Bicycle and Pedestrian Improvement Plan

---- Burlington City, NJ

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Executive Summary

The historic Burlington City is a suburb of Philadelphia, nestled along the banks of the Delaware River. The scenic enclave is the image of an ideal middle class American suburb interspersed with vegetation, a meandering creek, lively community and good quality roads, equipped with on-street parking! The residents commute out of the neighborhood by car or the beloved light rail. Settled by the English Quakers, its historic commercial district holds a distinct charm with various galleries, theaters, and cultural events occurring throughout the year, enjoyed by the many families with little children that call it their home.

However, the realities aren't quite ideal. Burlington City has faced economic challenges in recent decades with efforts underway to revitalize the downtown area and attract new businesses and investments. Its streets are preoccupied with cars that do not speak to one another. Like many cities built in the 17th century, the streets are dominated automobiles and parking infrastructure. The poor sidewalk quality, lack of crosswalks and pedestrian pathways along major routes like Route 130 and the dangerous intersections has subdued the natural instinct to stroll. This is further attested by the dearth of any existing biking infrastructure or recognition for biking. In an region with a sizeable population under the age of eighteen, a quarter of the residents are obese, which is above the state and the national average. Recognizing the necessity of car usage in the city, our vision for Burlington City Bicycle and Pedestrian Improvement Plan focuses on non-work commute activities, encouraging recreation and exercise for all age groups.

The report examines the existing conditions and as well as existing transportation policy framework in Burlington city to identify issues and opportunities. The next chapter outlines the goals, objectives and recommendations, ending with implementation and evaluation strategies. The report highlights the limitations in mobility due to infrastructure and safety issues. It provides guidance on creating a seamless child-friendly pedestrian and bicycling infrastructure that enhances the perception of safety. The report also looks at sustainable multi-modal transit network as a means of revitalizing commercial downtown through improved community engagement and social adhesion.

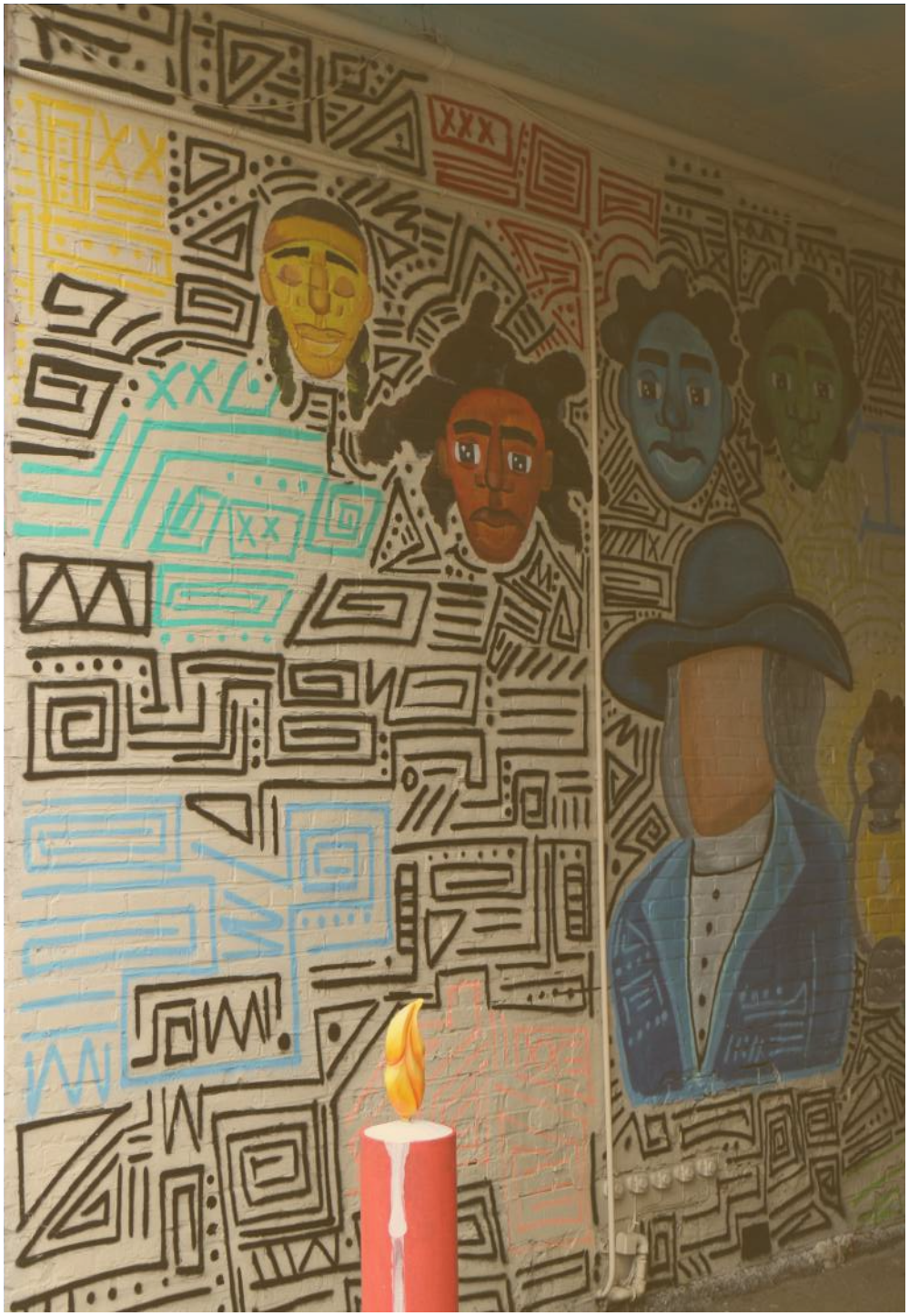
Acknowledgement

We would like to express our heartfelt gratitude to our Professor Xiaoxia Dong, for the unrelenting support, guidance and feedback in this endeavor. His constant encouragement gave us the drive to work on the Burlington City Bicycle and Pedestrian Improvement Plan.

We extend our gratitude to instructor Dan Levin and the CPLN 600 City Planning Studio 1- Burlington city group, including Jeffery Tseng, Kyle Arbuckle, Michael Clifford, Sara Lepley and Yujin Song, for disseminating the foundational data as well as their insights that helped in our research to understand the local context. Your ideas, and enthusiasm have been instrumental in shaping the vision and goals of the plan.

We are also deeply thankful to Mayor Barry Conaway and Burlington City Council members for engaging with the students and and responding to our inquiries. Their feedback has been essential in advancing the objectives of the bike-ped plan and ensuring its alignment with broader community priorities.

Lastly, we want to thank our amazing peers in CPLN 655 Multimodal Transportation for cultivating an environment of trust and respect. Their invaluable discussions, unwavering support and camaraderie throughout the duration of this project has undoubtedly enriched the depth and quality of this report.



