

INVESTING FOR MOMENTUM IN ACTIVE MOBILITY

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Transport Decarbonization Investment (TDI) Series

The TDI Series is a partnership between the World Bank, the Government of the Netherlands, and the World Resources Institute (WRI) with the goal of sharing recommendations for overcoming investment barriers to decarbonizing transport and spurring joint action by governments, companies, civil society, and international development and financial institutions. This discussion paper on “Investing for Momentum in Walking, Cycling, and Other Active Modes of Transportation” is the third in a series of technical notes in the lead up to COP26 in November 2021. Other TDI series discussion papers include: Cleaner Vehicles and Charging Infrastructure; Motorization Management and Used Vehicles; Greening Freight and Logistics; Decarbonizing Cities with Public Transport; and Financing Decarbonization of Transport.

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1. Introduction

Road planning and design that cater to motorized vehicles have detrimentally impacted air quality, greenhouse gas emissions (GHGs), road injuries and fatalities, congestion, and equity. These problems will only be exacerbated, unless a meaningful shift to sustainable transport is achieved. Active mobility—which refers to walking, cycling, wheelchair users or other light device users, and other modes such as scooters and e-bikes—provide the lowest emissions of all forms of transport. These modes equip people with active lives that bring health, social, and economic benefits. However, walkers and cyclists are the most vulnerable to road injuries, given the lack of safe infrastructure and speed management protecting them from motor vehicles.

While some countries have already committed to vision zero and follow a safe system¹ approach to their road infrastructure planning and design, car-centric practices continue to take the lead in most countries. The trend progresses despite a range of global initiatives and agreements, such as the Stockholm Declaration that calls on countries to acknowledge the negative impact of road traffic deaths and injuries on achieving the UN's Sustainable Development Goals (SDGs). Safe walking and cycling infrastructure remain grossly underfunded, despite its proven cost effectiveness.

Two primary misconceptions have led to this neglect: one is that investment in active mobility is an economic burden, and the other is that active mobility is a recreational activity rather than an integral part of the broader transport networks. Yet, active mobility outperforms all other forms of transport when it comes to positive social, economic, and environmental outcomes. Active mobility networks also frequently serve greater numbers of people, and in many cases offer a booster for inclusive economic growth and shared prosperity.

Photo 1-1: Children playing on a residential street in Cartagena, Colombia.



Source: Claudio Olivares

In many low- and middle-income countries (LMICs), rates of active travel are already high, reflecting a need for mode retention by providing these travelers with safe, high-quality infrastructure. Pedestrians and cyclists in these countries often comprise poorer populations and those experiencing economic precarity. High-quality walking and cycling infrastructure create greater accessibility for low-income populations to connect with more resources, services, and opportunities, whether economic or otherwise. However, a major barrier to progress on active travel is that LMICs experience 93 percent of the world's traffic fatalities and injuries, most of whom are low-income, vulnerable users.² For these populations, fatality or injury can be financially disastrous for themselves or their families or for both. Even as these numbers soar, LMICs are expected to witness the greatest increase in motorization in the coming years, which poses devastating ramifications not only for road safety but the environment as well.

The carbon footprint left by the transport sector is already staggering, producing 24 percent of global GHG emissions.³ Urban transport alone consumes 40 percent of total transport energy.⁴ Increased motorization in the most rapidly urbanizing regions of the world would be detrimental to efforts to stabilize the climate. LMICs and their cities can aid the fight against climate change by maintaining and promoting active mobility while reducing and regulating rising motorization. Should rates continue as they are, the consequences will be costly and near impossible to reverse.

Governments must understand the wide and diverse benefits of investment in walking and cycling infrastructure to achieve a meaningful modal shift or else retain their high modal share. They should be aware of the tools and methods available to help them fund and make these investments. Governments should also prioritize funding for walking and cycling infrastructure that maintain high safety standards and follow a safe system approach. This paper provides governments, policy makers, civil society, and other key stakeholders with the needed arguments, financing alternatives, and examples to unlock investment opportunities and take their active mobility initiatives to the next step.

Walking and cycling are often overlooked in infrastructure financing. National governments usually do not incentivize or commit funds to walking and cycling promotion. Multilateral or international finance programs are often inclined toward large infrastructure projects, without adequate consideration to invest in active mobility. Subnational governments find themselves stranded with the task to coordinate planning and financing of active mobility networks, without a regional or metropolitan vision or strategy for this mode. They have to contend with very limited access of government transfers or alternatives to invest in active mobility itself as part of finance packages of infrastructure loans. Furthermore, while car-centric infrastructure continues to be highly subsidized by general taxpayers, other tax policies either on importing, manufacturing, or purchasing bicycles can limit the expansion of public bike-share systems and discourage users from buying bikes, including e-bikes.

Notably, 2020 presented a momentous year for active transport. The COVID-19 pandemic has led to an increased urgency to implement policies that benefit and protect active travelers, because cities are witnessing a global rise in active mobility as people follow social distancing. The pandemic has also exacerbated poverty and made the poor poorer, potentially leading many to walk and cycle at higher rates outside of the rate increase brought by the need to socially distance.⁵ According to the UN, the effects of the COVID-19 pandemic have the potential to lead to a decade of development. The 2021 Financing for Sustainable Development Report estimates 114 million jobs were lost during the pandemic, and approximately 120 million people have dropped back into extreme poverty.⁶

Pop-up bike lanes and pedestrianized streets are just two examples of initiatives that cities have deployed to ensure their residents are able to safely travel and enjoy the outdoors. These interventions will also play an important role in pandemic recovery as public transportation ridership remains low. Due to the economic downturn brought by the COVID-19 pandemic, local governments—many of which are seeing their budgets reduced—could focus on funding walking and cycling as a less intensive and more effective investment option. Cities and countries should be careful not to lose the momentum of active mobility, especially as active mobility increases real estate and property values and retail revenues that will contribute to building back better and to a green recovery.

In this paper, we provide an overview of the benefits and opportunities of active mobility for accessibility and climate, and connect these elements to broader health and equity issues. We then briefly summarize effective active mobility infrastructure options, and explore the ways that finance and investment in active mobility can be and has been achieved to increase or sustain significant rates of walking and cycling globally, particularly in developing countries. We examine finance assessment along: (i) local finance and policies that encourage investment in cycling and walking; (ii) national level finance initiatives; (iii) international and multilateral finance; and (iv) private sector funding sources that may support bicycle use and walking.

Photo 1-2: Authorities in Santa Cruz, Bolivia installed used tires as separators for pop up cycle lanes.



Source: Claudio Olivares

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2. What Active Mobility Delivers

Greater connectivity and accessibility are at the heart of active travel. One of the most efficient ways to link residents with other travel modes, opportunities and resources rests in creating high quality walking and cycling networks. Active mobility's untapped potential is especially reflected in the fact that, on average for most urban areas, most trip distances are easily walked or cycled, with 35 percent of trips being under three kilometers and 50 percent being under ten kilometers.^{1,2}

Countries and cities that promote and enhance active mobility are contributing to economic and social justice in their territories. Investing in walking and cycling is a policy that responds to the needs and journeys of the poor that can change the livelihoods of the most vulnerable. In addition to improving the urban experience of people that generally cannot afford motorized private transportation, active mobility projects can unlock the health, environmental, and economic benefits of low carbon lifestyles among the poorest residents. Moreover, making active modes of transport safer and more efficient rather than a burdensome necessity can lead to mode share retention and future prevention of modal shift to private motor vehicles. Even within middle- and high-income countries, favoring active mobility initiatives enables their poorest residents to access more economic, employment, education, and cultural opportunities without having to commit their scarce financial resources.

In low- and middle-income countries (LMICs), many of the challenges are about retaining the already high modal share for walkers and cyclists. In some cities, the numbers are especially high. Many African cities, such as Addis Ababa, Dar es Salaam, Lagos, and Nairobi have more than 40 percent of their population traveling on foot or bike, and of this number, most are pedestrians.³ Such high modal shares represent an opportunity that is not to be squandered. However, motorization rates are growing at alarming rates in LMICs in Africa, Asia, and Latin America and the Caribbean regions. The developing world will have most of the 2.6 billion motorized vehicles that the world is expected to have by 2050.^{4,5} While nations across the Global North, in Europe, and elsewhere spend millions and in some cases, billions to increase walking and cycling infrastructures, the developing world stands at the precipice of opportunity. Now is the time to be bold and invest big in safe and convenient walking and cycling infrastructure to improve connectivity, protect pedestrians and cyclists, and reap the multitude of benefits that come with active travel.

Photo 2-1: Dramatic modal shift from bicycles to motorcycles in Ho Chi Minh, Vietnam .



Source: Giovanni Zayas

2.1 The Benefits of Active Mobility

High quality active mobility infrastructure correlates with higher levels of active travel, which brings numerous transport, social, economic, and environmental benefits to the communities that invest in such infrastructure. Outside of the direct benefits to transport, the two most heralded co-benefits of increased active mobility are reduced greenhouse gas emissions and pollution, and improved health for residents who take up active mobility modes. Notably, no other mode of transportation brings such diverse and potentially powerful benefits; only meaningful shifts to active travel will reap these benefits for communities.

Attaining and sustaining high rates of walking, cycling, and other active modes is an underutilized method to achieve a number of transport planning objectives. Such measures comprise reduced traffic and parking congestion, reduced or more reliable travel times, and increased public transport ridership. In Strasbourg, France, pedestrian improvements—widened sidewalks, narrowed roads, and adapted intersections—saw a 40 percent reduction in bus travel times. In New York City, the creation of pedestrian plazas improved the speed of taxi journeys by 15 percent. Similarly, improvements to a cycle lane in Copenhagen saw a 45 percent drop in car traffic along the corridor.⁶

Reducing congestion is a key way cities can improve their economic performance. Many cities in the developing world see millions lost annually to high levels of traffic congestion. According to UN Habitat, developing countries in Asia lose two to five percent of their annual GDP to congestion.⁷ In Lagos, Nigeria, residents are estimated to lose a collective three billion hours per year to traffic congestion, totaling a cost of US\$1 billion.⁸

Cities also produce more than 60 percent of the world's GHG emissions and approximately one-third of these emissions stem from urban transport.^{9,10} A recent study that observed 3,800 people across seven European cities, showed that small changes in in person's transport habits can significantly cut their carbon footprint. The study concluded that if people switch just one trip per day from driving to cycling, they will reduce their carbon footprint by 67 percent—about 0.5 tons per year.¹¹

Likewise, a high modal shift scenario modeled by the Institute for Transportation and Development Policy (ITDP) found that if urban passengers' use of bikes and e-bikes were to increase to 11 percent by 2030 and 14 percent in 2050, energy use and carbon emissions for urban transport would be reduced by seven percent in 2030 and 11 percent in 2050. Under this scenario, the high uptake of cycling and e-bike use would save the world a total of USD 6 trillion between 2015 and 2030, and USD 24 trillion between 2015 and 2050.¹² The enabling factor behind the feasibility of such striking changes in travel behavior lie in that most trips made in urban areas are under ten kilometers, a distance easily cycled, especially when safe infrastructure is present.

Research has also found that achieving a significant modal shift from motorized to active mobility globally is one of the fastest ways to dramatically reduce emissions in the transport sector. On the other hand, replacing the world's fossil-fueled vehicles for an electric fleet would still take 15-20 years.¹³ Moreover, comparing the life cycles of each transport mode, including manufacturing, fueling and disposal, emissions from cycling are 10 times lower than electric vehicles.¹⁴

Comparatively, the carbon savings and emission reductions of walking have been less researched. However, walking is frequently viewed as a zero carbon form of transport. One study found that walking 1.5 miles would result in 75 percent less carbon emissions than driving the same distance.¹⁵ Pedestrianization of designated areas, such as busy market streets or city centers, has had a significant effect on emission reductions. In Pontevedra, Spain, the city center has been pedestrianized since 1999 and the city estimates that this measure has resulted in a 70 percent decrease in carbon

dioxide emissions.¹⁶ Converting areas to pedestrian plazas has also positively impacted air pollution. For example, New York City's Times Square saw a 60 percent decrease in nitrous oxide pollution levels and a 41 percent reduction in nitrogen dioxide.¹⁷ As the world continues to grapple with the climate crisis, nations and cities alike must recognize that GHG emission reductions through active travel initiatives are faster and more efficient than any changes brought by electric vehicles or other future technologies.

