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INTEGRATING ACTIVE TRANSPORTATION INTO TRANSPORTATION PLANNING IN DEVELOPING COUNTRIES: CHALLENGES AND BEST PRACTICES

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ABSTRACT

Active transportation is gaining recognition as a sustainable and healthy mode of transportation in developing countries. However, integrating active transportation into transportation planning in these countries presents unique challenges. This study aims to identify the challenges and best practices for integrating active transportation into transportation planning in developing countries. Through a literature review, the study found that the lack of infrastructure is one of the primary challenges in integrating active transportation into transportation planning in developing countries. Developing safe and connected infrastructure for active transportation, such as well-maintained sidewalks and bike lanes, can help to address safety concerns and encourage more people to walk and cycle. The study also found that safety concerns, limited resources, and cultural attitudes are significant challenges. Engaging the community in the transportation planning process and prioritizing active transportation in transportation planning and funding can help to ensure that it is given equal consideration to other modes of transportation. Additionally, promoting active transportation through education campaigns and public events can help to change cultural attitudes and encourage more people to walk and cycle. The study recommends using data to inform decision-making and ensure that resources are being used effectively. Collecting and analyzing data on active transportation use and infrastructure can help to inform transportation planning decisions and prioritize the needs of pedestrians and cyclists. Further research is needed to evaluate the effectiveness of these best practices in different contexts and to identify additional strategies for integrating active transportation into transportation planning in developing countries.

Keywords: Active transportation, Developing countries, Infrastructure, Pedestrian, Policy, Sustainable transportation, Transportation planning

INTRODUCTION

Active transportation, which involves the use of human-powered modes of transportation such as walking, cycling, and public transportation, plays a crucial role in developing countries. This is particularly important in these regions where the majority of people are low-income earners who cannot afford private cars. Active transportation provides them with an affordable and sustainable means of commuting. It also reduces the reliance on motorized transportation, which is known to contribute significantly to carbon emissions, leading to environmental degradation and air pollution.

Active transportation is becoming increasingly popular as more people recognize the many benefits it offers. Unlike motorized vehicles, which emit harmful pollutants into the air and contribute to climate change, active transportation has little to no carbon footprint. Additionally, active transportation is much quieter and less disruptive to communities than motorized transportation. By promoting active transportation, cities can create more livable and sustainable communities.

Walking or cycling regularly can help individuals maintain a healthy weight, reduce the risk of chronic diseases, and improve mental health. Active transportation also provides an opportunity for social interaction and community building, as people are more likely to interact with their surroundings and with other individuals while walking or cycling. In addition, active transportation can be a more cost-effective mode of transportation for many individuals. With rising fuel costs and increasing traffic congestion in many urban areas, active transportation can be a more efficient and affordable way to get around.

Transportation planning in developing countries is a complex and challenging task, primarily due to the unique set of issues and factors that these countries face. Developing countries often have limited financial resources, inadequate infrastructure, and a growing population, all of which can impact their transportation systems. Therefore, it is imperative to develop efficient and sustainable transportation systems that can meet the growing demand for mobility while also addressing environmental concerns and social equity.

One of the major challenges faced in transportation planning in developing countries is the lack of adequate infrastructure. Most developing countries have limited resources to invest in transportation infrastructure, resulting in poor road conditions, inadequate public transportation systems, and insufficient funding for maintenance and upgrades. As a result, many people in developing countries are forced to rely on walking or cycling, which can be dangerous and time-consuming, especially for those who need to travel long distances. This problem is further compounded by the fact that developing countries often have a high population density, which puts additional pressure on the transportation infrastructure.

Another issue that transportation planners face in developing countries is the lack of data and information. Transportation planning requires accurate data on travel patterns, trip origins, and destinations, as well as information on the mode of transport used. However, in many developing countries, such data is either non-existent or unreliable, making it challenging to plan transportation systems effectively. Additionally, transportation planners in developing countries must also take into account the diverse cultural and socioeconomic backgrounds of their communities, which can impact travel behavior and transportation needs.