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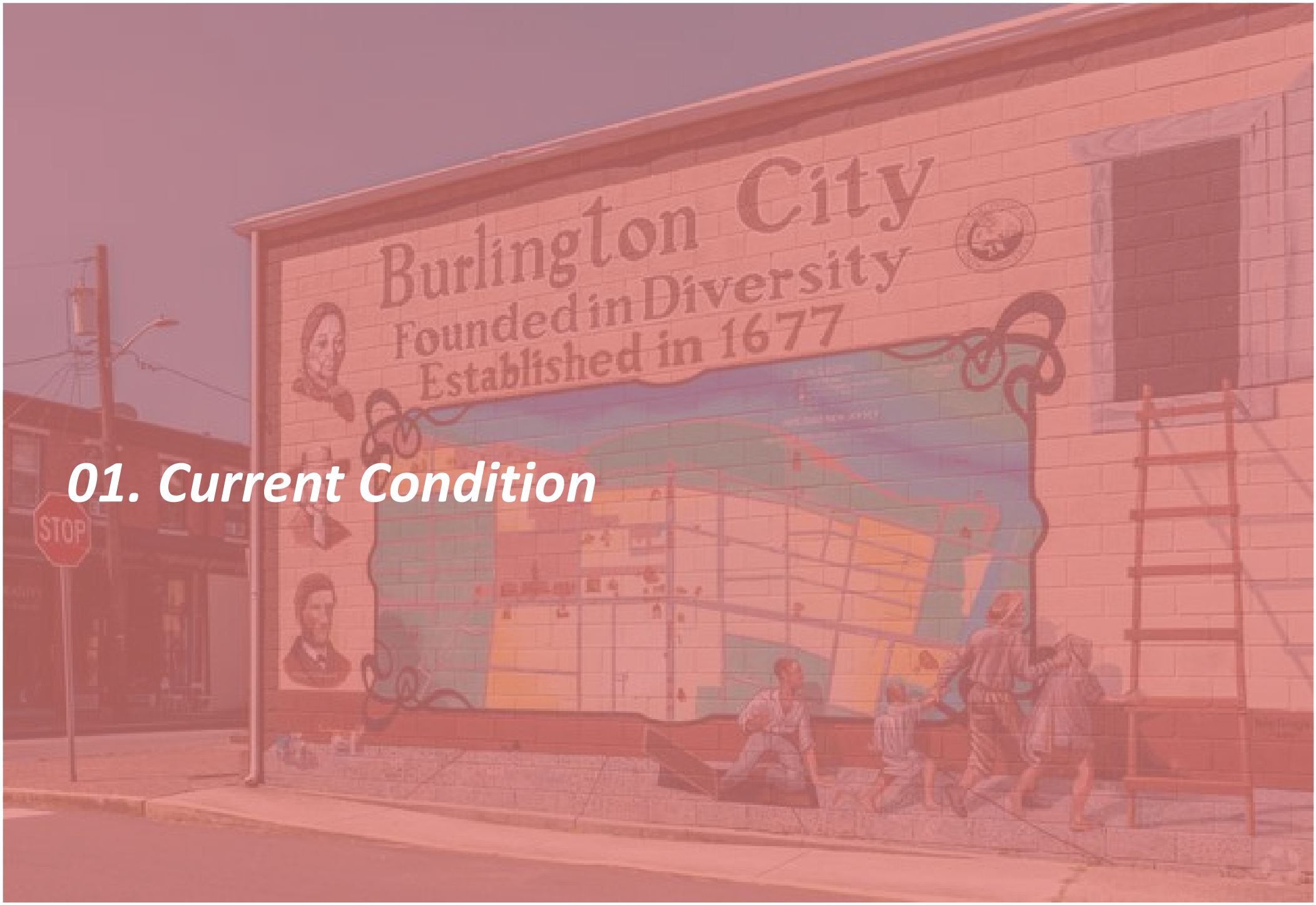
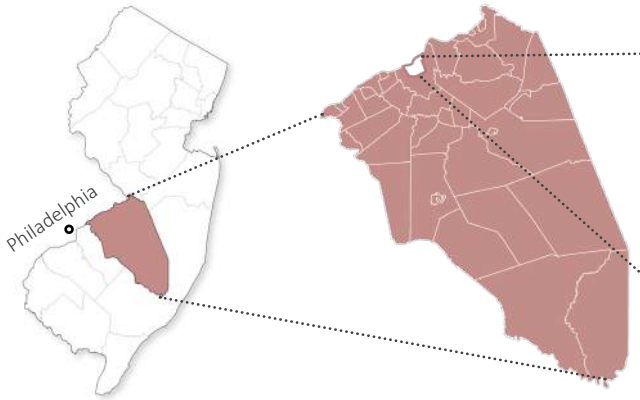


01. Current Condition

Study Area

Located in Burlington County in NJ, Burlington City is well-connected to nearby areas

Geographic Context



Within NJ

Burlington, New Jersey, is strategically positioned with a 45-minute driving distance from Philadelphia, offering convenient access to this major city. Its central location between Philadelphia and New York City makes it an attractive hub for both commuters and businesses

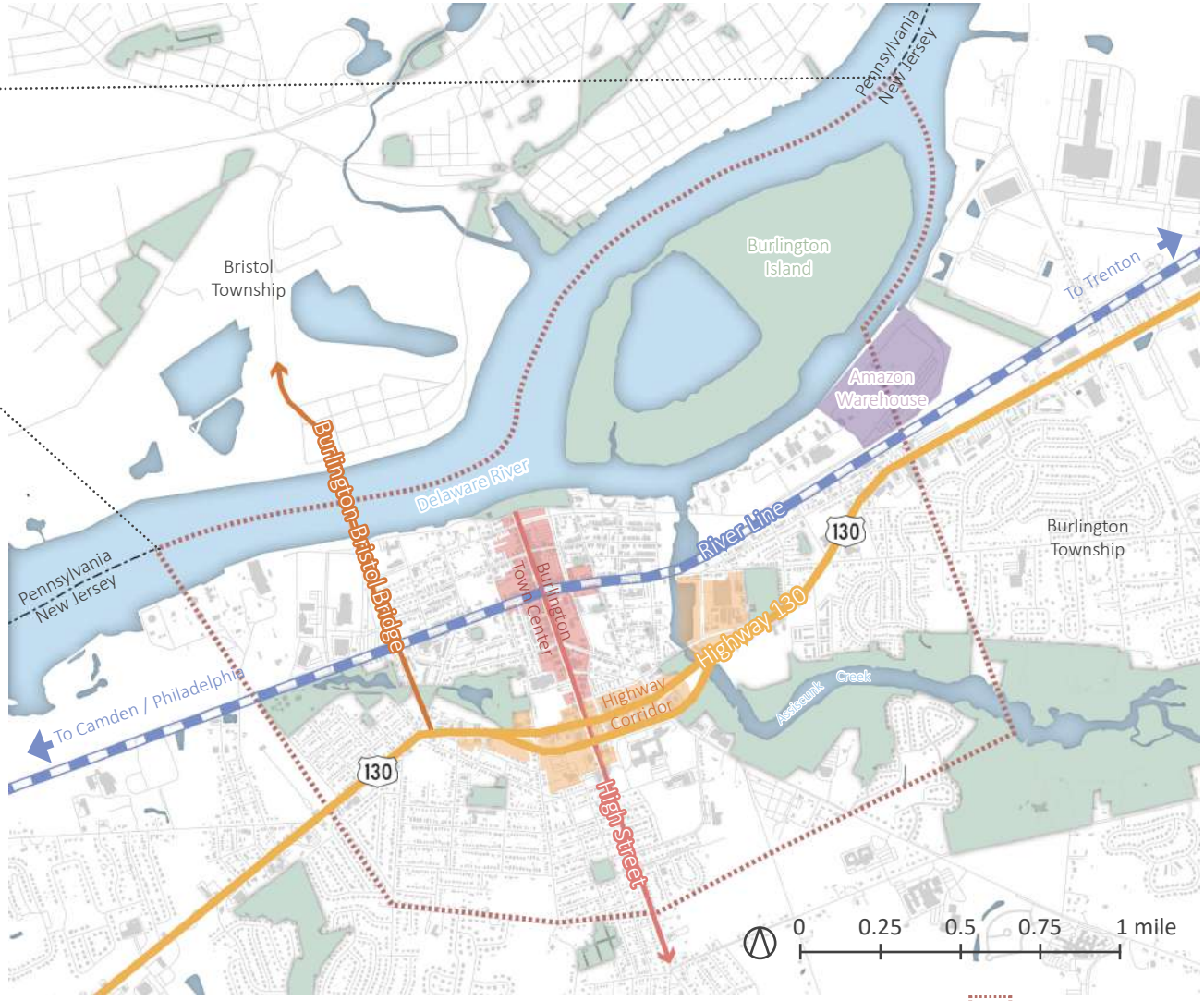
Within County

The city is situated in the northeastern region of Burlington County, adjacent to the Delaware River.

Within City

The City of Burlington is bisected by Route 130, creating a distinct division within the city. To the north, the Delaware River forms a natural boundary, while Assiscunk Creek meanders through the city, adding to its natural charm. Additionally, Burlington Island, a unique feature of the city, boasts a freshwater lake at its center and is owned by the city, providing a potential recreational and natural resource for residents and visitors alike.

Burlington City



Historical Context

Densely located landmarks and sites associated with the Underground Railroad

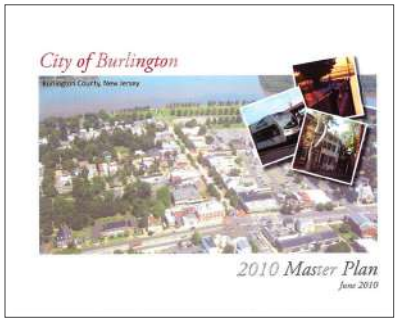
Burlington boasts many historical landmarks that span 300 years. This map highlights the abundance of valuable historical landmarks and districts in Burlington City. The landmarks are mainly concentrated on the main streets of High and Broad Street.