The benefits to health are also abundant with greater rates of cycling and walking. Insufficient physical activity is a leading risk factor for noncommunicable disease. Around 3.2 million deaths per year, including 2.6 million in LMICs, are related to physical inactivity, and more than 670,000 deaths are premature, of people aged below 60 years.¹⁸ Active travel offers one way to mitigate some of these deaths. For example, one study of the city of Accra, Ghana, by the World Health Organization (WHO) found that scaling up sustainable mobility, such as safe cycling and walking, could save up to 5,500 premature deaths with improvements to air quality and an additional 33,000 lives from increased physical activity over a 35-year period, for a total of USD15 billion from averted healthcare costs.¹⁹ Similarly, the World Bank, in collaboration with the University of Cambridge and the University of Oxford in the United Kingdom, evaluated the health impacts of active transport policies in five Latin American cities. The results show the case-study cities could avoid about ten premature deaths per 100,000 inhabitants each year by increasing walking and cycling mode shares to 30 percent and 6 percent respectively.²⁰

Pedestrians and cyclists also compose 26 percent of global road traffic deaths.²¹ LMICs disproportionately bear this burden, with these countries witnessing 93 percent of all road traffic fatalities, despite only having 60 percent of the world's cars.²² Traffic incidents represent an immense social and economic loss totaling at approximately 1.35 million global road fatalities per year. In Latin America, an estimated 1.5 to 2.9 percent of national GDP is lost to traffic fatalities and injuries for countries in the region.²³ Countries and cities can commit to protecting vulnerable users by building safe walking and cycling infrastructure and reducing or effectively managing speed limits to stymie this road safety crisis.

Photo 2-2: Pedestrianized street in Puebla, Mexico.



Source: Giovanni Zayas

Yet, the benefits brought by active mobility go far beyond those of health and the environment, ranging from increased economic activity to improved social cohesion and job creation. Upon improving pedestrian and cycling infrastructure, many cities, and especially downtown areas, have seen positive economic impacts on local businesses. These impacts largely relate to increased footfall, sales, and rent in commercial areas that often come about after pedestrianization or other active mobility interventions.

Evidence from a review of studies supports economic impacts on local businesses of investments in bicycle and pedestrian infrastructure. It indicates that pedestrian and bicycle facilities are likely to provide a positive co-benefit to local retail and food service businesses, even where vehicular travel lanes or parking are removed or reduced in the process. The review found that most of the active mobility infrastructure had positive economic effects. Indicators such as retail or food sales, employment, and customer spending increased and that adding bicycle and pedestrian facilities encouraged more visitors by bike or on foot without reducing the number of those traveling by car.²⁴ After New York City pedestrianized Times Square, the area saw a 22 percent increase in economic activity compared to a nine percent increase across the rest of the city.²⁵ Transport for London (TfL) has estimated that high street investments in walking, cycling, and the public realm can increase retail sales by 30 percent with activities like stopping, sitting, and socializing.²⁶ Similarly, ever since Mexico City pedestrianized the central shopping avenue of Madero Street, commercial activity has increased by 30 percent and reported crimes have decreased by 96 percent.²⁷ Employment can also go up in these areas with an estimated 11 to 14 jobs being created per US\$1 million invested in cycling and walking projects as compared to the seven jobs created when investing the same amount in highways.²⁸

The economic benefits of cycling and walking have also been realized in new industries, namely that of green tourism. Under this umbrella, bicycle tourism has long been one of its more popular forms. In Europe and the United States, bicycle tourism has had immense economic impact to the tune of USD 96.7 billion and 44 billion euros annually.^{29,30} In the postpandemic world, cycling tourism also has the potential to be a boon to struggling tourism industries in need of socially distanced leisure activities, giving renewed importance to the many pop-up lanes built during the COVID-19 pandemic.

Improving active mobility in cities and other communities can also reap social benefits of social cohesion, perceptions of security, and livability. Traveling on foot or by bike along with others is believed to promote feelings of positive fulfillment.³¹ After the pedestrianization of Istanbul's historic peninsula, a survey revealed that 68 percent of pedestrian respondents felt more comfortable being in that area than previously, and that 66 percent reported spending more time in the area.³² The lockdowns brought by the COVID-19 pandemic have had serious impacts on people's physical and mental health. Active mobility modes increase opportunities for social interaction between diverse members of the community, which can broaden people's ability to engage with difference and in turn, positively impact social cohesion.³³ Ultimately, people's physical, mental, social, and economic health will benefit from the ability to move in safe environments.

Notes

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3. Active Mobility in the International Agenda

Active mobility's presence in policy agendas the international as well as local level has steadily increased as walking and cycling are recognized as important for safe, healthy, and green transport. Yet this growth is not yet reflected in widespread financing for active travel infrastructure and programs. We briefly present an overview of global goals and policies that support the advancement of active mobility, which can be furthered through greater walking and cycling rates.

3.1 Sustainable Development Goals

Active travel and its related benefits of active mobility are not directly referenced in the Sustainable Development Goals (SDGs) or even passingly referred to in climate targets and other major global policy agreements. However, walking and cycling fit well under several existing elements of the global agenda¹ and contribute to development objectives. Two SDG goals especially relate to walking and cycling:

Goal 3: Ensure healthy lives and promote well-being for all at all ages.²

The connection between active mobility's benefits and its impact on the health goal is clear. Ensuring safe streets for walking and biking would render streets safer for all users, especially the most vulnerable users such as children, the elderly, and people with disabilities. High rates of walking and cycling will also promote healthy living through increased physical activity for recreation and also through daily commutes and basic short trips. The larger the switch from motor vehicles to active mobility in a community, the larger the impact on public health, whether through physical activity or reduced air pollution.

Goal 11: Make cities and human settlements inclusive, safe, resilient, and sustainable.

Safe, inclusive, and sustainable cities require safe, inclusive, and sustainable streets. Improved safety for pedestrians and cyclists will be necessary to meet the road safety target to halve road traffic deaths. Providing safe public spaces that are accessible to all entails making cities bicycle- and walking-friendly. Safe, comprehensive active mobility networks when coupled with speed management will raise equal opportunities for city dwellers.

Walking and cycling also have a clear connection to addressing sustainable infrastructure (Goal 9) and climate change (Goal 13) (figure 3-1). High quality pedestrian and cycling infrastructure creates better accessibility to opportunities and services for those most in need, while also supporting and promoting a shift to reduced car use, which will positively impact the climate and GHG emissions.

Figure 3-1: SDGs that relate to walking and cycling



GLOBAL GOALS THAT RELATE TO WALKING AND CYCLING



Source: WRI analysis and UNDP
*Goals have been paraphrased

Several SDG goals also relate indirectly to active mobility, yet investment in active mobility could have a great impact on achieving these goals. Some of these goals are:

Goal 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.

Access to schools is a major global challenge, especially in LMICs where walking or biking are the main modes of transportation and routes are often unsafe. A safe route to school will not only provide physical access to education, but also will encourage students to continue their education. A challenging trip to school would be an added burden for a student while an enjoyable, safe walk, or ride to school can improve the experience and positively impact mental health and focus.

Goal 5: Achieve gender equality and empower all women and girls.

Women are often at a greater transport disadvantage than men as women tend to take shorter, more varied, and more frequent trips, which public transportation sometimes does not efficiently accommodate. As a result, women walk more and, in many cases, find themselves at risk to the dangers of motor vehicles. Making active mobility options more available and safer for women will contribute to gender equality by creating infrastructure that protects women walkers. Similarly, when cities establish protected cycle lanes, it improves the safety of cyclists and attracts greater numbers of women cyclists, who regularly cite safety concerns as a reason for avoiding cycling in cities.

Goal 8: Promote sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all.

Often the most vulnerable populations reside in the urban periphery that tends to lack adequate coverage by public transportation, and which produces lengthy commutes. These residents rely on informal transport and active mobility modes, namely walking to move about the city. The difficulties associated with these forms of mobility hinder their access to jobs and economic opportunities. Cities could ameliorate some of the difficulties endured by those living in areas with low transport access by developing equitable transport systems—in particular, incorporate infrastructure that promotes and encourages active transport modes, specifically cycling.

3.2 The New Urban Agenda

The New Urban Agenda is the outcome document agreed on at the Habitat III conference in Quito, Ecuador in 2016.³ It is expected to guide urban policy for countries, cities, international development funders, UN programs, and civil society for the next 20 years.

Contrary to the outcome of the previous two Habitat agendas, which mention cycling just once, the New Urban Agenda promotes and encourages walking and cycling through fostering road safety, particularly for school children. It encourages accessible public space for walking and cycling, and supports sustainable mobility that explicitly includes walking and cycling (figure 3-2).

Figure 3-2: The New Urban Agenda's inclusion of active mobility



Source: New Urban Agenda, Citiscope
*Goals have been paraphrased

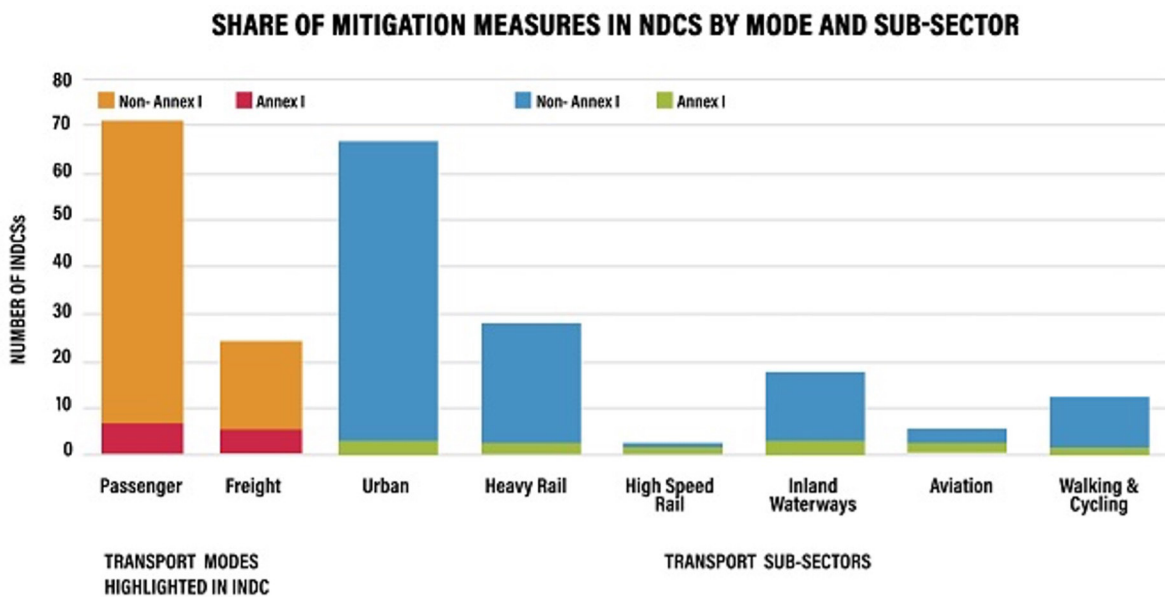
3.3 Global Climate Agenda

Although the Paris Agreement⁴ does not specifically reference transport, countries have committed to nationally determined contributions (NDCs)⁵ that indicate what they will do to meet global emissions targets (figure 3-3). A review by SLoCaT found that 74 percent of the NDCs submitted so far mention urban transport, although only 14 percent specifically reference walking and cycling.⁶

3.4 Global Health Agenda

In addition, significant aspects of other global efforts promote safe walking and cycling, such as the Global Action Plan for the Prevention and Control of Noncommunicable Diseases⁷ and the UN Decade of Action on Road Safety.

