Active Transportation

EGRS 451

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Introduction

Historically, streets were spaces shared by pedestrians, slow-moving carriages, and children at play. However, with the rise of automobiles, American cities, including Easton, have shifted to car-centric designs, leaving pedestrians and cyclists feeling unsafe and overlooked. Easton's compact size and walkable neighborhoods suggest great potential for active transportation, such as walking, biking, and public transit. However, these options remain underutilized due to inadequate infrastructure, safety concerns, and poor connectivity, despite research showing that many residents prefer walking as their primary mode of transportation. This project aims to address these barriers by proposing sustainable solutions to improve Easton's active transportation infrastructure, enhance safety, and promote healthier, green commuting alternatives.

At the end of our project, we will propose three options that contain active transportation features that we believe are best fit for what the city is currently considering and our own potential designs and reconstruction of the space. Simple changes, like extending pedestrian crossing times or implementing all-stop pedestrian phases at intersections, can significantly enhance walkability and safety. Specific challenges, such as crossing Larry Holmes Drive(LHD), where speeding cars create hazardous conditions for pedestrians and cyclists, will be addressed through traffic-calming measures discussed later in the report.

Cycling infrastructure will also be prioritized to serve residents who lack access to cars and could benefit from bikes as a practical commuting option. This requires designing routes that accommodate daily needs rather than recreational use while addressing Easton's winter weather challenges, such as snow and ice, through consistent maintenance. By focusing on strategic enhancements, this project aims to make active transportation in Easton safer, more accessible, and more appealing for all residents.

Social Context

Active transportation refers to human-powered, non-vehicular modes of mobility that provide essential alternatives to driving, public transit, and other motorized options. It primarily includes walking and biking, but also extends to skateboarding, scootering, and mobility aids like manual wheelchairs and walkers. Designing for active transportation means offering safe travel solutions for those relying on all of these tools to navigate their environment. According to the U.S. Department of Transportation (USDOT, 2024), active transportation infrastructure is vital for creating accessible, connected, and safe travel networks for all users, including pedestrians, cyclists, and wheelchair users. Despite over half of all trips in the U.S. being under three miles—ideal distances for walking or biking— American communities lack the necessary active transportation infrastructure (USDOT, 2024). This is primarily due to American traffic engineers prioritizing the efficiency of vehicular transportation over all other modes of transportation (Marshall, 2024).

The use of active transportation is crucial for redefining the purpose of a street as a space meant to accommodate a diverse array of users. By designing streets to be more inclusive, we can help reduce the effects of economic and physical discrimination that currently limit mobility options for many people. Anna Zivarts, in her book When Driving is Not an Option, examines the everyday hardships and systemic neglect faced by Americans who are unable to drive due to age, disability, financial constraints, or other reasons. Zivarts, a disability rights advocate and non-driver herself emphasizes how current transportation systems largely overlook the needs of this demographic. This is especially evident in Easton, PA, where gaps in infrastructure make navigating the city particularly difficult for non-drivers.

The sidewalks and streets in Easton require significant improvement, posing major challenges for pedestrians and cyclists. Through our on-site observations, we noticed many areas

are obstructed by broken sidewalks, missing curb cuts, and other hazards that make safely commuting difficult. These deficiencies in the city's infrastructure increase the risk of accidents and injuries, especially for those traveling on foot or by bike. High-traffic zones, such as LHD, are particularly problematic.

The social context allows us to see how pedestrians and drivers are affected by the current infrastructure and technologies that exist in Easton and more particularly LHD. Those groups break down even further to varying identities like the elderly, children, adults, people with disabilities, etc. We had issues with navigating around the intersection and will focus our attention on analyzing why it is ineffective, and unsafe, who it is unsafe for, and propose solutions. Likewise, the inclusion of these critical stakeholders in the redesign of the Larry Holmes Drive is especially important as they are the end users whom the project is intended to benefit. Another essential social aspect is recognizing civic duty and our role as socio-technical engineers to incorporate end users into the design process for active transportation improvements

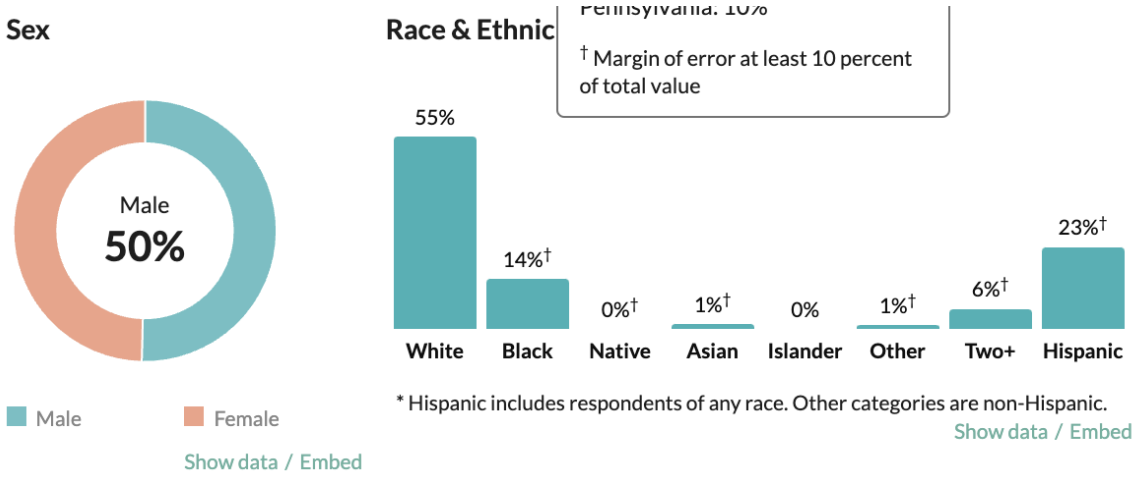

Figure 1: Easton Census Data 2022 (Census Reporter, 2022)

Another essential social aspect is recognizing civic duty and our role as socio-technical engineers to incorporate end users into the design process for active transportation

improvements. According to the U.S. Census Bureau, Easton had nearly 29,000 residents as of 2022, with a demographic breakdown of 55% white, 14% Black, and approximately 25% Hispanic—a notably diverse community. For Easton, fostering an inclusive process that encourages input from all demographics, particularly minority groups, is crucial to ensuring equitable and community-centered urban planning.

By improving active transportation options, Easton could create safer streets and foster a healthier community overall. These health statistics from Northampton County underscore the need for increased physical activity and active transportation options in Easton. With “31% of the adult population classified as obese” and “64% of Medicare recipients experiencing high blood pressure,” the community faces elevated risks of chronic health issues, such as heart disease and diabetes, which are exacerbated by the lack of physical activity (LVHN 2023). The high heart disease mortality rate, particularly among males, at “104.3 per 100,000 compared to 52.7 per 100,000 for females,” highlights the urgency of preventive measures to improve cardiovascular health in the region (LVHN 2023). Expanding infrastructure for active transportation, such as bike lanes, parks, and well-maintained sidewalks, could promote regular physical activity, making it easier and safer for residents to incorporate movement into their daily routines. Prioritizing these improvements could help address high obesity and hypertension rates,

ultimately supporting the well-being of the Easton community for the long term.

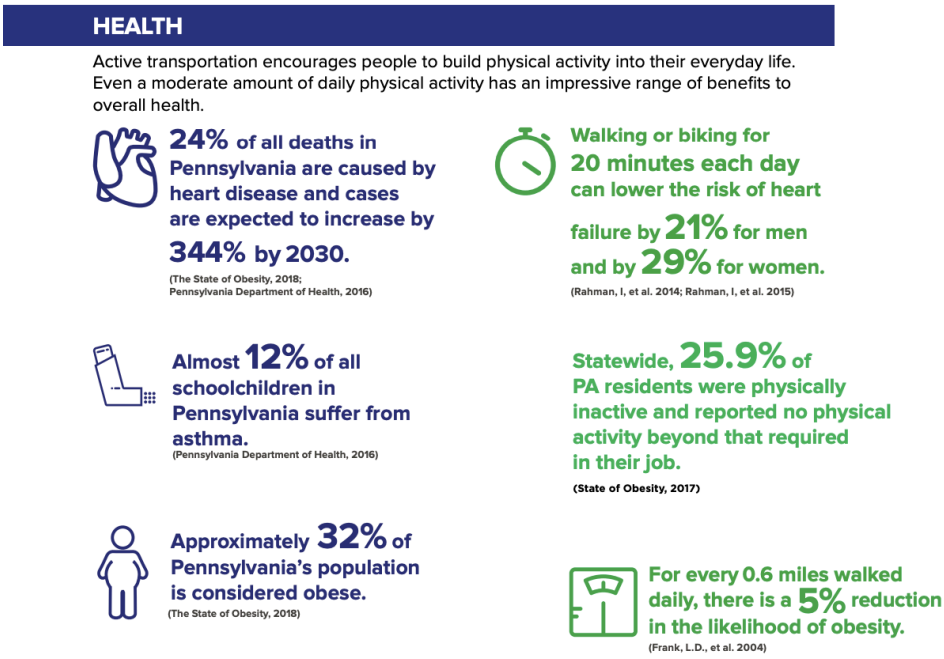

Figure 2: PennDot Active Transportation Plan Health Statistics (PennDOT, 2018)

While Easton currently lacks pedestrian-friendly infrastructure, there is hope for positive change. We can take some inspiration from cities like Columbus, Ohio, which have made efforts to integrate active transportation features. Columbus's adoption of elements like bike lanes, ample sidewalks, parks, and open spaces has not only enhanced pedestrian safety but also encouraged healthier lifestyles by making it easier and safer for people to move around without cars. This shift would not only address current safety concerns but also support the community's long-term health and well-being by promoting an active lifestyle.