Historical Landmarks

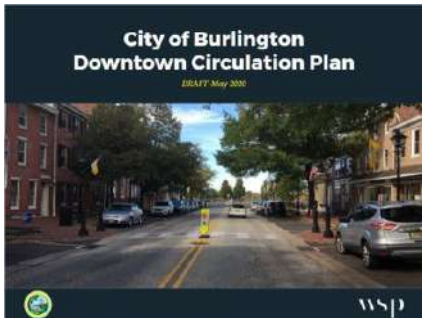
The City of Burlington was founded in 1677 by English settlers, primarily the Quakers. Their first site of settlement was Burlington Island. The City of Burlington was also the first New World development by William Penn, eight years before Philadelphia. It also boasts the oldest pharmacy in New Jersey, which, along with the Grubb Estate, served as a gateway for the Underground Railroad, underscoring the area's pioneering role in the history of black emancipation

Planning Context

Rich Historical Context



City of Burlington Master Plan 2010 – Circulation Plan Element



City of Burlington Downtown Circulation Plan 2020

Key goals include improving bicycle and pedestrian travel, enhancing roadway safety, and facilitating multimodal mobility, with specific recommendations for pedestrian and bicycle circulation

Demographics

Stagmented Population, fragile groups, low-income community.

Population

9,833 2022

9,835 2017

Median Age

39.2 2022

40.0 2017

Single Householders

~50% 2022

20% 2017

Median HH Income

$69,351 City

$102,615 County

Poverty Rate

12.5% City

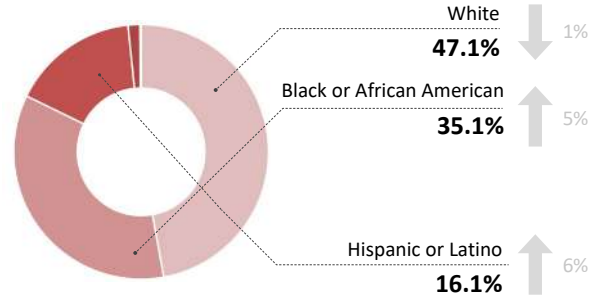
6.6% County

Bachelor Degree Attainment

27.0% City

41.4% County

Racial Composition



Foreign-Born

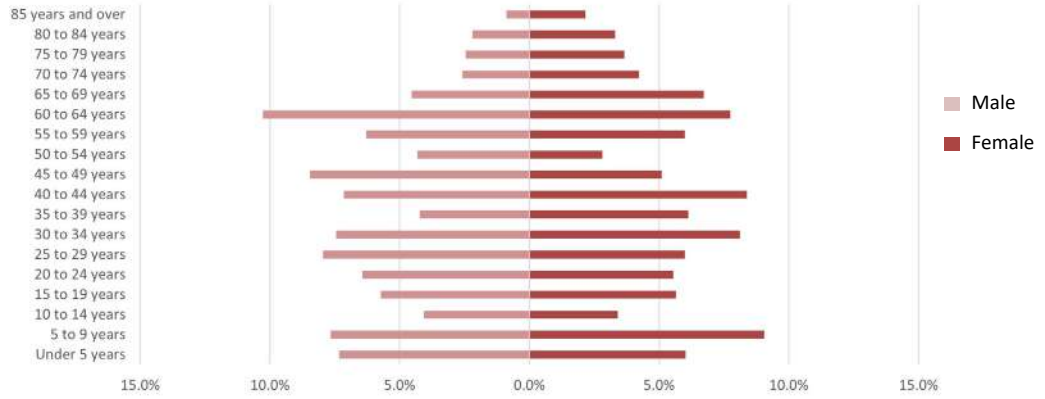
11.1%

Immigrants

>300

Enterred into the city
Lost native residents

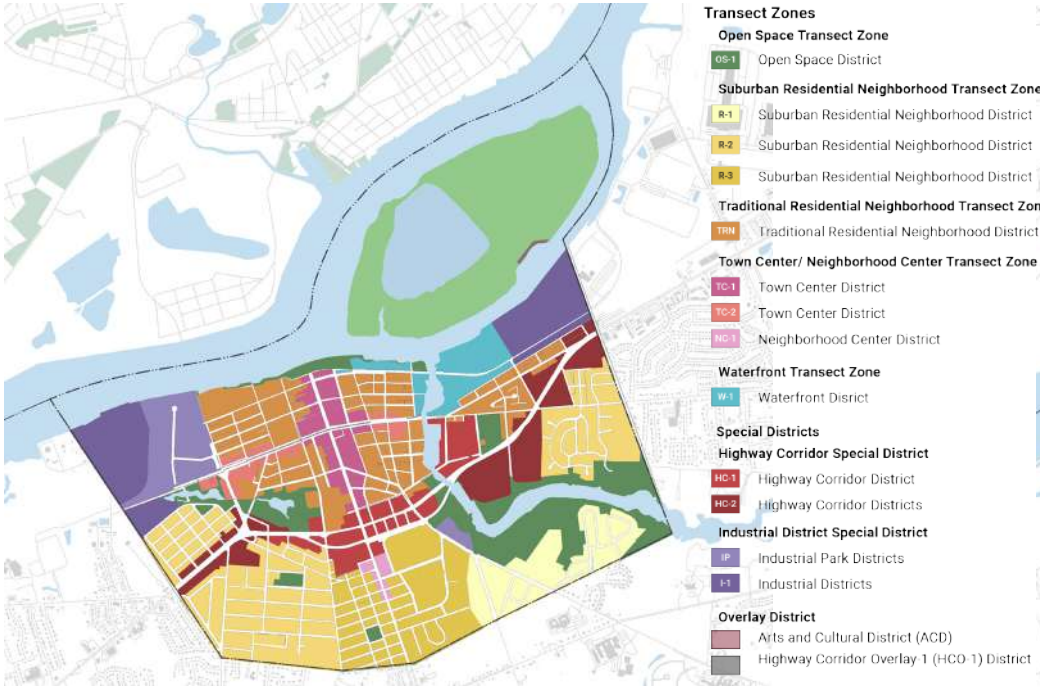
Population Pyramid



Zoning and Landuse

A form-based coding method divides the city into seven transect zones from the level and intensity of the physical and natural character.

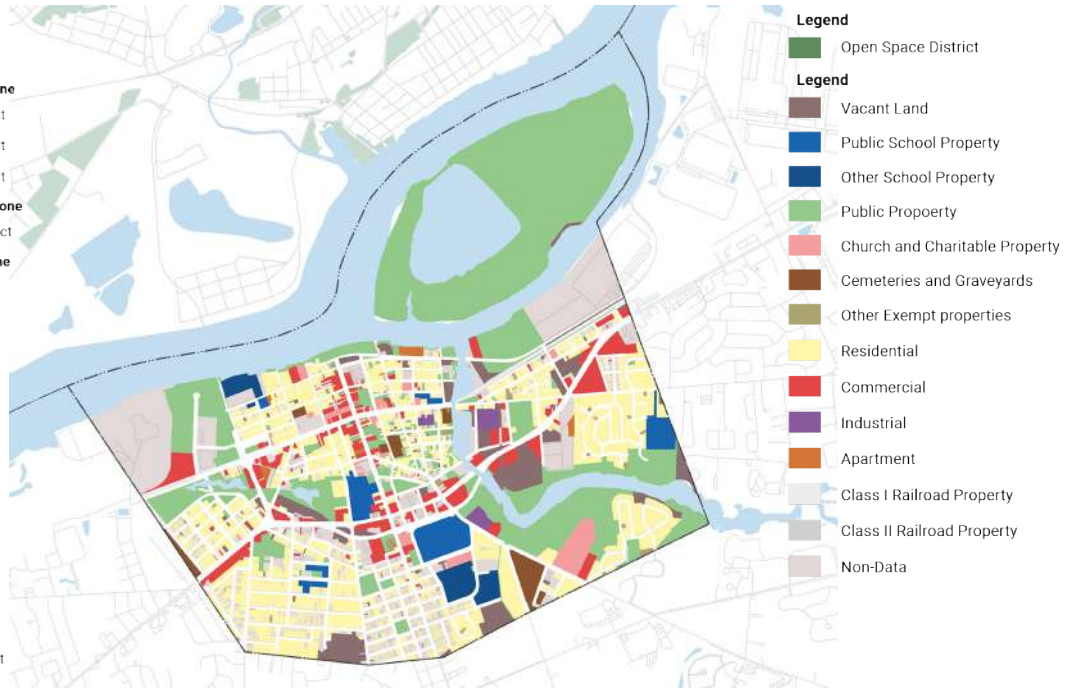
Zoning



Zoning Map

Resource:

Landuse



Landuse Map

Resource:

Open Space (OS-1), Suburban Residential Neighborhoods, Traditional Residential Neighborhoods (TRN), Town Center District (TC-1 and TC-2), Waterfront Transect District (W-1), along with two special districts: Highway Corridor District (HC-1 and HC-2) and the Industrial District Special District (I-1 and IP) and two overlay districts: the Arts and Cultural District Overlay (ACD) and the Highway Corridor Overlay (HCO-1).

