivers.

Projects

High-frequency Transit

Transit is the economic backbone of Pittsburgh. Trolleys (streetcars) used to crisscross the City connecting all ninety neighborhoods, providing a web of connections between the many centers. Over the decades, the system contracted with receding population numbers. Frequent transit – transit service at least every 15-minutes during most hours of the day – is now available on only a dozen or so corridors, most of which travel through Downtown.

This Plan and *NEXTransit* envision a system that increases connectivity and service across existing frequent routes, providing the opportunity for seamless transfers and more timely connections to more destinations. Although specific transit modes are yet to be determined, the City can aid implementation of envisioned improvements by prioritizing transit operations on identified streets and enhancing transit stop amenities and connections to mobility hubs to distribute passengers the last several blocks or mile to their final destination.



Aerial Rapid Transit and Urban Escalators

Pittsburgh's steep slopes and broad rivers are phenomenal assets – and major barriers that make polycentric connections difficult. The City's seventeen original inclines were built in response to these challenges. In equally topographically challenged cities in South America and several closer to the west coast, aerial ropeway transit (also known as gondolas) have been successfully implemented.

Suspended gondolas can travel above buildings or adjacent to roadways and extend along longer corridors. Although continuously moving, aerial ropeway transit can have multiple stations to connect multiple centers. Urban escalators, like those in Medellin, Colombia and Hong Kong, China, are another option for navigating steep slopes over shorter distances.

Aerial ropeway transit is not a new consideration. Pittsburghers have been pitching the idea since at least 1986. This Plan draws from many past concepts and proposes aerial ropeway transit / gondola connections from Mount Washington to the North Shore and again from the Strip District all the way to Carrick, connecting the Hill District, Oakland, Hazelwood, and South Side along the way. An aerial connection linking the Lower Hill to a revived and dignified train station at the Pennsylvanian could also be explored.

Some of the old incline routes could have new life again in a greatly repopulated Pittsburgh where non-auto connections will be in demand to link the South Side and West End communities to employment opportunities at infill development on the flats. Similarly, the neighborhoods in

Pittsburgh's north may grow to demand aerial tram or inclined plane (re)connections to the historic Allegheny City area while new connections from South Oakland and Glen Hazel may be sought by way of urban escalators or other topography connector to access jobs along the riverbanks they overlook.



Bike(+) Network

In 2020, 25 percent of all automobile trips taken in Pittsburgh were less than one mile in distance. Fully 40 percent of vehicle trips were less than two miles. Public surveys indicate many people would happily take these trips on foot, bicycle, or a personal electric device if only streets and intersections felt safe and welcoming for such travel.

The City's *Bike(+) Plan*, completed in June 2020, outlines a vision for doing just that. The plan serves as a roadmap for connecting centers and neighborhoods with safe, accessible, and comfortable facilities for people using bikes and other small, non-combustion-powered vehicles

This Plan calls for building out this proposed 10-year network and continuing to expand both capacity and connections in subsequent decades toward the goal of placing a bicycle-oriented connection within a quarter mile of every residence in the City, and subsequently shifting a considerable share of short distance vehicle trips



The *Bike(+) Plan* calls for a significant expansion of the network over the next ten years.

to more sustainable and less congesting modes. As the bike(+) network anticipates utilization by more than pedalcycle, when scaled and designed appropriately, it can also serve a critical role in inner city deliveries by cargo bike, electric “sled” scooter, and / or personal delivery device.

Smart Streets

There are over 600 signalized intersections in the City that manage movement along scores of corridors. Multimodal movement along these corridors is the principal means of connecting between centers today and will remain equally vital in the decades to come.

Pittsburgh must continue to make smart investments in smart technologies to efficiently manage these critical corridors. This includes sustained and sizeable investment to modernize outdated equipment, establish high capacity communication lines to provide and promote more real-time management of variable demands, and facilitate optimal throughput of the diversity of modes. Smart corridors connecting centers will provide a backbone not only for increased street safety through connected vehicles and “V2I” (vehicle to infrastructure) optimization but can also provide a broadband corridor to each city center.

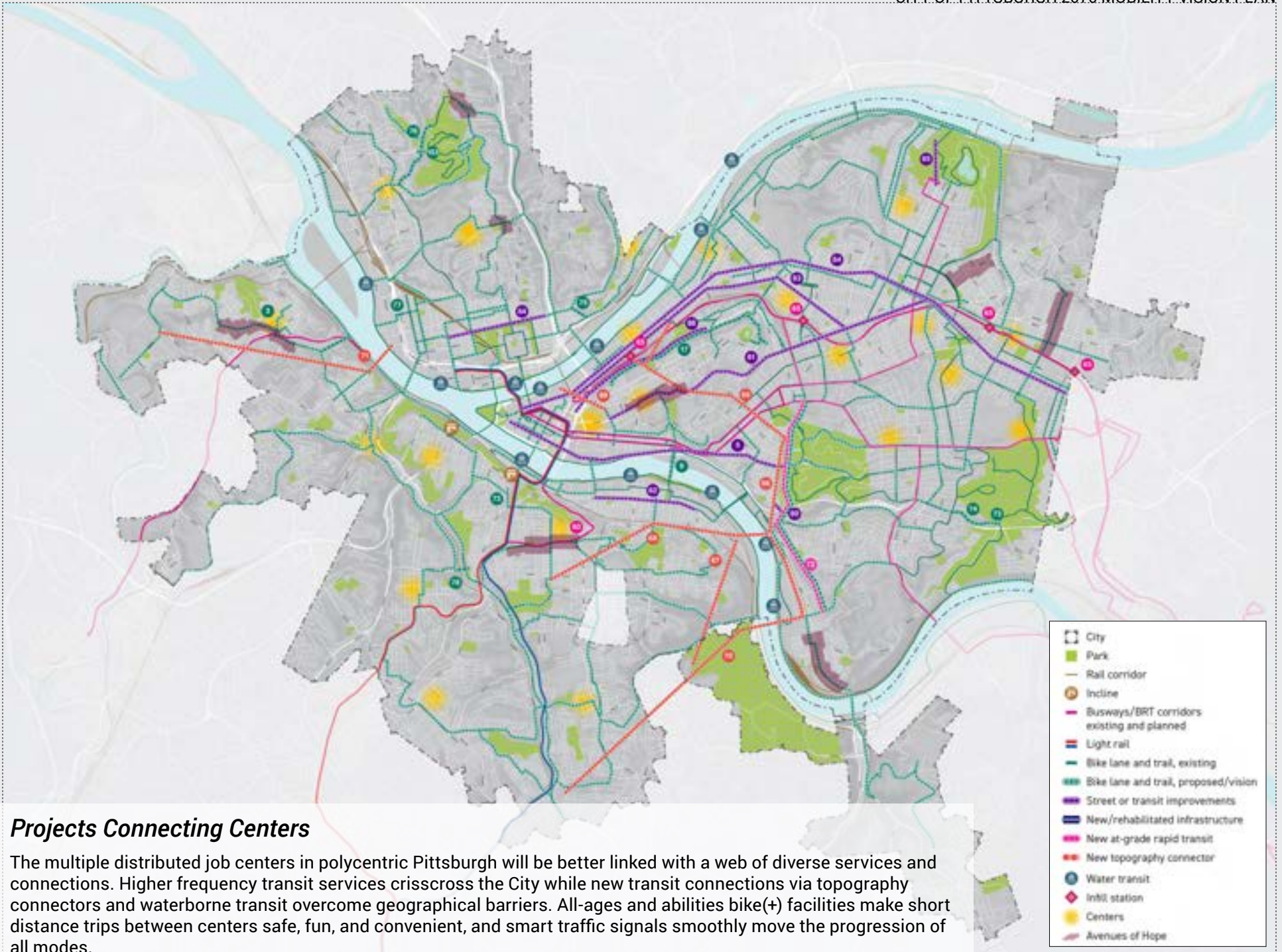
Water Transit

Pittsburgh is a riverfront city – three rivers in fact. The waterways have been and continue to be high capacity and highly efficient freight corridors with tons of material moving on barges up and down everyday. Pittsburghers perennially long for the rivers to once again be vital corridors for moving people as well.

Over the next half century, waterborne transit may once again provide critical connections between and among centers. It is certainly a mode that people enjoy and one that has seen significant increases in ridership in places like New York City and Boston in recent years. As economic centers cluster at the water's edge, water buses and taxis can ferry passengers and commerce to many destinations from Highland Park to McKee's Rocks, Homestead, and beyond.

Waterborne passenger transit is generally an expensive and / or heavily subsidized form of mobility but such an investment can also catalyze land development much as real estate interests invested in early streetcar lines. Critical to the viability of waterborne transit is the consideration of land-side connections to smoothly transfer and transport passengers to destinations further inland and into hilltop communities. Ferry stops are natural mobility hubs but must be thoughtfully designed and anticipated.





Process

Leverage infill development to aid in the implementation of pedestrian, bike+, and transit networks.

The centers will grow over the next half century with substantial private sector and real estate development. Each will place additional demand on the multimodal network yet will also take advantage of the increasing connectivity provided with the incremental build out of the projects identified in this Plan. DOMI and DCP will put policies and processes in place to ensure that infill within centers also contributes to connectivity between centers. Rather than simply providing parking for development tenants and residents, the City will pursue strategies to establish a “Mobility Fund” and / or Mobility Authority to utilize parking “payment in lieu” fees to invest in the intermodal, polycentric network.

Plan for mobility hubs and facilitate intermodality.