Figure 3-3: Share of mitigation measures in NDCs by mode and subsector



Source: SLoCaT.

Notes

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4. Designing for Active Mobility: What Works

Globally, many cities have high rates of cycling and walking. Some owe it to good policy and investment, but for others, it may be attributed to a lack of public transit or the high expense of driving. In the context of LMICs, due to the heavy costs of owning a personal motor vehicle. In Europe, city leaders in cycling such as Amsterdam and Copenhagen are known for their safe, connected, and high-quality cycling and walking networks that are based in the safe system approach to road design. This extensive infrastructure has led Amsterdam and Copenhagen to reach walking and cycling modal shares of 61 percent and 47 percent respectively.^{1,2}

Cities in the United States, such as Portland, Minneapolis, and Washington, D.C., have grown their cycling rates. For example, Portland has seen a 374 percent increase in the bicycle commuters between 2000 and 2017, largely attributable to its 385 miles of bikeways.³ The city also has the highest number of bike commuters in the United States, which in 2014 peaked at 7.2 percent.⁴

In middle-income countries such as Colombia, the city of Bogota has grown its rates of cycling from 0.58 percent in 1996 to 9.1 percent in 2017 through development of its bike network.⁵ In China, once known as the bicycle kingdom, rates for cycling and walking in cities plummeted from the 1980s as the country threw its finances behind the automobile industry. However, China's active mobility rates have since stabilized and rebounded from 5.6 percent of the market share of bicycle traveling to 11.6 percent on account of the establishment of the largest bike share systems in the world and the creation of protected networks of cycling infrastructure.^{6,7}

Other cities have taken aim at improving their walkability. Zurich boasts a high percentage of walkers at an estimated 46 percent of modal share, but the city is not stopping there. The government is investing in improving pedestrian infrastructure throughout the city by redesigning intersections and pedestrianizing its squares and streets.⁸ Cities elsewhere have taken similar steps. In Mexico City, the government is making concerted efforts to improve the experience of pedestrians. The city undertook a major street redesign for one of its main corridors. The project widened sidewalks, added bollards and benches, and planted trees. As part of the project, the city reduced the speed along the corridor to protect and accommodate the 150,000 pedestrians that use it daily.⁹

In Istanbul, the city's immense richness has drawn greater and greater numbers of residents to the city. However, this influx also led to increasing traffic congestion that began to detrimentally impact quality of life, mobility, and even the city's cultural depth. The city sought to preserve its cultural integrity while accommodating the needs of its growing population.¹⁰ The resulting initiative, dubbed the "Istanbul Public Spaces and Social Life" project, identified and prioritized streets for pedestrianization and expedited ongoing infrastructure works. The project resulted in the pedestrianization of 295 streets across the Historic Peninsula, which included associated improvements to traffic signaling, granite paving, and waste management.

A post-pedestrianization survey of residents, students, and business owners and employees found that 80 percent of all respondents were satisfied with the results of the Historic Peninsula's facelift. Respondents across all survey groups especially noted the improvements to pedestrian safety with 68 percent of residents, 55 percent of students, and 77 percent of business owners or employees saying that the streets had become safer. Similarly, the survey found that 52 percent of residents, 51 percent of students, and 83 percent of business owners or employees felt the Historic Peninsula's walkability had improved (photo 4-1).¹¹

Photo 4-1: A pedestrianized street in Istanbul's Historic Peninsula.



Source: World Resources Institute Flickr account

In light of these impressive projects, the following section reviews design measures that have resulted in improving rates and quality of active mobility. The section does not provide an exhaustive list of measures, but in general, illustrates the types of infrastructure and programs that have either improved the use, quality, safety, or experience for walking and cycling.

Notably, when investing in active mobility infrastructure, projects must follow high standards that prioritize safety over all other attributes. Cities and countries should move toward an integrated approach—such as the safe system approach—that shifts responsibility from the road user to the transport system designers. The safe system approach recognizes that human error is inevitable, while traffic fatalities and serious injuries should not be. Under this premise, variables such as transport governance and planning, road design, and protective road infrastructure must be factored during infrastructure development. The infrastructure must be intentional, considering the many factors that affect active travel mode choice. This entails redesigning streets and intersections to meet the needs of the most vulnerable, namely pedestrians and cyclists. For example, it is rarely enough for cycle lanes to solely consist of lines painted on a street.

4.1 Planning and designing active mobility infrastructure

Infrastructure policy needs to protect pedestrians and cyclists to make active mobility safer to existing users and more attractive to potential new users. City dwellers should be able walk or cycle across their city via safe, convenient, and comfortable routes, free from traffic-related dangers and stress, regardless of their age, gender, and abilities. Infrastructure planning and design, along with other policies like traffic enforcement, need to protect people from collisions with motor vehicles. These measures include separated facilities like sidewalks and cycle tracks, and speed management with reduced speed limits, traffic calming, and safe intersections.

Instead of isolated individual projects, infrastructure planning and design for active mobility should contribute to the articulation of networks that connect places and neighborhoods in a city. Car-centric planning led to city- and country-wide networks that allow motorists to reach most places in most cities around the world. Likewise, a paradigm shift that prioritizes active transport should lead to repurposing street networks to safely and conveniently connect most origins and destinations for people that walk or cycle.

Photo 4-2: Protected Bicycle Lane in Copenhagen, Denmark.



Source: Claudio Olivares

Safe, high quality pedestrian infrastructure is frequently overlooked in transport infrastructure projects despite nearly all trips beginning and ending with a walk-trip segment. In general, pedestrian infrastructure should endeavor to follow universal design, a design concept that ensures spaces are inclusive and accessible to all regardless of age, disability, or other factors. Several organizations focused on walkability have developed criteria and indicators to plan and design quality infrastructure for pedestrians.

The following are some of the most important components of neighborhood walkability:¹² walkways; crosswalks; visually active frontage; physically permeable frontage; shade and shelter; small blocks; prioritized connectivity; complementary uses; access to local services; driveway density; and roadway area.

In network planning, pedestrian networks should be designed to be:¹³

- i. Continuous and connected: pedestrians must be able to enjoy multiple continuous, well-linked routes that reach key destinations.

- ii. Accessible and comfortable: streets must offer universal access to users from all walks of life and must provide enough capacity for people to walk comfortably next to someone else.
- iii. Safe: streets must always guarantee personal and traffic safety through well-lit, obstruction-free, and accessible spaces, as well as short, direct, and visible pathways at intersections.
- iv. Relevant to context: networks must adapt to the scale, character, identity, topography, and green elements of the streets

Barcelona offers an innovative example of pedestrian-centric infrastructure. In 2015, the mayor of Barcelona, Ada Colau, sought to reclaim the city's streets as livable, social spaces from congestion and pollution. She did so by focusing on transport policy, which produced the famed superblock strategy in the city's 2016 Urban Mobility Plan. The successfully implemented superblock model grouped several blocks into a large 400 by 400 meter unit with the purpose of rerouting all the regular motorized through traffic to the edges of the new unit.¹⁴ Residents can still access the internal local streets with their cars at speeds of ten kilometers per hour, though not always through the most direct route. All the space liberated within the superblock allows for people to walk and cycle and to enjoy new activities in the streets in a clean and safe environment. Although only six superblocks have been fully implemented as of 2021, municipal authorities have a 10-year plan in which one-third of all the Example district will have superblock-style interventions.¹⁵

Bogotá is following Barcelona's footsteps and is already developing its own Barrios Vitales or Vital Neighborhoods program (box 4-1).¹⁶ Woonerfs, or living streets, in the Netherlands, which feature the same principles, have been a reality for many decades and are a key component in the country's cycling network.¹⁷ Low traffic neighborhoods in England have also existed for many years but have recently multiplied during the COVID-19 pandemic, especially in London.¹⁸

Photo 4-3: A modal filter in a Low Traffic Neighborhood and a cycle track in London, UK



Source: Giovanni Zayas

State-of-the-art cycling infrastructure also follows a set of principles, enshrined in the renowned Dutch CROW Design Manual for Bicycle Traffic. These principles are safety, directness, cohesion, comfort, and attractiveness. When conflicts arise between principles during the design process, safety is prioritized over all others.¹⁹ The CROW Design Manual has set the standard for cycling infrastructure for decades and its five principles are easily applied to a variety of contexts and localities.

Box 4-1. Bogota's Barrios Vitales

Authorities in Bogotá launched the city's Barrios Vitales (Vital Neighborhoods) program that aims to prioritize walking and active modes of transport while reclaiming public space for neighbors and street users. The program will transform the existing nature of streets in Barrios Vitales by filtering through traffic and increasing space for pedestrians and active modes at the expense of space dedicated to car mobility and parking. In addition to enhancing walkability in the neighborhoods, traffic speed and flow reductions will allow cyclists to move safely and comfortably through Barrios Vitales, thus providing connectivity to Bogotá's robust cycling infrastructure network.

Residents in districts with Barrios Vitales projects will experience reduced air and noise pollution in revitalized public spaces, with street furniture and other urban design features that will offer people more opportunities to enjoy public spaces. These improvements will also contribute to reactivating the local economy by increasing foot traffic around neighborhood businesses. The projects will also have a strong road safety component by incorporating speed management strategies through urban design.

Main characteristics that candidate districts to Barrios Vitales interventions should have:

- Proximity to protected cycle lanes and public transport networks
- Poor air quality
- Proximity to areas of ecological importance
- Proximity to schools and universities
- Proximity to parks and gardens
- Proximity to health and public services
- Presence of commercial areas
- Lack of road safety measures

The program is financed by the government of Bogotá City. Several of its agencies are responsible for and oversee its implementation, including the Secretary of Mobility and the Secretary of Planning. The City Climate Gap Fund and other multilateral agencies have supported the program by providing technical assistance focused on strengthening its planning foundations, increasing its benefits measurement and quantification capacities, and enhancing its investments program.

Authorities in Bogotá have been leading consultation processes in candidate neighborhoods to explain the expected benefits and engage with neighbors and stakeholders. Public works in some of the twelve districts that will have Barrios Vitales are due to start soon. After an initial tactical urbanism phase, Barrios Vitales projects will be implemented with more permanent infrastructure.

Source: <https://movilab.co/barriosvitales/>

As for the infrastructure itself, Peter Furth (2021) separates cycling infrastructure into four different categories:²⁰

- i. Standalone paths are facilities that are located independently from the street network, as in parks or former rail infrastructure.
- ii. Cycle tracks or protected bicycle lanes are on-street facilities that are separated from traffic lanes with hard elements like curbs, bollards, or planters.
- iii. Bike lanes are only marked with paint and lack physical separation.
- iv. Mixed traffic roads do not consider any sort of separation but may consider flow and speed reductions.

Cycle tracks or protected bicycle lanes are needed in arterial roads or streets with speed limits over 30 kilometers per hour and constant motor traffic flows (photo 4-2). Conversely, mixed traffic roads without any design measures that reduce speed and manage traffic flows can be dangerous for cyclists. However, traffic management strategies, including street redesign, that limit speeds and divert through traffic not only benefit cyclists, they also make the streets safer for pedestrians and other road users.²¹

The Stockholm Declaration calls on governments to mandate a maximum road travel speed of 30 kilometers per hour in areas where vulnerable road users and vehicles mix in a frequent and planned manner.²² Efforts to reduce speed in general will have a beneficial impact on air quality and climate change as well as being vital in reducing road traffic deaths and injuries. Several major cities across France, including Paris, have recently reduced their speed limits to 30 kilometers per hour— in part to reduce reliance on cars and support the shift to active modes of transportation.²³

Photo 4-4: A one-way cycle track with physical barriers in México City



Source: Jason Margolis/Cities Safer by Design.

4.2 Cargo and electric bicycles

Although electric pedal-assisted bicycles have a motor, they are still considered an active means of transport since they require energy from human-powered pedaling. While health benefits could be less than that of standard walking and cycling, the cardiorespiratory, metabolic, and psychological benefits of attracting people who participate in physically inactive transport dynamics to e-cycling are quite considerable. E-bikes make distances and hills more accessible to most people—especially those with age and physical limitations—and losses in physical activity compared with regular cycling may be offset by traveling longer distances. A study in the Netherlands concluded that e-bike users were older, had higher body mass indices, had higher access to private vehicles, and commuted 50 percent longer distances than regular cyclists.²⁴ Such a diversity of users, exemplifies how e-bikes make modal shift away from cars more viable than ever before.