Landuse Composition

~40% Natural Zones
water bodies, forests, and wetlands

~60% Urban Area

~5% Vacant Land

~50% Public Property
~20% Residential
~6% Commercial

Key Findings

The city boasts abundant natural resources and an excessive amount of open space and compared to other cities, suggesting a strong orientation towards environmental and green space areas.

Burlington City is a highly developed urban area with only 5.1% vacant land, and almost half of the land is designated as public property.

Community Assets

Burlington City has rich community assets

Residential Area

North of Route 130, the traditional neighborhoods have smaller, attached homes from before the automobile era. South of Route 130, they feature suburban, detached homes from the automobile age.

Suburban Residential Neighborhood

Traditional Residential Neighborhood

Schools

The city boasts a diverse range of educational institutions, from elementary to high schools and from day schools to religious schools.

Doane Academy

Wilbur Watts Intermediate School

Healthcare

There are only a few healthcare centers and community healthcare services within the city. The hospital and emergency facility are located in the township, approximately a 10-minute drive away.

South Jersey Medical Center

Virtua Willingboro Hospital

Natural Area

Burlington features a Riverfront Promenade along the river with an island in Delaware River, a divided JFK Park, and preserved lands along Assiscunk Creek.

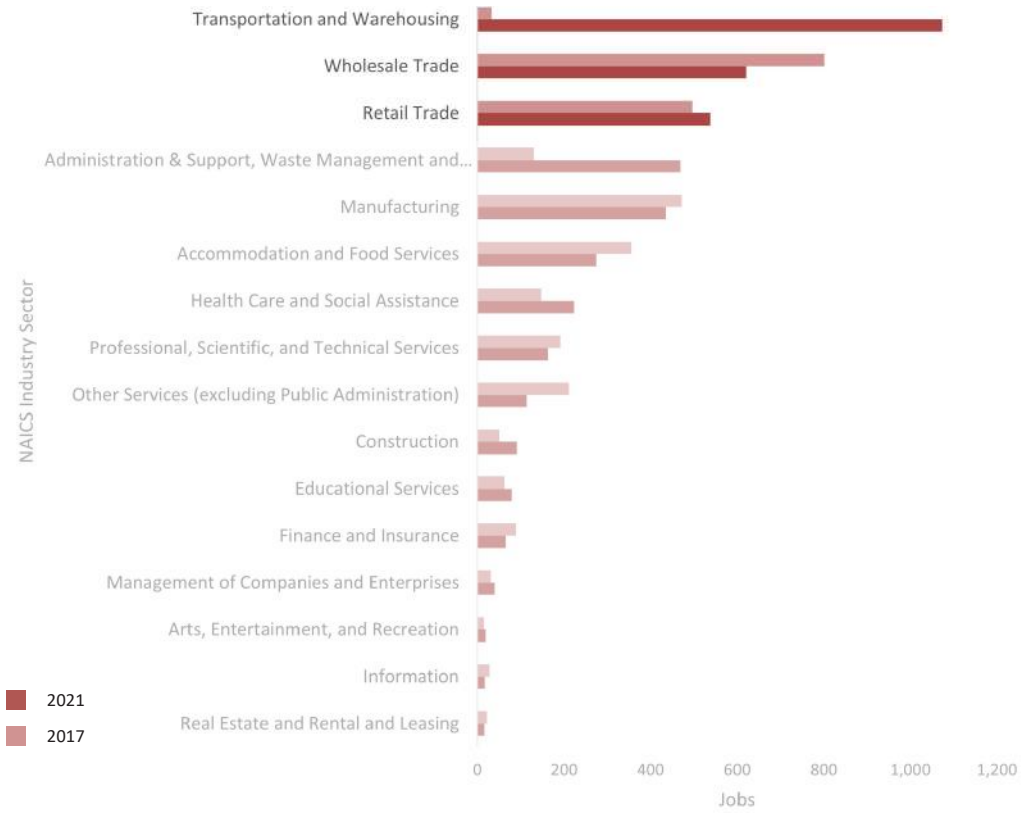
JFK Park

Waterfront Promenade

Employment and Industry

Transportation and warehousing as the top industry partly fueled by the opening of an Amazon fulfillment center in 2019

Top Industries



Transportation and Warehousing

TOP 1 industry in the city

25.4% share of all local jobs

4X more concentrated in the city than county

1000 new jobs 2017-2021

Wholesale/Retail Trade

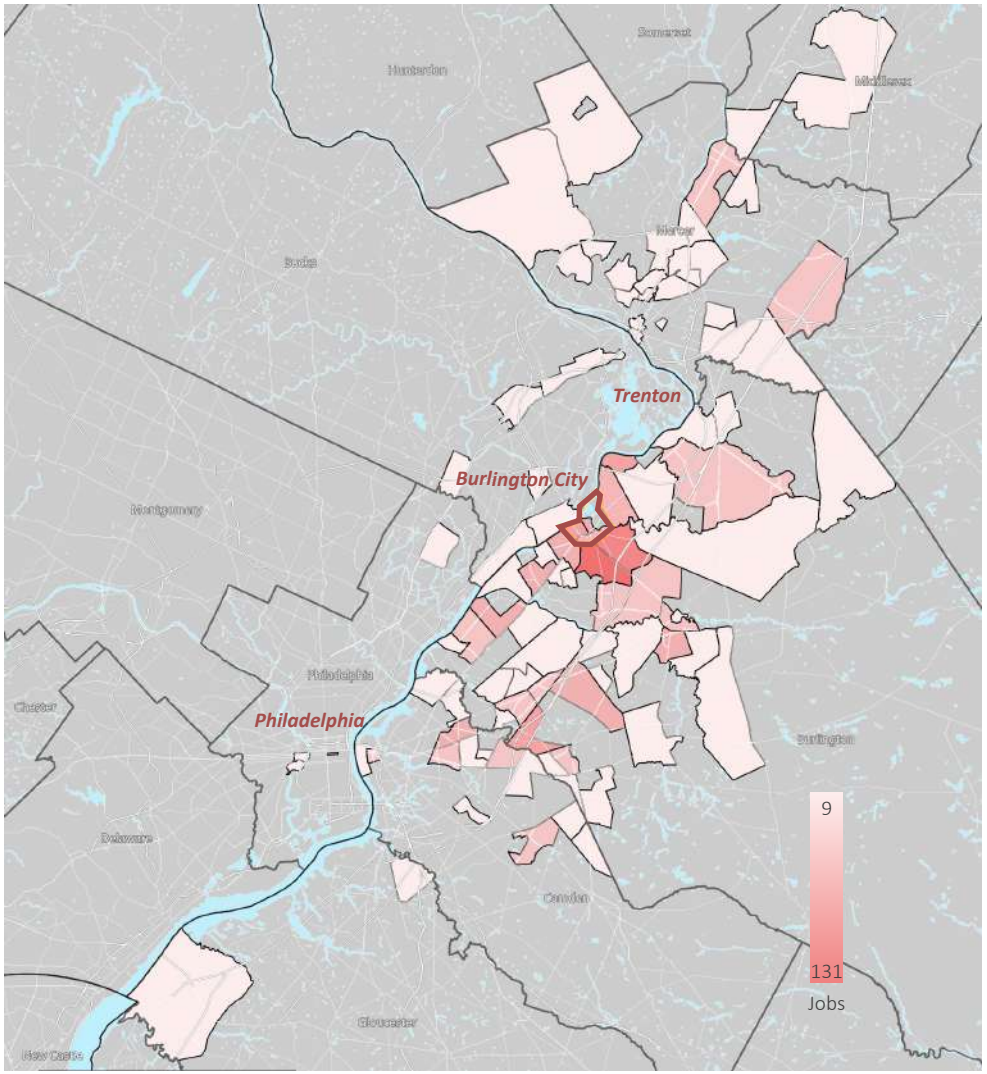
TOP 2 biggest sector in the city

20.1% share of of all local jobs

> 500 jobs were lost in this time frame, possibly due to the pandemic.