CHALLENGES IN INTEGRATING ACTIVE TRANSPORTATION INTO TRANSPORTATION PLANNING IN DEVELOPING COUNTRIES

Lack of infrastructure:

One of the major infrastructure challenges in developing countries is the lack of safe and well-maintained sidewalks. In many cities, sidewalks are either non-existent or in a state of disrepair, making it difficult for pedestrians to walk safely. This is especially problematic for individuals with disabilities or those who use mobility aids, as they may not have alternative options for transportation. Additionally, poorly maintained sidewalks can lead to tripping hazards, which can cause injury and deter people from using active transportation.

Table 1. Necessary infrastructure for active transportation

Infrastructure Element	Description
Safe and well-maintained sidewalks	Dedicated walkways separated from vehicular traffic or with clear demarcations. Proper maintenance with good lighting and landscaping.
Bike lanes	Dedicated lanes for cyclists with physical barriers or clearly marked separation from vehicular traffic. Can be one-way or two-way.
Crosswalks and pedestrian signals	Marked crossing points with signs, pavement markings, and/or signalized controls to allow pedestrians to safely cross roads.
Shared-use paths	Off-street paths or trails for use by pedestrians, cyclists, and sometimes other non-motorized vehicles, separated from vehicular traffic.
Bicycle parking facilities	Secure, covered, and convenient parking spaces for bicycles, often located close to key destinations such as public transit stations and commercial areas.
Traffic calming measures	Design features that reduce vehicle speeds, such as roundabouts, speed humps, chicanes, and narrow lanes.
Signage and wayfinding systems	Clear and informative signs and markings that help pedestrians and cyclists navigate the transportation network, including directional signs, route numbers, and distance markers.
Accessibility features such as curb ramps and tactile paving	Features that help people with disabilities or mobility issues, such as curb ramps, tactile paving, and audible crossing signals.
Lighting and security measures	Adequate lighting to increase visibility and reduce crime risk, and security measures such as surveillance cameras and patrols to deter theft and vandalism.
Public transportation integration	Integration with public transit networks to allow cyclists to bring bikes on buses, trains or trams, or access to bike share programs at transit stations.

Another significant issue is the lack of bike lanes in many developing countries. In cities where bike lanes do exist, they are often poorly designed and not well-maintained, making cycling unsafe and discouraging people from using bicycles as a mode of transportation. This can be particularly challenging for commuters who may need to travel long distances, as cycling can be an efficient and cost-effective way to get around. Without safe and well-maintained bike lanes, however, cyclists are forced to navigate traffic, which can be dangerous and intimidating.

The lack of infrastructure for active transportation can also lead to safety concerns for pedestrians and cyclists. In many developing countries, the roads are designed primarily for cars, with little consideration for the needs of pedestrians and cyclists. This can result in dangerous situations, such as cyclists riding in the same lane as cars or pedestrians having to walk on the side of the road. In addition to increasing the risk of accidents, this can also contribute to air pollution and traffic congestion, which can have negative impacts on public health.

The lack of infrastructure for active transportation can also discourage people from using these modes of transportation. Without safe and well-maintained sidewalks and bike lanes, people may feel unsafe walking or cycling, or may not have access to these modes of transportation at all. This can result in increased reliance on cars, which can contribute to air pollution and traffic congestion. Additionally, lack of access to active transportation options can limit economic opportunities, particularly for low-income individuals who may not have access to a car.

Safety concerns:

One of the most significant barriers to active transportation in many developing countries is safety concerns. The lack of proper infrastructure for pedestrians and cyclists, coupled with high levels of traffic and unsafe driving practices, makes it challenging for people to choose walking or cycling as their primary mode of transportation. For example, in many cities in Africa and Asia, roads are narrow, congested, and poorly lit, with few dedicated lanes or paths for pedestrians and cyclists. As a result, people feel unsafe and vulnerable on the roads, particularly at night. Moreover, many drivers in these countries disregard traffic rules and drive recklessly, putting pedestrians and cyclists at risk of accidents.