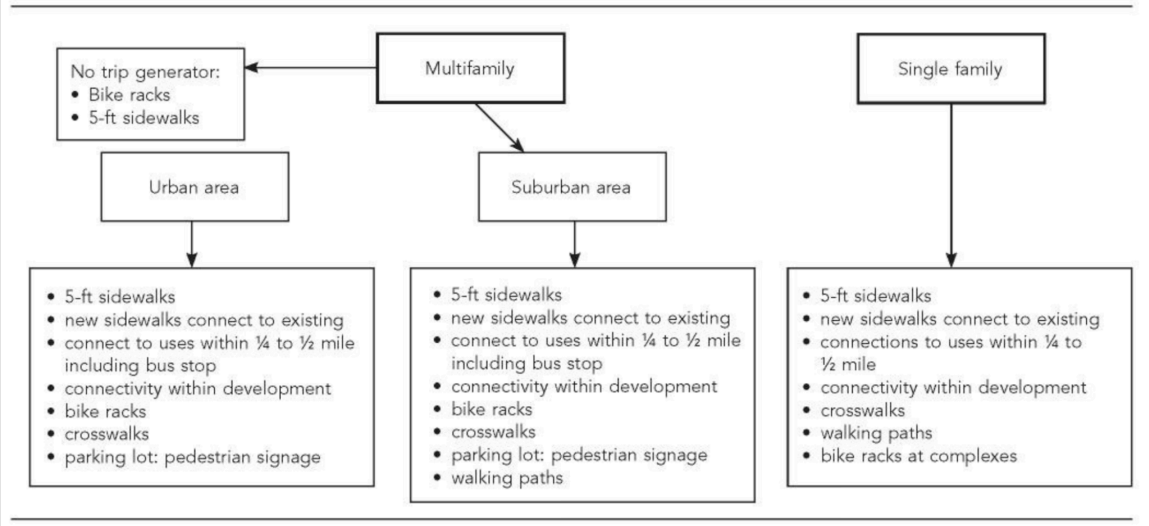

Figure 3: Columbus Healthy Places (Public Health Reports, 2011)

To get into more detail, Easton could draw inspiration from successful models like Columbus's Columbus Healthy Places (CHP) program, which integrates public health goals into urban planning. In the article, it states, "CHP conducted 10 walk audits during the first year of the program. Residents walked the neighborhood and gave input on preferred locations to walk or bike, and whether they felt safe doing so, as well as locations perceived as unsafe or not preferable to walk or bike" (Green & Klein, 2011). Including the direct voices of the community encourages more specific and tailored solutions that directly benefit and accommodate their needs and desires.

The Columbus Healthy Places (CHP) program has effectively transformed community design to promote active transportation by implementing a social-ecological approach that emphasizes environmental and policy changes. Since its inception, CHP has seen "64% of new developments voluntarily include features such as bike racks (82%), sidewalk connections (26%), and 5-foot sidewalks (18%)," illustrating a significant shift in urban planning that aligns with public health goals (Green & Klein, 2011). The program also initiated a new parking code that requires "walking and biking infrastructure features" in parking lots, ensuring a permanent

commitment to active transportation. While quantifying the direct impact on community walking and biking rates poses challenges, CHP has established a framework for collaboration between public health and urban planning, demonstrating that strategic partnerships can foster a healthier built environment. By linking public health objectives to city planning initiatives, CHP not only addresses the obesity epidemic but also promotes an active lifestyle, making it a valuable model for other metropolitan areas aiming to improve community health outcomes (Green & Klein, 2011). Drawing on models like Columbus's Columbus Healthy Places program, Easton has the potential to implement meaningful changes that make walking and biking safe, viable options for all residents.

The next section highlights the socioeconomic benefits and limitations within Easton's transportation system, bridging the wider health and safety benefits of active transportation with an emphasis on equality. Beyond enhancing the physical infrastructure, addressing inclusion and accessibility may create a community where all citizens, regardless of ability, income, or ethnicity, feel secure and supported.

There are implicit driver biases built into our current transportation system. For example, drivers are less likely to yield to black pedestrians attempting to cross the street in crosswalks (Burden, 2017). Studies also show that pedestrians with mobility impairments or disabilities are not adequately accounted for within the design of our current transportation system; we see this through a lack of curb cuts, lack of adequately timed crosswalks, as well as steep inclines, and broken or cracked sidewalks. It is already not ideal for an able-bodied pedestrian to cross many busy streets, so it is virtually impossible for disabled and mobility-impaired individuals to rely on active transportation methods in their everyday lives.

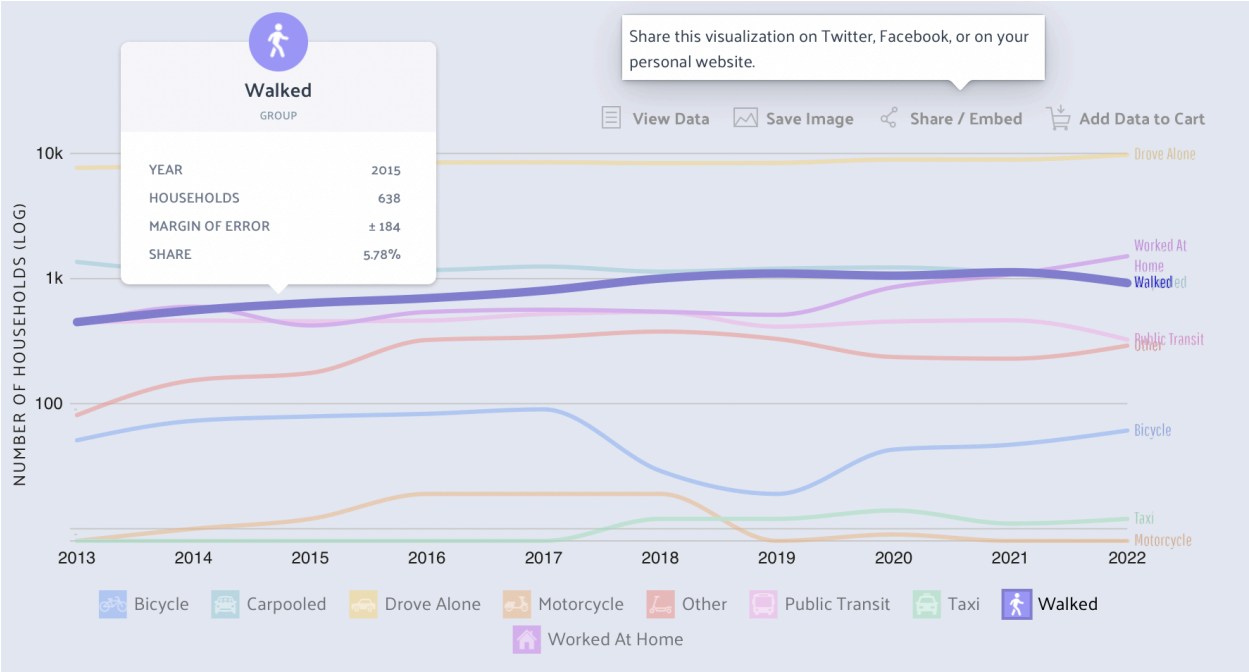

Figure 4: Commuter Transportation Metrics (datausa.io, 2022)

This graph shows the data regarding the breakdown of how Easton residents commute. It shows that although the majority of households commute by driving their personal vehicles alone or carpooled, the next method of transportation with 5.78% of households utilizing it is walking. Public transportation and bicycling are also notably used methods of commuting within this graph. With that being said, it is surprising and frustrating that the current infrastructure in place for commuting is lacking heavily in terms of accessibility and comfort for all non-vehicle commuters.

We also researched the benefits and costs of active transportation infrastructure. The cost/benefit analysis regarding active transportation is promising. Not only is active transportation economically beneficial, but the source also mentions the physical health and fitness benefits, as well as reduced roadway congestion, pollution reduction, and energy conservation. We also cover the factors that affect the impacts of active transportation infrastructure and methods for monetizing the costs and benefits. The reading (Litman 2024,

p.44) mentions how the user travel time is one of the largest “costs” of commuting. Since walking and biking tend to be slower than commuting by car, they are usually looked at as inefficient and costly modes of transportation. However, under favorable conditions, active travel has low or even negative time costs as users typically consider time spent walking or cycling a benefit rather than a cost as it is enjoyable, provides health benefits, and helps achieve a healthy lifestyle and mindset. Therefore, users may take active transportation rather than other modes of transportation, even if they take longer than driving or carpooling.

Enhancements to active transportation go beyond safety; they also call for a reconsideration of Easton's general walkability. Easton may promote healthier lives and safer streets by emphasizing the creation of walking-friendly surroundings. Improving walkability makes it easier for locals to move about the city, which in turn encourages people to use active transportation choices and creates a more lively and connected neighborhood.