Centers will be connected by way of a multitude of complementary multimodal services and networks. The City must ensure that these various services work together in a single system to facilitate easy movement between modes and dynamic travel routing, even without a private vehicle. Mobility hubs should be thoughtfully located within centers to organize and integrate the diversity of modes and ease travel within and between centers.

Explore opportunities for public-private partnerships and creative funding and financing.

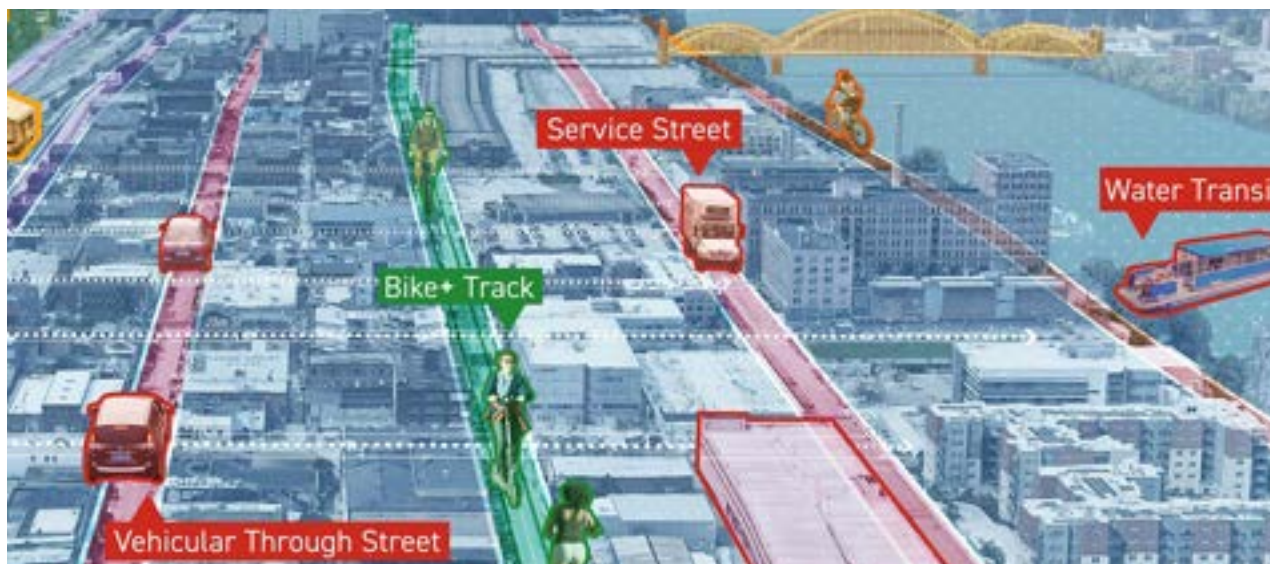
Transit enhancements – whether conventional terrestrial transit or topography connector or

waterborne – are capital intensive. Not only will the introduction of these proposed improvements require thoughtful planning and robust engagement but they will also require strategic partnerships and innovative funding structures. The City and Port Authority should outline a framework to evaluate future proposals for private construction for public service, revenue sharing arrangements, or joint development proposals to assist in funding such ambitious ideas.

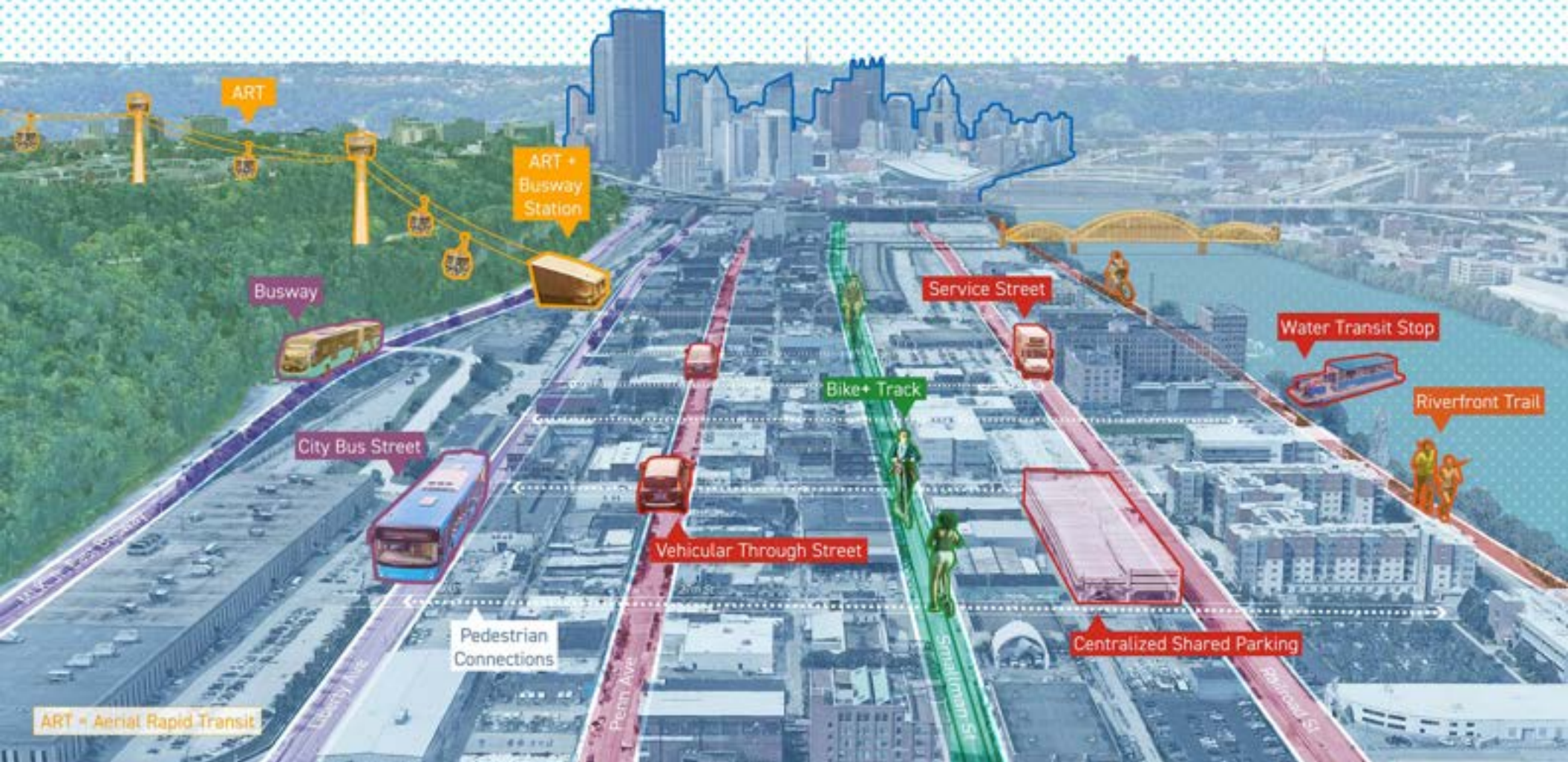
Coordinate with ForgingPGH to optimize land use in centers slated for expanded mobility investments.

Transportation and land use go hand in hand. Generally transportation responds to population demand but it can also act as a catalyst for compact growth patterns and infill development. This Plan and *ForgingPGH* are two sides of the same coin and inherent components of one another. *ForgingPGH* will identify likely areas of expanded growth and economic activity.

DOMI and our transportation partners are actively participating in the comprehensive planning process to ensure that new growth areas are well served by sustainable and space-efficient modes that provide convenient and cost-effective access for all Pittsburghers. Similarly, the comprehensive plan should seek appropriate ways to increase allowable development density near high-capacity / high-frequency transit stations to make the highest use of that substantial investment and concurrently absorb housing pressures and maintain housing affordability. Land use and transportation planning and policy must align closely to ensure that mobility improvements expand access and opportunity for all Pittsburghers and minimize potential adverse impacts to existing populations.