While electric and autonomous cars dominate media attention and have received millions of dollars in subsidies, electric bicycle sales are already skyrocketing and are expected to grow. 300 million e-bikes will circulate in cities around the world by 2023. During the past year, more electric cargo bikes have been sold in Germany than electric cars.²⁵ In the Netherlands, a country with more bicycles than residents, 53 percent more e-bikes were sold than cars of all types, including fossil-fueled.²⁶

Logistically, cargo bicycles are a low carbon freight solution that benefit from and are compatible with broader active mobility infrastructure and policy improvements that may be burdensome for traditional delivery vehicles like vans and trucks. The often overlooked potential of cargo cycles to fulfill regular deliveries is quite significant. Studies commissioned by the European Union (EU) concluded that 25 percent of all goods and 50 percent of all light deliveries in urban areas could be serviced by cargo bikes.²⁷ Furthermore, electric cargo bicycles can facilitate the transition to low carbon freight delivery by expanding the reach of nonelectric cargo bikes, but with more efficient use of energy and space than regular delivery vehicles. A recent study of London found that the implementation of cargo bikes could reduce emission from package delivery by one-third in comparison to electric vans and by 90.5 percent when compared to diesel vans.²⁸

Photo 4-5: Cargo Bicycles in Rio de Janeiro, Brazil.



Source Claudio Olivares

Notes

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5. Integrated Active Mobility Planning

Effective active mobility initiatives require careful consideration and an integrated planning approach. Authorities should consider synergies with other urban planning subjects to amplify active transport's potential and to improve the implementation chances for projects.

Enhancing land use policies is an effective way to reduce travel distances, which makes walking and cycling more attractive and convenient, especially in cities with relatively low car ownership rates. Mixed land use patterns and density have proved to be instrumental in keeping and increasing levels of active mobility.¹ Low carbon transport in cities can also be consolidated through the blend of safe and comfortable active transport infrastructure with public transport and land use policies that culminate in transit-, pedestrian-, and cycling-oriented development.

5.1 Land-use planning and active mobility

Land use planning directly affects the accessibility and mobility experiences of urban residents. The paradigm of segregated land use planning, which allocated different functions to different territories, heavily relied on motorization to allow growing populations in residential areas to access jobs and commercial activities in central districts or industrial activities in the peripheries. A strong negative correlation ties transport-related energy consumption and urban density; cities with lower densities in the United States, Canada, and Australia report the highest energy consumption for transport in the world.² However, cities with higher densities have also experienced considerable territorial expansions, resulting in longer distances that can only be reached by public or private motorized transport.

If lower density and segregated territorial planning have contributed to the consolidation of carbon-intensive urban transport systems, then compact, dense and multifunctional land use planning will be instrumental in achieving transport decarbonization. Dense urban areas that mix residential, commercial, cultural, and employment opportunities facilitate access to a more livable urban experience. As distances shrink, energy and infrastructure requirements are reduced substantially, making cities more resilient and more economically vibrant. For example, the World Bank estimates

Photo 5-1: Walking and cycling accessibility and TOD around Rotterdam's Central Station.



Source: Alfonso Velez

that the adoption of compact urban development pathways would allow Chinese cities to achieve higher economic growth and productivity.³ Planning for cities with compact, dense and mixed land use can lead to more walkable and cyclable cities. At the same time, it can also optimize public transport services by reducing required service coverage and alleviating demand for trunk and feeder transport services.

A step further in integrated transport and land use planning would be transit oriented development (TOD). TOD focuses on the integration of residential and commercial development with citywide connectivity through high quality public transport services and neighborhood accessibility through walking and cycling-friendly street design and livable public spaces. Successful TOD projects have been implemented in cities like London, Tokyo, and Buenos Aires. In the Malaysian capital of Kuala Lumpur, authorities have used transit planning zones to implement TOD projects that focus on transit-supportive land use activities, mixed use and street level activities for personal safety and economic vibrancy, high intensity development, and pedestrian priority urban design.⁴

5.2 Public transport and active mobility

In many cases throughout cities in the developing world, public transport services are segregated, unreliable, saturated, and unsafe. However, public transport often represents the only viable choice for residents to access employment and other basic urban needs, especially in cities with low density and urban sprawl. While active mobility cannot substitute for long distance trips, walking and cycling ideally complement the overall mobility experience for public transport users. Streets that connect walking and cycling to public transport services effectively increase catchment areas of the system. Thus, transport planners need to consider people that walk or cycle to or from stations and bus-stops as public transport users at their first or last mile phase.

Photo 5-2 shows the high number of bikes chained to the guardrails of the bus rapid transit (BRT) station in Barra da Tijuca in Rio de Janeiro because of a lack of proper bike parking infrastructure for those who cycle to the station. In this case, like many, the lack of proper walking and cycling infrastructure, including parking facilities, places the lives of commuters in danger and deters those that have other travel options from biking or walking to the station. The first- and last-mile problem can be partly solved by supplementing the existing transport network with walking and cycling infrastructure. This measure is also immensely cost efficient when compared to the costs to build BRT feeder routes or a metro line. In combination with mass transit systems, the transit plus active mobility mode could be the most efficient, flexible, and accessible formula for travel in urban areas or large metropolitan regions.

Photo 5-2: Bicycles chained near a bus stop in Barra da Tijuca in Rio de Janeiro.



Source: World Resources Institute Flickr account

Walking is also a natural complement to public transport even in countries with an elevated private car mode share. The Netherlands, for example, has 47 percent of trips completed by car, 27 percent by bicycle, 18 percent walking, and 3 percent by train and public transport each. However, walking accounts for a large share of public transport access and egress when traveling to a destination other than the home: approximately 50% for train, 70% for bus and nearly 80% for tram/metro. Conversely, walking from the station home is much lower because users have more mobility options (nearly 20% for train, 40% for bus and nearly 40% for tram/metro).⁵ Even in the United States, a country with around 80% of commuting trips completed by car,⁶ urban residents who live within 400 meters of a public transport station are 5-7 times more likely to walk to the station.⁷

Transport planners that have successfully integrated active travel with public transport are responsible for creating a powerful means of transport that compensates for what each individual solution lacks— the first or last-mile connectivity that requires costly feeders in public transport and the long-distance reach that is hard to achieve by cycling. The benefits of such integration include an increased catchment area and a more customizable journey that allows users to choose stations, transit services, and how to react to service disruptions.⁸ The three main methods for achieving bike-transit integration are through high-capacity bicycle parking at mass transit stations, public bike-sharing systems, and bicycle-on-board policies.

Considering the constant budgetary constraints to fund walking and cycling projects, active mobility initiatives should be included as components of major public transport projects. For those public transport projects that disregard active travel, the consequent user experience can only be considered deficient. The social and economic impacts of public transport projects can only be bolstered by inclusion of low cost walking and cycling interventions that increase the catchment areas of public transport.

Photo 5-3: Bus stop on a wide sidewalk in Buenos Aires, Argentina.



Source: Claudio Olivares

Notes:

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6. "Travel Mode Shares in the U.S." 2016. The Transport Politic (blog). August 24, 2016. <https://www.thetransportpolitic.com/databook/travel-mode-shares-in-the-u-s/>
7. Regional Plan Association. 1997. Building Transit-Friendly Communities: A Design and Development Strategy for the Tri-State Metropolitan Region. <https://rpa.org/work/reports/building-a-transit-friendly-community>
8. ITF. 2017. Synergies from Improved Cycling-Transit Integration: Towards an integrated urban mobility system. <https://www.itf-oecd.org/sites/default/files/docs/improved-cycling-transit-integration-synergies.pdf>

6. Unlocking Finance for Active Mobility from Local to Global Level

Financing active mobility infrastructure can be one of the main obstacles for many communities wishing to expand walking and cycling opportunities. Although among the lowest in costs compared to other forms of infrastructure, investments in walking, and cycling infrastructure remain low within budgeting priorities. Active mobility is often not perceived as a component of integrated transportation systems. Lack of development of active mobility in developing countries leads governments to focus their attention, finances, and physical resources on motorized transport. Proper financial planning and understanding of the benefits of active mobility can make investment in active mobility more attractive to governments and more likely to happen (box 6-1).

It is imperative that governments recognize the role of active mobility as a strategic component of the integrated transportation systems, especially for lower-income communities. Many rely on cycling or walking to connect to public transit stations within a few miles and end up traveling in unsafe conditions because of a lack of infrastructure. In these cases, building sidewalks or separated bike lanes to cover the first and last miles and safe intermodal bicycle parking facilities is cheaper than extending the transit network with feeder bus services.

An example of the potential cost efficiency of active mobility networks can be seen in Seville, Spain, where the city spent 32 million euros on its 80-kilometer network of segregated cycle lanes that serve approximately 70,000 trips per day. Comparatively, Seville spent 800 million euros building its single, 18-kilometer metro line that serves 44,000 trips per day.¹ Similarly, the World Bank has estimated a potential US\$300 million investment for Lima, Peru, for a 1,173-kilometer connected network of safe bike infrastructure with the potential to capture more than a million trips per day, similar to the actual ridership of the metro line 1 and the BRT systems combined.²

Box 6-1. Case Study: How did the Dutch move from a car-centric culture to leaders as bicycle commuters?

Around the world, cycling is embraced to tackle a wide variety of individual and societal challenges. The Netherlands is often seen as an ideal living laboratory, because cycling has retained its significant share of mobility throughout the country. The Netherlands has the world's largest number of cyclists, but it is also the safest place in the world to cycle. That is largely because of the safe cycling infrastructure that can be found throughout the country. How did the Dutch get this network of high quality cycle paths?

In the 1970s, the Netherlands started leaning toward a car-dominated culture, with prominent levels of pollution and traffic-related deaths. The rise in traffic fatalities, especially among children, led to mass public protests. An oil crisis and an economic crisis led to gas shortages and soaring prices of energy. Consequently, decision makers and planners shifted their prevailing stance and political will at the national and municipal levels. They decided to turn away from car-centric policies and make way for efficient and convenient transport options like cycling. Now, cycling is an integral part of transport policies.

Thanks to pressure groups and enlightened local politicians, cities such as the Hague, Delft, and Groningen began to encourage the growth of cycling. Mass cycling programs and initiatives as well as local

movements in favor of cycling infrastructure created awareness that slowly but gradually changed the vision around traditional transport policies.^a

The paradigm policy shift in the mid-1970s, made municipalities experiment with complete and safe cycle routes. Financed by the national government, the first cycle routes were created in Tilburg and The Hague. The success at the local level led to a national policy of funding cycling infrastructure and to the Netherlands to being preeminent among nations for its cycle use.^b

The national policy called, “Master plan Fiets,” or bicycle plan in Dutch, was established by the Dutch Ministry of Transport for the period of 1990–1997.^c The plan included goals focused on improving the quality of life, public health, increasing accessibility, and making streets safer for all, especially for children.^d The policy received significant national funding. Most municipalities had specific budget allocations, which ensured continuity and scalability in bicycle policy implementation. Municipalities also reached out to external funding sources. Bicycle projects were often backed by larger infrastructure projects, traffic safety projects, or urban developments.

Campaign groups and organizations, such as Stop de Kindermoord, the First Only Real Dutch Cyclists’ Union, and the Dutch Cycling Embassy, were instrumental in promoting the cycling initiative. Stakeholders were actively involved in the design and implementation of bicycle policy in the Netherlands, including the national government, provinces, and municipalities as well as nongovernmental stakeholders such as the Traffic and Transport Infrastructure department for promotion of the policy.^b Stakeholders such as health insurance providers, schools, transport companies, retailers, and the media also participated in the push of the policy.^d

The only challenge was to garner substantial funding for the quality of and the connected cycling infrastructure. Policy makers tested the financial feasibility of encouraging the expansion of cycling. The main sources of funding included regional subsidies, contributions from city sectors, the municipal mobility fund, and each urban area’s own budget. Commitment from agencies and stakeholders was also evident.^e

Photo 6-1: Woman and girl cycling in Amsterdam, The Netherlands.