It is shown that a system that promotes the use of cars will lead to more car traffic. Even though it seems logical that accommodating cars will help car traffic, this often doesn’t happen in urban planning. The reason is induced demand. If a highway has been widened to accommodate more cars, more people will choose to use it. If a city is designed around making car travel as convenient as possible, people will drive. In addition to concerns about safety and CO2 emissions, large groups of cars take up more space than an equal number of people. This makes cars less convenient to plan around for a tightly packed city

Bike lanes sometimes face criticism for taking space away from cars. A study from Bogota, Columbia, where numerous permanent and temporary bike lanes were created during the COVID-19 pandemic, investigated if their presence had any effects on average vehicle speeds. The result was somewhat inconclusive, with some roads seeing a decrease in average speed of as much as 19%, and other roads seeing an increase in speed (Pena-Bastidas et al, 2024). It makes

sense that traffic flow across a whole city is so complex that the effect of such a change is hard to quantify. Based on our observations of Larry Holmes Dr, drivers exceeding the speed limit seem common. Because of this, and because of the other benefits a bike lane will provide, we will still look into adding a bike lane, even if it has the potential to slow drivers down.

Through their literature review, Miriam Zuk discovered that transit-induced gentrification examines how transit investments, like new rail or bus lines, can increase nearby real estate values and reshape neighborhood demographics. Studies show that when transit provides a car-free option, it often attracts higher-income residents, leading to increased demand and land values. This demand can push existing lower-income residents out as property prices rise.

The issue of gentrification intensifies as we improve public assets such as schools, parks, highways, and transit infrastructure. When public investment, like the proposed enhancements to active transportation along Larry Holmes Drive, increases accessibility and aesthetic appeal, it may inadvertently drive up property values. This risks displacing the very community members these projects aim to benefit, as rising property prices can make the area unaffordable for lower-income residents. This concern is particularly relevant to Easton, where residents like Brenda Williams and her mobility-impaired husband have shared insights on the lack of equitable public infrastructure funding, particularly in neighborhoods like the West Ward.

Easton is divided into Downtown and the West Ward, with Downtown receiving significantly more investment. This disparity is apparent in the well-maintained streets, curb cuts, and general cleanliness Downtown, compared to the West Ward, which features deteriorating sidewalks, limited accessibility, and a generally lower-income population. While improvements along Larry Holmes Drive make it safer and more attractive to pedestrians and

cyclists—a sentiment echoed by local users and workers—this raises concerns that similar investments across Easton could lead to unintended displacement.

The team's visit underscored the stark contrasts within Easton, revealing and documenting the disparities between Larry Holmes Drive and other neighborhoods. Users reported that Larry Holmes Drive feels notably safer and more pedestrian-friendly, especially compared to areas beyond 6th Street, where safety concerns rise significantly at night. However, this improvement-focused approach requires careful planning to avoid spiking property values and inadvertently fueling gentrification. Without such planning, increased investment in active transportation and amenities could contribute to gentrification.

The social context of active transportation initiatives not only within Easton but around the world tends to prove the many benefits that result from improvements in active transportation and making cities become more walkable, granting safety and inclusivity to all stakeholders and users of active transportation methods. This also reduces congestion and vehicle traffic, as well as fatal vehicle accidents as there will be more users of active transportation resulting in fewer cars on the streets.

Political Context

The political perspective is one of the most important considerations we will analyze. Policies in which the streets were designed, structured, and maintained will set the boundaries in which our then proposals will take shape in Easton. We will not only look into Easton's political history in terms of adhering to PennDots requirements and policies but also understand how the United States goes about its procedures in city development and urban planning. Understanding both scopes is crucial because it allows us to understand why Easton is the way it is, understand

any barriers in place preventing Easton from being accessible to all, and what will need to change to progress Easton into a more pedestrian-friendly city.

A possible reason for a lack of existing accommodations for active transportation in Easton is the small number of current users. 71% of Easton residents drive alone to work, while only 9% walk or use public transit. During our field interviews, we found that a substantial amount of people walking or biking were doing so recreationally. Another group did so because they did not own cars. We felt that people are choosing to walk not because it's convenient, but either because they have to or for recreational reasons.

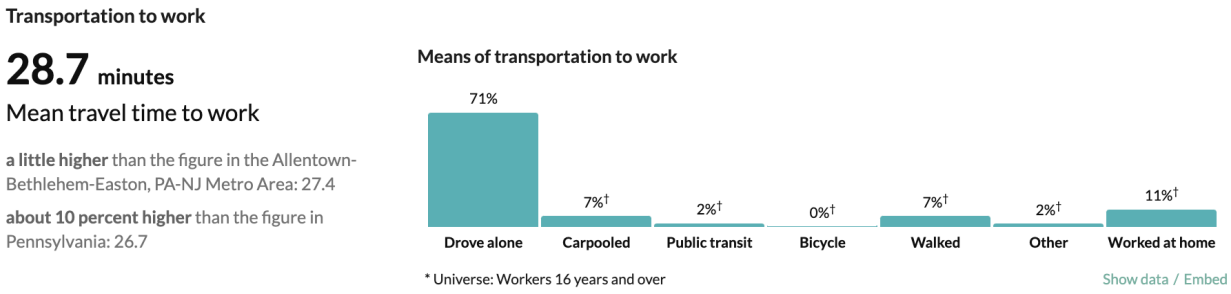

Figure 5: Commuter statistics (Easton Census, 2022)

Apart from the census bureau, we also conducted our own research on LHD. In order to better understand the weight and impact of active transportation reform, we created an asset map pictured below consisting of individuals, community organizations, businesses, and institutions that are key stakeholders and contributors to the active transportation initiative.

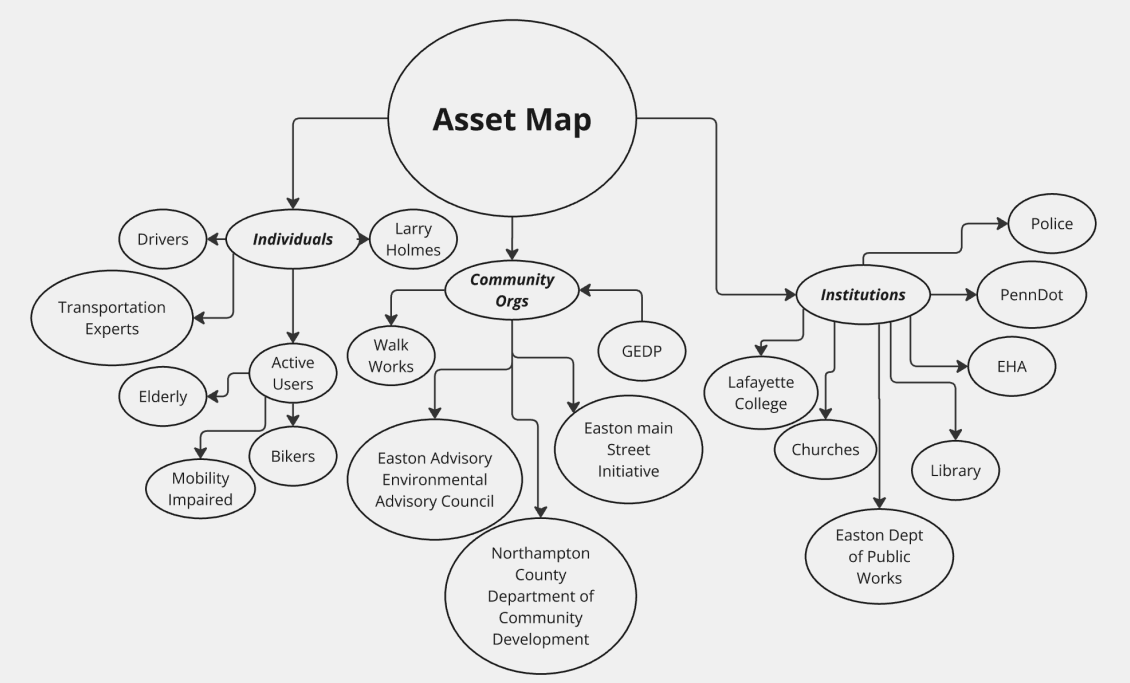

Figure 6: Easton Stakeholders Asset Map

Figure 6 visualizes a breakdown of the various stakeholders within our Easton community. We proceeded to split the asset map into three stakeholder groups, individuals, community organizations, and institutions. We divided them into three groups so that we can identify who exactly is our intended users/audience, if there are current initiatives involved in transportation, and who is responsible for enforcing the current infrastructure.

For data collection, we developed a concise survey that captures users' perceptions of LHD and broader transportation in Easton, PA. To ensure a representative sample, we conducted interviews at different times: a weekday evening and a weekend noon. Greater reforms may need collaboration among city officials, experts, and the community. We aim for our project document to spark productive dialogue on enhancing streets for everyone.

During this project, we employed various data collection methods, including site visits, pedestrian surveys, and interviews. Key interviews included technical experts such as Sam Pearson, who highlighted overlooked locations, and Professor Sanford, who offered potential solutions. We also consulted Brenda Williams, a community contact, to understand Easton's political context and funding distribution, and Professor Wilford-Hunt, who provided feedback on our proposed solutions and identified areas for improvement.

We conducted 17 interviews, including paired data, and found that nearly 60% of respondents regularly walk in LHD (Figure 7). Additionally, 56% prefer walking or biking as their primary mode of transportation (Figure 8), and 43.8% know someone who is mobility impaired (Figure 9). These results indicate a strong community of walkers and bikers, highlighting the potential for accessibility improvements to benefit not only these groups but also individuals with physical disabilities by creating more inclusive and accessible spaces.