Vision Connecting Centers



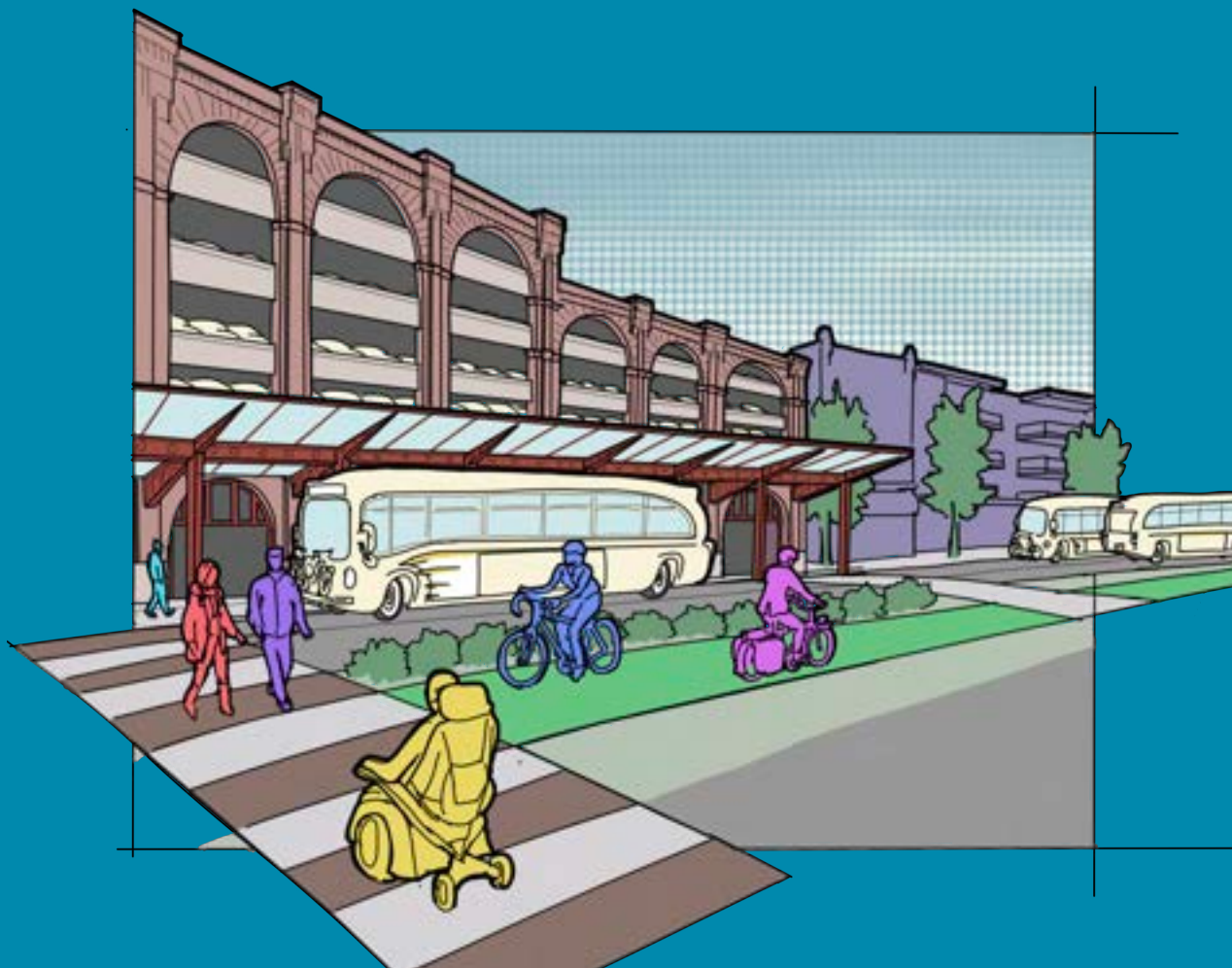
The City's multiple centers are efficiently connected to one another by a multitude of modes including frequent transit, reestablished topography connectors, dedicated bike(+)ways, and waterborne transit – all working together in an integrated multimodal system.

Connecting within Districts

Some of Pittsburgh's neighborhoods have coalesced into larger districts, extending beyond the 15-minute walkshed of single centers. Examples include the several neighborhoods of the flats north and south of the Allegheny River or south of the Mon, the string of neighborhoods extending along the ridges from the Point to the East End, and the many hilltop neighborhoods of the West End and South Hills.

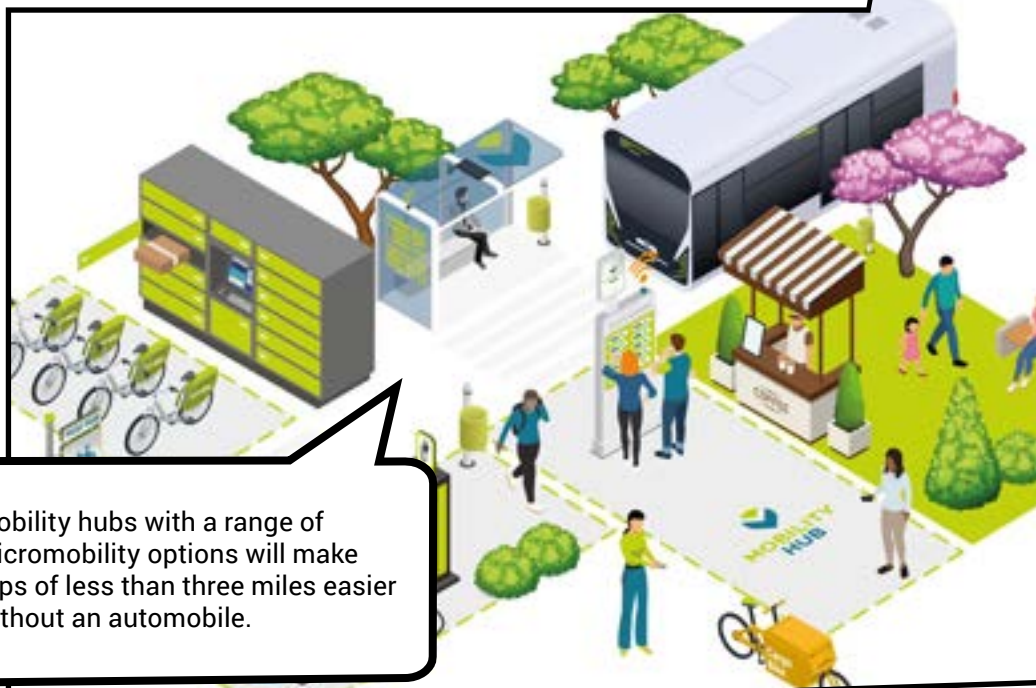
These districts are micro-economies that people circulate within for work, shopping, and services. Districts often serve the surrounding lower density residential areas for everyday needs like groceries, entertainment, and education. Districts can also be important warehouse, distribution, and / or industrial job centers, as is the case in Fairywood and others.

To compete, sustain, and grow, districts require space-efficient, sustainable, and convenient non-auto circulation within the district itself and a variety of scheduled and on-demand connections to the surrounding residential area that are available from early morning to late at night. Transit circulators and shuttles, bike(+) corridors,



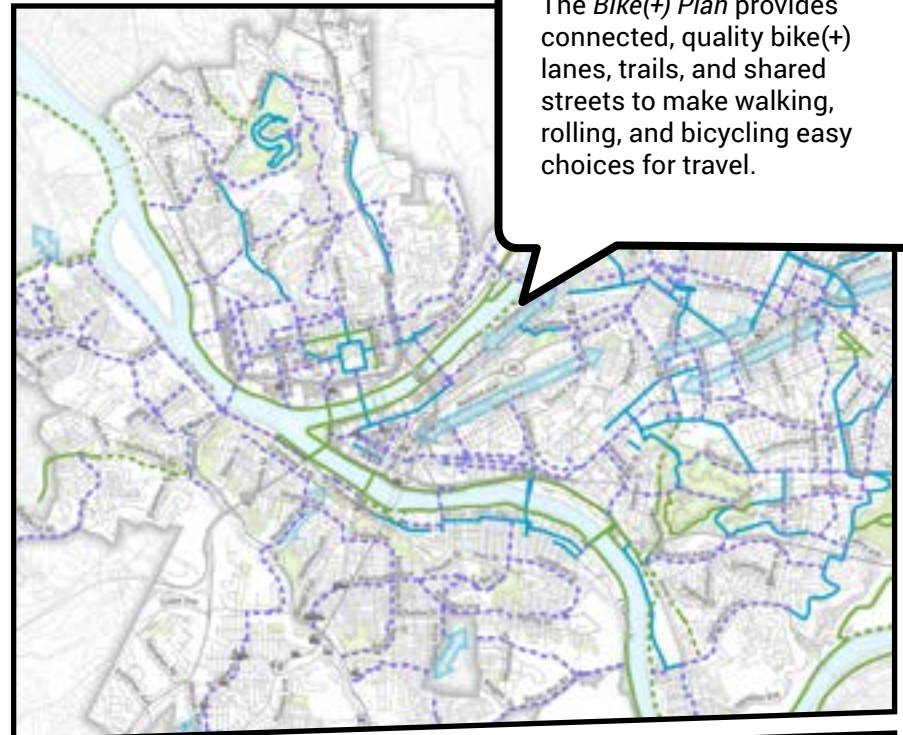
enhanced pedestrian networks, restored public steps, non-motorized bridge connections, urban escalators, and mobility hubs for both people and goods delivery are important strategies and investments for strong and vital districts that catalyze a strong return on investment to the City and larger region.

Past and ongoing plans connecting districts...

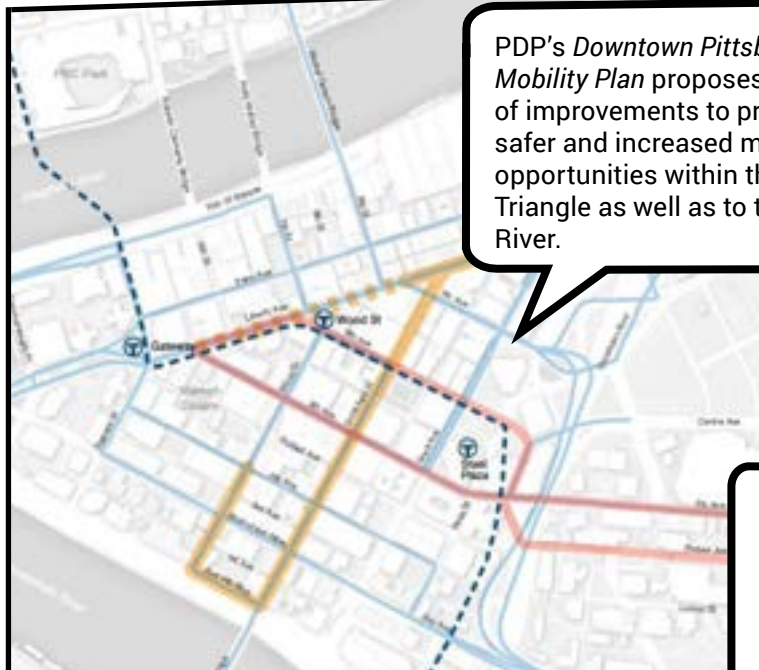


Mobility hubs with a range of micromobility options will make trips of less than three miles easier without an automobile.