Source: Alfonso Velez

Dutch authorities at the local, regional, and national levels spent more than 24 euros per person on cycling projects and infrastructure in 2010. Several alternative methods of funding were also deployed. EU funding is increasingly being used for bicycle projects; and in some municipalities, bicycle parking is financed from car parking income.^f

The growth of cycling culture in the Netherlands indicates the levels of investment. The Dutch coalition government agreed to nationally invest an additional 2 billion euros in mobility in 2017, of which five percent or 100 million euro, was allocated to cycling infrastructure projects over the next four years, for bicycle parking facilities at railway stations and for fast cycle routes.^g The Hague is also investing significantly in its cycling infrastructure with US\$79 million to be spent from 2021 to 2026 as part of a plan to increase cycling numbers by 50 percent by 2040.^h

Notes:

- a. “How Groningen Invented a Cycling Template for Cities All over the World,” The Guardian (Guardian News and Media, July 29, 2015), <https://www.theguardian.com/cities/2015/jul/29/how-groningen-invented-a-cycling-template-for-cities-all-over-the-world>.
- b. “How Amsterdam Became the Bicycle Capital of the World,” The Guardian (Guardian News and Media, May 5, 2015), <https://www.theguardian.com/cities/2015/may/05/amsterdam-bicycle-capital-world-transport-cycling-kindermoord>.
- c. The Dutch Bicycle Master Plan (The Hague: Director-General for Passenger Transport, 1999).
- d. “The Rise of Cycling in the Urban Areas of the Netherlands,” Centre For Public Impact (CPI), accessed September 17, 2021, <https://www.centreforpublicimpact.org/case-study/focusing-bicycles-transport-urban-netherlands>.
- e. Melissa Bruntlett and Chris Bruntlett, Building the Cycling City: The Dutch Blueprint for Urban Vitality (Washington: Island Press, 2018).
- f. “Cycling for Growth - European Commission,” accessed September 17, 2021, https://ec.europa.eu/transport/sites/default/files/cycling-guidance/ecf-cycling-for-growth-using-european-funds-for-cycling_0.pdf.
- g. “New Dutch Government Will Invest 100 Million Euro in Cycle Projects,” ECF, January 11, 2018, <https://ecf.com/news-and-events/news/new-dutch-government-will-invest-100-million-euro-cycle-projects>.
- h. CitiesToday, “It’s 2021, and the Netherlands Still Invests Millions to Support Cycling,” TNW | Shift, May 6, 2021, <https://thenextweb.com/news/its-2021-and-the-netherlands-still-invests-millions-to-support-cycling-syndication>.

6.1 Economic planning and assessment

When planning for active mobility interventions, cost-benefit analysis (CBA) is a favored approach for estimating the cost of active mobility infrastructure that also incorporates estimating the direct benefit to active travelers and indirect benefits to the communities. Although the technical methodology for performing a CBA is not described here, understanding the intervention costs and its benefits can be helpful when comparing transport infrastructure alternatives, or alternative analysis, and deciding what type of active mobility intervention to finance.

In general, costs are typically broken into two major categories: (i) capital and construction costs, which relate to the type of facility and the equipment needed and its maintenance, and (ii) operating costs, which relate to factors like location and volume of use. Benefits can also be split into two categories, direct and indirect. Direct benefits are those reaped by the user, such as improved mobility and accessibility, increased physical activity, and fuel and healthcare savings. Indirect benefits go to the community through reduced emissions and pollution, less traffic congestion, improved livability, and increased economic activity, whether through greater sales, employment, or tourism.³

CBAs previously performed for existing active mobility infrastructure have shown that the benefits of these facilities massively outweigh their associated costs. One study found that building a network of sidewalks and bike lanes was 12 to 14 times more efficient than building an underground subway system.⁴ In Norway, a cost-benefit analysis of walking and cycling infrastructure in cities around the country found that the estimated benefits of walking and cycling infrastructure—such as reduced air and noise pollution, improved public health, and reduced parking costs—were 4 to 5 times greater than the costs.⁵

The World Bank prepared the Lima Cycling Infrastructure Plan for Peru and the consulting firm Decisio developed a social CBA that quantified and monetized social benefits of construction of a low-stress cycling network. After considering infrastructure costs as well as other indirect costs related to the construction of the network, Decisio found that road safety, health, and productivity benefits outweigh costs by a factor of 19. The social CBA assumes an increase of cycling modal share from 0.9 percent of trips in 2009 to 15 percent in 2050.²

A simplified way to understand the cost of a cycling investment is by estimating the cost of one kilometer bike lane which usually includes typical pavement markings, signage, and curb work. This number varies widely between countries, and many factors impact it such as fluctuations in material and labor costs. Table 6-1 shows estimated costs for cycle lane infrastructure from a tool designed by the Institute for Transportation and Development Policy (ITDP).

Table 6-1: Estimated costs for cycle lane types.

Cycle Lane Type	Estimated Cost per Kilometer (US\$)	Maintenance
Cycle track or cycle lane protected by physical devices	\$72,000 -140,000 ^a	\$5,000 per kilometer every 3 to 5 years
Cycle lane protected by on-street parking	\$50,000 -56,000 ^b	\$2,130-4,520 per kilometer ^c
Cycle lane without protection	\$56,500 - 75,000 ^b	\$2,130-4,520 per kilometer ^c
<i>Notes:</i>		
a. US\$72,000 from the Colombian Cycling Infrastructure Guide, while ITDP Mexico specifies US\$130,000-140,000. The Mexico City government spends.		
b. ITDP Mexico		
c. Colombian Cycling Infrastructure Guide, based on costs of repainting cycle lane every 5 years		

Estimating the costs of walking infrastructure is rendered difficult to assess because much depends on the size of the road or area on which the sidewalk and pedestrian crossing infrastructure is built. The cost range is also much broader given the diversity of pedestrian infrastructure, ranging from fully pedestrianized streets to widened sidewalks. Intersections require extensive redesign to safely accommodate pedestrians, and the costs of other more complex forms of infrastructure—raised crossings or pedestrian islands for instance—are highly dependent on factors such as the type of material used, the size of the road, and the drainage conditions. Table 6-2 provides an example of yearly spending on active mobility infrastructure in Addis Ababa, Ethiopia.

Photo 6-2: Installation of a protected cycle lane in Cholula, Mexico.



Source: Giovanni Zayas

Table 6-2: Addis Ababa projected estimate of annual spending on active mobility-related infrastructure (2019–2020).

	Unit	2019–2020 Projected Estimates		
		Quantity	Unit rate (US\$)	Cost (US\$)
Walkway	square meter	244,500	\$17.30	\$4,229,850
Bollards	pieces	1,000	\$18.42	\$18,420
Fences	linear meter	1	\$32.50	\$32.50
Speed humps	square meter	1,300	\$325.03	\$422,539
Intersection modifications	number	15	\$43,336.94	\$650,054
Traffic signal	pieces	30	\$85,048.75	\$2,551,460
Crossing	square meter	1	\$32.97	\$32.97
Bicycle facility	km	2.7	\$36,114.13	\$97,508.20
Grand total				\$7,969,897

Agencies and organizations responsible for constructing active mobility infrastructure must also consider future maintenance costs. If active travel infrastructure is not maintained to a high standard, fewer people are likely to walk and cycle and so the community loses the host of benefits brought with this mode. The choice of materials, scale of the project, and volume of use will dictate maintenance costs. For example, plastic bollards will need replacing, painted and thermoplastic marking will need to be redone every few years, and any planters or greenery must be tended to. Table 6-3 presents a range of estimated infrastructure costs for various active mobility-related infrastructure projects built in Latin America, including estimated maintenance costs.

Table 6-3: Examples of active mobility-related infrastructure costs.

Infrastructure	Description	Cost source	Cost (US\$)	Unit	Maintenance
Sidewalk ^a	Concrete sidewalk includes concrete curb, ramps with bollards	Mexico City	\$25–35	square meter	\$25,000 yearly per linear kilometer (4-6 m wide), including: repairs from root-caused damage; green area maintenance and watering; and change of lightposts
Safe intersection ^a	4 or 5 street intersections of maximum 1,000 square meters includes trees and vegetation, paint and obstacle removal (phone booths, old lightposts)	Mexico City	\$625,000 plus an additional \$625,000 to include 6 traffic lights and 8 pedestrian traffic lights	Not applicable	5–10% yearly
Traffic calming	Includes speed bumps, chicanes, road diets and sidewalk expansions	Colombia	\$444,659 –1,752,482 ^b	linear kilometer	5% yearly ^d
Vital Neighborhood (see Active Mobility Infrastructure section)	Tactical urbanism phase that includes traffic signs, paint, bollards, speed cushions, street furniture (benches, tables, parklets and chairs), planters and trees	Bogotá	\$8,172 – 15,337	hectare (10,000 square kilometers) ^c	5% yearly ^d
	Civil works phase that includes road diets, sidewalk expansions and adaptation of sewage, water and technical networks		\$156,296 –\$184.856	hectare (10,000 square kilometers) ^c	5% yearly ^d

Notes:

- a. Direct communication with Erik Cisneros from the Mexico City Government
- b. <https://www.despacio.org/wp-content/uploads/2016/04/Guia-cicloinfraestructura-Colombia-20160413-ISBNpercent20digital.pdf>
- c. Direct communication with David Uniman from the Bogotá City Government
- d. Based on authors' estimates

6.2 Local financing

The ways to finance active mobility on the local level range widely. Perhaps the most common way local governments fund their active mobility projects is through general municipal funds, public works budgets, or capital improvement programs. Merging projects with other departments, such as pavement resurfacing, can also reduce costs and unlock further funds. For example, bike lane projects in Bogotá rely on the city's Secretariat of Mobility general budget and the budgets of other city agencies (Box 6-2). Many of the projects would fall under maintenance contracts with the public works arm of the Secretariat. Resurfacing and marking projects as well as BRT projects would include the installation of bike lanes within the public right of way.⁶

Larger cities like Bogotá, Lima, Addis Ababa, London, and others prepare active mobility, sometimes termed nonmotorized transport (NMT) strategies to set their goals and identify the infrastructure to be built and budgeted for. Addis Ababa adopted the Addis Ababa NMT Strategy In 2018 that sets out an ambitious plan for improving the city's walking and cycling facilities. The strategy calls for the implementation of 600 kilometers of new footpaths and 200 kilometers of dedicated cycle facilities over ten years. The strategy also calls for the introduction of a bicycle sharing system to serve short trips in the city center and improve connectivity to light rail transit (LRT) and BRT.⁷

While larger cities are more in control of their budgeting and have the capacity to finance their active mobility plans, smaller local governments often rely on receiving regional, metropolitan, national, or federal funding for which active mobility projects are eligible. Some local governments face challenges and bureaucracy in receiving funding from high levels of government. Notably, these funding sources are also not always sufficient to match a city's infrastructure goals. As a result, local governments have become creative and have developed other ways to source the needed funds.

Photo 6-3: A pedestrian crossing and plaza in Buenos Aires, Argentina



Source: Claudio Olivares

Local and regional authorities can achieve the dual purpose of enhancing their funding capacities and reducing incentives to drive by adopting measures to manage travel demand, such as congestion charges, parking meters, vehicle registry, and vehicle gas surcharges. Local governments can also collect resources from private real estate developers for development rights that could be earmarked to fund infrastructure provisions for walking and cycling. One such example is London, in which the city is using revenue from congestion pricing to fund active mobility. Another source is dedicated taxation that relies on certain services such as using ride-hail taxes and fees instituted by the city of Fortaleza, Brazil, for example. Fortaleza adopted a cycling infrastructure strategic plan in 2014 with a total grid plan of 524 kilometers. The city tapped into revenue from the digital Zona Azul, a new on-street parking regulation system, to be reinvested into bike lanes for implementation. Annual bike counts conducted by the city have seen a 153 percent increase in the number of cyclists from 2012 to 2017 and the cycle network has grown 350 percent, or 170 kilometers since 2013.⁸

Another type of funding beyond general city funds involves setting special tax or charge systems that are dedicated wholly or partially to cover infrastructure needs. One measure set by local governments is tax increment financing (TIF). TIF is a land-based financing instrument that enables local governments to use the additional expected income from taxation during a set period on a designated territory to finance investments needed in urban infrastructure. Projects are structured based on future tax revenues resulting from the development of a specific area and the revenues produced above a specified baseline property value established at the inception of the project.