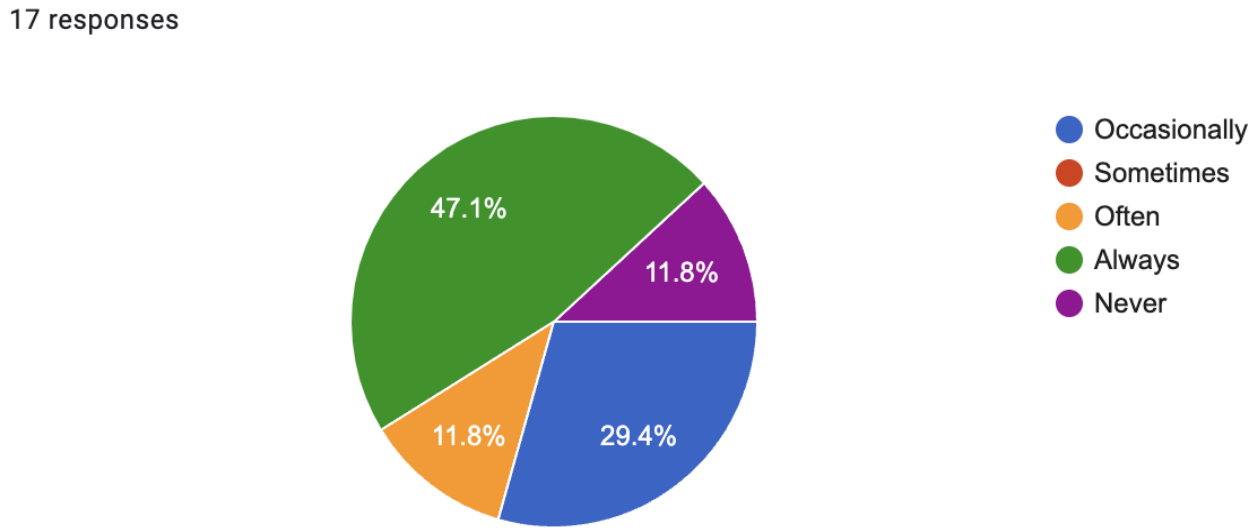

Figure 7: How often do you walk near LHD?

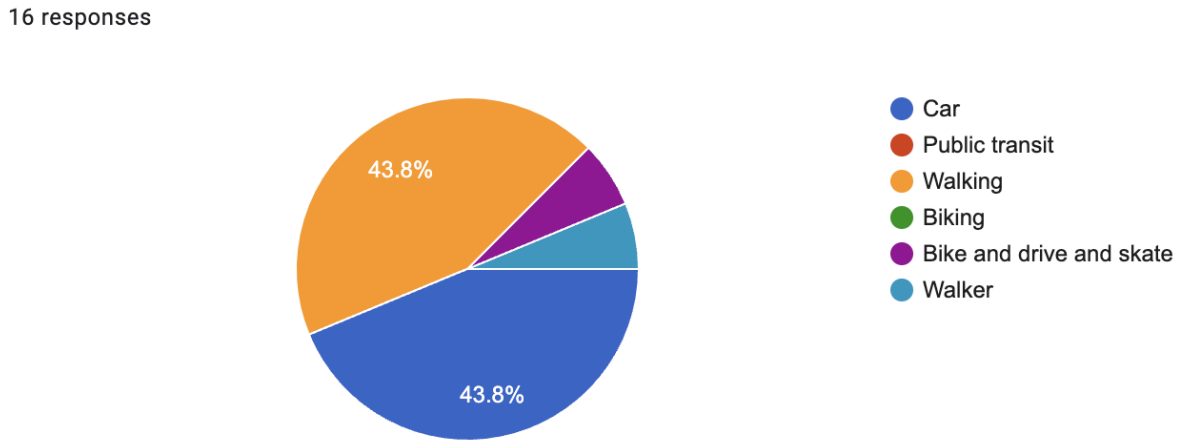

Figure 8: What is your preferred daily method of transportation?

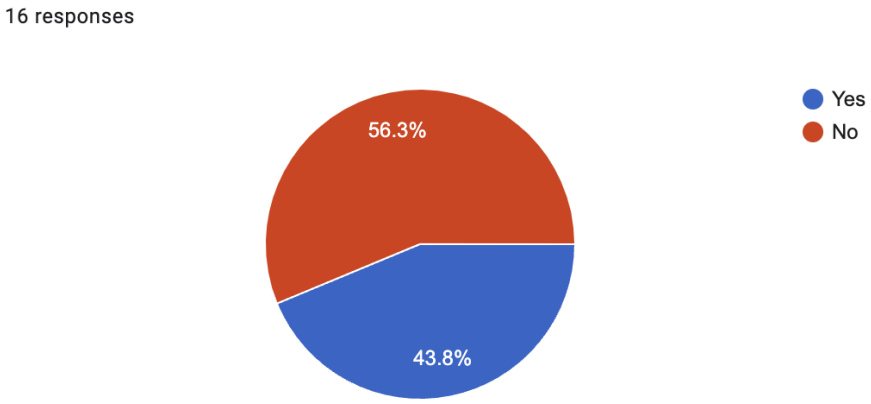

Figure 9: Do you or any loved ones experience mobility issues? (wheelchair, cane, mobility vehicle, etc…)

Our group encountered several challenges throughout this project. First was data collection: we struggled to determine the right questions for our site interviews. Second was site selection: while we identified several areas needing development, a lack of data limited our options. Third, cost feasibility was a constraint; we deemed some radical changes to be infeasible due to their cost. Finally, while we made significant progress this semester, we couldn't fully

design a usable product for the LHD location, hoping future Lafayette College engineers and the WalkWorks organization can build on our foundation.

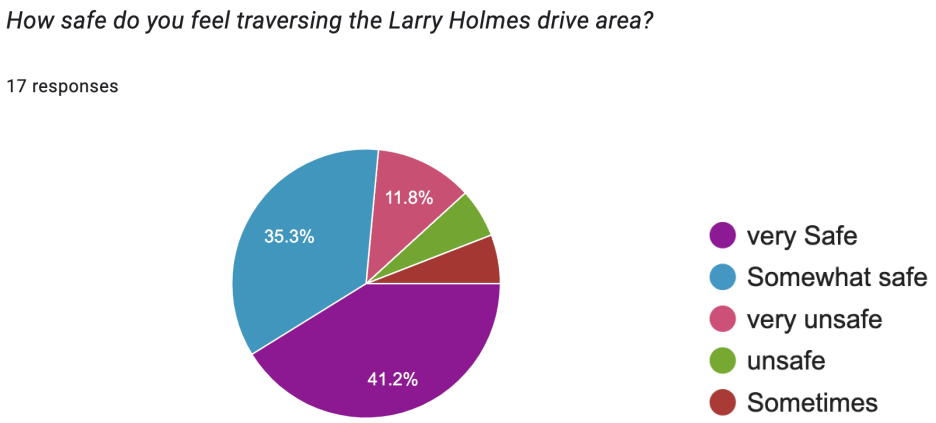

Figure 10: LHD Safety

During our on-site interviews, we found a notable critique: although LHD is often perceived as dangerous and unsafe, many Easton residents we spoke with felt it was relatively safe. However, several residents expressed that the city's focus should shift away from LHD and prioritize areas like the West Ward, which lack basic sidewalk and street infrastructure. Despite these insights from the community, the city has yet to acknowledge the West Ward as a problem area. Moving forward, future projects should allocate the time and resources needed to address the West Ward's infrastructure challenges.

One of our community contacts, Brenda Williams, a lifelong resident of Easton, shared similar concerns about the West Ward. She expressed feeling unsafe and uncomfortable navigating her neighborhood, especially with her husband, who relies on a mobility scooter. The couple noted that her husband often has to ride on the street because the roads are smoother than the cracked and uneven sidewalks. They also pointed out that some streets lack curb cuts, making them inaccessible for mobility scooters. This raises an important question: why is the

city prioritizing investment in an area already considered to be in good condition instead of addressing more pressing infrastructure needs in underserved neighborhoods like the West Ward.

Easton's traffic fatality rate is relatively low, but available data on traffic injuries is limited. This lack of information highlights the need for ongoing monitoring to reduce the risk of injuries and fatalities on city roads. Public policy interventions can be a key factor in achieving these safety goals. A study by Frances Bunn found that area-wide traffic calming, which involves narrowing roads and adding features that encourage slower driving, can effectively reduce traffic injuries in urban settings. In our area of focus near Easton's city center, current measures—like speed limits, stop signs, and pedestrian crossings—are in place to control traffic speed. However, multiple responses from our site surveys claimed that vehicles often exceed the posted 25 MPH speed limit, which can make the space less safe to walk for pedestrians.

To enhance road safety, we propose exploring additional measures to slow traffic near the city center. Of the Menu of Traffic Calming Strategies and Devices provided in Bunn's article, Narrowing lanes could encourage drivers to lower speeds. Research suggests that reducing lane widths and adding curb extensions or landscaped barriers can create a visual cue for drivers to slow down, reinforcing the traffic-calming efforts already in place. Such strategies would make streets more accessible and safer for pedestrians and cyclists.

Understanding how transportation initiatives get funded will be key to our project. On October 26, 2023, Congresswoman Susan Wild announced a $120,000 "Safe Streets and Roads for All" (SS4A) grant for the City of Easton (Wild 2023). The grant was funded by the US Department of Transportation as a result of the Bipartisan Infrastructure Law. The SS4A program was created to address the rising roadway fatalities in the United States. It provides $5 billion over five years to prevent roadway deaths and serious injuries, focusing on regional,

local, and Tribal initiatives (Dept of Transportation). SS4A offers Planning and Demonstration Grants for creating safety plans and Implementation Grants to fund infrastructure, behavioral, and operational safety projects.