Table 2. Unsafe driving practices in developing countries

Unsafe Driving Practices	**Description**
Speeding	Drivers in developing countries often drive at high speeds, which can lead to accidents, especially on poorly maintained roads.
Drunk driving	Drunk driving is a common problem in many developing countries due to a lack of strict enforcement of drunk driving laws.
Overloading	Drivers often overload their vehicles beyond the legal limit, which can affect the stability and handling of the vehicle and increase the risk of accidents.
Non-use of seatbelts	Seatbelt use is often not enforced in developing countries, which increases the risk of injury in the event of an accident.
Distracted driving	Drivers in developing countries often engage in distracting activities such as using mobile phones while driving, which can lead to accidents.
Driving without a license	Many drivers in developing countries do not have a valid driver's license, which means they may not have the necessary skills and knowledge to drive safely.
Poor vehicle maintenance	Vehicle maintenance is often neglected in developing countries, which can result in mechanical failures that can cause accidents.

Speeding is a widespread issue in many developing countries, where drivers often travel at high speeds, particularly on poorly maintained roads. This can lead to an increased risk of accidents and collisions, as well as a higher chance of fatalities and serious injuries. High speeds can make it more challenging for drivers to react to unexpected situations or to navigate difficult terrain, particularly if the roads are poorly marked or have unclear signage. In many cases, speed limits may not be posted, or drivers may simply ignore them, leading to dangerous and unpredictable driving conditions.

Drunk driving is another significant problem in many developing countries, where a lack of strict enforcement of drunk driving laws can lead to a higher incidence of accidents and fatalities. Drivers who are under the influence of alcohol may have impaired judgment, slower reaction times, and reduced coordination, making it more difficult for them to safely operate a vehicle. In some cases, drivers may also engage in reckless or aggressive behavior when they are drunk, further increasing the risk of accidents and collisions.

Overloading is a common issue in many developing countries, where drivers may overload their vehicles beyond the legal limit. This can have a significant impact on the stability and handling of the vehicle, making it more challenging for the driver to maintain control, particularly in adverse weather or road conditions. Overloaded vehicles are also more prone to accidents and collisions, particularly if the driver is inexperienced or untrained in handling such vehicles.

The non-use of seatbelts is another widespread problem in many developing countries, where seatbelt use may not be enforced or may be seen as unnecessary. This can increase the risk of injury or death in the event of an accident, particularly if the driver or passengers are ejected from the vehicle or are not properly restrained. Seatbelts are a simple and effective way to reduce the severity of injuries in the event of an accident, and their use should be encouraged and enforced wherever possible.

Distracted driving is a growing problem in many developing countries, where drivers may engage in distracting activities such as using mobile phones while driving. This can lead to a higher incidence of accidents and collisions, as well as an increased risk of fatalities and serious injuries. Distracted drivers may not be paying attention to the road or to other drivers, and may be more likely to make sudden or unexpected maneuvers, increasing the risk of accidents and collisions. Enforcing laws against distracted driving and promoting safe driving practices can help to reduce the incidence of accidents and improve overall road safety.

Driving without a license is another significant issue in many developing countries, where many drivers may not have the necessary skills or knowledge to drive safely. This can lead to a higher incidence of accidents and collisions, particularly if drivers are inexperienced or untrained in handling different types of vehicles or driving in adverse conditions. Encouraging and enforcing the use of driver's licenses and providing training and education to drivers can help to improve overall road safety and reduce the incidence of accidents and collisions.

Poor vehicle maintenance is also a major issue in many developing countries, where vehicle owners may neglect to maintain their vehicles properly, leading to mechanical failures that can cause accidents. Poorly maintained vehicles may have worn or faulty brakes, defective tires, or other mechanical issues that can make them more prone to accidents and collisions. Regular maintenance and inspections can help to identify and address these issues before they become more serious, improving overall road safety and reducing the risk of accidents and collisions.

The fear of accidents and injury is a significant deterrent for people who might otherwise consider walking or cycling as a viable transportation option. Safety concerns can be particularly acute for women, who are more likely to be victims of harassment and assault on the streets. In some cities, women are forced to limit their mobility or rely on male relatives or hired drivers to get around, which can be costly and restrictive. Addressing safety concerns is, therefore, a critical step towards promoting active transportation, particularly for vulnerable groups such as women, children, and the elderly.

