U.S. Department of Transportation, Climate Change Center
Climate Strategies that Work

ACTIVE TRANSPORTATION

Safe, comfortable, and continuous active transportation networks seamlessly connect people to places, foster healthier communities, and reduce reliance on carbon-intensive modes of travel.

Also known as

NONMOTORIZED TRAVEL, BIKE/PEDESTRIAN, OR MICROMOBILITY

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OVERVIEW

Best Suited for:
Long Term & Short Term
Urban, Suburban, Rural, & Tribal

Walking, biking, and rolling—collectively known as active transportation or micromobility—are fundamental elements of **sustainable, connected, and vibrant communities**. Nearly every trip involves active transportation, from walking to a bus stop to cycling the final stretch to work. This inherent connection to daily travel is underscored by recent data from Bureau of Transportation Statistics: in 2021, **over half (52%) of all trips in the U.S. were less than three miles** – suitable for a twenty-minute bike ride; and a **significant portion (28%) of trips were less than one mile**.

Given that most people are comfortable walking up to half a mile and cycling up to two and a half miles for everyday trips, the potential for active transportation to reduce greenhouse gas emissions becomes readily apparent. Investments in well-designed, inclusive active transportation infrastructure and programs offer benefits that extend beyond the environmental gains. These networks create a more **engaging, affordable, accessible, and convenient travel experience**, while helping to ensure people are connected to the outdoors and essential daily destinations like work, school, healthcare, and community centers.

Did you know?

U.S. Department of Transportation (DOT)'s Strategic Plan for 2022-2026 sets a target to increase the percentage of trips by transit and active transportation modes by 50%.

Electric micromobility options, like e-bikes and e-scooters, expand the reach of active transportation, making slightly longer distances feasible for more users, and further reducing car dependence. These networks create a more engaging, affordable, healthy, and convenient travel experience. Additionally, active transportation serves as a valuable extension of public transit, bridging the first- and last-mile gaps for riders.

Active transportation networks can also contribute to more sustainable and efficient urban freight delivery by enabling cargo bikes and other

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micromobility devices to navigate urban areas with greater ease, reducing the reliance on delivery trucks. With more people walking and cycling, streets become more vibrant and inviting, cultivating a sense of community and increasing foot traffic for local businesses.

A safe and accessible active transportation network goes beyond just physical infrastructure. ***Elements of bicycle and pedestrian infrastructure and supportive programs may include:***

Infrastructure for Bike/Scooters/Other Micromobility Devices

- Protected or shared bike lanes
- Separation/buffers
- Intersection treatments for bicycles (bicycle boxes, stop bars, lead signal indicators)
- Wayfinding and Signage
- Secure parking and storage facilities
- Bike and Scooter Share Programs *(Read more at the Shared Micromobility & Microtransit Page)*
- Bike Repair/Tool Stations
- Bike Rebates and Tax Credits
- Bike Schools, Bike Ambassadors and Capacity Building
- Community Rides
- Ramps
- Bike Racks

Shared Infrastructure

- Lighting
- Workplace or destination-based facilities / supportive infrastructure (lockers, changing facilities, secure parking)
- Traffic calming
- Integration with Transit

Infrastructure for Pedestrians

- Curb extensions (also known as Bulb-outs)
- Landscaping, Street Furniture, and Shade
- Quality, continuous, wide sidewalks
- Tactile wayfinding systems to assist visually impaired travelers
- Signalized, high visibility pedestrian crossings with Audible and Visual Countdowns
- Mid-block/refugee islands
- Bicycle/pedestrian bridges
- Pedestrian Zones/Pedestrian Streets
- Woonerf or "Living Street" *(Characterized by shared spaces where vehicles are allowed but must yield to non-motorized users, woonerfs encourage slower speeds and foster community interaction)*

Supporting Public Policy

- Land-use regulation to encourage pedestrian-oriented infrastructure
- Micromobility parking and charging standards

GREENHOUSE GAS REDUCTION POTENTIAL

This section provides an overview of greenhouse gas (GHG) emission reductions associated with the strategy. It highlights key findings and relevant metrics from GHG modeling resources, peer-reviewed studies, and real-world applications.

CYCLING AND OTHER FORMS OF ACTIVE TRANSPORTATION ARE LESS EMISSION-INTENSIVE THAN OTHER OPTIONS

Passenger vehicles produce approximately 0.95 lbs. of CO_2 per passenger-mile compared to 0.05 lbs. of CO_2 per passenger-mile emitted by biking (European Cycling Federation, 2016).

This study considered not just the emissions from the vehicles themselves, but from the entire fuel and vehicle lifecycle including production, maintenance, and fuel.

BENEFITS FROM A COMPREHENSIVE APPROACH

Each mile driven produces approximately 1 pound of CO_2 emissions, assuming an average vehicle fuel economy of 25 miles per gallon. If modest improvements are made to promote more walking and bicycling across the U.S. for trips up to 3 miles, over 1,000 million gallons in fuel or 9 million tons of CO_2 emissions could be avoided (Rails to Trails, 2019).

If the length of trips in the U.S. are reduced by only 1-3% through denser, mixed use developments, an additional 500 million gallons in fuel could be saved, or over 4 million tons of CO_2 emissions (Rails to Trails, 2019).

BENEFITS FROM SPECIFIC STRATEGIES

Provide Pedestrian Network Improvements: A study by the California Air Pollution Control Officers Association (CAPCOA) estimates that increasing sidewalk coverage to improve pedestrian access can reduce GHG emissions from vehicle travel by 6.4% (CAPCOA, 2021).