Easton's Public Works Director, Dave Hopkins, and Mayor Sal Panto have emphasized the urgent need for upgraded safety measures in the city, including adding bike lanes, expanding sidewalks, and improving intersections to enhance pedestrian safety. Mayor Panto expressed enthusiasm for the SS4A Program, saying, "We are excited for this chance to make Easton a safer place to walk, bike, and drive. Some of our streets were designed in the 19th century, and this grant will help us adapt them safely for our residents and visitors" (Wild 2023).

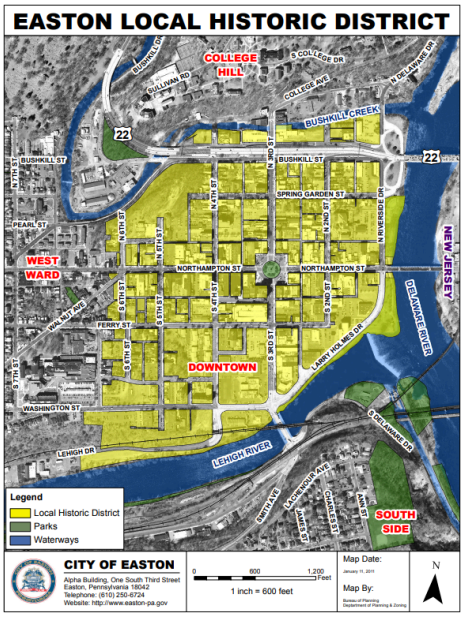

Figure 11: The map of the Easton Local Historic District (City of Easton, 2011)

Making significant changes to Easton's streets and sidewalks requires careful consideration of the regulations of its historic districts, which are designed to preserve the unique architectural character and aesthetics of the downtown region. Easton, PA, is a city rich in culture

and history, recognized by its inclusion on the National Register of Historic Places. Any proposed modifications must not only promote safety and accessibility but also respect the area's historical significance and charm.

Incorporating active transportation such as adding bike lanes and expanding sidewalks can be challenging. The city of Easton is incentivized to preserve historical landmarks because of the profit generated from tourism, economic development, and a tool to draw in visitors(HDDC). Property owners are also incentivized to continue to preserve historical landmarks because these properties have a tendency to appreciate over time and are more resilient to changes to inflation and economic downturns. When both the city and its property owners benefit from maintaining the historic character of the city, it can be difficult to propose and implement more modern active transportation features.

There are also policy-related procedures that can make adopting active transportation rather difficult. As stated in the Historic District Design Guidelines, “Any proposed changes to a property, which are visible from a public right-of-way… are subject to review by the HDC”(HDDC 2005). This indicates that even minor modifications must undergo an approval process. The Commission's primary concern is “to protect historic resources from demolition and to preserve the neighborhood’s historic character,” which can slow down or limit the implementation of modern transportation solutions. Additionally, according to Easton’s Local Historic District, “Properties requiring a COA for work must have the proposal reviewed by the Historic District Commission (HDC), which is tasked with ensuring properties are maintained appropriately. The HDC makes a recommendation to the City Council, whether to approve or deny a Certificate of Appropriateness (COA) for any proposed exterior work within the LHD”(LDC). This highlights the multiple steps involved in getting the approval for

modifications of the current infrastructure, considering the entirety of downtown is a historical district is safe to imply that making physical progress would take longer compared to areas that are not in the district. As the main focus of our project is Larry Holmes Drive which is in the historical district, we should expect to navigate the HDC and COA for our proposals.

The intricacy of putting in place efficient infrastructure solutions becomes evident as Easton's active transportation programs gain traction. The focus on cooperation and funding emphasizes the necessity of strategic alliances between local groups, government institutions, and planning experts. In addition to addressing the current pedestrian infrastructure issues, this cooperative endeavor will also be in line with larger state and federal assistance programs.

There are many factors, variables, and groups of people that need to work together in order for the idea of active transportation infrastructure to become a reality. The biggest issue regarding the implementation of new infrastructure is typically funding. Large-scale infrastructure changes are usually very expensive and most small cities and towns do not have the means to begin the implementation stage for any type of infrastructure construction or maintenance. This is why cities typically rely on state or federal funding through grants and subsidies for any large-scale projects, unfortunately, this typically results in lengthy project timelines and long waiting periods.

The city of Easton is currently working with Traffic Planning and Design, Inc. to come up with a possible solution to the disaster that is the current pedestrian infrastructure surrounding the Larry Holmes Drive area. One of the most feasible solutions proposed is a roundabout that would connect Larry Holmes Drive and S. 3rd Street. This would eliminate the existing traffic lights and would reduce the roads to one lane, with the exception of a right-turn-only lane on the west side of Larry Holmes Drive which is pictured below.

Many government agencies are now issuing grants and other forms of funding to cities and townships that wish to implement a new active transportation plan. The Pennsylvania Downtown Center issued a grant to the City of Easton to conduct research into the existing infrastructure and to help create possible solutions and fixes (Myszkowski 2024). The Easton City Council is generally supportive of the plan, but first have some questions about feasibility, costs, and traffic rerouting which may hinder the implementation of the proposed roundabout. With an increase in political policies pushing for sustainable cities and more eco-friendly transportation initiatives, there will hopefully be an increase in grants and subsidies being awarded to small municipalities and cities, as these small communities are typically overlooked and there is very little research being put into these "at risk" areas with poor pedestrian infrastructure. We see this happening recently with the launch of The Active Transportation Infrastructure Investment Program, or ATIIP, which is a new competitive grant program created by the Bipartisan Infrastructure Law. This incentivizes safe and connected active transportation facilities (Hall 2024).

Figure 12: Traffic Planning and Design, Inc. (Myszkowski, 2024)

We could also consider lengthening the time that traffic lights give right-of-way to pedestrians. This improves walkability for everyone but is especially important for people with

mobility issues, such as those in a wheelchair. Many cities do not provide enough time for people with mobility issues to properly cross the road before the sign goes red again.

In conclusion, transforming Easton into a more pedestrian and cyclist-friendly city involves addressing several interconnected challenges and opportunities. The city's reliance on private vehicles, combined with limited incentives for active transportation, underscores the need for a comprehensive approach. Political history, funding limitations, and the constraints of Easton's historic district regulations present barriers to progress but also provide a framework for careful, well-integrated urban planning. Grants and other federal and state funding opportunities offer a pathway to address safety concerns and modernize infrastructure. Initiatives like adding bike lanes, expanding sidewalks, and implementing traffic-calming measures can enhance accessibility while maintaining Easton's historical charm. However, collaboration among city officials, historic preservation bodies, planners, and the community is crucial to overcoming procedural and logistical hurdles.

Technical Context

Building sustainably often means preserving existing infrastructure since the CO2 emissions from demolition and new construction can outweigh the benefits if the project isn't successful. Strategic improvements to active transportation can enhance air quality, improve safety, and increase visibility, ultimately creating a healthier, more accessible environment.

So after all our personal observations, interviews with different stakeholders, and reviews of different literature related to reimagining active transportation generally and more locally in Easton PA. We have come up with recommendations. Our report will cover in depth the technical

aspects of our Active Transportation initiatives and how we will further connect Easton residents to amenity spaces as well as local businesses.

It's crucial to look outside regional precedents for inspiration as Easton investigates possible ways to improve its transportation infrastructure. Globally, cities are putting new ideas into practice that not only solve traffic problems but also encourage healthier urban settings. These global strategies provide important insights for regional efforts to lessen dependency on cars and promote sustainable mobility choices by demonstrating the significant effects that efficient transportation policies can have on public health and air quality.

Places outside of the US are taking drastic measures to reduce the presence of cars in city centers. London has a “Low Emission Zone” and an “Ultra Low Emission Zone” that restrict all car traffic in central London to cars with the newest emissions technology, and EVs. The scheme, originally meant mostly to reduce traffic congestion, has had very significant benefits to air quality in the city. On average, in the period between 2008 and 2013, there was 13% less particulate matter (PM10) in the air than when the scheme was first introduced in 2003. Nitrogen dioxide levels in the air were also down. By 2019, they were 18.4% lower than when the ultra-low emission zone was introduced. The health benefits from the lower emissions were also significant. Apparently, “Cleaner air in London brought about by the low emission zone contributed to a 4.5% reduction in long-term health problems and an 8% decrease in respiratory issues like asthma and bronchitis” (Kelly, 2023)

Bike lanes are a logical way to encourage the use of active transportation. They provide a separate space for cyclists, making them safer than if they had to ride along a sidewalk or in traffic. According to Zabe Bent, creator of a set of bike lane design standards that have been endorsed by the Federal Highway Administration, a solid separation between car traffic and a bike lane is only needed if the speed limit for cars is greater than 35 miles per hour (Wollan,

2022). The speed limit on LHD is 25 miles per hour. While we find that cars rarely seem to stick to the posted speed limit, we can employ traffic calming techniques to change that.

Zabe Bent also advises that bike lanes be clearly marked. Bike lanes are usually painted red or green, and Bent advises that even if there's no physical separation from cars, the road markings should leave a gap of a few feet in between them (Wollan, 2022). While LHD is wide, adding enough space for a bike lane that's sufficiently separated from traffic will still take careful consideration.

Finally, something to encourage the use of bike lanes is that they have a destination (Wollan, 2022). In our case, we will have to look at key destinations that cyclists may want to travel to using LHD. Having a destination should mean that it will find use as a route for travel, rather than only appealing to people in the area who want to cycle for exercise. Hopefully, a cycle lane in our area will be convenient enough that people will choose to use it, possibly over existing solutions. That should improve safety, lead to more people getting exercise, and improve air quality in Easton.