Limited resources:

In developed countries, the transportation sector has seen tremendous growth over the past few decades, with extensive investments in modern transportation systems and infrastructure. However, the story is different for developing countries. These countries often face significant challenges in transportation planning and infrastructure development due to limited financial and human resources.

One of the significant challenges facing transportation planning and infrastructure development in developing countries is the limited financial resources. Many developing countries are characterized by a high poverty rate, and they allocate only a small portion of their budget to transportation infrastructure development. This can have a severe impact on the development of active transportation systems. Active transportation includes walking, cycling, and public transit, which are essential modes of transportation in developing countries due to their affordability and accessibility. However, limited financial resources mean that these modes of transportation are often not prioritized in favor of private cars.

Another challenge facing transportation planning and infrastructure development in developing countries is the limited human resources. Developing countries often have a shortage of qualified transportation planners, engineers, and technicians. This can be attributed to the lack of investment in education and training in the transportation sector. The limited human resources can significantly hinder the development of active transportation infrastructure as there is a need for skilled personnel to design and implement these systems.

The limited resources also mean that developing countries have limited access to the latest technologies and equipment required for transportation infrastructure development. For instance, advanced technologies such as intelligent transportation systems, which are crucial in managing traffic flow and improving transportation efficiency, are often not available in developing countries. This can hinder the development of active transportation systems as modern technologies are essential in developing safe and efficient infrastructure for active transportation.

Limited resources also have a severe impact on the maintenance and upkeep of transportation infrastructure. Developing countries often have a high demand for transportation services, and the existing infrastructure may not be able to keep up with the demand. This can lead to poor maintenance of transportation infrastructure, which can cause safety hazards and negatively impact transportation efficiency. The limited resources mean that developing countries may not have the necessary funds to invest in regular maintenance and upkeep of transportation infrastructure.

Another challenge that developing countries face is the lack of political will to prioritize active transportation over other modes of transportation. Political leaders in developing countries often prioritize private car use over active transportation as they view it as a symbol of wealth and status. This can be attributed to the fact that many politicians in developing countries are wealthy and own cars, and therefore do not see the need to prioritize active transportation. The lack of political will can significantly hinder the development of active transportation infrastructure, even when there is a need for it.

The limited financial and human resources in developing countries pose significant challenges to transportation planning and infrastructure development, particularly in the prioritization of active transportation over other modes of transportation. The lack of investment in education and training, limited access to advanced technologies, and the lack of political will can severely hinder the development of active transportation infrastructure. Addressing these challenges requires significant investment in education and training, increased funding for transportation infrastructure development, and a shift in political priorities to prioritize active transportation over private cars.

Cultural attitudes:

in some developing countries, cultural attitudes can pose a significant challenge to promoting active transportation as a viable and desirable mode of transportation. In particular, walking and cycling may be seen as a sign of poverty or a lower social status, which can deter people from using these modes of transportation and instead opt for more expensive and environmentally harmful modes, such as driving or taking public transportation.

The stigma surrounding walking and cycling in developing countries is rooted in a variety of cultural and socioeconomic factors. In many developing countries, car ownership is often viewed as a symbol of wealth and social status. This is particularly true in urban areas, where owning a car is often seen as a necessary status symbol for upwardly mobile individuals. Conversely, walking and cycling are often associated with lower-income individuals who cannot afford a car or do not have access to public transportation. This creates a cultural bias against these modes of transportation, which can be difficult to overcome.

Another factor that contributes to the stigma surrounding walking and cycling in developing countries is safety concerns. Many developing countries have inadequate infrastructure for pedestrians and cyclists, which can make it dangerous to use these modes of transportation. For example, sidewalks may be poorly maintained, and bike lanes may be nonexistent, forcing pedestrians and cyclists to share the road with motor vehicles. This can lead to accidents and injuries, further reinforcing the idea that walking and cycling are dangerous and undesirable modes of transportation.