Bikeshare Program: A study quantifying the environmental benefits of bike share trips across different metropolitan bike share systems estimated the annual reduction in 2016 in Seattle to be 41 tons of CO_2e, and as large as 5,417 tons of CO_2e in New York City (Kou et al., 2020).

Roadway Reconfigurations: By reconfiguring streets, cities and towns can allocate more space for pedestrians and cyclists and contribute to GHG reductions. A reconfiguration project in Davis, California resulted in an estimated reduction of 24.4 metric tons of CO_2e over a 12-year period. The 0.8-mile segment was reduced from four vehicle lanes to two vehicle lanes, with a bike lane on other side, and an isolation strip in between (California Climate Investments Quantification Methods Assessment, 2019).

CHOOSING ACTIVE TRANSPORT REDUCES GHG EMISSIONS AND VEHICLE MILES TRAVELED

Even seemingly small changes can have a significant impact on GHG emissions. Studies show that if residents in a city of 50,000 people switched just one mile of their daily trips from driving to active transportation, this choice could result in a collective reduction of 10.14 million pounds (5,070 tons) of CO_2 per year and nearly 400,000 fewer miles driven (HUD, 2016).

An RMI analysis explored the VMT reduction potential of cutting vehicle trips under 5 miles. Across 10 large cities, shifting 25 percent of short vehicle trips from cars to e-bikes would cut overall VMT by an average of 3% and annual CO_2-equivalent emissions by over 1.8 million metric tons or 4.2 million barrels of oil. Shifting a more modest 1 out of every 8 trips to an e-bike would cut 920,000 metric tons of CO_2e emissions (Grunwald, et al., 2023).

> The average American drives about 1,200 miles monthly. Reducing these vehicle trips in the 10 largest cities equates to removing over 388,000 vehicles from the road (Grunwald, et al., 2023).

CO-BENEFITS

This section outlines the multiple co-benefits associated with the strategy, including safety benefits, local air quality improvements, and improved accessibility. Each co-benefit presents examples that demonstrate how the strategy enhances regional or community well-being while addressing emissions.

SAFETY

Investments in and the expansion of active transportation infrastructure are **proven safety countermeasures** promoted by FHWA for reducing roadway fatalities and serious injuries.

> See other FHWA Safety Countermeasures here.

Researchers are finding that cities with a high level of bicycling are not just safer for cyclists but for all road users. U.S. cities with higher per capita bicycling rates tend to have lower traffic fatality rates for all road users, which can be partly attributed to increased street network density that supports cycling and lower traffic speeds (Marshall and Garrick, 2011). Investing in active transportation not only improves actual safety but also enhances the **perception of safety**. A higher volume of people walking and cycling fosters a stronger sense of community (University of Colorado Denver, 2014).

Communities designed with pedestrians, bicyclists, and other micromobility users in mind can reduce the incidence of collisions, injuries, and fatalities on shared roadways. Safer streets and connecting trails can, in turn, encourage further shifts towards active transportation (Bas et al., 2023).

> An example of the federal government's commitment to increase the safety of infrastructure can be found here: DOT Fiscal Year 2022-2026 Strategic Plan

ACCESSIBILITY AND EQUITY

By reducing reliance on cars, prioritizing safety, and fostering connections, active transportation creates a more equitable and accessible transportation system that benefits all members of the community. This is achieved through inclusive infrastructure planning and design that caters to a variety of abilities and experiences (FHWA, 2023).

One study estimated that 20-40% of the population in most communities cannot or should not drive due to disability, low incomes, or age. Active transportation improvements benefit existing users as well as new users who walk and bike more following improvements.

Increasing the safety and accessibility of active transportation can allow non-drivers to live more independently and provide greater access to economic opportunities (Litman, 2024b).

ECONOMIC GROWTH

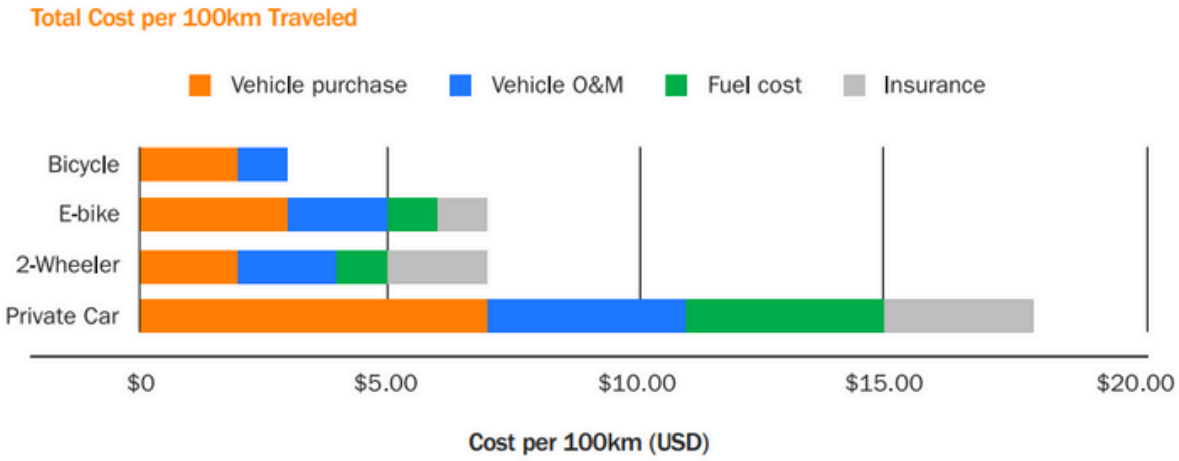
Communities with well-connected active transportation networks experience increased foot traffic, which translates to economic benefits for local businesses (Smart Growth America, 2015).