A method that can significantly increase traffic flow is a simple reprogramming of traffic lights. A study done in Kuwait found that they could decrease average wait times at traffic lights by 40 to 60% by changing the logic of the traffic lights (Alkheder et al, 2019). We can look into this for our site, potentially making a significant improvement to the state of congestion there without making any real changes to the physical infrastructure.

The advantage with the current installation is that although it is not a roundabout, they clearly mark in bold maroon colors where we have pedestrian crossings. There are currently traffic lights that allow for pedestrians to have the right of way for a certain amount of time. And lastly, there exist curb cuts on all four corners making it easier for cyclists, skateboarders, and wheelchair users to traverse. The disadvantage is that there doesn't seem to be enough time for

all active users to cross the road effectively and furthermore the roads are too large to be traversed at one juncture with traffic coming from both directions. Lastly, the speed limit is too high, exacerbated by the absence of a center island.There is a significantly higher risk of direct collision for vehicular and non-vehicular transport.

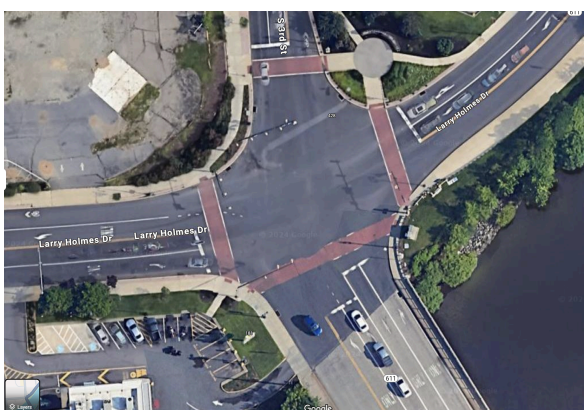

Figure 13: LHD (Google Earth, 2023) and Figure 14: Proposed Roundabout (Myszkowski, 2024)

Our first potential solution is to optimize an already proposed roundabout as roundabouts are safer for bikes and pedestrians and favor low-speed, yield-at-entry traffic flow when compared to four easy intersections and traffic circles. An advantage of the proposed roundabout is that the junction drastically decreases head-on collisions. Furthermore, there are small islands on each crosswalk drastically shortening the distance a pedestrian would have to travel at once, and lastly simplifying traffic as now the pedestrian-only needs to worry about traffic coming from one direction at a time and is also protected by the infrastructure while they wait to cross the second half. We also like that the circle has been changed to a single lane traffic which reduces the amount of cars at the intersection at any given time. Lastly because of how the roundabout is made traffic is encouraged to travel at 12-15 miles per hour which effectively makes collisions less deadly. However, there is still room for improvement in the proposal. Pictured below is our rendering.

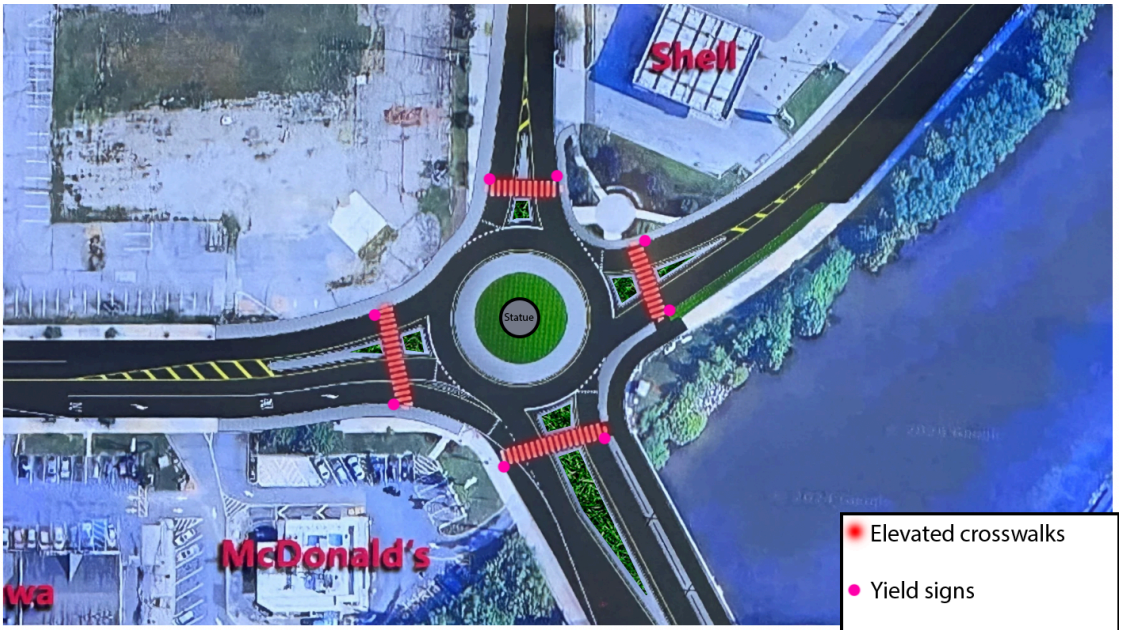

Figure 15: Option A: satellite image of our proposed roundabout changes

For starters, we propose retaining the original maroon colored bricks for three reasons: it enhances pedestrian visibility, aligns with historical preservation and the built environment, and signals to drivers that they are sharing the space with non-vehicle users, as it visually differs from regular streets (in-person conversation with Professor Mary Wilford-Hunt 2024). Another potential option would be to allow the locals to decorate the crosswalks as they wish and for that decoration to either be made permanent or allowed to be changed occasionally. Engaging youth in designing the space fosters ownership and pride, encouraging care for the area. Community-decorated crosswalks enhance its pedestrian-friendly appeal. These decorations can include individual artworks, community organization logos, and even local business advertisements. We propose elevating the crosswalk, as the current design lacks this feature. This adjustment would also serve as a speed bump for drivers.

We are also proposing the installation of a statue within the green space, which will function as a roundabout. There already exists one of Larry Holmes but I'd propose either relocating that one, building another one, or making a statue of another historically significant

figure preferably a minority, ie. a POC, woman, native american, etc. to help tell the full diverse story of the historical district. Surrounding that statue should be more green space as greenery is typically lacking in cities but holds many benefits. If possible, this greenery should extend into the traffic islands separating traffic from both directions.

The Pennsylvania Downtown Center and a federal grant have already allocated funds for this project. A potential risk of our improvements could be increased vehicle congestion, causing pushback from drivers as this is an essential road. By reducing the number of lanes, implementing slower speed limits, and adding speed bumps, we make driving in the area less convenient. While there may be initial resistance, the benefits far outweigh the drawbacks. Increased foot traffic could boost local businesses, Easton residents would enjoy improved health through walking and biking, and the overall number of accidents would decrease. Another drawback about this proposal is that although it makes active transportation better at that particular intersection, it does not take into account our half-mile span of LHD.

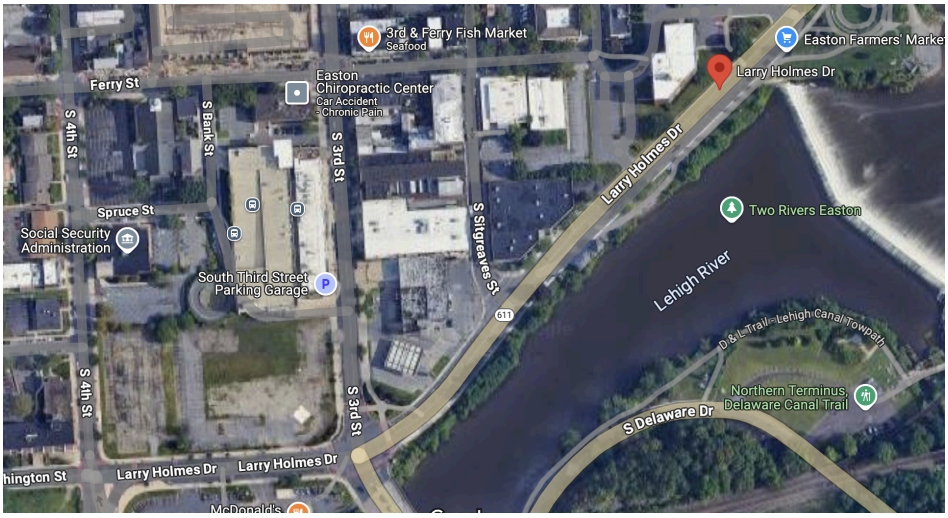

Figure 16: Screenshot of Larry Holmes Drive (Google Maps, 2024)

This section will cover two options that we designed to improve our half-mile span of LHD to foster a safer and pedestrian-friendly location. To start this figure above depicts the drive

and the streets intersecting. It starts from 4th Street, connects to the intersection at 3rd Street which is the area in which they are proposing a roundabout, and the drive continues and stretches past Scott Park until the New Jersey Bridge. Our options B and C will include elevated crosswalks and repairs/renovations of damaged sidewalks and curb cuts.