Top Economic Areas

Working Locations (Census Tracts)



Travel Pattern

Residents have long commutes in vehicles but also exhibit walking and transit demand during non-work trips

Commute Facts

Travel Pattern 2021 Fact

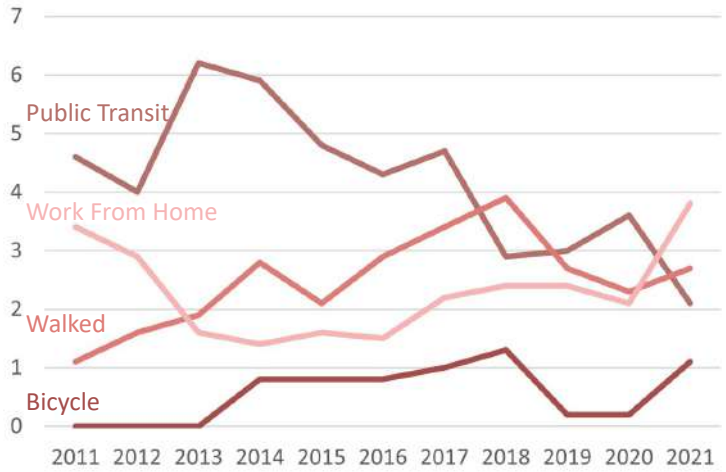
Commute in vehicles

Commute over 10 miles

Commute over 20 minutes

Commuting Mode Share

Change of Commuting Mode Share



Between 2011 and 2021, Burlington City experienced a shift in commuting behaviors, with a decrease in transit commuting and an increase in walking, cycling, and working from home. Despite these changes, in 2021, the residents faced lengthy commutes predominantly by car. This trend can be attributed to the dispersed nature of work locations, as evidenced by the fact that 54% of commuters travel over 10 miles to work, and 66% commute more than 20% of the time each day, resulting in 88% of commuters depending on vehicles for their daily travel.

Comparison of Mode Share

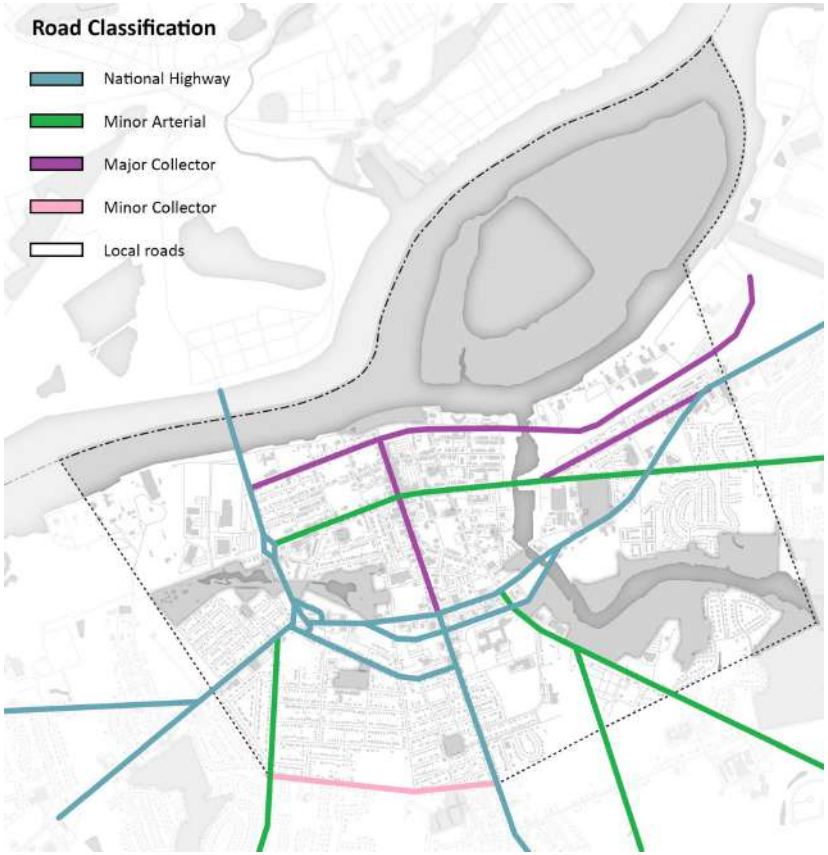
However, the use of walking and public transit differs significantly when it comes to non-work-related activities. Walking accounts for 8.1% of all trips but only 1.6% of commutes, while transit is used for 5% of all trips compared to 4.0% for commuting purposes. This discrepancy highlights a potential area for increasing non-vehicular travel modes for commuting.

In Burlington County, the obesity rate among adults is 28%, exceeding both the New Jersey and national averages. Given this health challenge, promoting biking and walking can be an effective strategy to improve physical health in Burlington City, especially in combating childhood obesity by incorporating more active transportation into daily routines.

Roadways and Public Transit

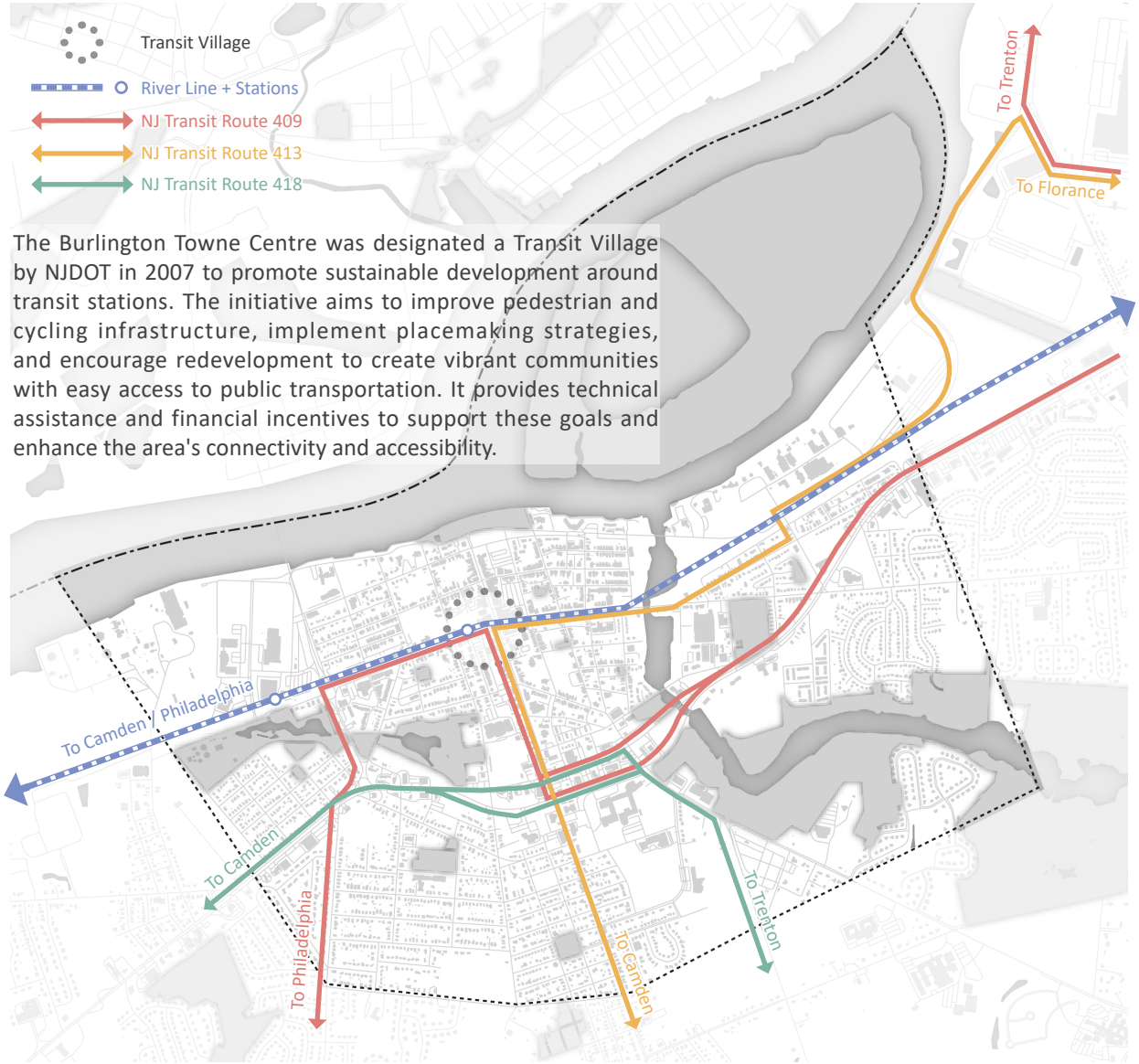
Burlington City is transit convenient and was appointed a Transit Village by NJDOT in 2007 to promote non-motorized developement

Roadways



The area is served by five road classifications, with Route 130 acting as a national highway that bisects the city into two distinct parts. Additionally, three minor arterial roads facilitate connections between the city and neighboring townships and cities, supporting regional traffic flow. Major collectors within the city serve as vital thoroughfares, promoting both business and recreational activities by providing efficient access to key destinations.

Public Transit Network



The Burlington Towne Centre was designated a Transit Village by NJDOT in 2007 to promote sustainable development around transit stations. The initiative aims to improve pedestrian and cycling infrastructure, implement placemaking strategies, and encourage redevelopment to create vibrant communities with easy access to public transportation. It provides technical assistance and financial incentives to support these goals and enhance the area's connectivity and accessibility.