Investing in active transportation infrastructure creates jobs. International Energy Agency (IEA) data suggests that pedestrian and bike lanes generate 8 to 22 jobs for every million dollars spent. These jobs typically involve construction, painting, signage installation, and paving (IEA, 2020).

This job growth is comparable to investments in charging infrastructure which can generate 7 to 21 jobs per million dollars spent; higher than railway investments, battery electric car manufacturing which produce 5 to 9 jobs, and 4 to 8 jobs per million dollars spent, respectively (IEA, 2020).

COST SAVINGS

Owning and operating a bicycle is considerably cheaper than owning and operating a car, freeing up resources for other essential needs for individuals and families. Owning and operating a bicycle typically costs around $3.00 per 100km (62 miles) traveled, while a private car can be six times more expensive, at approximately $18.00 per 100km. This includes factors like purchase price, maintenance, fuel, and insurance (ITDP, 2021). Networks of safe bicycle lanes may encourage households to replace car trips with bike trips and forgo a second or third car, leading to savings on car payments, insurance, and other car-related expenses (Grunwald et al., 2023).



The total cost of travel per 100km by mode of transportation.
(*Source: ITDP, 2022*)

AIR QUALITY AND HEALTH

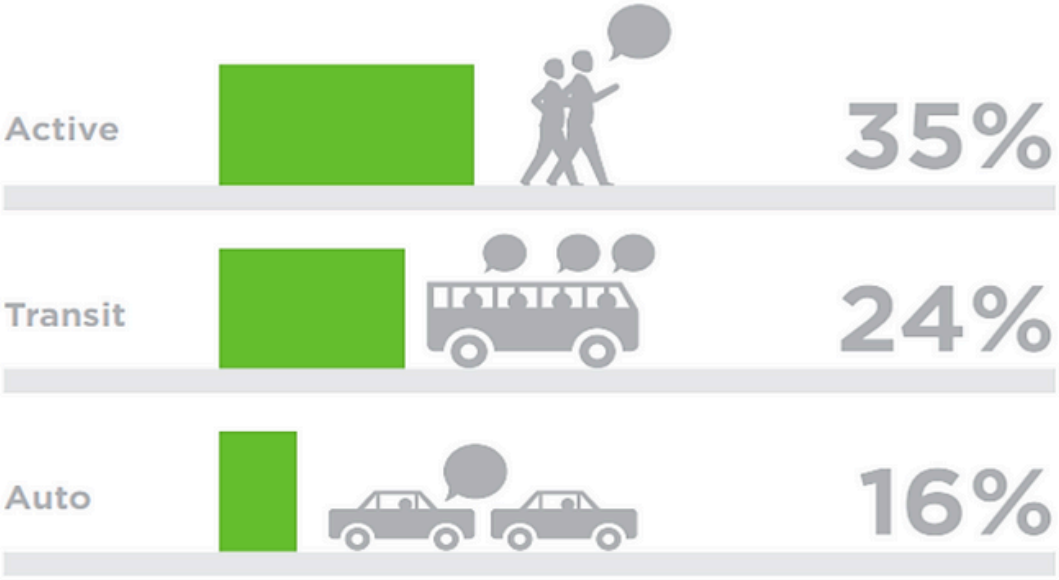
Reducing the number of vehicles on the road, especially in densely populated areas, decreases emissions of air pollutants that are harmful to human health (Litman, 2024a). If a quarter of short vehicle trips became e-bike trips in the 10 largest U.S. cities, an RMI analysis found that fine particulate pollution (PM2.5) would drop by 25% (Grunwald et al., 2023).

Driving less correlates directly with health outcomes. A per-capita VMT reduction of 20%, supported by a shift to walking, cycling and other active transportation modes, could prevent 45,000 deaths by increasing physical activity and improving public health (Warsing, et al., 2024). For example, three hours of biking per week can reduce a person's risk of heart disease by 50% (Department of General Services, n.d.).

A benefit cost analysis analyzing bicycle improvements in Portland, Oregon indicates that by 2040, $138 to $605 million in total investments will provide $388 to $594 million in estimated healthcare benefits (Gotschi, 2011).

Active transportation is linked to decreased loneliness, increased access to family and friends, and greater levels of socialization (Williams et al., n.d.). A 2023 advisory from the Surgeon General stated that the "mortality impact of being socially disconnected is similar to that caused by smoking up to 15 cigarettes a day" (HHS, 2023).

A survey conducted by City of Vancouver reveals people are more likely to have a friendly social interaction when walking or biking than when traveling by private automobile (City of Vancouver, 2016).