Additionally, there is a cultural perception in many developing countries that physical activity, particularly outdoor physical activity, is only suitable for lower-income individuals who do not have access to other forms of entertainment or leisure. This perception is often reinforced by media portrayals of physical activity as a form of punishment or a sign of poverty. As a result, many people view walking and cycling as a form of drudgery rather than a healthy and enjoyable mode of transportation.

BEST PRACTICES IN INTEGRATING ACTIVE TRANSPORTATION INTO TRANSPORTATION PLANNING IN DEVELOPING COUNTRIES

Engage the community:

it is crucial to engage the community in the transportation planning process to ensure that their needs and preferences are met.

Engaging the community is essential because pedestrians and cyclists have unique needs that may not be considered when designing transportation infrastructure. For example, people who walk or bike need safe and convenient access to sidewalks, bike lanes, and crosswalks. They also require well-lit pathways, accessible curb cuts, and other features that enhance safety and accessibility.

By engaging the community, transportation planners can gain a better understanding of the needs and preferences of pedestrians and cyclists. They can learn about the routes that people take to get to work or school, the times of day that are busiest for walking and biking, and the destinations that people need to reach. This information can help planners design transportation infrastructure that meets the needs of the community and encourages more people to walk and bike.

Engaging the community in transportation planning can take many forms. One common approach is to hold public meetings or workshops where community members can share their thoughts and ideas about transportation infrastructure. These meetings can be an opportunity for planners to present their ideas and receive feedback from the community.

Another approach is to conduct surveys or focus groups to gather input from community members. Surveys can be distributed online, through social media, or by mail. They can ask questions about people's transportation habits, the barriers they face when walking or biking, and the types of infrastructure they would like to see in their community.

Focus groups are another way to gather input from the community. In a focus group, a small group of people is brought together to discuss a specific topic. This approach can be particularly useful for gathering in-depth feedback from people who have experienced barriers to walking or biking.

Engaging the community can also involve working with community-based organizations, advocacy groups, and other stakeholders. These groups can provide valuable insight into the transportation needs and preferences of specific populations, such as low-income or elderly residents. They can also help to mobilize community members to advocate for transportation infrastructure that meets their needs.

When engaging the community in transportation planning, it is essential to ensure that the process is inclusive and accessible to everyone. This means providing language translation services, making meetings and workshops accessible to people with disabilities, and reaching out to diverse communities to ensure that their voices are heard. It is important to recognize that engaging the community in transportation planning is not a one-time event. Rather, it is an ongoing process that requires ongoing communication and collaboration between transportation planners and the community. Regular feedback and input from the community can help to ensure that transportation infrastructure is developed to meet the evolving needs of the community.

Engaging the community in transportation planning is essential for creating infrastructure that meets the needs and preferences of pedestrians and cyclists. By gathering input from the community, transportation planners can design infrastructure that is safe, accessible, and convenient for everyone. Through public meetings, surveys, focus groups, and working with community-based organizations, transportation planners can gain valuable insights into the transportation needs of the community. By making the process inclusive and accessible, transportation planners can ensure that everyone's voice is heard. Engaging the community in transportation planning is an ongoing process that requires ongoing communication and collaboration between transportation planners and the community to create a more livable and sustainable community.

Create safe and connected infrastructure:

developing safe and connected infrastructure is crucial to encouraging active transportation and reaping its benefits.

One key aspect of safe infrastructure for active transportation is well-maintained sidewalks. Sidewalks provide a safe and accessible space for pedestrians to walk, jog, or run, and can be particularly important for those with disabilities or limited mobility. In many urban areas, however, sidewalks are in disrepair, obstructed by parked cars or debris, or simply nonexistent. This can make it difficult or even dangerous for people to walk, discouraging them from choosing active transportation. Improving sidewalks by repairing cracks and potholes, removing obstacles, and adding curb cuts and other accessibility features can go a long way in making walking a safer and more enjoyable option.