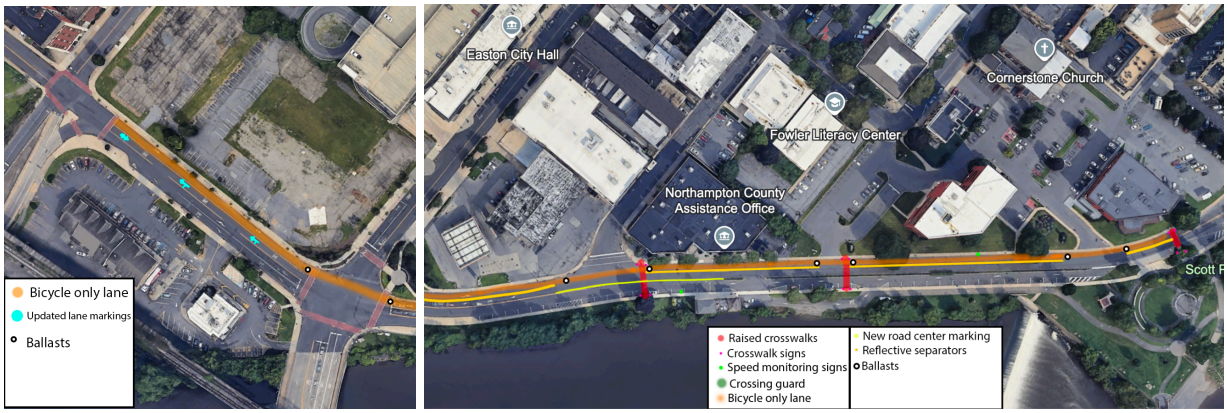

Figure 17: Option B: satellite image depicting proposed changes

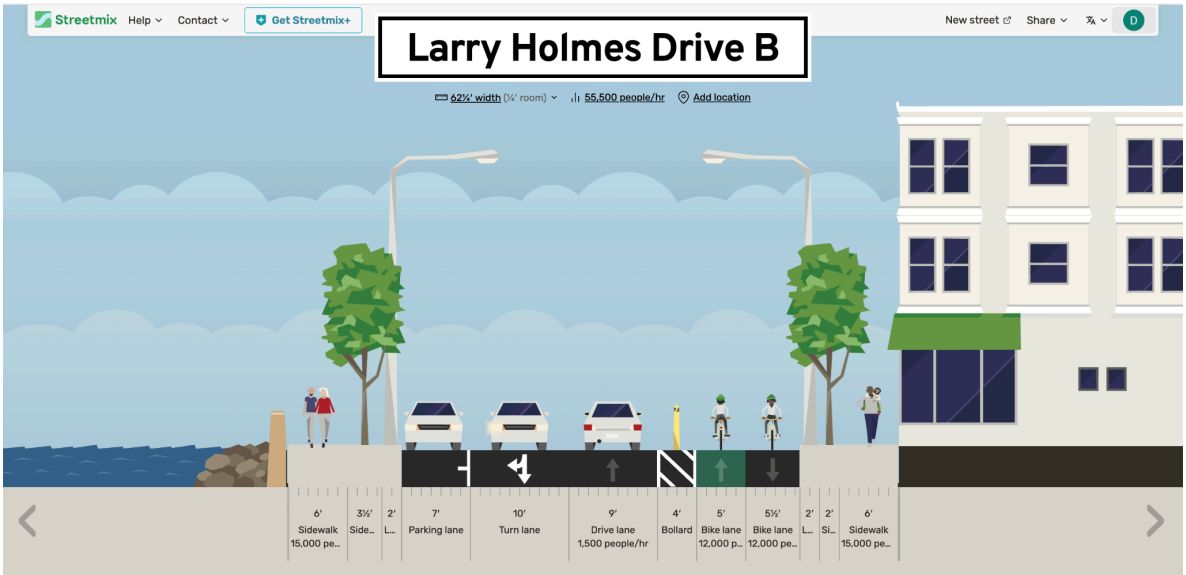

Figure 18: Option B rendering depicting visual of our proposal

For Option B, starting from 3rd Street to 4th Street, we propose converting the westbound left-turn-only lane into a combined straight-and-left-turn lane. Additionally, the white lane divider on the westbound side will be replaced with reflective plastic separators and a 3x3-inch curb that separates the bike-only lane from the traffic lane. This separator will extend to Scott Park, providing approximately half a mile of dedicated bike lane space, transforming the previous bike-shared lane into a bike-only lane. The bike lane will also connect to Scott Park's bike trail allowing cyclists to explore the Easton trails further and the separators will be placed every three feet, totaling 880 separators for the half-mile stretch. The lanes are designed to be about 10 feet wide, providing ample space for two bike lanes accommodating westbound and eastbound cyclists.

We also propose modifying the yellow lane divider in front of Saint Sitgreaves Street to connect directly to the traffic divider instead of passing on the left side, leaving the parking spaces untouched. These changes will not only create dedicated space for cyclists, but by narrowing the lanes, they will also encourage drivers to reduce their speed. We are also adding yield signs at the intersection of LHD and 3rd Street, as well as S Sitgreaves Street, and the parking space between Fowler Literacy Center and Maternal and Family Health Services. Additionally, incorporating bike racks, benches, and water fountains along the bike path will provide amenities for those engaging in active transportation.

One limitation of Option B is the potential reduction in traffic flow between 4th and 3rd Streets due to the businesses for cars traveling both eastbound and westbound. This change will require drivers to turn more carefully and be more mindful of both pedestrians on the sidewalks and cyclists in the bike lanes. Another limitation would be the cost of implementing these

features, from ballast to painting lanes, reflective separators, and more, the project will be quite expensive.

Figure 19: Option C

Option C improvements on LHD aim to foster a safer, more accessible environment that encourages walking and cycling. The elevated crosswalks near Saint Sitgreaves Street and the Shell Gas Station parking lot will serve a dual purpose and we will also allow the community to decorate the crosswalks, similarly to what we described in option A. Additionally, a speed monitoring device near Saint Sitgreaves Street will remind drivers to adhere to speed limits, making the area safer for both pedestrians and cyclists. Increasing the pedestrian walk times at the 3rd Street and LDH intersections ensures that people of all ages and abilities have ample time to cross safely, especially during peak traffic hours. Employing crossing guards will further enforce pedestrian safety and vehicle speed limits. While road and sidewalk renovations will improve quality and accessibility, together these measures create a vibrant, people-oriented corridor along LHD.

Considering these options for improving LHD, a robust maintenance and upkeep plan is crucial to preserve both functionality and aesthetic appeal. Increased street maintenance, including regular inspections and repairs, will keep the newly added bike lanes, curbs, and

elevated crosswalks safe and accessible. Snow removal is essential to ensure year-round usability, particularly during winter months. Additionally, amenities such as bike racks, benches, and water fountains will require periodic cleaning and repairs to stay inviting for active transportation users. The community-decorated crosswalks, a unique and welcoming feature, will need touch-ups to maintain the vibrant artwork created by Easton's youth. Periodic calibration of speed monitoring devices and checks on signage will reinforce driver adherence to safety standards. Together, these maintenance steps will help sustain the improvements and promote a safe, attractive environment that encourages active transportation and community connection along LHD.

In summary, the proposed enhancements to LHD emphasize safety, accessibility, and community involvement, transforming the area into an inviting and inclusive space for everyone. By incorporating features such as elevated crosswalks, dedicated bike lanes, reflective separators, community-designed elements, and improved pedestrian amenities, the plan encourages active transportation while supporting Easton's local businesses and cultural heritage. Measures like yield signs, speed monitoring devices, and extended pedestrian crossing times will improve the safety of all road users, particularly cyclists and walkers. While these initiatives require substantial funding and may initially face opposition from drivers, the long-term advantages—such as decreased traffic congestion, healthier lifestyles, greater foot traffic for businesses, and cleaner air—will far outweigh the drawbacks. With thoughtful design, community participation, and consistent maintenance, these improvements will establish LHD as a cornerstone of sustainable urban development and an example of equitable infrastructure.

Economical Context

The economic aspect of this project is very crucial. We will discuss and break down the economic feasibility of specific aspects of the potential active transportation infrastructure we plan to implement; such as roundabouts, curb cuts, crosswalks, and traffic light improvements. The economic impact will not only apply to the public roadways, sidewalks, and crosswalks, but will also affect nearby businesses, restaurants, gas stations, and public housing along the LHD site. We will assess and describe how improvement within active transportation infrastructure will positively impact and boost business and sales for surrounding companies and amenities as well as improve the economy of the city of Easton as a whole. Boosting the economics of local businesses and city amenities will be essential in acquiring private donors and state/federal grants and other funding.

Solution A: Roundabout with Raised Crosswalk				
Item	**Unit Cost**	**Quantity**	**Total Cost**	**Notes**
Roundabout Construction	$1,900,000.00	1	$1,900,000.00	Based on Bucks County comparable
Raised Crosswalks	$8,500.00	3	$25,500.00	Improves pedestrian safety
Bronze Statue	$250,000.00	1	$250,000.00	Moduled after a Larry Holmes statue
Maintenance	$0	0	$0	Maintenance cost remains same as for previous infrastructure
Total Estimated Cost			$2,175,500.00	

Figure 20: Option A Total Estimated Cost

Now that we have proposed these three solutions the question is how much will it cost? In order to estimate the potential total cost of construction on this roundabout, we looked for market comparables. Recently Bucks County constructed a similar roundabout (WFMZ-TV, 2023). That cost was $1.9 million. Pieces of our design currently not in this design seem to be raised crosswalks, (the cost of those typically ranges from ($7,000-$30,000 with an average price of around $8,500)(PennDOT, 2024) four of those would cost around $34,000 if we chose to use the average price. We estimate our design would cost somewhere around $2.1 million as they share a lot of similarities.