For example, Chicago uses TIFs for some infrastructure and redevelopment projects. With TIF districts created throughout several neighborhoods, the city was able to implement Vision Zero pedestrian infrastructure improvements, sidewalk upgrades, and bike infrastructure projects.⁹ However, TIFs frequently entail large scale bureaucratic management involving communication with commercial and community stakeholders. The funds created out of TIFs are also limited by location and the potential for that location to have appreciating property tax values.

Another form of taxation-based funding is through the establishment of business improvement districts (BID). Under a BID, business owners elect to contribute to the development of their district. However, for a BID to be formed often legislation must exist at the regional, state, or national level that allows for groups of commercial property owners to do so.

Other measures include inviting private investors or business owners to invest in bonds created by the local government. Bonds have the potential to fully fund projects, however full funding can hinge on how the bonds are packaged and marketed to stakeholders. One example is the third Mobility Bond in Austin, Texas, which was approved by voters in 2020. The bond totals US\$460 million with approximately US\$285 million going to active transportation projects in the city. This comes in addition to the first bond approved in 2016 at US\$720 million and the second, approved in 2018 at US\$160 million. This bond will be used to implement projects outlined by the Austin Strategic Mobility Plan, which includes reducing dependence on vehicle trips, such that only half are made alone by car by 2040. Some of these projects include sidewalks, urban trails, vision zero improvements, bikeways, and safe routes to school program improvements.¹⁰

Public-private partnerships (P3) offer yet another lever to finance active mobility and have been used to introduce bike share systems in several large cities such as Paris, New York City, and Mexico City. Paris's bikeshare system, originally known as Vélib', was financed as a concession to the French advertising corporation JCDecaux. The company was responsible for the operation and maintenance of the bikeshare system, while they received exclusive control of a certain number of billboards in Paris. The Paris bikeshare was then converted to a publicly funded model in 2018. Similar models have been replicated in several other cities ranging from municipality-owned bikeshare assets that are operated by private companies, such as Washington D.C. and Mexico City, or entirely privately operated by concession as in Rio de Janeiro.¹¹

Box 6-2. Bogotá's Bike Boom: How the city built its cycling culture

The city of Bogotá has seen a monumental increase in bicycle ridership since the 1990s. It is the Latin American city with the highest mode share of bicycle trips.^a As such, the case of Bogotá may offer insights into why cycling ridership increases, what sort of policies help strengthen cycling culture, and how to replicate this model in other cities globally.

Bicycle ridership culture has been present in Bogotá in various forms—recreation, racing, and transportation—for several decades. Traditionally, cycling was seen as being a transport mode for low-income individuals, while the automobile was seen as a status symbol and indication of wealth.

Following the oil crisis in 1973, *Ciclovia*, or the weekly car-free program, was introduced to promote active mobility and exercise throughout the city on non-working days.^b However, it wasn't until 1994 that the first bike policies were introduced into the mayor's city plan. The next nine-year period was labeled as the change from a "car-centered transportation system to a people-oriented one."^c This period was characterized by street space reallocation programs, where parking space was turned into sidewalks and cycle lanes and the labelling of exclusive bus lanes, both BRT and conventional.

Enrique Peñalosa, the mayor from 1998–2000, implemented the most aggressive urban development and transportation changes by tripling the transport budget. It must be noted that investments in road infrastructure projects were not financially attractive owing to a lack of financial returns, thus, Peñalosa's policies were effective due to his exceptional execution capabilities and the notion that sustainable mobility is fundamental.^d Peñalosa implemented car free days, car circulation restrictions certain days of the week, raised the municipal surtax on gasoline by 5 percent, and constructed 232 kilometers of bicycle lanes.

During the period between 2004–2012, there was waning political interest in bicycle policies. The first attempt to create a public bicycle system in 2008 was rejected because of lack of funding.^e In the meantime, previous bicycle infrastructure started to deteriorate due to poor maintenance services. In the absence of political will, citizen advocacy groups formed to encourage bicycle policies.

Finally in 2012, the new mayor showed his recommitment to cycling initiatives by allocating funds to the construction of 145 kilometers of bicycle lanes (of which 63.1 kilometers were built) and by hiring experts from bicycle advocacy groups for government positions.^d Since then, a variety of actions by differing institutions have been introduced to help strengthen the cycling culture in Bogotá, including giving cyclists reflective gear, role reversal programs where cyclists and bus drivers are switched to understand the visual limitations of both parties, and bicycle promotion programs in schools.^f In 2016, the first government-appointed bicycle coordinator took office, and efforts since then have focused on increasing road safety for cyclists.

The administration and funding of cycling infrastructure in Bogotá is largely split between five agencies. Each agency is responsible for funding and constructing different types of cycling infrastructure, as shown below. The main sources of revenue for these agencies is through tariffs or fines, such as traffic tickets and fuel surcharges.^g

- i. District Secretary of Mobility - oversees the construction of cycling infrastructure along the primary roads of the city and undertakes major works and receives much of its budget from traffic and parking fines.
- ii. Urban Development Institute (IDU) - undertakes public space works on behalf of the District Secretary of Mobility, including cycling infrastructure, and is responsible for their maintenance. Works are prioritized through an algorithm that cycling infrastructure falls under, which then receive funding.

- iii. Special Administrative Unit for Road Rehabilitation and Maintenance (UMV) - builds cycling infrastructure on secondary roads and performs intermediate civil works. Most funding comes through the general budget and is negotiated with the IDU.
- iv. The Aqueduct and Sewerage Company - a partially state-owned enterprise that has built cycling infrastructure on the land it owns surrounding the various bodies of water in Bogotá. Maintenance of these routes is done by UMV.
- v. Parks and Recreation Department - builds cycling infrastructure in the city's parks and recreational spaces and is self-funded through their own budget.
- vi. BRT (TransMilenio) and Metro (EMB) public companies - builds cycling infrastructure in the city's mass transit system corridors and stations.

The city spent more than US\$200 million on the initial construction of its bike network in the first few years. In recent years, the average cost of one kilometer of bike lane in Bogotá has been US\$600,000, whereas the average cost of one kilometer of road (30 m wide) is around US\$6.5 million. Between 1998 and 2008, approximately US\$560,000 was spent on maintenance of the bike network; then in 2010, the city moved to invest big in the network's maintenance with US\$2 million spent on upkeep.^{g,h} For Bogotá, the benefits of its cycle network have been numerous with an estimated 36,600 tons of carbon dioxide emissions saved, an increase of bicycle mode share to 5%, and an estimated savings of US\$165 per month for families using the cycle network.⁹

From the national level, the city is not eligible to receive funding for cycling infrastructure in the context of transfers through a law that allocates funding for mass transit infrastructure. But cities also can receive funding through Nationally Appropriate Mitigation Actions (NAMAs) from the NAMA Facility or other international climate funding leverage at the national level, such as NAMA TAnDem (Active Transport and Travel Demand Management). NAMAs specifically target climate change and include commitments to reducing GHG emissions. With regard to cycling, the NAMA TAnDem includes mitigation measures, such as public and private bike parking spaces, construction and rehabilitation of bike lanes, public bike share systems, and promotion of formal bike taxi services and e-bikes. However, funding for this NAMA has not been confirmed yet to support the active mobility initiatives in Bogotá.

It can be deduced that a combination of political leadership, advocacy groups, and cycling infrastructure over the past several decades have led to the prominent bicycling culture that exists today in Bogotá.^e Nonetheless, this shift was also largely due to meaningful investments in infrastructure and evolving social norms, namely the acceptance of the bicycle as a viable transport mode for all, regardless of socio-economic background.

Notes:

- a. https://www.movilidadbogota.gov.co/web/sites/default/files/Paginas/20-12-2019/resultados_preliminares_encuestamovilidad_2019-20191220.pdf
- b. Montero, S., 2017. Worlding Bogotá's Ciclovía. *Lat. Am. Perspect.* 44, 111-131. <https://doi.org/10.1177/0094582X16668310>
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- f. Cámara de Comercio de Bogotá, Universidad de los Andes, 2016. Observatorio de Movilidad - Reporte Anual de Movilidad 2016. Bogotá DC. (Spanish)
- g. <https://development.asia/case-study/strategy-creating-bicycle-friendly-city>
- h. <https://www.weforum.org/agenda/2014/08/bikes-buses-helped-bogota-clean-act/>

6.3 National financing

For many countries, the most effective way to unlock financial resources to support active mobility infrastructure and initiatives is through the creation of national plans that include dedicated funding. Policies come in various forms, such as national urban transport strategies and programs, national road safety programs or projects, or even dedicated active travel funds. Although these policies have been primarily implemented in the European context, they offer a blueprint to other countries looking to increase their active travel commitments as green recovery programs from the COVID-19 pandemic.

A critical first step for LMICs seeking to improve active travel can be to integrate active mobility infrastructure into national and local transport standards and broader transport plans. For example, plans could require implementation of cycle tracks alongside rail lines or large-scale bicycle parking in transport hubs and stations, or mandate improved pedestrian accessibility in neighborhoods around major transport projects.

A shift in spending priorities can also result in more investments that incentivize sustainable transport while discouraging motorized private mobility. For instance, 77 percent of federal transport spending in metropolitan areas in Mexico goes toward facilitating private transport mobility¹² while 80 percent of trips nationally are made by public transport and active mobility.¹³

Historically, nationally designated funds for active mobility have been lacking, but as the climate crisis looms and the COVID-19 pandemic persists, the importance of active mobility is increasingly being recognized. The funding that does exist is largely clustered in high-income countries located in Europe and North America, reflecting a distinct need for national governments around the globe to prioritize active mobility in their budgets. Even as the COVID-19 pandemic has seen unprecedented surges in walking and cycling, only four percent of funds from stimulus packages for pandemic recovery globally have gone toward active mobility¹⁴ (box 6-3). In contrast, the United Nations Environment Program has advocated for a minimum of ten percent of transport infrastructure budgets to be allocated to nonmotorized transport since 2008.¹⁵

Box 6-3. Combating COVID-19: Peru's Investment in Pop-Up Bike Lanes

In response to the COVID-19 pandemic, countries around the world have announced emergency finance packages, including emergency active travel funds to accommodate people's mobility needs. These active travel funds have been primarily used to establish pop-up bike lanes and pedestrianized streets to adapt to outdoor dining and events.

In Peru, the government passed an emergency decree to approve more than US\$5.5 million for the construction of pop-up bike lanes. This was the result of witnessing a growth in demand for active mobility after public transport commuters began avoiding buses. Carrying out such an ambitious initiative at the national level in a country without a strong cycling culture was a remarkable accomplishment, showing how national governments can make a difference investing in sustainable transport during times of a crisis.

After the emergency decree was passed, Peruvian municipalities were invited to submit proposals for planning and implementing pop-up cycle lanes that included an operations and monitoring plan and ridership demand forecasts. The proposals also needed to include plans for making the emergent

cycle lanes permanent once the infrastructure achieved significant usage and public acceptance. On careful review of the proposals, 25 of mostly mid- and small-sized cities were selected to build about 400 kilometers of cycle lanes. While most of the cycle lanes are targeted for completion in October and November of 2021, these critical changes on the road are happening in many places where cycle lanes and cycling culture did not exist.