Another critical element of safe infrastructure for active transportation is bike lanes. Bike lanes are designated spaces on the road for cyclists, separate from motor vehicle traffic. They provide a clear and safe path for cyclists to ride, reducing the risk of collisions with cars and improving overall safety. In addition, bike lanes can help to reduce congestion on roads, as more people opt to cycle instead of drive. However, like sidewalks, bike lanes are often insufficient or nonexistent in many areas, making it difficult for cyclists to navigate safely. Developing well-connected and well-maintained bike lane networks can encourage more people to cycle and make active transportation a more feasible option.

In addition to sidewalks and bike lanes, other infrastructure improvements can also support active transportation. For example, installing pedestrian crossings at busy intersections can make it easier and safer for pedestrians to cross the street. Adding traffic calming measures such as speed bumps or roundabouts can also help to reduce the risk of collisions between cars and pedestrians or cyclists. Furthermore, creating dedicated bike parking areas can make it more convenient and secure for cyclists to lock up their bikes, encouraging more people to choose cycling as a mode of transportation.

Developing safe and connected infrastructure for active transportation can have numerous benefits for individuals and society as a whole. For individuals, it can promote physical activity and improve

access to affordable transportation options. For society, it can help to reduce air pollution, traffic congestion, and healthcare costs associated with physical inactivity. However, developing such infrastructure requires a commitment from policymakers, city planners, and community members alike. It requires careful planning and investment to create well-connected and well-maintained networks of sidewalks, bike lanes, and other infrastructure improvements that support active transportation.

Prioritize active transportation:

Prioritizing active transportation means giving it equal consideration to other modes of transportation, such as driving and public transit. This can involve a range of strategies, including allocating more funding for active transportation infrastructure, integrating active transportation into transportation planning processes, and incorporating active transportation considerations into traffic management plans.

One key strategy for prioritizing active transportation is investing in infrastructure that supports it. This includes building and maintaining sidewalks, bike lanes, and other dedicated infrastructure for pedestrians and cyclists. It also means ensuring that public transit systems are designed to accommodate active transportation, such as by providing bike racks on buses and trains. Investing in active transportation infrastructure can make it safer and more convenient for people to walk, cycle, and use other active transportation modes, encouraging them to choose these modes over driving.

Another important strategy for prioritizing active transportation is integrating it into transportation planning processes. This means considering active transportation alongside other modes of transportation in transportation planning, such as when designing new roadways or public transit systems. It also means engaging with stakeholders, such as pedestrian and cycling advocacy groups, to ensure that their perspectives are considered in transportation planning processes. By integrating active transportation into transportation planning processes, it can be given equal consideration to other modes of transportation, ensuring that it is not overlooked or undervalued.

In addition to investing in infrastructure and integrating active transportation into transportation planning processes, prioritizing active transportation also means incorporating active transportation considerations into traffic management plans. This can include measures such as reducing speed limits on roads where pedestrians and cyclists are present, installing traffic signals that prioritize pedestrian and cyclist movements, and creating pedestrian-only zones in city centers. By incorporating active transportation considerations into traffic management plans, it can help to improve safety and convenience for active transportation users, encouraging more people to choose these modes of transportation.

Prioritizing active transportation is crucial to realizing its benefits for individuals and society. By investing in infrastructure, integrating it into transportation planning processes, and incorporating it into traffic management plans, it can be given equal consideration to other modes of transportation. This can encourage more people to choose active transportation, resulting in improved health outcomes, reduced traffic congestion and air pollution, and increased access to affordable transportation options.

Promote active transportation:

By raising awareness of the benefits of active transportation and changing cultural attitudes towards these modes of transportation, it can help to make them more appealing and accessible to a wider range of people. Education campaigns and public events are two strategies that can be used to promote active transportation.

Education campaigns can help to raise awareness of the benefits of active transportation and provide information on how to incorporate it into daily life. This can involve outreach to schools, workplaces, and community organizations, as well as advertising campaigns in traditional and social media. Education campaigns can also highlight the potential health benefits of active transportation, such as increased physical activity and improved mental health, and provide information on how to stay safe while walking or cycling.