The *Bike(+) Plan* provides connected, quality bike(+) lanes, trails, and shared streets to make walking, rolling, and bicycling easy choices for travel.



PDP's *Downtown Pittsburgh Mobility Plan* proposes a series of improvements to provide safer and increased multimodal opportunities within the Golden Triangle as well as to the Allegheny River.



MODE EMPHASIS
 IN - PRIORITY: EVERYWHERE
 TRANSIT
 BICYCLE
 WALKER
 CAR

The *Manchester-Chateau Neighborhood Plan* examines solutions to the safety and urban design challenges posed by SR 65.



Projects

Sidewalk and Pedestrian Infrastructure Improvements

Sidewalks and accessible pedestrian accommodation is the fundamental building block of all urban mobility systems and central to the functioning of both districts and centers. Complete, connected, quality, and accessible pedestrian networks must be provided and maintained throughout every district during every season of the year. Pedestrian networks are not only the most efficient mode for circulating within districts but also connect surrounding residential areas.

Using an equity analysis tool, DOMI has identified critical sidewalk gaps that currently present barriers to residents getting to transit, schools, local retail, and other community amenities



and destinations. Addressing these gaps is the very first priority of this Plan, together with the provision of safe and accessible crossings and travel.

In combination with complete sidewalks, intersection and corridor safety for pedestrians is crucial to districts. DOMI's *Pedestrian Safety Action Plan* identifies corridors and areas of critical pedestrian safety concern. The City will invest in safety improvements in these high priority areas in addition to similarly identified locations that will emerge in the decades to come with a goal of achieving zero pedestrian deaths on city streets.

Bike(+) Network

Districts are often slightly too large to be covered end to end in a 15-minute walk trip. However, they are easily and often most enjoyably traversed in a matter of minutes by bicycle, scooter, or other current or to-emerge micromobility device. These devices are highly efficient with little to no carbon output. They are significantly more affordable than automobile travel, particularly when provided through a publicly available shared fleet. Bicycles and scooters (or their larger cargo cousin the electric "sled") are 60 percent more efficient at moving cargo and deliveries within districts as compared to their full-size truck counterpart.

For all this high-efficiency, high-enjoyment, low-emission travel to occur within districts, complete, connected, and appropriately scaled and protected bike(+) facilities must be provided. Pittsburgh's *Bike(+) Plan* provides the first ten-years of priority bike(+) corridors for development. The provision of bike(+) lanes, trails, tracks, and shared-use slow streets will enable the over 40 percent of short distance trips currently driven in a vehicle to convert to smaller modes, saving road



space, easing congestion, and lowering stress for motorists, transit vehicles, and other travelers passing through the district on longer distance trips to other centers or connections with the region.

Local Circulator and Shuttles

While transit is the most efficient way to move people, even for short distances, short distances are not the most efficient way to run transit. That is why most transit agencies focus on long-haul routes rather than local circulators. That said, circulators can be highly valuable to districts and many of the major employers, real estate interests, or commercial establishments within them.

They can also encourage motorists to use larger parking facilities at the edge of districts (which helps optimize parking resources) by swiftly and seamlessly connecting them to the pedestrian-dense heart of a district and then carry them comfortably back to their vehicle with whatever packages and purchases they bring with them.

This Plan calls for the exploration of shuttles and circulators to connect key destinations within districts, including multiple mobility hubs and parking facilities, that are easy transfer points to the larger region. Such circulators should complement, not compete, with existing or planned public transit services. Public-private partnerships can reduce the comparatively high subsidy required for such services. Autonomous driving systems and / or on-demand routing can further lower the cost of shuttle and circulator services making it affordable or, better yet, free to residents, employees, and visitors of the district.

Mobility Hubs

High-frequency / high-capacity transit stops provide value to their surrounding area by increasing connectivity to the region. Mobility hubs add similar value in areas that have moderate transit frequencies by augmenting transit services with a diversity of shared and on-demand mobility services such as bike-, scooter-, and car-share in addition to pick-up locations for shared rides. Electric charging facilities, real time transit information, and placemaking elements, such as seating, greenspace, and / or public art, add further attraction and utility to mobility hubs.

Mobility hubs should be distributed across the district and generally sited along major travel corridors and adjacent to transit stops. Mobility hubs serve to extend the reach of transit and provide reliable, redundant, and resilient mobility

from a variety of vehicle and device types suitable for a diversity of trip purposes. They may also serve functions for goods delivery or pick up, including secure lockers for delivery and pick up of online orders, and serve as distribution points for personal delivery devices.

Shared Parking

Parking demand varies greatly by land use, time of day, day of week, and season of the year. Office uses typically have the greatest parking demand during the workday and work week but their parking lots and garages are empty on evenings and weekends. Restaurants see peak demand in the reverse pattern.

Shared parking districts optimize the parking provided within the district to share it across all land uses. This not only levels out the peaks and valleys of demand but results in less cost burden to developments throughout the district as they can share parking resources. Shared parking strategies are also more convenient for patrons as they no longer feel compelled to move their vehicle only a few blocks to their next destination.

Shared parking within a district provides publicly accessible parking in centralized locations that also provide access to local destinations on foot, circulator, or via micromobility. Such arrangements are preferable to serve patrons, workers, and visitors of all types. They lower land development costs and free up valuable land and resources for higher value land uses, such as affordable housing, parks, playgrounds or open space, or office and commercial space.



Reinvestment in Public Steps

Fifty years ago, countless Pittsburgh workers commuted from their homes on the slopes or hilltops to the mills and ports on the riverfront flats. In the intervening decades, many of these beloved and iconic public steps have fallen into various states of disrepair, closure, or removal.

As Pittsburgh grows again over the next half century, and once again prioritizes historic modes of travel, the public steps will become increasingly vital connectors. The City's *2019 Steps Plan* establishes a framework for prioritizing the maintenance, repair, and reconstruction of the network. The evaluation of these critical connections will continue to be revisited to ensure that investment is equitable and enhanced access is provided for those who depend on their neighborhood steps most.



The newly reconstructed Vista Street Steps on the North Side.

Restored (or new) Pedestrian / Bike Bridge Connections

Some connections that once were have ceased over the past half century or more. Over the coming fifty years, they may once again become important to connect multiple neighborhoods to their districts and the amenities and opportunities within. The Davis Avenue Bridge and I-579 Cap projects are just two examples currently under design and construction.

In the decades to come, this Plan anticipates other such connections, including linking East Liberty to Homewood across the East Busway and the reopening of the Wilksboro Bridge to give Brighton Heights and Marshall-Shadeland improved access to a boulevardized SR 65 corridor and future transit to the airport. A new pedestrian bridge in Allegheny Commons and potential pedestrian connection from South Oakland to Hazelwood Green are also anticipated.

Highway Transformations

Traditional districts within the City – such as Manchester / Chateau, East Allegheny / Troy Hill / Spring Garden, and the Lower Hill / Downtown – have been cleaved apart by regional highways and interstates built over the last seventy-five years. Despite the hostile, imposing, and menacing infrastructure that divides them, these districts still retain the muscle memory of what once was and desire to be made whole again.

Over the next fifty years, Pittsburgh will seize the opportunity of new federal programs and funding streams to undo the harm caused by these often racist and xenophobic investments of past generations.

Opportunities in Pittsburgh include reconnecting the Lower Hill back to Downtown via the ongoing I-579 Cap Project and complementary urban street design improvements; replacing the elevated SR 65 with a boulevard between Manchester and Chateau; figuratively bridging the SR 28 / I-279 interchange to complete regional connections and reconnect the district to its riverfront; overhauling West Liberty Avenue to be a dignified, safe, and yet efficient boulevard; and transforming the Boulevard of the Allies from a limited-access roadway into a multimodal street with stunning views of the Mon and South Side.



The rendering below shows a vision for an at-grade boulevard.



Illustration from the *Manchester-Chateau Neighborhood Plan* showing SR 65 being converted into an at-grade boulevard



Projects Connecting within Districts

Several Pittsburgh neighborhoods naturally agglomerate into districts that serve as the economic centers for surrounding residential areas. Over the next half century, the City will invest in better circulation within districts by way of shuttles and circulators, shared mobility services, and multimodal hubs. Pedestrian and bike(+) connections to surrounding residential areas include restoration of public steps, new pedestrian/bike bridge connections, and enhancements to sidewalks and bikeways.

For more additional project information, [click here](#)



Process

Explore Regulatory Reform for Sidewalks and Pedestrian Networks

Additional funding streams are necessary to ensure sidewalks are maintained in a very good state of repair. At present, adjacent property owners are responsible for their sidewalk frontage. This responsibility results in an often disjointed and disconnected network for the most important of urban travel modes. The City and Commonwealth should revisit this private responsibility as a crucial component of the public mobility system. Regulatory and project delivery processes should facilitate the use of public infrastructure funding for quality, accessible pedestrian networks.