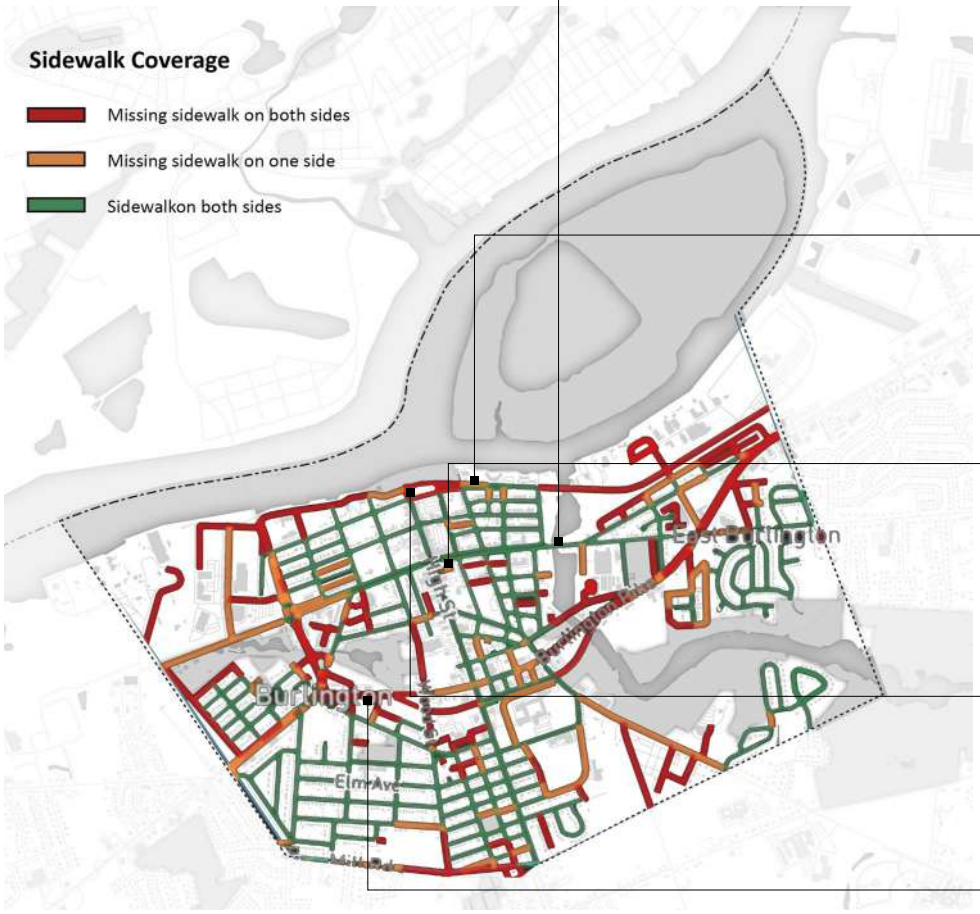
Transportation Infrastructure

Limited infrastructure challenges non-vehicle travel

Sidewalk Infrastructure

Missing Sidewalk

There are six types of roads in Burlington City. However, one or more sidewalks are missing along the National Highway and Minor Arterial. Most of the local roads in the residential areas are equipped with sidewalks on both sides. However, the western corner of Burlington lacks sidewalk infrastructure, including along the riverbank. This absence of sidewalks creates a particularly challenging environment for pedestrians and restricts their mobility to just the residential neighborhood.



Columbus Road

Sidewalks on both sides

The sidewalk are narrow without barriers

East Pearl Street

Missing sidewalk on one side

East Broad Street

Missing sidewalk on one side

Riverbank

Missing sidewalk on both sides

Route 130

Missing sidewalk on both sides

Transportation Infrastructure

Some sidewalks have low to poor quality and impact non-vehicle travel

Sidewalk Infrastructure

Low Sidewalk Quality

Bad quality waterfront trail in ***Open Space District Riverfront Promenade***, creating tripping hazard.

Photo by Anna Wu

Green Street in ***Traditional Residential Neighborhood*** photo. The sidewalk condition is deteriorating and is expected to worsen in the future.

Photo from Google Street View

Sidewalks disappear on both sides after crossing the bridge of County Route 656 in ***Waterfront District.***

Photo from Google Street View

Bad quality sidewalk in ***Town Center District High Street***

Photo by Anna Wu

Sidewalks are poorly maintained on West Broad Street in Industrial District. Grass are overgrown on top, might deteriorate in the future.

Photo from Google Street View

Sidewalk disappears on Route 130 Highway Corridor District HC-2 Photo by Google Street Map
HC-2 is intended for the auto-oriented commercial highway corridor. A portion of the sidewalk was observed through Google Street Map. However, it disappears into the asphalt automobile entrance on both ends of the sidewalk, creating confusion and inconvenience for pedestrians.

Photo from Google Street View

Transportation Infrastructure

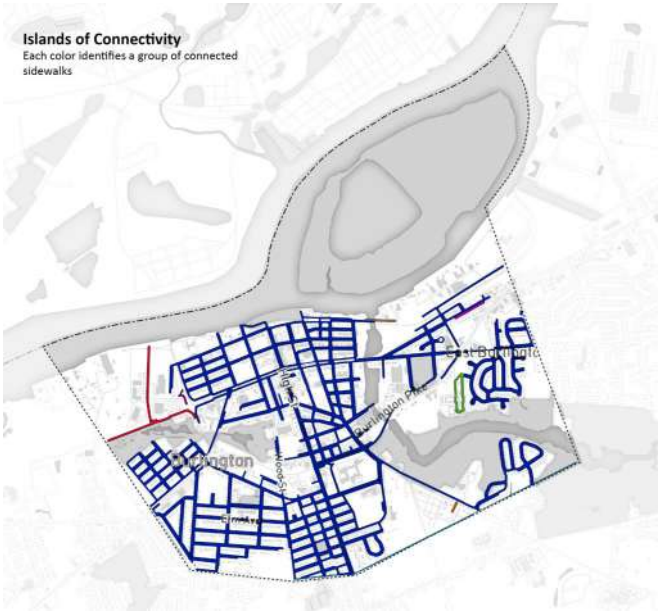
Accessibility to public transit and schools are fair in general; Connectivity is low on the North-West and North East sides

Accessibility

The first map highlights access to public transit. Most of the public transit stops are accessible by the Burlington community with the sidewalk, except for a few places in the suburbs in the South-East. These suburbs are designed around a cul-de-sac which increases travel time. It shows areas that do not have an easy and immediate access to public transit, which might limit their use of public transit and in-turn reduce walking.

The second map highlights access to schools in the area. Areas in the extreme ends on both sides have a longer travel time by walking. This could be due in part due to the lack of sidewalk infrastructure along the western strip near riverbank, while along the eastern part, although sidewalk infrastructure exists the lack of crosswalks and increased distance from school contribute to increased walk time.