Yet these efforts have not been without their challenges. Many of the municipalities receiving these funds have insufficient human resources to execute the work. The bureaucratic processes have also slowed down the projects and caused significant delays. However, the Ministry of Transport and Communications (MTC) has provided support and capacity building to help facilitate the projects.

Another challenge, especially in the cities without a strong cycling tradition, has been the resistance from several groups who believe that replacing vehicular travel lanes or street parking with cycle lanes will impact them negatively. This strong resistance has come particularly from private vehicle users, as well as taxi and informal transport operators.

The MTC believes the program could have been executed more efficiently by increasing engagement with the local communities to learn about the many benefits of the new cycling infrastructure. In each city, workshops were carried out with civil society and media engagement, and such activities will continue throughout the duration of the program. Several local groups and organizations have been very supportive of this program and have helped promote it.

Once the pop-up cycle lanes are completed, the MTC will continue to support the 25 cities throughout their operations and monitoring phases. The MTC will also continue engagement with the local communities in an effort to make these cycle lanes permanent.

Source: Interview with Ismael Sutta Soto, former Executive Director of the National Sustainable Urban Transport Program - PROMOVILIDAD of the MTC and Advisor to the Vice Ministry of Transport. Conducted on September 17, 2021.

Cycling has enjoyed greater funding as evidenced by many European countries that have especially earmarked funding for cycling. France created a national cycling fund in 2018 that will channel 350 million euros into constructing new cycle lanes and improving existing networks through 2025. The French Agency for Ecological Transition manages the fund and is dedicated to fighting climate change and promoting resource efficiency. The COVID-19 pandemic also led to unprecedented spikes in cycling throughout France—the use of cycle paths increased by 29 percent since the end of confinement—which has spurred the national government to invest a further 200 million euros into cycling through 2022.¹⁶

At the time of the announcement, cycling only made up three percent of public transport in France, less than half the European average, and far below the modal share seen in northern Europe. The strategy intends to increase these levels to nine percent by 2024 when Paris hosts the Olympics.¹⁷ The rationale behind the creation of the fund is to promote cohesion between existing cycling facilities. In France, cycling infrastructure is the responsibility of individual municipalities, meaning cycle networks are often discontinuous and, in some cases, without safe intersection redesign.¹⁸

Likewise, Germany has announced the third iteration of their national cycling plan that details strategies for increasing cycling in urban and rural areas through 2030.¹⁹ Germany has long been known for its heavy car presence, largely due to the immense sway of the German automotive industry economically and politically, but attitudes are changing as the nation faces the climate crisis as well as high numbers of cycling accidents. The country has seen a big push for equitable public

space, particularly when it comes to sharing the road among all users.²⁰ This means reclaiming part of the road for safe bike infrastructure. The plan includes a national investment of 900 million euros in cycling as part of the national climate protection program, and will, like France, be administered by its national climate protection program. This investment comes on the heels of several other budget lines as Germany scales up its cycling initiatives, totaling 1.46 billion euros to be invested in cycling between 2020 and 2023 alone.²¹

Germany has also announced a forthcoming National Walking Strategy that sets out national goals and strategies for achieving them.²² Although the details of the strategy are not yet known, a portion will focus on financial resources. A policy framework previously published by Germany's Federal Environment Agency and the German Institute for Urban Affairs briefly outlines where potential funding could come from.²³ Apart from improving existing mechanisms, the framework suggests integrating walking into research funding for studies or pilot projects or integrating pedestrian infrastructure into ongoing development projects.

Other countries have chosen to develop comprehensive active travel programs and funds that cover both cycling and walking in one plan (box 6-4). Ireland has chosen such a model, having developed a national active travel investment program that is set to receive 20 percent of the annual transport budget. The Irish government introduced the Programme for Government (PfG) in June 2021, in which it clearly established its commitment to improving the climate impact, quality of life, air quality and physical and mental health of its citizens via substantial investments into its active mobility systems and infrastructure. The government devised a five-year, multiannual funding program in which 20 percent—€360 million per year—of its total transport capital budget will be allocated to cycling projects and pedestrian infrastructure. It means Ireland is investing nearly one million euros a day into active travel projects.²⁴ Notably, Ireland has also made the choice to split the funds equally between walking and cycling, highlighting the need for walking and pedestrian infrastructure to be given greater weight. This is a substantial increase to the cycling infrastructure budget, which in 2018 was only €12.64 million—less than two percent of the total transport budget.²⁵ The funding will be used primarily to improve the safety of road users—both cyclists and pedestrians—through increased separations, better signage and marking, and road design. In doing so, the government hopes to foster a low carbon, active mobility culture in Ireland.

Aside from national transport plans or strategies, countries have established fiscal instruments or other forms of dedicated revenue streams that may go toward active mobility project. These policies also function dually in managing transport demand by incentivizing modal shifts away from private car use to active mobility modes.

For example, many nations have implemented a fuel tax or gas tax on the sale of fuel, particularly those used in transportation. Often, the revenue generated from fuel taxes is invested back into transportation infrastructure projects. In Canada, the federal Gas Tax Fund has been allocated to infrastructure projects, some of which relate to active travel such as direct walking and cycling projects, recreational infrastructure, tourism infrastructure, and capacity building.²⁶ Some nations frame fuel taxes as ecotaxes or environmental taxes, that are purposefully levied to encourage environmentally friendly activity, in this case to avoid driving motor vehicles.²⁷

Yet, countries around the world and of varying income levels continue to subsidize fossil fuels under the false guise of fostering development. Fossil fuel subsidies are typically divided into consumer and producer subsidies, wherein the former benefits customers and household and the latter benefits suppliers and companies. In the developing world, consumer fossil fuel subsidies are often presented as a method to address energy poverty and reduce wealth inequalities. However, fossil fuel subsidies have been known to reinforce or exacerbate existing inequalities. A study by

the International Monetary Fund (IMF) found that 61 percent of gasoline subsidies in LMICs went to the richest 20 percent, whereas only 3 percent went to the bottom 20 percent.²⁸ Ultimately, fossil fuel subsidies are diverting crucial public funds away from those that need them most, while also harming the environment and encouraging unsustainable practices. The money unlocked by eradicating fossil fuel subsidies would be better spent on developing investment in renewable energy and sustainable systems, such as active mobility.

In contrast to taxation and other revenue streams, some countries are incentivizing active travel, particularly cycling. Across Europe several countries have implemented national cycle to work schemes that reward bike commuters for their mode choice. Belgium has the longest running cycling- to-work scheme in Europe, that started in 1999. In Belgium, cyclists can claim 0.24 euro in tax credits for every kilometer biked on the way to work. According to the European Cyclists Federation, the percentage of commuters claiming these credits rose by 30 percent between 2011 and 2015.²⁹ Likewise, some European countries are subsidizing bicycles for its citizens or businesses. In Italy, residents in urban areas can claim up to 500 euros in compensation for purchase of bikes, e-bikes, and other similar vehicles.³⁰ Scrappage premiums can also be employed to encourage purchasing e-bikes or cargo bikes. France is developing a purchasing premium for the scrapping of old vehicles that could be worth up to 2500 euros toward an e-bike or cargo bike.³¹ Yet LMICs often trail high-income countries in this regard. In Ethiopia, a longstanding tax on bicycles—customs duty 15 percent, VAT 15 percent, and withholding tax 3 percent—as a luxury good has limited ownership and made it difficult for poorer populations more likely to benefit from biking to attain the necessary equipment. Although some developing countries may not be poised to provide monetary incentives for active mobility, steps can be taken to promote greater rates of safe walking and cycling by removing or reducing import duties and other fees.

6.4 International financing

Several countries in the Global North have made sustained progress articulating regional, national, and supranational funding mechanisms that have resulted in infrastructure projects that support active mobility. Considering the daunting financial and institutional challenges among countries in the Global South, multilateral finance has an important role to play in funding active mobility in countries across the developing world.

Multilateral development banks (MDBs) have effectively supported nations in all continents in integrated policy making and the development of basic infrastructure like roads, sewerage, and hospitals. In the context of a growing demand for infrastructure funding, the networks and capacities that these organizations have deployed throughout the world make active mobility funding transactions much easier and cost effective to implement. MDBs can contribute significantly to covering the US\$440 billions of transport infrastructure annual financing gap that is needed to meet the UN Sustainable Development Goals by the target date of 2030. Furthermore, funding for the global road network should address its road safety deficits, given that 88 percent and 86 percent of roads in the world lack minimum safety for walking and cycling respectively.³²

The participation of MDBs in the financing of nonmotorized mobility has primarily consisted of technical assistance projects. For example, Bogotá received US\$1 million—through the C40 Cities Finance Facility, in partnership with the Inter-American Development Bank and the World Resources Institute—to develop studies for the city's Quinto Centenario cycle avenue, a 25-kilometer cycling highway.³³ Other planning instruments for cycling infrastructure plans or public bikeshare systems have received funding from MDBs and fellow international organizations in cities around the world.

National governments, which ultimately request lending programs, have their priorities focused on traditional regional road development or exclusively on mass transit projects rather than on active transport initiatives that normally fall within municipal jurisdiction. Even when national governments may display a lack of appetite for sustainable transport projects,³⁴ MDBs have proved they can effectively sway financial flows, especially when working collectively. During the 2012 United Nations Conference on Sustainable Development (Rio+20), eight different multilateral development banks made the commitment to provide US\$175 billion in lending to developing countries in the 2012–2022 decade. The initiative is on track to meet or exceed its target: by the end of 2018, MDBs had already approved US\$149 billion or 85 percent of the original pledge. Although funding for urban transport peaked at 31 percent in the 2018 period, “only a small number of walking and cycling projects” have been supported.³²

The heightened interest for climate action projects represents an opportunity to implement ambitious active mobility initiatives and certain MDBs have already included walking and cycling within their climate investment strategies. In its Climate Action Plan 2021–2025,³⁵ the World Bank lays out a vision for its climate-related operations, pledging to align financial flows in all new projects with the Paris Agreement by July 2023 and to achieve an average of 35 percent of climate finance for all the World Bank Group institutions during the plan’s 5-year period. Support for active mobility is included in the transport section as it is one of the five key system transitions that the World Bank will prioritize.

The European Investment Bank’s (EIB) Climate Bank Roadmap 2021–2025³⁶ includes commitments for the same criteria: alignment of operations with the Paris Agreement before 2030 and 50 percent of lending activity to green finance by 2025. The EIB climate plan also mentions infrastructure and equipment funding for active mobility—walking, cycling, e-bikes, and scooters—under the land transport infrastructure activity.

The Asian Development Bank (ADB) has augmented its support for sustainable transport in its developing member countries in Asia. It is increasing its general lending volume for transport from US\$2 billion to US\$4 billion per year and, as part of its Sustainable Transport Initiative, will be putting increased emphasis on mainstreaming of sustainable transport in its existing transport operations.³⁷

The Development Bank of Latin America (CAF in Spanish) also has formulated the Green Bond Program to assist countries achieve a low carbon society. CAF’s strategic approach focuses on mobilizing financial resources in the region to promote investments in infrastructure, energy, social development, environmental sustainability, and climate change. Clean transportation is among the main categories that qualify for the Green Bond Program.³⁸

Cooperation between environmental funding organizations and MDBs has resulted in a few examples of active mobility infrastructure projects. For instance, the World Bank and the Global Environment Facility (GEF) through its Sustainable Transport and Air Quality Programme (STAQ), financed sustainable mobility projects in four Argentinean cities in 2009.³⁹ The investments, which were linked to two World Bank urban transport operations, financed 18 kilometers of bikeways, a public bike sharing system, and capacity building projects, as well as other public transport and urban planning activities. The operation required coordination between government agencies at the national, regional, and local level and two international organizations. Although the reach of the project was modest, the replication potential is significant and should serve as an example of how climate funding may result in infrastructure that improves conditions for people who walk and cycle.