An eight-foot-tall bronze statue like Larry Holmes' cost about $250,000 (George, 2011) to build and so if we are looking to build something similar at the circle that is how much we would recommend we allocate. Lastly

Figure 21: Example roundabout Bucks county (PennDOT, 2023)

Next, we looked into the estimated economic costs associated with our proposed solution B; the traffic lane reduction and implementation of a bike only lane. This incorporates both a "road diet" and a "car-free streets" approach. Road diet can be defined as restricting the width of

streets by removing a lane(s) of traffic, this can be related to street narrowing, which follows the same idea of limiting the width of the roads in a bid to slow traffic down. A car free streets approach is the idea of designing streets to be orientated around pedestrians rather than drivers. For this cost estimation, we will be considering a half mile span of LHD that would be renovated. In an article about street infrastructure changes, it is mentioned that the cost of restricting a mile of four lane street to one lane in each direction plus bike lanes on each side would cost around $12,500 per mile (Bikesafe, 2014), depending on lane lines that need to be repainted. Considering we would be neglecting the bike lanes on the river side and we are only planning on restructuring a half mile stretch of road on the “city” or North side of LHD, our estimated cost to repaint would be on average $5,000. The more expensive aspect of this initiative would be the raised median or curb separating the traffic lane from the bike only lane. This can cost around $100,000 per mile, so in our case it would be around $50,000 (Sundstrom and Nabors, 2014). Next, we need to add the cost of the reflective lane dividers that will attach to the top of the curb. We are looking to place one reflective divider every three feet and considering we are retrofitting a half mile stretch, we would need 880 reflective posts which on average, cost around $90 each. This would add another $80,000.

Solution B: Traffic Lane Reduction and Pedestrian lane Implementation

Item	**Unit Cost**	**Quantity**	**Total Cost**	**Notes**
Lane Restriping (Half Mile)	$12,500.00	0.5	$6,250.00	Accounts for shifting traffic lanes
Raised Median Curb	$100,000.00	0.5	$50,000.00	Separates traffic lane from pedestrian-only lane
Reflective Lane Dividers	$90.00	880	$79,200.00	Adds safety and visibility

Elevated Crosswalks	$8,100.00	3	$24,300.00	Enhances pedestrian safety
Landscaping (trees, benches, shrubs)	$6,250.00	1	$6,250.00	Beautiful and supports bike lane
Yield Signs	$70.45	5	$352.25	Improves safety at intersections
Ballasts (Curb Cuts)	$50.00	8	$400	Installed at every curb cut
Maintenance	$0	0	$0	Maintenance cost remains same as for previous infrastructure
Total Estimated Cost			$166,752.25	Includes all outlined adjustments

Figure 22: Solution B Total Estimated Cost

The bicyclist only lane would not cost any additional money as the lane already exists as a traffic lane and would simply be repurposed. The additional cost would be incurred when shifting the lanes of traffic on LHD between S. Sitgreave street up and Scott Park. All traffic lanes will be shifted one lane position to the right towards the Lehigh river, eliminating the current street side parking and turning that into the north/northwest travel direction traffic lane. This additional cost would be accounted for within the half-mile lane re striping. Some miscellaneous add-ons to our roadway design would be three elevated crosswalks which typically cost around $8,100 (FHA, 2018) each as well as a few trees, shrubs, flowers, benches, and bike racks that we would like to add alongside of our bicycle only lane which would add an extra $6,250. We are also adding yield signs at all intersections and curb cuts for the bicycle only lane. We would like to use diamond grade yield signs, which are $70.45 each if purchased in a quantity of 5, this adds an additional $353 (roadtrafficsigns, 2024). The last sunk cost that we

will be adding is the cost for the ballasts installed at every curb cut. For this, we would be using poured concrete posts, which would cost around $50 each and we would need eight of them, which would add another $400. All in all, this proposed solution along a half-mile stretch of LHD would cost an estimate of $166,752.25. Now to add on the maintenance and upkeep costs, typical snow plows will not be able to remove the snow within the bicycle lanes as the concrete ballasts will bar them from entering. This means snow removal employees will have to utilize smaller-scale methods to remove the snow, which will in turn take more time and result in a higher cost for snow removal. The city of Easton already accounts for annual maintenance and upkeep of the roads, so we would not need to worry about adding in the additional cost. With the aid of federal and/or state grants, subsidies, and other forms of funding, this proposed solution would be easily economically feasible.

Ultimately, we looked into the estimated economic costs associated with our proposed solution C; a more conservative approach that accepts the built environment yet makes minor tweaks that could yield major benefits to active users of the space. To slow down traffic and make pedestrians feel safer, we feel some more traffic calming needs to be in place thus we are adding elevated crosswalks, minor sidewalk renovations, more signage, traffic light programming, a crossing guard, and permits for the special decorations of the crosswalks.

Solution C: Minor Tweaks to Existing Infrastructure				
Item	**Unit Cost**	**Quantity**	**Total Cost**	**Notes**
Elevated Crosswalks	$8,100.00	3	$24,300.00	Improves pedestrian safety
Signage	$70.45	5	$352.25	Yield signs at key intersections

Sidewalk Renovations	n/a	n/a	n/a	Responsibility for adjacent property owners
Crosswalk Decorations	$1,000.00	3	$3,000.00	For special further specification
Traffic Light Programming	$3,000.00	4	$12,000.00	Requires further specification
Crossing Guard Salary	$35,000.00	1	$35,000.00	A salary wage for a crossing guard making $17/hr
Maintenance	$0	0	$0	Maintenance cost remains same as for previous infrastructure
Total Estimated Cost			$74,652.25	Excludes permits and programming costs

Figure 23: Solution C Total Estimated Cost

In terms of cost, the elevated crosswalks including the necessary signage would cost about $8,100 (DOT, 2018) for a total of $24,300. Although there are supposed to be sidewalk renovations throughout LHD, that is the responsibility of the adjacent property owners and thus we cannot add that to our cost of renovation. We do insist that the city send citations to the respective buildings telling them that they need to fix their sidewalks per regulation. For the crosswalk decorations, we will put aside $1,000 for potential permit costs for closing the street: $250 per block per day, for three blocks is $750 (COP, 2024) as well as painting materials for the community members. In addition, about $12,000 for reprogramming the street lights (DOT). We

also included the addition of a crossing guard to enhance safety for both pedestrians and drivers, with an estimated cost of $35,000(Indeed, 2024). The final costs will amount to $74,625.25.

In conclusion, the viability of the suggested fixes for improving LHD's active transportation infrastructure shows promise for both lifesaving and economic stimulation. The advantages of increased safety, fewer fatalities, and a boost to local companies greatly exceed the significant financial expenses of putting these measures into place. All of the suggested fixes, including the more conservative traffic-calming techniques, the road diet and pedestrian lane reduction, and the more comprehensive roundabout layout, are financially feasible with the help of public funds, state and federal grants, and private donations. Furthermore, spending money on this infrastructure promises to improve the quality of life for locals, draw in new companies, and aid in the city's overall economic development in addition to addressing the pressing problem of mortality caused by transportation. The potential for these improvements to bring about long-lasting beneficial change for Easton should ultimately take precedence over their economic and human value.

Conclusion

In conclusion, the suggested upgrades to LHD's transportation infrastructure offer a comprehensive and financially sound strategy for resolving long-standing safety concerns and promoting sustainability and continuous economic growth. From a comprehensive redesign with a roundabout to a more targeted traffic lane reduction with a pedestrian-only lane, and finally, to a conservative approach with small but effective traffic-calming measures, each of the three solutions we have described offers significant benefits catered to particular community needs.

Despite being more expensive, Option A, the modified roundabout, should theoretically lower collision rates by removing hazardous junctions and establishing safer pedestrian

crossings. Our modifications should help further prioritize pedestrians and ensure that cars are slowing down. However, Option B, the traffic lane reduction and pedestrian lane implementation provides a creative and economical way to lower vehicle speeds, improve pedestrian safety, and encourage active transportation—all of which are in line with the larger urban planning objectives of lowering reliance on cars and boosting walkability. Conversely, the features in Option C such as raised crosswalks, remodeled sidewalks, and greater signage—represent a more economical, phased strategy that can result in notable enhancements in pedestrian comfort and safety without interfering with the current infrastructure.

When taking into account the possibility of state and federal financing, private gifts, and grants, our calculations indicate that the suggested solutions are economically viable and well within reach. The roundabout's substantial cost seems insignificant compared to the long-term financial gains from fewer traffic accidents, which currently put significant financial strain on local communities, families, and healthcare systems. With its low initial expenses, the road diet plan delivers short-term enhancements with long-term advantages for Easton's local businesses, tourism, and the economy as a whole. Even though the conservative measures are less costly, they nevertheless constitute a significant investment in community well-being and pedestrian safety, guaranteeing that the neighborhood will continue to be accessible and appealing to locals, visitors, and businesses alike.

Furthermore, in addition to addressing urgent safety issues, these infrastructure upgrades will support Easton's long-term prosperity. Residents' and companies' insurance premiums and medical expenses will eventually drop as fewer traffic-related fatalities and injuries occur as a result of improved safety measures. Moreover, it is impossible to overstate the benefits to nearby companies—by enhancing the pedestrian flow and accessibility, we make the area more

welcoming to customers, restaurants, and tourists, which boosts foot traffic and boosts the local economy along LHD.

Intimately, the planned project is an investment in the people of Easton, not simply in infrastructure. We can build a more sustainable and lively urban environment by tackling safety issues, improving transportation, and bolstering the local economy. This proposal offers a future where transportation infrastructure emphasizes the safety and well-being of bicycles, pedestrians, and the community at large in addition to meeting the demands of automobiles. It also corresponds with the larger objectives of sustainability, safety, and economic growth. These upgrades may be made a reality with the help of federal and state money and local stakeholder support, making LHD a model for safer, more welcoming, and financially successful urban areas.

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