Public events can also be an effective way to promote active transportation. This can include events such as bike festivals, community walks, and car-free days. These events can help to make active transportation more visible and accessible to a wider range of people, providing opportunities for people to try out walking or cycling in a safe and supportive environment. They can also help to build a sense of community around active transportation, fostering social connections and promoting the idea that walking and cycling are not just individual activities, but also ways to build stronger and more connected communities.

In addition to education campaigns and public events, there are a range of other strategies that can be used to promote active transportation. One such strategy is to make it more convenient and accessible for people to walk or cycle. This can involve improving sidewalks and bike lanes, providing secure bike parking facilities, and integrating active transportation into public transit systems. By making active transportation more convenient and accessible, it can help to remove barriers that may prevent people from choosing these modes of transportation.

Another strategy is to provide incentives for people to choose active transportation. This can include programs such as bike-share systems, employer incentives for active commuting, and rewards programs for walking or cycling. By providing incentives, it can help to motivate people to choose active transportation and reinforce the idea that it is a valuable and worthwhile mode of transportation.

Promoting active transportation can help to change cultural attitudes towards walking, cycling, and other active transportation modes. By raising awareness of the benefits of active transportation, providing information on how to incorporate it into daily life, and making it more convenient and accessible, it can encourage more people to choose these modes of transportation. Education campaigns and public events are just two strategies that can be used to promote active transportation, but there are a range of other strategies that can be used as well. By promoting active transportation, it can help to create healthier, more sustainable, and more connected communities.

Use data to inform decision-making:

Data plays an important role in informing transportation planning decisions and ensuring that resources are being used effectively. Collecting and analyzing data on active transportation use and infrastructure can help transportation planners understand current usage patterns, identify gaps in infrastructure, and make informed decisions about where to invest resources.

One important source of data on active transportation use is travel surveys, which provide information on the modes of transportation people use for different types of trips. This information can be used to understand the factors that influence people's travel choices and to identify areas where active transportation infrastructure may be needed. Another source of data is automated counters, which can provide information on the volume of cyclists and pedestrians using a particular route or facility. This information can be used to assess the impact of infrastructure improvements or to identify areas where new infrastructure may be needed.

Data on infrastructure quality is also important for making informed transportation planning decisions. This can include information on the condition of sidewalks and bike lanes, as well as the quality of lighting, signage, and other amenities. This information can be used to identify areas where infrastructure improvements are needed and to prioritize investments based on need and potential impact.

Analyzing data on active transportation use and infrastructure can help transportation planners identify gaps in the system and make informed decisions about where to invest resources. For example, if data shows that a particular route or facility is heavily used by cyclists or pedestrians, but lacks safe infrastructure, it may be a high priority for investment. Similarly, if data shows that there is low usage of a particular route or facility, it may be an opportunity to reassess the need for infrastructure in that area.

Data can also help transportation planners evaluate the impact of infrastructure improvements over time. For example, if data shows an increase in cycling or walking after a new bike lane is installed, it can provide evidence that the investment was effective. This information can be used to guide future investments and to build support for active transportation infrastructure among decision-makers and the public.

In addition to informing transportation planning decisions, data can also be used to monitor progress towards goals related to active transportation. For example, if a city has set a goal of increasing the percentage of trips made by walking, cycling, or transit, data can be used to track progress towards that goal over time. This information can be used to adjust strategies and investments as needed to achieve the desired outcomes.

Using data to inform decision-making is a key component of effective transportation planning. By collecting and analyzing data on active transportation use and infrastructure, transportation planners can make informed decisions about where to invest resources, monitor progress towards goals, and build support for active transportation infrastructure among decision-makers and the public. Data can help ensure that resources are being used effectively and that investments are targeted to where they will have the greatest impact on promoting safe and active transportation.

CONCLUSION

Active transportation is often not prioritized in transportation planning in developing countries. Cars and motorbikes tend to dominate the roadways, and pedestrians and cyclists are often relegated to the margins. Moreover, many cities lack the necessary infrastructure, such as bike lanes and pedestrian crossings, to make active transportation safe and accessible. However, this is beginning to change. Cities in developing countries are increasingly recognizing the importance of active transportation and are taking steps to integrate it into their transportation planning. For example, in Latin America, the city of Bogota, Colombia, has implemented a highly successful bus rapid transit system that includes bike lanes and pedestrian walkways. In Africa, the city of Lagos, Nigeria, has built a network of cycle paths to encourage cycling and reduce congestion.