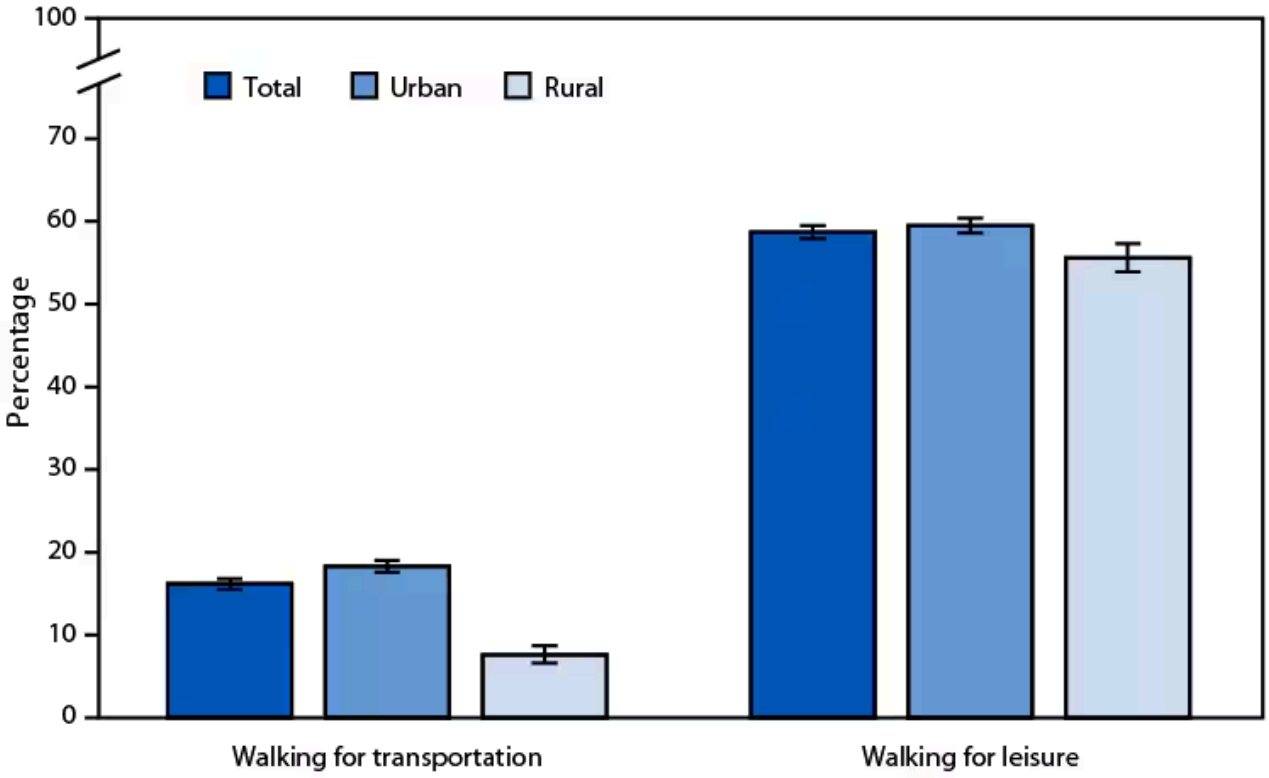


Likelihood of a Friendly Interaction During Trip (Source: City of Vancouver, 2016)

RURAL COMMUNITIES

Residents of low-density areas, especially in rural settings, are less likely to have access to safe infrastructure to walk. Yet, rural residents walk to their destinations almost as often as urban residents (CDC MMWR, 2024) and are less likely to have a variety of modes to choose from.

This lack of infrastructure causes higher rates of death and injury, especially in Tribal communities. Rural communities can build recreational bike and pedestrian trails which often have dual use as commuter routes for some trips.



Prevalence of leisure and transportation walking in the past 7 days among adults by Urban-Rural Status (Source: CDC MMWR, 2024)

COST CONSIDERATIONS

COST OF IMPLEMENTATION

The cost to implement active transportation projects varies widely depending on the scale, scope, and location of the project.

Active transportation infrastructure has **lower installation and maintenance costs** compared to other modes:

- Roadways cost upwards of $1 million/lane km (ITDP, 2022).
- Metros (heavy rail) cost at least $50 million/km (Flyvbjerg et al., 2008).
- Bus rapid transit projects cost at least $700,000/lane km (ITDP, 2007).
- In contrast, bike lanes can range from a **few thousand dollars per mile for simple signage to $500,000 for more elaborate, off-street paths**. Similarly, pedestrian improvements can be as low as a few thousand dollars for crosswalks and traffic calming measures (Burchell et al., 2002).*

*Bike lanes were found to cost as little as **$5,000 per mile** for signing and striping only, or up to **$50,000 per mile** for designing a roadway with additional width to accommodate a lane.

Conversion of minor streets to "bicycle boulevards" was estimated to cost **$250,000 to $500,000 per mile**.

Construction of an off-street shared-use path ranges from **$500,000 to as high as $2 million per mile**. These costs can be compared with typical local road construction costs of about $2 million per mile (Burchell et al., 2002).

COST EFFECTIVENESS

Investing in bicycle and pedestrian infrastructure and street design improvements can pay dividends. A study by the Southern California Association of Governments found that for every dollar spent on bicycle and pedestrian infrastructure, over $5 is added to the regional economy (SCAG, 2016). According to an Institute for Transportation Development and Policy (ITDP) report, street redesigns with a focus on bikes, pedestrians, and bus-only lanes have resulted in 10% or more increases in revenue-generating transactions for local businesses, compared to car-focused designs (ITDP, 2022).

Multi-use paths and complete streets projects promote use of non-motorized modes, supporting regional emissions reduction goals. The Boston Region Metropolitan Planning Organization (MPO) evaluated the cost-effectiveness of statewide and MPO investment programs, finding that investing in complete streets and multi-use paths would cost approximately $4,000 and $1,900 per lane mile, or $20 and $40 per ton of GHGs reduced (Boston MPO, 2016).