Coordinate with DCP on Small Area Plans

The districts contemplated in this Plan are conceptual. Land uses and development patterns will continue to change as will the understanding of cohesive districts. Districts will require in depth, thoughtful, and engaged plans to define the diversity of mobility interventions, service routes, intermodal hubs, and other elements appropriate to each area. DCP will need to lead a land use response that optimizes mobility investment and infrastructure, preserves and expands affordability, and increases economic opportunity. The process will translate general ideas, such as new bus lanes or dedicated bicycle facilities, into specific projects for design and implementation in the decades ahead.

Coordinate with the Port Authority and / or Private Partners on Circulator Transit

In addition to the existing Port Authority transit network, a number of private entities provide local shuttles. In Pittsburgh, this includes hotels, large employers, hospitals, and universities. These private shuttles are not available for public use and many are redundant with existing transit service and each other. DOMI and the Port Authority will work with private partners to encourage the pooling of resources so shuttles are available to the public as local fixed route circulators in a way that complements, not competes, with Port Authority service. This will provide an enhanced level of service for all users, has the potential to reduce drive alone trips in heavily congested areas by providing more and better coordinated shuttle service, and optimize remote parking areas. One



successful example of this comes out of Atlanta, where a shuttle system has been coordinated by their transit agency, Metropolitan Atlanta Rapid Transit Authority, the Atlantic Station mixed-use development, and Georgia Tech.

Work with Micromobility Providers

As new technologies and business models continue to be developed, DOMI will initiate new policies and programs to ensure that users are safe, services are affordable, access is distributed equitably, and adaptable and / or inclusive models are available to serve people of all abilities. One ongoing initiative is the *Pittsburgh Mobility Collective* (also known as *MovePGH*). This initiative, which was launched by DOMI, guides the rollout of privately-operated mobility systems across the City, with goals of coordinating car-, bike-, and scooter-sharing services as well as driving and transit information so the range of mobility services is effectively communicated and accessible to our diverse communities. Use of the different modes will be measured to determine if services need to be augmented to best match the needs of specific populations.

Conduct Detailed Planning, Preliminary Design, and Funding Plans

Some of the projects contemplated for district improvements, notably transforming highways, are not immediate actions. They will take years to evolve and implement. In the near term, planning, public engagement, and feasibility assessments of alternatives are needed. Over the mid term, this will require securing major federal and / or Commonwealth funding for the significant investment required before, over the long term, these major transformations can be realized.

Vision Connecting within Districts



Districts are multi-neighborhood areas with economic centers surrounded by residential development. Common components of district mobility include significant investments in safe and accessible pedestrian connections to area destinations; all ages and abilities bike(+) corridors; shared centralized parking; and district shuttles or circulators that provide essential connections to high-frequency transit and mobility hubs spread across the district.

Managing the Street

Pittsburgh has roughly 1,200 miles of public streets. Most of these streets were established well over a century ago. They have served generations of Pittsburghers as the City has changed from a frontier Appalachian outpost to a major industrial powerhouse to a mid-sized city reemerging as a leading innovation economy.

Through all of this, the design and management of the street has changed and adapted, even while the fundamental alignment, construction, and dimension of the street has changed little.

Streets have functions beyond simply moving people and goods. They are the front doors of businesses and the addresses of residents. They move power, water, and telecommunications. They are places to linger while visiting with a neighbor, stroll while window shopping, or dine during the pandemic.

The public ROW occupies roughly one-sixth of Pittsburgh's total land area making DOMI the single largest land manager in the City. DOMI serves as the steward of the public ROW – a role it takes very seriously. To sustain and support the City well into the future, DOMI must continue to strategically and sensibly manage the street

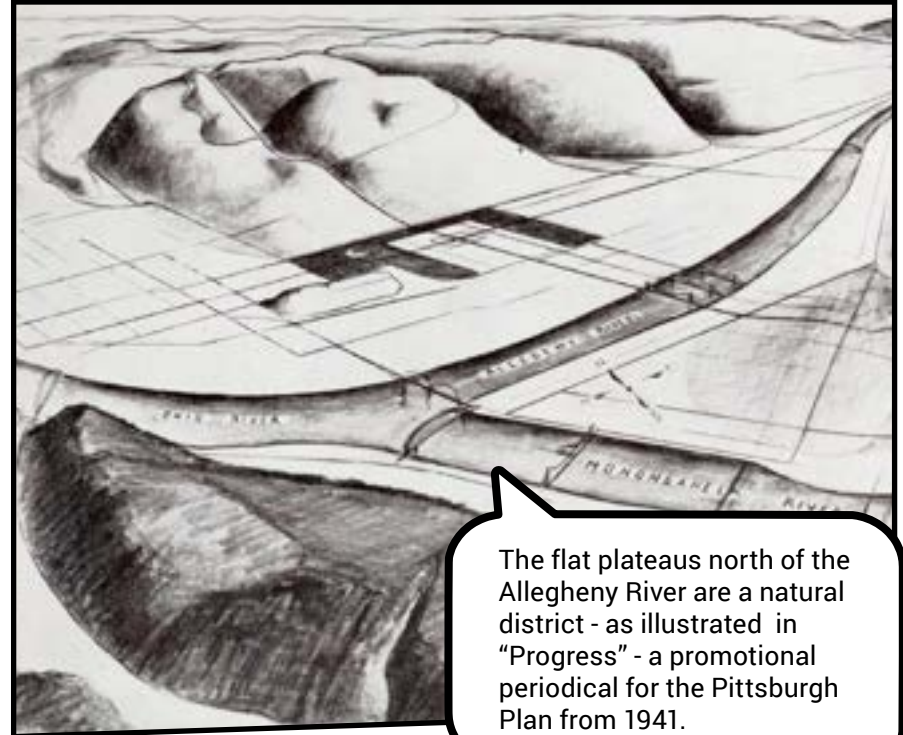


to promote safety, support economy, mitigate the effects of climate change, accommodate evolving technologies, and provide for the efficient movement of people, goods, utilities, and ideas.

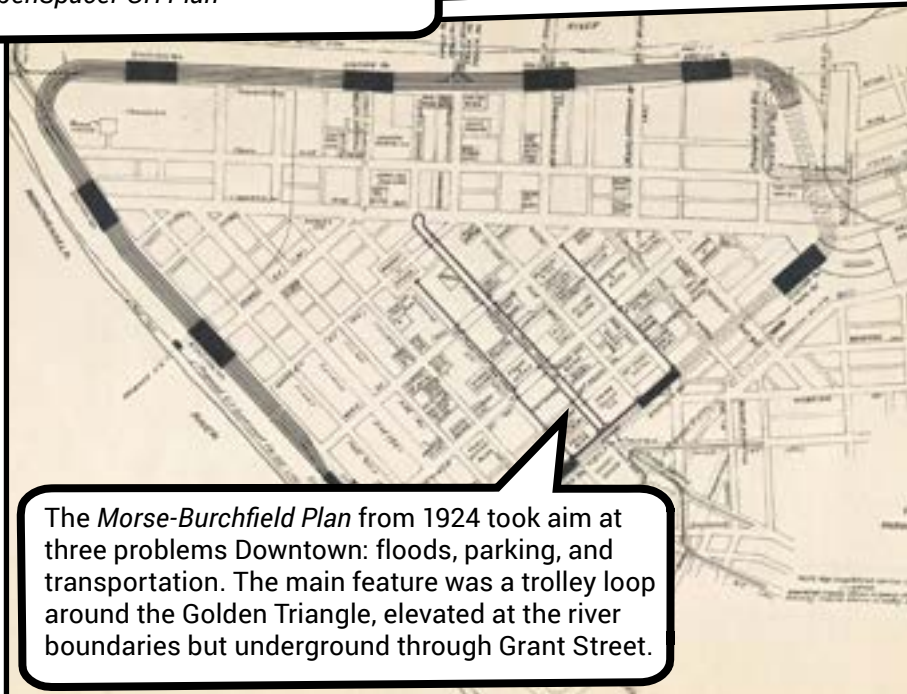
Past and ongoing plans managing the streets...



Streets can become linear parks to help address disparities in the "green premium" - the economic benefit provided by sizable green spaces. - as illustrated in the *OpenSpacePGH Plan*



The flat plateaus north of the Allegheny River are a natural district - as illustrated in "Progress" - a promotional periodical for the Pittsburgh Plan from 1941.



The *Morse-Burchfield Plan* from 1924 took aim at three problems Downtown: floods, parking, and transportation. The main feature was a trolley loop around the Golden Triangle, elevated at the river boundaries but underground through Grant Street.



Strategies for a more resilient future built on new and improved green and gray infrastructure are outlined in the *PWSA Green First Plan*.

Past and ongoing plans managing the streets...



The *Pedestrian Safety Action Plan* identified high-risk and high-need corridors where improvements are needed to increase pedestrian safety as well as business districts with frequent transit service.

Kiwibot is a autonomous and/or remotely operated personal delivery device for transporting cargo or goods that can already be found around Downtown.

E-cargo bikes can help deliver goods on narrow city streets and be loaded at freight hubs/villages. They take up less room, are quieter, and much more sustainable than large, bulky trucks that have difficulty navigating Pittsburgh's narrow streets.



A full geographic database of the City's streetlights shows how many new lights might be needed to address equity concerns related to the availability of streetlighting in city neighborhoods.



Projects

Complete Streets

The City's 2016 Complete Streets policy requires "a safe and accessible multimodal transportation system that will promote enhanced mobility for all users regardless of mode of travel, including people of all ages and abilities." Implementing this policy requires rebalancing street allocations to provide safe travel for all street users, rather than a disproportionate accommodation of vehicles alone.