Bike-sharing schemes, where people can rent a bike for a short period, have been highly successful in cities around the world. In developing countries, bike-sharing schemes can provide an affordable and convenient way for people to access transportation. However, it is essential that these schemes are designed with the needs of local communities in mind. For example, in India, bike-sharing schemes have struggled to gain traction because many people are not familiar with cycling and do not feel safe cycling on busy streets.

Car-free zones are areas of the city where cars are not allowed, and pedestrians and cyclists are given priority. These zones can provide a safe and pleasant environment for people to walk and cycle, and can also help to reduce air pollution and congestion. In Latin America, the city of Quito, Ecuador, has created a car-free zone in the historic city center, which has helped to reduce traffic and improve air quality.

Dedicated bike lanes are lanes on the road that are reserved for cyclists, making cycling safer and more convenient. In many cities in developing countries, cycling is often seen as a leisure activity rather than a mode of transportation, and there are few dedicated bike lanes. However, this is beginning to change. In Africa, the city of Dar es Salaam, Tanzania, has built a network of bike lanes, which has helped to reduce traffic congestion and improve air quality.

Pedestrian-friendly streets are streets that are designed with pedestrians in mind, with wide sidewalks, pedestrian crossings, and street furniture. In many cities in developing countries, sidewalks are narrow and poorly maintained, and there are few pedestrian crossings. However, by designing streets with pedestrians in mind, cities can encourage more people to walk and reduce the number of accidents. There is an increase in the use of technology to support active transportation in developing countries. For example, mobile apps can be used to help people plan their walking or cycling routes, or to find bike-sharing stations. In China, the bike-sharing company Mobike has developed an app that allows users to unlock bikes with their smartphones, making it easier and more convenient to use bike-sharing schemes.

Many people in developing countries are not familiar with the benefits of active transportation, and may view walking or cycling as a sign of poverty. Education campaigns can help to change these perceptions and promote the benefits of active transportation.

Despite these positive trends, there are still many challenges that need to be overcome if active transportation is to become a mainstream mode of transportation in developing countries. One of the biggest challenges is the lack of funding for infrastructure projects. In many cities in developing countries, there is simply not enough money to build the necessary infrastructure, such as bike lanes and pedestrian crossings. Governments and international organizations need to invest more money in active transportation infrastructure if it is to become a viable mode of transportation in these cities.

In many cities, politicians are more focused on building highways and other infrastructure projects that cater to cars and trucks. To overcome this challenge, it is important to build a strong coalition of stakeholders, including community groups, NGOs, and businesses, that can advocate for active transportation and put pressure on politicians to prioritize it in transportation planning. By investing in infrastructure, raising public awareness, and building political support, we can create cities that are healthier, more sustainable, and more equitable.

Although several best practices have been identified for integrating active transportation into transportation planning in developing countries, further research is needed to evaluate their effectiveness in different contexts. Developing countries have unique challenges and constraints that may affect the implementation of these best practices, such as limited financial resources, cultural attitudes, and political support.

Therefore, it is important to conduct research to understand how these best practices can be adapted to local conditions and how they can be effectively implemented in different contexts. For example, the effectiveness of infrastructure interventions such as bike lanes and pedestrian crossings may depend on factors such as the density of the urban environment, the types of vehicles on the road, and the prevalence of informal settlements. Cultural factors such as gender, age, and socio-economic status may also influence the success of interventions aimed at promoting active

transportation. There may be additional strategies for integrating active transportation into transportation planning that have not yet been identified. For example, innovative approaches to public engagement, the use of technology to improve safety and convenience, and policies that incentivize active transportation may all have a role to play in developing countries. Therefore, further research is needed to identify effective strategies for integrating active transportation into transportation planning in developing countries.

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