Litman (2024) studied the benefits and costs of active transportation, including improved conditions for walking and cycling, reduced auto travel, land use impacts, and economic development. As an example, improving walking and cycling conditions creates an estimated $0.25 per person-mile benefit, while reduced vehicle costs and parking cost savings provide benefits of $0.23 and $0.36 per passenger-mile, respectively (Litman, 2024b).

Read more about active transportation benefits and costs here.

FUNDING OPPORTUNITIES

FHWA compiles pedestrian and bicycle activities and their likely eligibility under U.S. Department of Transportation surface transportation funding programs in this table.

FHWA's **Active Transportation Infrastructure Investment Program (ATIIP)** funds projects to provide safe and connected active transportation in active transportation networks or active transportation spines. Improvements in active transportation networks under ATIIP will expand and improve active transportation and promote it as a low-carbon transportation option.

USDOT's **Safe Streets and Roads for All (SS4A) Grant Program** was established by BIL to support regional, local, and Tribal initiatives to prevent roadway deaths and serious injuries through the safe system approach. Similar to the Zero Deaths and Safe System Program, safety improvements from SS4A will encourage mode choice by removing safety barriers to active transportation.

FHWA's **Carbon Reduction Program (CRP)** funds projects designed to reduce transportation carbon dioxide (CO_2) emissions from on-road highway sources. A variety of active transportation modes are eligible for funding including pedestrian, bicycle and shared micromobility.

FHWA's **Surface Transportation Block Grant (STBG) Program** provides funding to States for a wide variety of transportation infrastructure projects, including active transportation projects. Federal law requires 10% of these funds to be set aside for Transportation Alternatives, which include a variety of smaller-scale transportation projects like pedestrian and bicycle facilities. There is a further set aside for the Recreational Trails Program, which provides funds to develop and maintain recreational trails and trail-related facilities for both nonmotorized and motorized recreational trail uses.

FHWA's **Congestion Mitigation and Air Quality Improvement (CMAQ) Program** supports surface transportation projects and other related efforts that contribute air quality improvements and provide congestion relief. The BIL continues the CMAQ Program to provide a flexible funding source to State and local governments for transportation projects and programs to help meet the requirements of the Clean Air Act, including pedestrian, bicycle, and shared micromobility facilities and programs.

USDOT's **Reconnecting Communities and Neighborhoods (RCN) Program** provides grants to improve multimodal transportation access, to foster equitable development, and to remove, retrofit, or mitigate highways or other transportation facilities that create barriers to community connectivity. Projects that improve walkability, safety, and affordable transportation access are eligible for funding.

> An example of how Reconnecting Communities is improving active transportation access, mobility, and community livability can be found in the Reconnecting Communities Story Map feature of Buffalo, New York.

Department of Housing and Urban Development (HUD)'s **Community Development Block (CDBG) Program** supports community development activities to build stronger and more resilient communities. Activities may address needs such as infrastructure, economic development projects, public facilities installation, community centers, housing rehabilitation, public services, clearance/acquisition, microenterprise assistance, code enforcement, homeowner assistance, etc.

COMPLEMENTARY STRATEGIES

Employers can create a culture that embraces active transportation by offering commuter benefits for those who walk and bike to work rather than driving and parking.

Coordinated transportation planning complements active transportation when it leads to compact, mixed-use development where destinations are convenient, accessible, and support the development and use of active transportation infrastructure.

Travel demand modeling can be used to consider how the addition of active transportation infrastructure influences overall transportation patterns. Providing safe and accessible active transportation infrastructure can contribute to a shift in travel behavior, which may influence demand patterns by reducing reliance on personal vehicles, particularly for short-distance trips. This information can help justify investments in active transportation infrastructure and guide the allocation of resources to maximize the benefits of these projects.

Micromobility delivery services rely on the infrastructure established within active transportation networks. Leveraging bicycles and scooters for last-mile deliveries, these services contribute to the efficient movement of goods while complementing efforts to reduce traffic congestion and emissions in urban areas.

Shared micromobility services, such as bike and scooter-sharing programs, complement active transportation networks by offering convenient, low-barrier options for short-distance trips, thereby encouraging individuals to choose sustainable modes of transportation and reducing reliance on private vehicles.