Connectivity



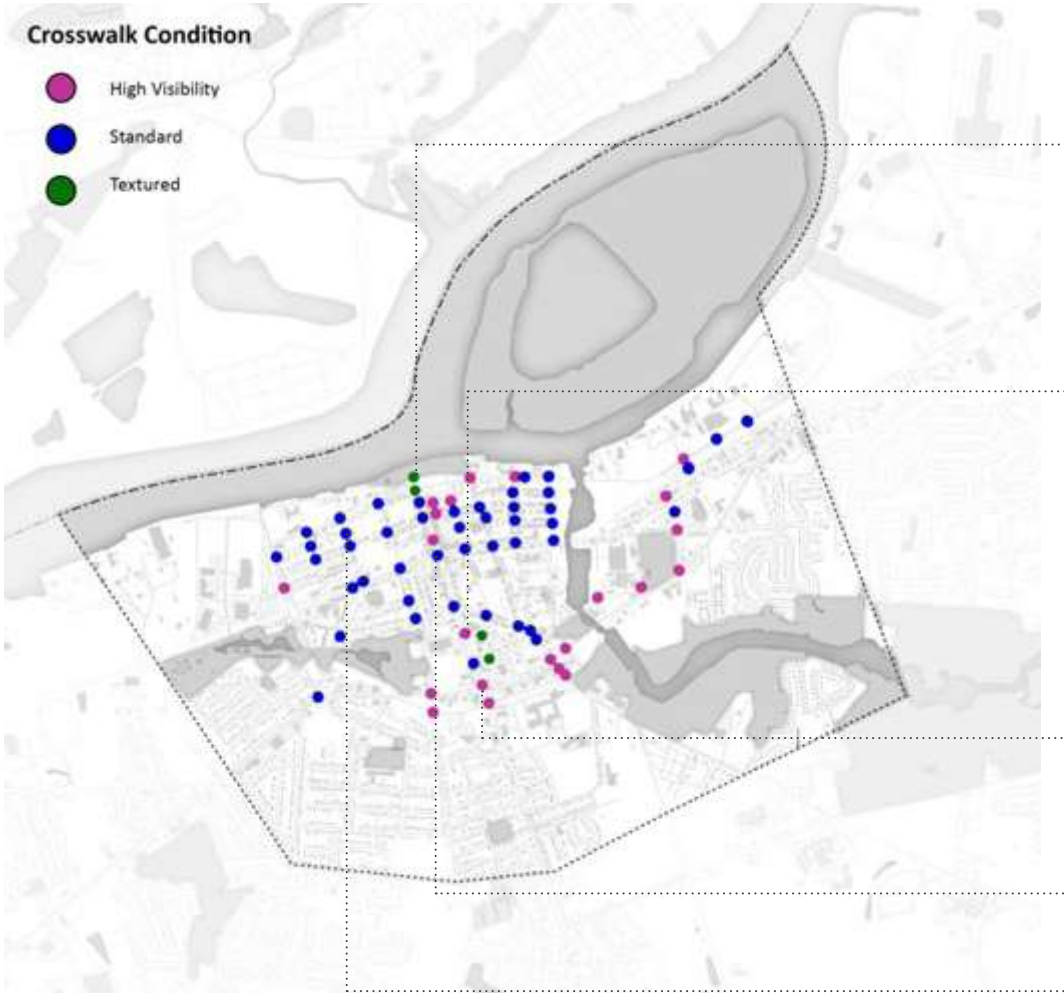
The third map highlights sidewalk island connectivity. We can see that sidewalk infrastructure is disjointed along Route 130. The sidewalk islands in the North-West and North-East are not connected to the rest. This makes it difficult for people to access these sidewalk as a preferred mode of commute to school.

Transportation Infrastructure

Most crosswalks are standard; Some crosswalks have high visibility; Few have textured crosswalks

Sidewalk Infrastructure

Crosswalk



Crosswalk Quality

Riverbank & High St.

Union St. & High St.

Route 130 & High St.

Broad St.& High St.

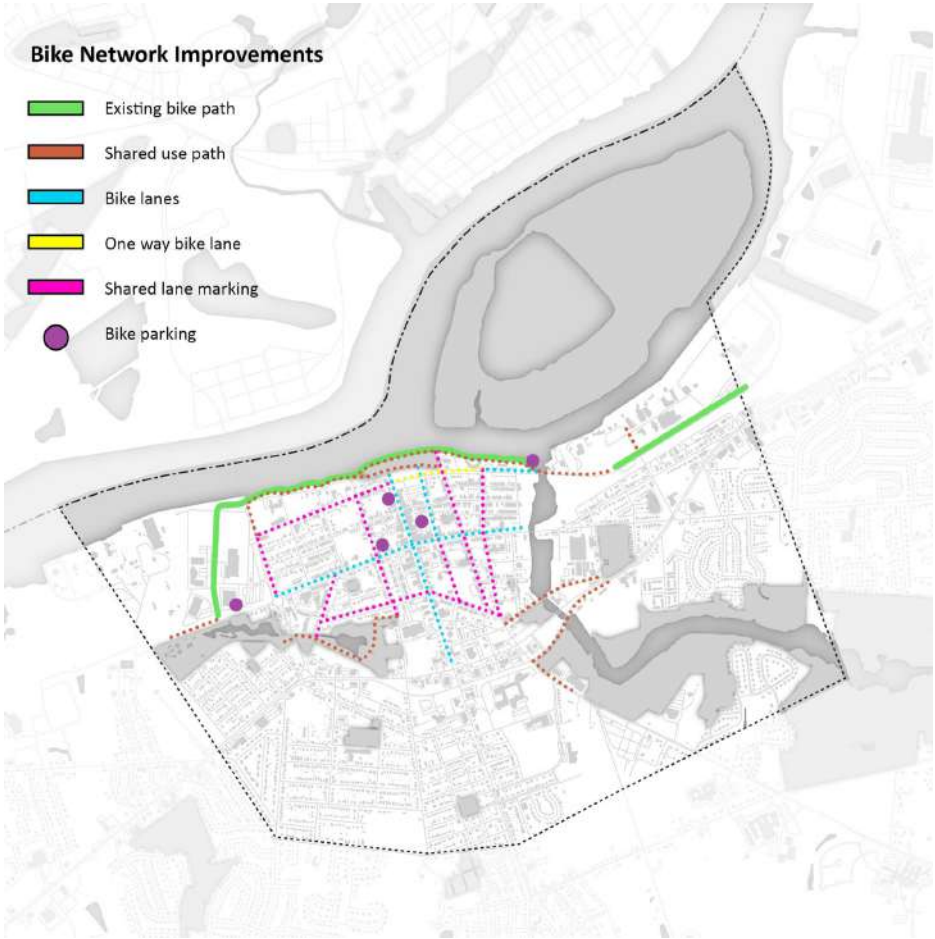
Ellis St.& Brown St.

Transportation Infrastructure

The city only has one shared multipurpose lane; The bike level of stress are high on traffic heavy roads

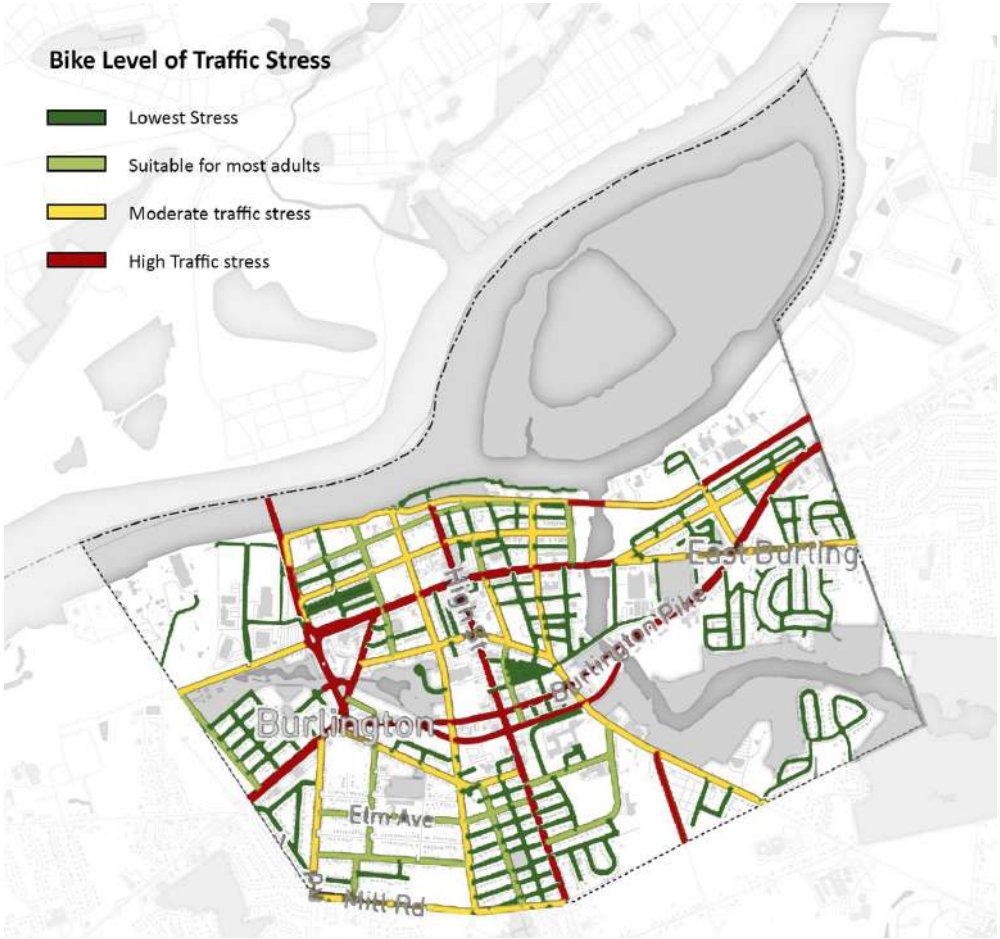
Bikelane Infrastructure

Proposed Bike Network, Burlington Circulation Plan 2020



In Burlington City, there is currently only one shared multipurpose lane along the riverbank. The Burlington Circulation Plan 2020 proposes several shared paths, bike lanes, and bike parking spots. However, many of these bike lanes are planned for roads with moderate to high traffic stress. The city's residential areas have narrow streets with parking on both sides, limiting the feasibility and necessity for designated bike lanes.