Users of all modes and people of all incomes, ages, and abilities, incomes, ages, and abilities will benefit from increased mobility options, improved safety, and reduced pollution and GHG emissions. The transformation of our public realm will also encourage physical activity, enhance quality of life, improve the local economy, and address stormwater management. The policy, and forthcoming *Complete Streets Design Guidelines*,



will provide a vision and specific guidelines for the future design of the public ROW.

Complete, Accessible Sidewalk Network

Closing critical gaps in the sidewalk network and ensuring that all sidewalks are maintained to a certain standard so they are accessible for all users is a top priority. Sidewalks are essential not only in districts and centers but indeed on every street throughout the City. Sidewalks provide safe space for travel by the City's most vulnerable street users, including children, older adults, and persons with disabilities. Sizable sidewalks investment, and support for low-income property owners, must be made over the next decade and every decade to follow to ensure a complete, connected, and accessible network. Sidewalk space must be protected from encroachment by parked vehicles, private occupancy, or non-compliant construction activity.

Safety Enhancements and Traffic Calming

From 2016 to 2019, the Commonwealth averaged about 128,000 reported traffic crashes per year, which resulted in approximately 1,100 traffic fatalities. Although crashes declined in 2020, largely as a result of dramatically reduced traffic during the early months of the COVID-19 pandemic, the proportion of fatalities actually increased and resulted in the greatest number bicyclist fatalities in the past five years. Pedestrian-related crashes account for nearly 13 percent of all traffic crash fatalities with the majority occurring at intersections.

Speed is the most significant factor in the severity of injury in the event of a crash. Since

the introduction of the City's *Neighborhood Traffic Calming Program* in 2019, DOMI has received hundreds of requests for traffic calming on residential streets, both local and arterial. Data collected at various locations confirms that excessive speeding is a concern on far too many city streets. While DOMI will continue to deploy engineering interventions in certain locations, native compliance is essential and will be pursued both through education and enforcement, including the pursuit of non-personal enforcement measures such as camera or automated enforcement.



A newer addition to the expanding bike(+) network

DOMI will systematically address areas of safety concern including intersections and corridors, prioritizing those determined through equity analysis that focuses on low-auto ownership / high transit dependency areas. Streets will be managed to reduce speed, improve pedestrian crossings, provide low-stress and / or protected space for bike(+) travel, and improve safety for all street users.

Street Trees, Stormwater Management, and Climate Change Readiness

The number and frequency of storm events are increasing in Pittsburgh, as they are across the nation and around the world. These events bring massive amounts of stormwater often in a very short time period. The impervious surface of streets and sidewalks cause substantial surface runoff. Missing or deteriorating curbs, meanwhile, fail to convey the stormwater from even minor storm events to catch basins. In combined sewer areas, or areas with undersized storm facilities, stormwater conveyance is of little help when the stormwater system is overwhelmed by volume.

In addition to being de facto components of the City's stormwater system, streets should also be de facto components of the City's green space network. In many cities, streets serve as linear parks and plazas providing attractive areas to decompress and enjoy one's neighborhood and community. Providing adequate space for street trees can aid in stormwater management, soften the hardscape of a street, and add tremendous economic value to a place. Canopy street trees are also very effective traffic calmers.

Storm events, rising temperatures, and other climate related events will increase in the coming years and may have potentially catastrophic impacts over the next fifty years. The redesign of the public ROW can help mitigate the effects of climate change by incorporating green infrastructure wherever practical and increasing the quantity and quality of canopy street trees. Taken together, a thoughtfully designed street can reduce the effects of extreme heat, flooding, and air and water pollution while adding beauty and vitality to neighborhoods.

Street Resurfacing

Pittsburgh's public streets experience a lot of wear from regular use, openings to support utility work, and the effects of climate change. Asphalt streets need to be resurfaced, on average, every ten years or so. Concrete streets can last with minimal maintenance investment nearly four times as long, while brick and blockstone streets have served the City for well over a century. With this in mind, DOMI and the City have adopted legislation to preserve traditional street materials and strategically repair and restore, rather than overlay, whenever practical.

Continued investment in street repair and resurfacing will occur annually for the foreseeable future. Pittsburgh will need to continue to find additional resources to address the growing backlog of deferred maintenance in street resurfacing and / or identify streets that may no longer be needed and can be removed from the street inventory.



Recent critical sidewalk gap construction

When street resurfacing occurs, curb ramps are also brought into modern compliance to improve accessibility. It is also an optimal time to make other street reallocations for more complete streets and / or safety improvements. DOMI will continue to strive to improve the advance planning of street resurfacing projects, increasingly applying an equity lens to selection and prioritization. Identifying future year investments facilitates opportunities for utility coordination and street redesign planning, which further preserves the investment.

Streeteries, Sparks, Shared Streets, and Placemaking

The COVID-19 pandemic of 2020 (and on) highlighted the incomparable value of streets as places for commercial activity, community interaction, and physical activity. "Streeteries" (outdoor dining spaces in the street itself) that were established on the fly in response to the economic crisis brought on by the pandemic



Example of a "Streeterie" established in Oakland during the COVID-19 pandemic

have become well-loved features of the urban streetscape. They add lively activity, interest, safety, and economic value. Similarly, low-volume streets all over the City were dedicated as shared, slow streets to enable people to get out, exercise, and mingle at a safe distance with friends and neighbors.

Making streets for people is one of the fundamental pillars of this Plan. The City will continue to implement projects over the next fifty years that formalize these street adaptations and create quality, human-oriented, and inclusive street designs. Public art will continue to be a key component that enlivens streets and helps to share the history and values of Pittsburgh's unique communities.



Shiloh Street curbside seating during the COVID-19 pandemic

Streetlighting

There are over 40,000 streetlight fixtures in the City. This number will increase as the City continues to modernize and address light equity. Streetlights are important for safety, security, and street operations. They are also tremendously energy consumptive and can adversely impact human health and the natural environment through unnatural light frequencies and light pollution.

Pittsburgh is currently making a massive investment in energy efficiency and light equity improvements across the City, converting city streetlights from inefficient sodium vapor to energy efficient light emitting diodes (LED). With this, the City will fine tune lighting temperatures to minimize consequences of blue-light on human health.

The City recently adopted a Dark Skies ordinance that sets forth processes and improvements for reducing light pollution. The omnipresent streetlight can serve additional purposes in a smart city. If well designed and with good city oversight and control, streetlights and their supporting network can become platforms to expand broadband connectivity and high capacity cellular communications and also to introduce sensors that monitor air quality, curbside utilization, or other helpful metrics. Over the coming decade or less, DOMI will develop policies and approaches to leverage the public infrastructure of streetlights to provide the greatest and most equitable public good.

Signals and Smart Cities

Traffic signals are critical to the management and operation of the street. Many of Pittsburgh's 600+ traffic signals are in need of major investment and modernization. Such an investment would not only aid in the efficient, real-time, and dynamic management of the street and provide transit signal priority, but a networked and connected traffic signal system can also serve as the backbone for fiber optics to help meet citywide needs for data communications. Modern traffic signals will become increasingly important in the coming era of automation when communications between vehicles and infrastructure will be vital to safe and efficient operation of the street.

Future-proofing Utilities

Utilities and communications infrastructure in the public ROW require periodic maintenance and upgrades; something that is becoming more common and complex as existing systems age. In order for this work to occur, private entities have to access underground infrastructure by opening up the streets and, on occasion, sidewalks. Partnering with these asset managers, and facilitating coordination between them, is one of the best ways to decrease costs and reduce public inconveniences associated with utility and roadway improvements. It is essential that DOMI works with these providers to not only minimize the duration of disruptions to the greatest extent feasible but to go even further to facilitate roadway improvements through cost-sharing and to promote the installation of new infrastructure (pipes, conduit, etc.) during times when individual streets are already opened.

Process

Continuously Improve ROW Permitting, Standards, Specifications, and Processes

In 2020, DOMI issued more than 14,000 permits and conducted more than 18,000 inspections. Permits are issued to utilities and telecommunications providers, plumbers, developers, restaurants, property owners, and others for a range of uses, improvements, and occupancies. Also in 2020, DOMI adopted an online permitting system that provides better integration with permits issued by the Department of Permitting, Licensing, and Inspection for building permits and DCP's Office of Zoning for land development. The system will be built out in the coming years to continue to improve on street management, construction coordination, and maintenance and protection of traffic.

Many permits involve street openings, where the street is cut for access to or improvement of subsurface utilities. Streets are then restored after the street opening. Concurrently, major developments also build or rebuild streets for dedication as public ROW. City standards and specifications for street design, construction, and restoration must continue to be modernized and made available to facilitate oversight, inspection, and enforcement to ensure the delivery of quality streets.

Thoroughly Inventory Street Assets and Conditions

DOMI is responsible for miles of streets, hundreds of traffic controls, scores of bridges, tens of thousands of signs, innumerable street markings, and on and on and on. A complete database of street assets is a tremendous asset in itself. Good

quality records on asset placement, type, and condition aids in strategic budgeting and project planning and delivery. While DOMI has asset condition inventories for a number of street assets, there are many gaps in available data. DOMI will require inventory to conduct data-driven analysis and inform planning and budgets.

Effectively Manage Curbsides

The public curbside is one of the most valuable spaces in the public ROW. It is also often the source of the greatest congestion and safety

risk. The strategic and real-time management of curbs and on-street parking – generally through the mechanism of price – will ensure that the curb is being used most effectively, ensuring space is available for users when it is needed, and travel along the street and sidewalk can continue safely, reliably, and unimpeded by wrongly parked vehicles or devices.