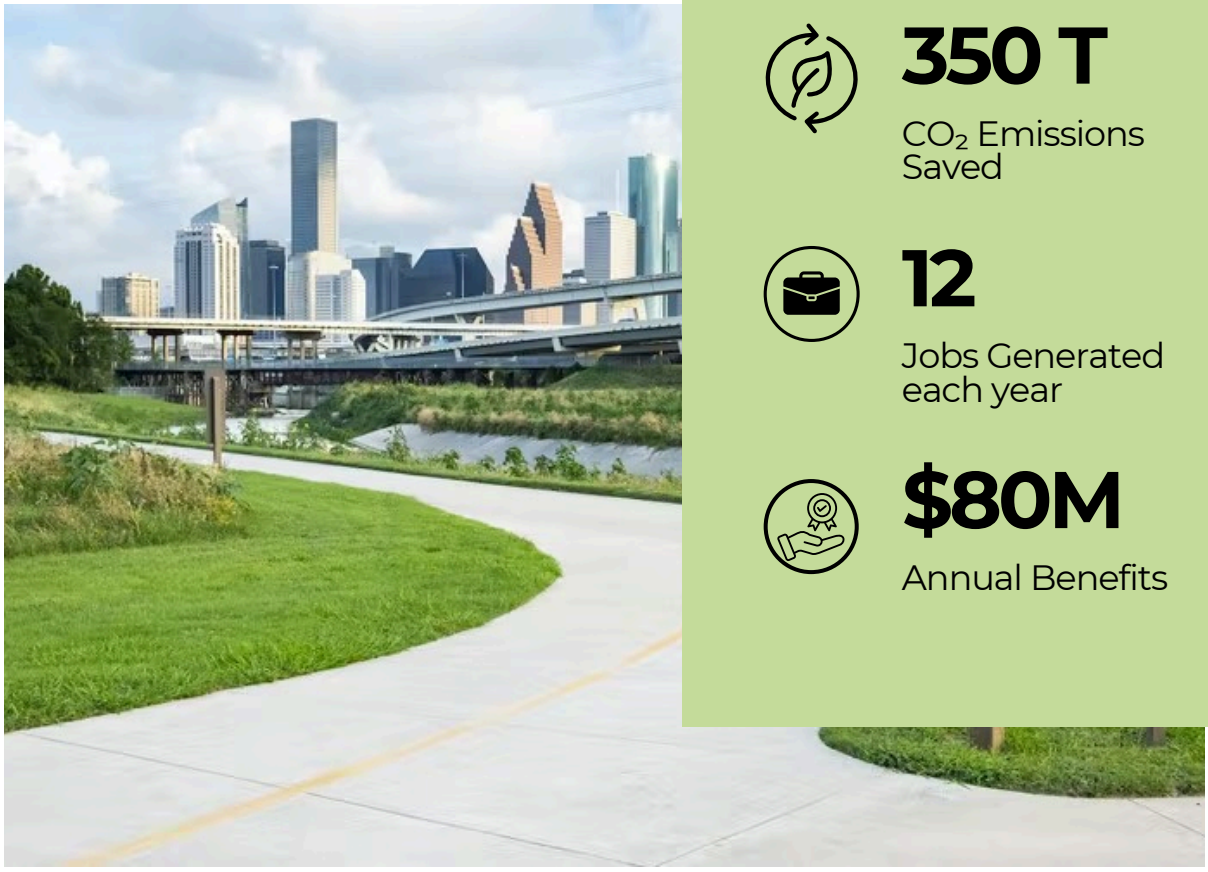
Transit-Oriented Development (TOD) can encourage active transportation by creating compact, mixed use neighborhoods with pedestrian-friendly streetscapes and bike infrastructure. Active transportation infrastructure can enhance the accessibility and attractiveness of TOD by providing residents and visitors with safe and convenient options to access transit hubs and navigate the surrounding area. TOD and active transportation infrastructure work together to promote sustainable mobility and reduce GHG emissions.

Zoning plays a key role in promoting active transportation by shaping the built environment. Zoning codes can influence the design and layout of neighborhoods, including the provision of sidewalks, bike lanes, and pedestrian-friendly infrastructure. By incorporating mixed land uses, reducing distances between destinations, and prioritizing bikeability and walkability, zoning can encourage and support active transportation options such as walking and biking. Additionally, zoning reforms may be needed to accommodate amenities like bike-sharing programs and pedestrian-oriented streetscapes, further promoting active transportation within communities.

View All Strategies

CASE STUDIES

WHITE OAK BAYOU GREENWAY - HOUSTON, TX



350 T
CO_2 Emissions Saved

12
Jobs Generated each year

$80M
Annual Benefits

The Houston White Oak Bayou Greenway (Source: Houston Parks Board).

The Greenway in Houston has reduced reliance on cars, avoiding an estimated 117,000 trips annually and saving 350 tonnes of CO_2 emissions. The development of cycling optionality not only benefits the environment but also creates jobs – the Greenway is projected to generate 12 jobs per year for the next 25 years – and fosters economic activity, with potential annual benefits exceeding $80 million when considering a city-wide 2% cycling mode share.

KATY TRAIL STATE PARK - MISSOURI

Stretching 240 miles across Missouri, the Katy Trail offers a safe and scenic route for cyclists, walkers, and runners. This car-free corridor has boosted tourism, revitalized communities along the trail, and demonstrates the economic and health benefits of promoting active transportation options.

COMPLETE STREET PLAN - PUERTO RICO

Launched in 2018, Puerto Rico's Complete Streets Plan prioritizes safety and accessibility for all travelers. The plan and accompanying design guidelines were developed under three main objectives. First, the guidelines emphasize use of infrastructure to improve people's quality of life. Second, the guidelines include tools to enhance pedestrians and cyclist access to the transit system. Finally, they define components to create accessible infrastructure that is inclusive to every population group despite its individual characteristics such as age or physical conditions. The Complete Streets guidelines are expected to improve air quality, reduce congestion, and foster economic growth through more connected and vibrant places.

ACTIVE TRANSPORTATION AT AMAZON

In a bid to reduce employee drive-alone rates, Amazon fosters active transportation through their MyCommute program. Employees enjoy a $170 monthly subsidy for various options including e-bike leases, bike maintenance, and public transit. Amazon has also invested in bike infrastructure at its Seattle campuses with 3,000 bike stalls, dedicated e-bike charging stations, and on-site bike maintenance partnerships. The company's focus on active commuting has demonstrably reduced reliance on cars, contributing to a more sustainable work environment.

IMPLEMENTING ACTIVE TRANSPORTATION: **WHAT TO READ NEXT**

There is comprehensive guidance available on creating safe, efficient, and inclusive active transportation networks from design standards, engagement strategies, and proven methods for overcoming issues. Several sources are summarized under Guidance Documents in the Resources section below. More detail can also be found on the USDOT's Active Transportation page or FHWA's Bicycle and Pedestrian Program page.