Climate-specific financing has also been directed at investment in active mobility, though largely indirectly. The aforementioned GEF has itself funded more than 1,330 sustainable transport

projects across 49 countries and 136 cities, 48 percent of which the GEF has said include active mobility components. Focus has particularly been given to cycling, with 575 kilometers of bike lanes constructed or repaired through these projects along with supporting infrastructure, such as bike parking and walkways.⁴⁰ The Green Climate Fund (GCF) has also funded projects with active mobility elements. For example, when the GCF gave US\$49 million to Karachi, Pakistan, for a BRT project, the plan also included initiatives to promote walking and cycling.⁴¹

6.5 Private sector sources

In addition to public funding, many private sources invest in active mobility infrastructure. The sources described in this section are not exhaustive but rather cover a range of private sources that have been known to fund walking and cycling initiatives related to their interests.

One common source of private funding is that of developers. Many cities require developers to either build or pay for the adjacent street infrastructure to receive the needed building permits or additional development rights. Some cities have mandated that with new development the street infrastructure must be upgraded to include landscaping and cyclist and pedestrian-friendly infrastructure. In 2019, the City of Cambridge, Massachusetts, USA, passed a Cycling Safety Ordinance that requires the construction of protected bike paths on any streets that are being reconstructed and have been designated for a bike path in the city's bike network vision plan. Any building proposal requiring a special permit for a development project that does not comply with the zoning ordinances may obtain them by constructing protected bike paths as part of the mitigation and permit requirements.⁴²

Photo 6-4: Pedestrianized commercial street in Ho Chi Minh, Vietnam.



Source: Giovanni Zayas

Other cities have entered public-private partnerships with local corporations looking to boost active mobility and frequently by proxy, their cycle-to-work schemes. In 2017, the city of Essen in Germany was awarded the title “European Green Capital” where promoting cycling among employers became a municipal objective. The city offers partial funding for employers to achieve the European Cyclists’ Federation’s Cycle-friendly Employer Certification and sponsors informational workshops for interested employers. Since 2017, 13 employers have been awarded a certification.⁴³

Other private institutions may find that their missions are mirrored in the benefits brought by active mobility, such as increases in sustainability and public health. Hospitals and healthcare systems form some of these institutions and have been known to contribute to physical infrastructure projects, especially those that provide access to their network for employees, visitors, and patients alike.⁴⁴ Public health departments and other local organizations focused on health can also make for strong partners. Data held by health-related systems and organizations on the benefits of safe active mobility infrastructure as well as data on traffic injuries and fatalities can also be used to form compelling arguments to achieve more funding.

Large cities around the world have funded public bike share (PBS) systems through sponsorship deals (see also Local financing). New York City’s Citibike, is one of the largest PBS operated with no public funding. Citibike was funded through a sponsorship deal with Citibank and loans from other private banks. Similarly, London’s Santander cycles operate with sponsorship deals with Santander Bank, and Mexico City’s Ecobici will be transitioning to a similar model starting in mid2022, where the cycles will bear the logo of the brand that sponsors the PBS.

Universities and colleges are also keen to improve accessibility for their students, faculty, and staff through cycling networks.⁴⁴ Many campuses, particularly those in urban settings, face parking challenges that make cycling an attractive alternative to passenger car use. Historically, schools have been associated with cycle commuting, given that many students at higher levels lack access to cars and that students are typically too young to drive during grade school. For example, an assessment by Decisio and the Dutch Cycling Embassy in Lima, Peru for Pontificia Universidad Católica del Perú found that it would cost the university six times less to provide its employees with cycling facilities than to provide on-campus parking comes in addition to benefiting the whole community.⁴⁵

Private philanthropical donations are yet another source of funding for active mobility initiatives. Cycleways in high demand, such as those that link culturally significant locations, can benefit from this form of private support. Although most philanthropical donations come from foundations and similar organizations, large donations can also be leveraged from the community through campaigns; however, this also depends on local income rates. More technologically diverse forms of private donation offer innovative ways to achieve needed funding like crowdfunding. Crowdfunding can also play an important role in boosting public awareness of a project and promoting enthusiasm.

6.6 Additional considerations

The benefits yielded by active mobility infrastructure are immensely sustainable, but sustainability can be taken a step further when additional considerations regarding the building process are considered. Integrating circular economy practices into infrastructure construction can not only be beneficial for active mobility interventions, but also for all transport infrastructure. In a circular economy, previously manufactured goods are reused, repaired, or recycled for repeated consumption or use. The circular economy approach shifts away from the traditional linear economy of take, make, use, and dispose.

National road authorities across the world, and especially those in Europe, have already begun shifting toward circular approaches. The European Commission issued a technical report in 2016, detailing circular practices for the pavement and road construction and maintenance sectors. The following methods were identified by the EU Commission as the most relevant and which could be rapidly instituted:

- i. Using resources efficiently in construction
- ii. Using recycled content in materials, such as asphalt pavements
- iii. Reusing excavated materials that are not hazardous during construction
- iv. Conserving the water and habitat on site through appropriate drainage systems, preferably ones that reuse the drained water⁴⁶

Cities and countries around the globe have embraced these recommendations and even taken further steps to cultivate a green economy. Costa Rica became the first country in Central America to pilot paving roads with recycled plastic, following in the footsteps of India, Canada, and Europe. The initiative is part of a public-private partnership formed between the Cost Rican government and a number of public and private partners.⁴⁷ The city of Zwolle in the Netherlands has implemented a bike lane made of recycled plastic waste, composed of plastic bottles, cups, old plastic furniture, and discarded packaging.⁴⁸ Glasgow has similarly trialed a variety of recycled plastic and rubber separators for bike lanes, which having proved successful, are to be deployed citywide.⁴⁹

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7. Conclusion: The Path Forward

Building on the momentum of active mobility from the global COVID-19 pandemic, many cities have made great strides, yet there remains much to do. Active mobility has yet to become an institutional priority at all levels: local, regional, national, and international, where decisions about resources and financing opportunities are made. Without a clear understanding of active mobility's potential to generate health, economic, and environmental benefits, aligning financial opportunities to funding needs in walking and cycling infrastructure projects will continue to be challenging.

Roads and public space must be reclaimed and redesigned to make these modes safer and more attractive to achieve a significant modal shift toward active mobility. Yet the most effective way to encourage walking and cycling will also include network integration with public transport systems, changes to land use planning, setting and managing safe driving speeds, and efforts to appropriately regulate users of highly subsidized and carbon-intensive transport modes. None of this will be possible without meaningful investment in active mobility infrastructure. The responsibility to boost momentum and steer it in the right direction is shared between international organizations, national and local governments, as well as private entities. Each can play an important role from where they stand. Several policy recommendations in this regard provide some direction.

Prioritizing active mobility in policies on national and local levels by aligning it to broader goals on climate, road safety, health, equity, and build back better strategies. Examples include goals like cutting 50 percent of emissions by 2030 or achieving zero traffic deaths by 2050. Multiple agendas linked together in this manner are more likely to yield multifold results than in developing siloed initiatives, while also being more cost effective. Around the world, 30 percent of all urban trips are five kilometers or less and 50 percent are 10 kilometers or less. These trips can be made by walking or cycling with great impact in reducing carbon dioxide emissions, congestion, air pollution and traffic fatalities. One way to begin this is to enshrine the safe system approach in national or municipal transport planning such that vulnerable users, namely pedestrians and cyclists, are prioritized and protected. In developing countries, the majority of people walk or cycle, therefore, providing them with safe and well-connected infrastructure will ensure these rates are retained both for the betterment of public health and society at large. To not prioritize active travel, is to neglect these users and inhibit their access to economic opportunities and better health.

Integrating cycling and pedestrian infrastructure into: (i) long term transport plans as a key component of integrated transport systems, (ii) standards for design in local practices for urban infrastructure, and (iii) financing schemes at the national and regional or metropolitan levels. For example, cycle lanes can be integrated alongside transit and rail projects. When Bogotá built its TransMilenio BRT system, the city made the choice to simultaneously build a cycle network to improve connectivity throughout the city and to its new BRT network. As such, the main bicycle network, secondary network, and complementary network were constructed, in which the secondary network partly functions to provide specific links to TransMilenio.¹

Gearing substantial amounts of international climate funding and investment toward active mobility and agreeing on corporate commitments for the inclusion of active mobility projects in infrastructure loans from MDBs. We are witnessing unprecedented levels of investments for climate finance, with flows reaching US\$574 billion per year on average in 2017-18.² Active mobility should be featured as the greenest, most resilient, and most equitable form of transport, as we seek to mitigate and adapt to climate change. MDBs can be game changers by financing active mobility through corporate and sector commitments for major urban transport projects or by pioneering standalone operations for citywide transformation through NMT infrastructure.

Setting a minimum 20 percent of the transport or infrastructure budget for active mobility is the most straightforward way to fulfill active mobility goals in a sustained form. Countries and cities with higher percentages of pedestrians and cyclists might consider proportionally allocating higher percentages of their budgets to active mobility. For cities and countries just starting out, setting a lower percentage is better than setting none, but UNEP recommends a minimum benchmark of 10 percent. For example, Ireland was able to set 20 percent of the national transport budget for active mobility as part of its commitment to achieving climate goals.³ Nairobi, with the support of UNEP, has also set a 20 percent commitment to active mobility within the city’s budget, yet Nairobi exemplifies how setting a percentage does not always lead to activation.⁴ Only in the pandemic context did the city begin to leverage these funds to build active travel infrastructure.

Establishing a screening process for transport and road infrastructure projects to ensure adequate and appropriate inclusion of walking and cycling components. Screening for inclusion of safe active travel accommodations and infrastructure in major transport and infrastructure works is another way to ensure these interventions are not only well integrated, but also built to a high quality. The inclusion of active mobility infrastructure, or lack thereof, can also be used by the responsible entity to dictate priority and even funding.

Undertaking capacity building to training staff on best practices for active mobility with the ultimate goal of creating a dedicated team or unit. Financing and implementing active mobility projects are only the first step, ensuring this infrastructure is up to standard in safety and comfort for users is what achieves modal shift. Implementing unsafe infrastructure will not reap benefits, on the contrary it will waste resources and result in more costs to public health and the economy. Building the high-quality infrastructure needed to foster modal shift and benefits will hinge on training planners, engineers, and other staff on best practices for designing active travel infrastructure.

Encouraging tax incentives for private investors, developers, and suppliers. This can take place on the local or national level depending on the type of tax or service. For example, a city can set an incentive for a developer to include new sidewalks or state-of-the-art biking facilities in their projects, while the national government is better equipped to set tax breaks and incentives on import or local industries for bike vendors.

Photo 7-1: People crossing the street in Guayaquil, Ecuador



Source: Claudio Olivares

Setting plans that reflect the political economy of each country or city is key. Europe seems to have the most advanced planning and funding for active mobility, and it is an example to follow. The EU has steadily reprogrammed its sustainability and transportation-related priorities to focus greater investments and commitments on walking and cycling. Countries throughout the EU, and Europe more broadly, have bound financial resources to a clear plan that will ensure funding goes to the right place and can provide mobility options for people who walk or cycle, either out of necessity or choice.

Realizing the opportunities to finance active mobility in the developing world and make a shift that would meet transport needs, address the economic constraints, and relieve climate change impact. In the developing world, where motorization rates are lower, where the vast majority of people walk and cycle, and where the economic impacts of COVID-19 will be felt stronger, opportunities to make change are also higher. Retaining modal share in these countries and cities will be the first step toward this goal.

This report explored the benefits and various methods of investment in active mobility that have been undertaken at the local, national, and international levels as well as through private sector sources. The ability to follow the examples provided from many of the high-income countries will depend on individual context. However, the path to sustainable mobility requires a beginning, and understanding how other countries and cities have invested in active mobility will provide the critical platform to begin. The role of political will in achieving progress in prioritizing active mobility investment is one clear common denominator through the number of success stories presented, and its lack thereof remains a major barrier. Therefore, governments play a major role in setting clear, strong, and durable policies to define the path of active mobility.

Notes

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3. Bray, J. 2020. "Cycling and Pedestrian Projects to Get €360m, Parties Agree." The Irish Times. <https://www.irishtimes.com/news/politics/cycling-and-pedestrian-projects-to-get-360m-parties-agree-1.4279850>
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