When parking prices are uniform, the most convenient spaces will have the highest demand making it difficult for drivers to find a space, encouraging them to circle the block or double park. This causes unnecessary traffic



congestion and hazards for other users of the public ROW. Instead, parking prices should be tiered to better balance supply and demand with the most convenient spaces costing more than spaces a block or two away from destinations. With this approach, drivers can choose whether convenience or price is most important to them.

The many partner departments and authorities engaged in the management of the curb will continue to collaborate to increase effectiveness. New technologies will be explored, piloted, and adopted, as appropriate, to manage this space. Public-private partnerships will be entertained, to the extent they benefit the overall goals and principles of the City.

Work with Developers and Private Property Owners

When new development projects are constructed, the adjacent sidewalks are often rebuilt and public amenities added. In some instances, a portion of the street or other infrastructure, such as riverfront trails in the Strip District's new RIV zoning district, may also receive improvements. As a result, DOMI's participation in development review and permitting provides an important opportunity to influence private investment in the public ROW and mobility services. DOMI will continue to work with developers and private property owners to ensure that all privately funded sidewalk and street (re)construction adheres to the *ROW Manual and forthcoming Complete Streets Design Guidelines*.

Expand EV Infrastructure

One of the goals of the *City's Climate Action Plan 3.0* is a 50 percent reduction of transportation emissions by 2030 and an 80 percent reduction of overall emissions by 2050. Multimodal investments outlined in this Plan are essential if we are going to meet these goals. Significant investment – both public and private – in EV infrastructure is also needed to make a meaningful shift away from fuel-based options. As a result, DOMI will work with the Parking Authority to prioritize the installation of public charging stations both in the public ROW and in public off-street parking facilities as well as private companies to ensure that new EV infrastructure is sited to have the highest utility. Over time, the City will explore the efficacy of techniques, such as induction charging on public streets, and develop policies, designs, and standards accordingly. The City will work with utility providers to facilitate the charging of micromobility fleets and to resolve barriers to public charging deployments.



An example of EV infrastructure in a publicly accessible parking garage

Vision Managing the Street



Street improvements, such as undergrounding utilities, adding traffic calming measures, and implementing accessible sidewalks, green infrastructure, and smart signals, will enhance the experience, efficiency, and competitiveness of the City over time.



4 MANAGING CHANGE

Managing Change

As the old adage goes, change is the only constant. This Plan looks out fifty years. In that time, some things are reasonably foreseeable: the City will still need quality sidewalks, there will still be competition for street space, transit will still run, neighborhood economic centers will still be destinations, and the majority of existing streets will still be the very same streets used by past generations.

Many things, however, will change: deliveries may be made by aerial drones or pneumatic tube, people may travel by robotic or flying water taxis, we may be implementing 7G (seventh generation) cellular telecommunications technologies, and / or managing hundred-year storm events once a month.

New opportunities will arise, new stresses will emerge, new technology and mobility services will be introduced, new materials and products developed, new construction methodologies available, and new travel preferences and patterns will result. While this Plan cannot anticipate all of the as-yet unknowns, it can provide a framework for evaluating new conditions or technologies and guide them to the greatest public good. The goal is to proactively manage change, rather than leave mobility and infrastructure in Pittsburgh up to chance.



Process

Organize DOMI and Partners to Manage Innovation and Change

City systems are generally organized and geared toward dealing with what is the practice and context of today. When something occurs that is outside of standard practice and familiar approaches, it can be difficult for a department to respond. Mobility innovators can be impatient. If there are no clear channels or processes to go through to introduce something that has heretofore never been, there is a temptation and potentially motivation to just launch the system, service, or innovation without formal approval. This is what we saw with the rapid introduction of ride-sharing services, such as Uber and Lyft, and what several cities experienced with the launch of e-scooters and guerrilla installations of 5G cellular antennas.

To avert this, it is important that there are clear channels for innovators to enter into government processes. The process itself must be clear enough that evaluation and consideration can occur in a predictable and manageable timeline. While DOMI seeks to foster a culture of innovation in service to equity and sustainability, the Department must also have structures to manage and minimize risk, ensure innovations serve real community needs, promote public understanding, and incorporate public feedback.

DOMI will work with partner departments and authorities to develop the relationships and structures appropriate to consider various types of mobility innovation. DOMI will seek to better understand regulatory structures with regard to new innovation and how these structures invite or exclude (but ultimately manage) the introduction

of mobility and infrastructure innovation. The Department will propose or pursue nimble regulations that serve and protect the public good while embracing and encouraging innovation that serves it. DOMI will develop guidelines and policies with regard to public-private and / or research partnerships, data sharing agreements, permitting arrangements, and similar.

Evaluate against Goals and Principles

DOMI and partners must always evaluate proposed and emerging innovations against the fundamental goals and principles that ground the work of the Department and serve the real needs of the people of Pittsburgh. Innovations need

to serve the baseline goals of promoting equity and narrowing the opportunity gap. Innovations must also demonstrate benefits toward climate resiliency. The Department will also consider near- and long-term impacts on the local workforce and economy in addition to the effect on infrastructure operation, maintenance, and improvement.

DOMI staff and key partners should individually consider the alignment of the proposed technology against the ten Pittsburgh Principles for shared and autonomous mobility and how it might help make progress towards DOMI's goals. This grounded evaluation will give insights into the tangible benefits the technology offers the City, if not immediately, then over time as the innovation evolves.



SwiftMile Mobility Hub

Practice Human-Centered Design Thinking when Managing Change

Human-centered design thinking is a mouthful, but put simply it is a process for project design that contemplates the real effect on real people experiencing real problems or challenges. It carefully defines and breaks down into component parts the problems that need to be solved. It then contemplates how technology and innovation can be applied to address that very real problem. It also then considers the realities and requirements of business (or government) success to evaluate if the possible solution is a sustainable one.

Human-centered design is empathetic. It is focused on the challenge or need as experienced from the perspective of the user, traveler, and / or resident. The need or problem is then clearly defined in an actionable way. An ideation process then considers various applications or changes that could address the need, which are then tested, evaluated, iterated upon, and potentially adopted as a tool or strategy to meaningfully meet the need. DOMI will continue to incorporate and refine, as appropriate, such practices into our decision-making framework.

Establish Standard Approaches to Testing, Demonstration, and Reporting

Pilots and demonstrations are valuable means to explore new products, approaches, services, or technologies in a safe and controlled way. They provide the opportunity for experiential learning that can provide critical insights when creating governing regulations or policies to manage change.

Successful pilots have a clearly defined and communicated hypotheses, a means to test the hypothesis, and an understanding of the intended use of the findings. In establishing a pilot, DOMI must:

1. Decide learning objectives, geography, scale, and duration.
2. Identify metrics for evaluation and collect baseline conditions.
3. Plan for data analysis and reporting.
4. Be transparent.

Pilots can and should iterate over time; the management, operation, design, material, or the like being augmented, as necessary, and measured for effectiveness. Pilots and demonstrations are not deployments. They are temporary by design and must conclude after the established timeline,

generally with one of several outcomes: the adoption and deployment of the piloted approach, rejection or termination of the piloted approach, or additional pilot(s) subsequent to the findings discovered by the initial pilot.

Embrace Iteration and Incrementalism

DOMI will never know everything. Cities and mobility systems have iterated and evolved over time. Pittsburgh and DOMI will be most successful if we embrace a willingness to not let the perfect be the enemy of the good. The role of the public sector is often to put guiderails up to manage technology, innovation, and change; directing it toward the greatest public good and striving to anticipate and avoid potential unintended consequences.