Inclusive infrastructure planning and design that prioritizes safety and caters to a variety of experiences and abilities is key to encouraging broader participation in active transportation.

Implementing subsidies and offering bike-share programs can reduce upfront costs for users. Bike-sharing, in particular, offers a low-commitment option that can be less intimidating than purchasing a bike outright, especially for first-time riders.

Lack of knowledge or confidence in riding a bicycle can pose significant barriers to active transportation. Several States offer bike subsidies and targeted bike programs, including Colorado:

Source: Bike School Bentonville

Read about Colorado's tax credit and rebate program, here.

Read about Fort Collin's Targeted Bike Programs, including a Bike School, here.

Targeted outreach and culturally sensitive programming can play a vital role in closing this gap. For example, cycling education can equip users with the skills and confidence they need to navigate the streets safely.

By providing accessible programs tailored to the needs of historically underserved groups, Fort Collins empowers individuals to overcome skill barriers and embrace cycling as a viable mode of transportation.

Other inclusive design elements may include incorporating **universally understood signage** for people with varying English proficiency, bike share systems that offer **adaptive bikes**, or bike facilities that **support a wide range of user needs**, such as providing lockers for users who trip chain.

Read more about equity considerations in active transportation here: FHWA's Pursing Equity in Pedestrian and Bicycle Planning.

Read more about inclusive design for active transportation here: NACTO's Designing for All Ages & Abilities, Contextual Guidance for High-Comfort Bicycle Facilities

Active transportation infrastructure requires ongoing maintenance to ensure safety, accessibility, and usability. Regular inspections, repairs, and upkeep of bike lanes, bike share stations, sidewalks, pedestrian crossings, and other amenities are essential to preserve their functionality and appeal to users.

Read NACTO's Guidelines for the Regulation and Management of Shared Active Transportation

Active transportation that is **well integrated with transit facilities** can allow for seamless connections and address first and last-mile gaps. When connections are safe, comfortable, easy to navigate, and engaging, they become a natural extension of public transit. Investments in infrastructure like secure bike lockers at transit stations, bike repair facilities, and designated areas for storing foldable bikes, also contribute to a more convenient and user-friendly experience for active commuters.

Read more about safety considerations when connecting to transit here: FHWA and FTA's Guidebook on Improving Safety for Pedestrians and Bicyclists Accessing Transit.

RESOURCES

GENERAL RESOURCES

It's Transportation for All of Us (ITS4US) Complete Trips: This $40 million multimodal effort is led by the Intelligent Transportation Systems Joint Program Office (ITS JPO) and supported by the USDOT Office of the Secretary, Federal Highway Administration, and Federal Transit Administration jointly working to solve mobility challenges for all travelers with a specific focus on underserved communities, including people with disabilities, older adults, low-income individuals, rural residents, veterans, and limited English proficiency travelers. This program prioritizes the needs of pedestrians and cyclists, making it easier and safer for people to choose active transportation options.

The Alliance for Biking and Walking Resource Library: This extensive online library offers hundreds of resources on bicycling and walking, including research, data, educational materials, and best practices.

CDC's Active Communities Tool: The tool consists of an action planning guide and assessment modules to help cross-sector teams create an action plan to improve built environments that promote physical activity.

FHWA Guidance: Bicycle and Pedestrian Planning, Program, and Project Development: This comprehensive guide offers a detailed framework for planning, designing, and implementing bicycle and pedestrian infrastructure projects.

FHWA Guidebook Measuring Multimodal Network Connectivity: This guidebook outlines five core components of multimodal network connectivity: Network completeness, Network Density, Route directness, Access to destinations, and Network quality. While these components are all related, the distinctions between them provide a framework for selecting connectivity measures that address specific questions. The guidebook describes analysis methods and supporting measures associated with each of these components.

U.S. Department of Housing and Urban Development, Creating Walkable and Bikeable Communities: This guide provides practical information and strategies for communities to plan, design, and implement improvements that promote walking and cycling.

National Association of City Transportation (NACTO) Urban Bikeway Design Guide: This is a leading resource for designing safe and efficient bicycle infrastructure that accommodates cyclists of all ages and abilities.

FHWA A Resident's Guide for Creating Safer Communities for Walking and Biking: This guide empowers residents to advocate for and participate in efforts to create safer streets for walking and cycling.

FHWA Pedestrian Lighting Primer, April 2022: This guide provides information on best practices for pedestrian lighting, ensuring safe and comfortable walking environments at night.

Association of Pedestrian & Bicycle Professionals' Essentials of Bike Parking: Selecting and Installing Bike Parking that Works: This resource offers guidance on selecting and installing bike parking facilities that meet the needs of cyclists and encourage bike use.

TOOLKITS AND MODELLING APPROACHES

FHWA Congestion Mitigation and Air Quality Improvement (CMAQ) Calculator Toolkit, Bicycle, Pedestrian, and Shared Micromobility Tool: The CMAQ Toolkit includes a tool specifically designed to estimate the air quality and greenhouse gas reduction benefits of bicycle, pedestrian, and shared micromobility infrastructure projects.

FHWA Active Transportation Funding and Finance Toolkit: This toolkit provides information about various funding sources and financing mechanisms that can be used to support active transportation projects.

C40 Knowledge Hub, Walking and Cycling Benefits Tool: This online tool allows users to estimate the potential health, economic, and environmental benefits of investments in walking and cycling infrastructure.

World Health Organization, Health Economic Assessment Tool (HEAT) for Walking and Cycling: This tool helps assess the health benefits associated with increased walking and cycling, including potential reductions in healthcare costs.

United Nations Environment Program Cost Benefit Analysis of NMT Infrastructure Projects: This resource provides guidance on conducting cost-benefit analyses for non-motorized transport (NMT) infrastructure projects, including walking and cycling facilities.

Smart Growth, Complete Streets Policy Evaluation Tool: This tool quantifies the Smart Growth Complete Streets Policy Framework and can help identify policy strengths, as well as areas where the policy can be improved.

FHWA, My Street Planning Tool for Improving Pedestrian Safety: My Street is a sketch-level planning tool designed to help users explore options for improving pedestrian safety in their project area.

Mobility Energy Productivity Tool (MEP): This tool evaluates the ability of a transportation system to connect individuals to goods, services, employment opportunities, and others while accounting for time, cost, and energy.

WORKING WITH COMMUNITIES

U.S. Department of Energy's Clean Cities Coalition Network: This network supports communities in achieving cleaner air and reducing dependence on fossil fuels by promoting alternative transportation options.

FHWA's Zero Deaths and Safe System Program: This program provides resources and guidance to help communities eliminate traffic fatalities and serious injuries. Active transportation is a key component of the Safe System approach, promoting safer streets for pedestrians, cyclists, and motorists.

Environmental Protection Agency's Smart Growth: This website provides resources and technical assistance to help communities integrate active transportation into their development plans, promoting compact, walkable neighborhoods.

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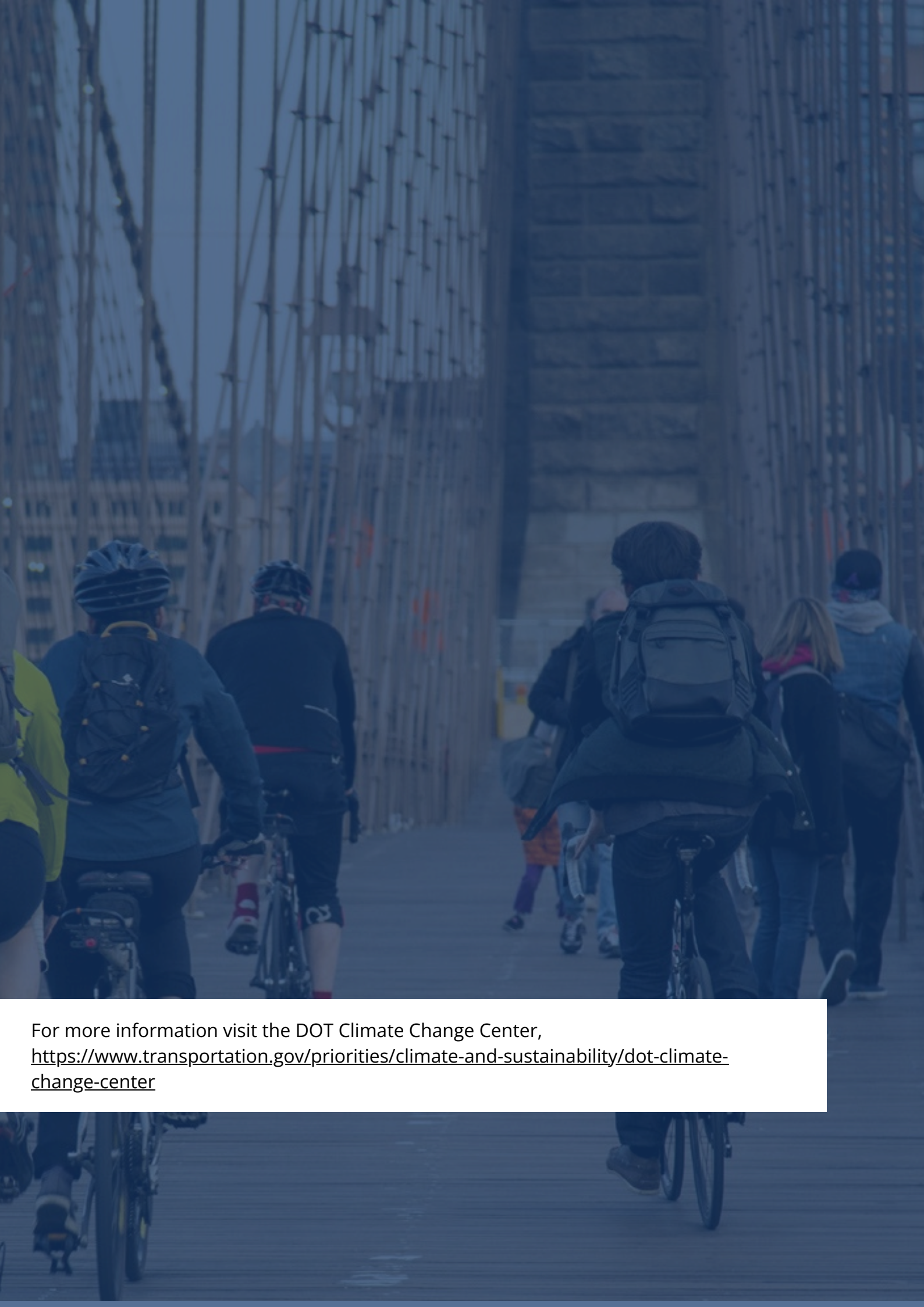

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