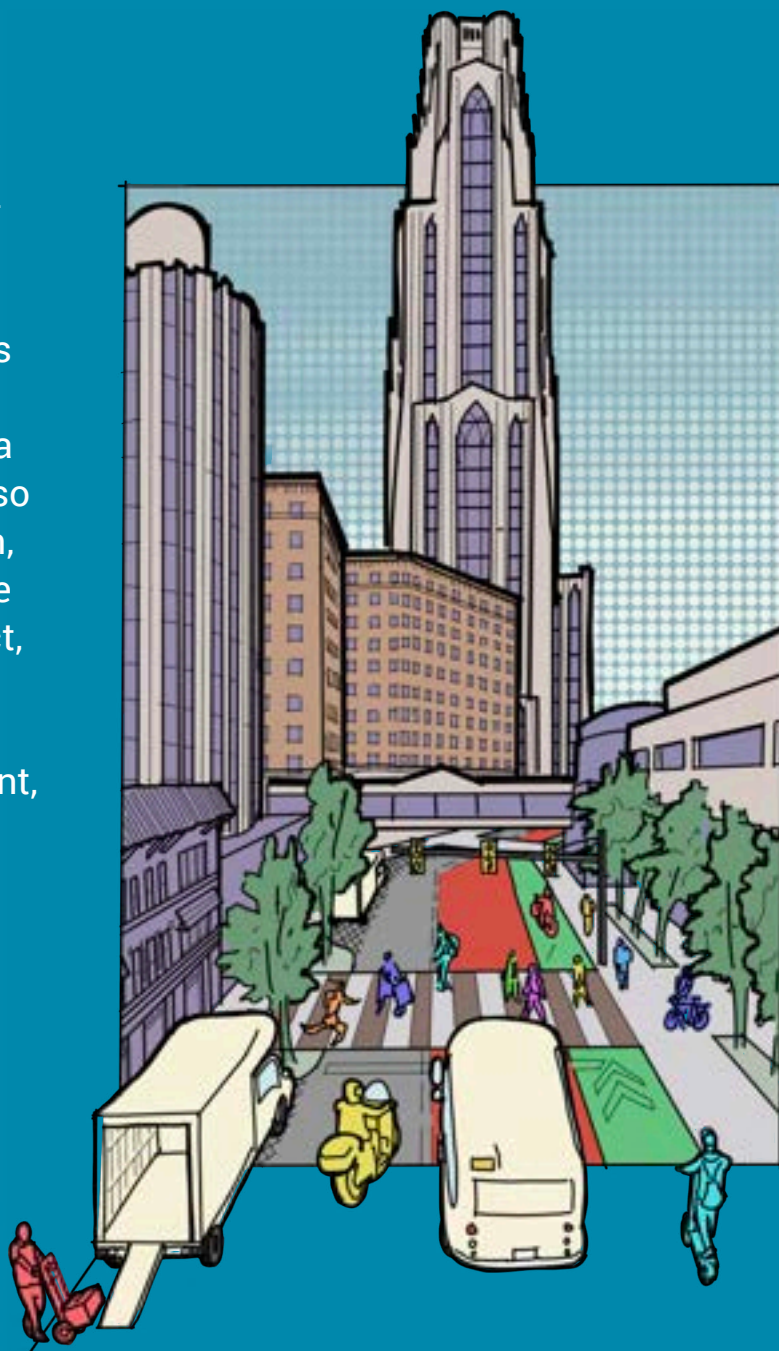
AirCar prototype



5 IMPLEMENTATION & ADAPTATION

Implementation and Adaptation

This Plan aims to align our short-term investments to a vision with a 50-year trajectory. The ongoing coordination of incremental steps with big picture goals will require the collective commitment from a broad range of partners. It will also require flexibility for the unknown, spending limited resources where they can have the greatest impact, and augmentation that may be appropriate because of changing needs, technological advancement, and funding availability.



Ensure Consistency with Other Plans

The 2070 Mobility Vision Plan is one of several intertwined plans and responsibilities. 'Critical partner plans include PennDOT's strategic plan, SPC's long-range transportation plan (*SmartMoves for a Changing Region*), the Port Authority's long-range plan (*NEXTransit*), the City's ongoing comprehensive plan (*ForgingPGH*), and detailed network, corridor, and area plans as they emerge. This Plan should be folded into those plans and also modified over time as those plans are updated and evolve. Together, this will ensure that the system management and project priorities and consistent and cohesive in an integrated network.



The *Greater Hazelwood Neighborhood Plan* focuses on ways to both support and strengthen the community while proactively preparing for growth.

Refine, Iterate, and Add

This Plan does not firmly prioritize among the many projects herein. Some projects are ready for immediate or near-term implementation, others are (very) long-range ideas. DOMI and the City should seize every opportunity to leverage public and private projects to make incremental progress toward advancing other local projects. For example, a private development in a district might not be able to take advantage of a local circulator that is not yet in operation but it can and should be designed in a future-leaning way, orienting toward the future service and building momentum toward its implementation rather than precluding the possibility.

For the larger, longer range projects, DOMI and partners should continue to evaluate, refine, and advance designs and funding strategies. This may include articulation and analysis of alternatives, more exploration of costs and benefits, and complementary investments that can “make ready” for the large-scale change or investment.

Projects should be additive to the system, building one upon the other. This is the benefit of a wholistic vision plan. Each individual project should be designed and implemented in a way that builds toward the ultimate vision.



Accessibility



Efficiency



Climate change



Funding sources



Public benefits

Spend Limited Dollars Where They Have the Greatest Impact

DOMI and City leadership will need to prioritize and select among these many projects. That selection methodology may vary depending on the funding source. What should not change, however, is that investments should be made on projects that have the greatest and most lasting impacts.

DOMI uses a number of factors in project selection and prioritization. Three indices are key.

- **Safety.** Nothing is more valuable than human life. Projects that address an eminent and persistent safety risk will always take precedent over “nice to have” projects. Sometimes, however, the City must invest in larger and transformative projects in order to meaningfully address growing safety concerns across the City or network.
- **Asset condition.** Investing in an improvement when an asset merely requires repair will save money over allowing the asset to deteriorate to the point where replacement is the only option. This will leave more dollars for more investment elsewhere in the system.
- **Equity.** DOMI has developed an Equity Index methodology that identifies areas where residents have lower access to opportunity and less economic mobility. Projects that can meaningfully improve physical and economic mobility for those historically left behind will be prioritized for implementation.

In many instances these factors coincide. It must be noted that projects are not prioritized by location alone. Projects that improve climate or mobility access across the whole of the City also improve outcomes for specific communities of concern.

Build Partnerships

Unless major systemic changes are made to the way infrastructure and mobility is funded and financed, money will continue to run substantially short of the actual need for investment. Partnerships with the private sector are already an important mechanism for delivering on the projects of this Plan. It is important to remember that a century ago, most transit services and lines (streetcars) were built and operated by the private sector. While these services were eventually turned over to governments to sustain, that initial investment in infrastructure and the impact of those original systems cannot be overstated. The

same possibility may exist over the next fifty years and should certainly not be discounted.

Partnerships will take a variety of forms. The City and Port Authority will work together to co-fund projects, such as bus rapid transit improvements on public streets. The City and Commonwealth can leverage each other’s resources to improve pedestrian accommodation while restoring street quality. Employers, institutions, and developers can help build components of this Plan to make the region more attractive for all those who enjoy, explore, live, work, study, and visit here, which will ultimately help improve their bottom line as well.



Repair of an elevated sidewalk platform between Maple Terrace and Shiloh Street

How will we know if we are succeeding?

Conditions on the ground will undoubtedly change over time. While the projects and programs we implement may need to be revisited as conditions change, success should always be measured by the efficiency, affordability, and sustainability of the transportation network.

This will require developing, tracking, and reporting on metrics that measure how well we are doing and how much more work still needs to be done. These metrics need to be realistic, tiered to help achieve incremental milestones, and most certainly flexible to allow for augmentation should targets change.

Develop Metrics

As the saying goes, “people measure what matters to them.” Today, we count cars and measure congestion. To memorialize progress toward the long-range vision, a more robust and appropriately diverse set of metrics will be necessary to include multimodal data sets that also focus on equity, economic impact, and quality of life. Examples include the average percent of income spent on transportation, distance to fresh fruits and vegetables, and improved health outcomes for obesity, diabetes, heart conditions, and other chronic diseases.

Track and Report

Once we have identified the best set of metrics and corresponding targets, data needs to be collected every one to two years so progress can be tracked. Data collection, analysis, and reporting will require some level of financial investment. Expectations need to be carefully managed and messaged. When targets are not met, the information should be viewed as an opportunity for improvement and call to action rather than fodder that invalidates the larger vision.

Be Ready to Adjust

The targets we set may be aggressive but we have confidence in our ability to deliver. Nevertheless, we should not expect to hit all of the targets all the time. We will need to develop a culture that tolerates and rewards measured risk-taking. At the same time, we need to be both focused and agile by allowing for course corrections in order to stay in alignment with the overall vision.

2070 Measures of Success

- No one dies or is seriously injured traveling on city streets.
- Every resident can access fresh fruits and vegetables within 15 minutes travel of home (without requiring a private vehicle).
- All trips less than one mile are easy and enjoyable to walk, roll, or bike.
- No household must spend more than 40 percent of income on basic housing and transportation mobility.
- The design, maintenance, and operation of city streets reflects the values of our community.

Balancing Immediate Needs with Long-Term Vision

Long-range planning can appear frivolous when the day-to-day responsibilities of paving streets, stabilizing slopes, improving crosswalks, and juggling permit requests is already overwhelming. However, today's long-range goals will become tomorrow's day-to-day challenges without proper foresight. The cumulative effects of climate change, technological advances, and steady decline of infrastructure funding sources need to be understood today. Failure to plan for these predictable changes now will only increase the magnitude and cost of future challenges.

DOMI is staffed with an exceptional group of professionals who could not work harder. The age, scale, and complexity of Pittsburgh's transportation network means that there is no shortage of work to be done and this will be amplified in the coming years. Department staffing levels will undoubtedly need to increase to meet this need. Beyond the day-to-day work and emergencies, DOMI will need dedicated staff to focus on mid- and long-range needs, solutions, partnerships, and funding opportunities.



Pulling Together Towards a Better Mobility Future

The vision and roadmap outlined in this Plan requires dedication, focus, and coordination among a broad team of implementation partners.

The integrity of public process alongside the resilience and strength of partnerships will together make this possible to achieve. Great thanks are owed to the public and all the partners called out throughout this Plan for the grit, creativity, and civic spirit that powered this planning process and enabled this far-reaching vision.

We hope this Plan is an inspiration for Pittsburghers to continue working towards a better mobility future for all those who call this city home. Together, we will work to ensure that our shared values of a safe, equitable, and sustainable transportation network drive all mobility processes, projects, and policies. Together, we can ensure that our mobility investments are forward-looking and designed to support the City's economic competitiveness and quality of life. Together, we can actively manage our streets to maximize public benefit. Together, we can integrate new technologies in a strategic rather than reactive manner. We are and must be in this together if we are going to make the 2070 Mobility Vision Plan our reality.





ENVISION 2070

Mobility in a Sustainable Pittsburgh
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