Traffic Stress



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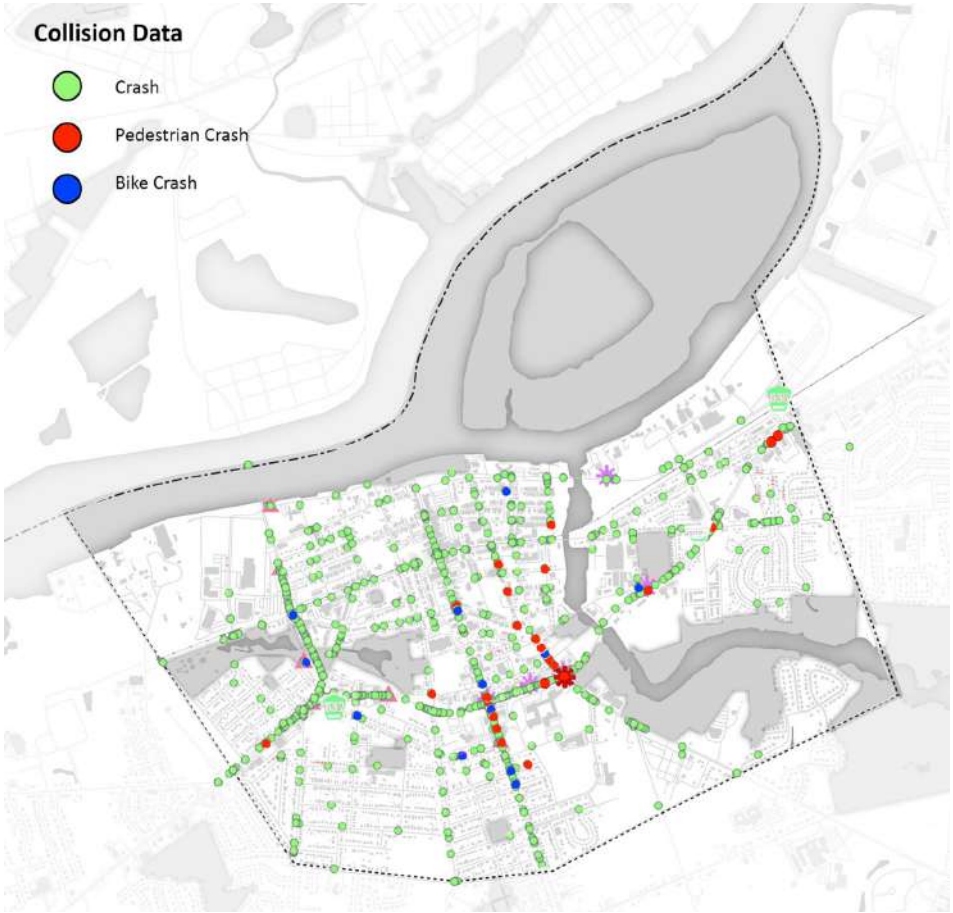
Transportation Perception

Crahses happened mostly on heavily trafficked roads lacking sidewalks; Severe crashes also occur in areas with no sidewalks.

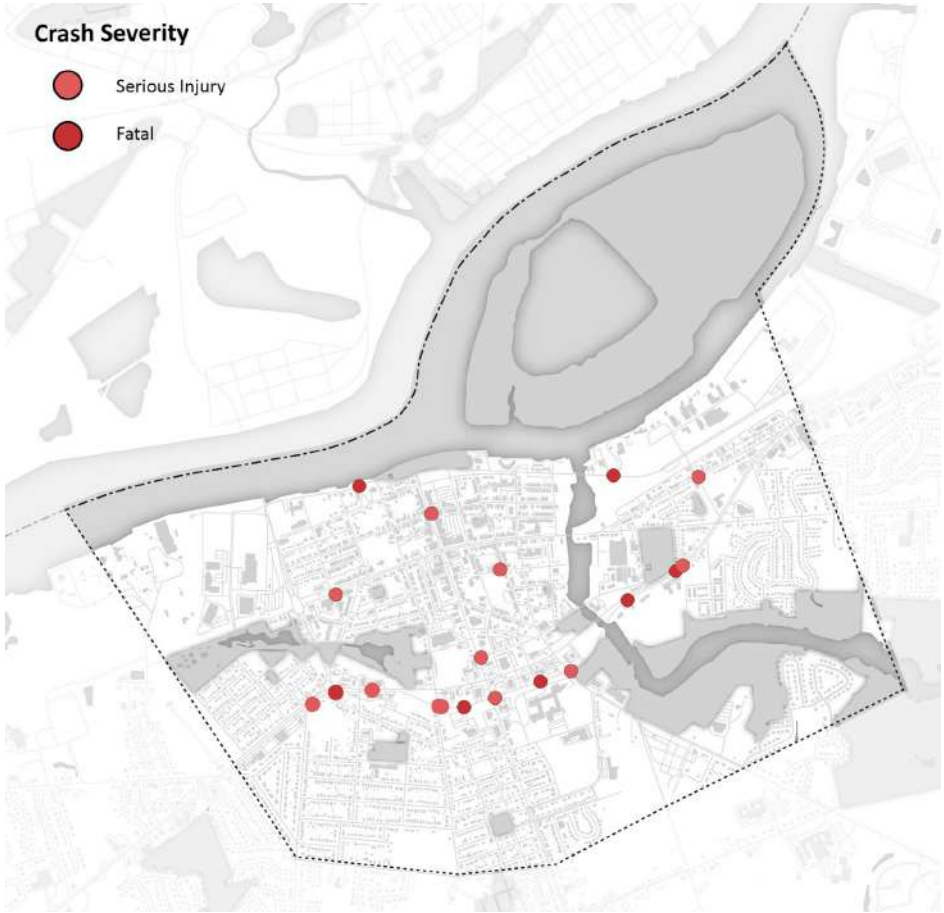
Safety

Crashes and Collisions



The suburban neighborhood has sidewalk on both sides, low stress level for biking (without bike-lane) and lower crashes. Highway and major arterials witness most of the collisions.
Common (twice crash rate per mile) than the county but less deadly (0.31 V.S. 0.37%) [2016-2020].
Pedestrian-involved crash: less fatal than the county (6.5% V.S. 11.6%) [2016-2020] clustered in certain corridors in the city, especially along U.S. 130. (55.9%) [2013-2017]

Severity and Fatality



There has been a rise in severe crashes, including pedestrian crashes along the national highway. This route also has no sidewalks for pedestrians thereby making it extremely dangerous. The incidence of pedestrian crash along the road shows that people still need to walk along the highway corridor. Thus there is a need for a protected sidewalk.

02. Issues and Opportunities

Issues

1 Lack of cycling infrastructure

The absence of proper cycling infrastructure, such as designated lanes and bikeshare systems, leads to increased risks and stress for cyclists, particularly on major roads, deterring the adoption of cycling as a safe, eco-friendly transport method.

2 Inadequate Crossings

Inadequate crossings, low visibility, inconsistent signals, and the absence of traffic lights significantly increase pedestrian risk and confuse both walkers and drivers, making street crossings more hazardous.

3 Insufficient Sidewalk

In some areas, poor or absent sidewalks on one or both street sides disrupt connectivity and access, impeding residents' mobility to key destinations like transit stations and schools, and compromising pedestrian safety.

4 Safety Concerns

U.S. Route 130 has a high rate of crashes, including many with injuries and fatalities, particularly involving pedestrians and cyclists. Main roads like High Street are notably dangerous, with issues such as jaywalking on high-speed thoroughfares increasing the risk of accidents.

Opportunities

Demand for non-motorized trips 1

Local demand for non-motorized trips is evident as residents increasingly opt for walking to access nearby amenities, highlighting a community preference for walkable spaces.

Transit village Designation 2

The Transit Village Designation supports pedestrian and bicycle improvements, enhancing the transition from public transit to city areas and promoting sustainable urban mobility.

Vibrant commercial areas 3

The vibrant, historic downtown is ideal for walking and cycling, potentially attracting tourists and boosting the local economy through accessible small businesses along the commercial corridor, enhancing the area's appeal and economic vitality.

Non-motorized commute trend 4

The non-motorized commuting trend from 2011 to 2021 shows an increase in walking, bicycling, and working from home, particularly post-pandemic, indicating a strong foundation for expanding these transport options.

Sufficient natural resources 5

Burlington City boasts extensive natural resources, with half of its area covering diverse natural zones like creeks, riverbanks, and islands. These are well-integrated into the urban fabric, including areas like JFK Park, improving the city's landscape and enhancing the quality of life for residents.

Need for Child-Friendly Infrastructure 6

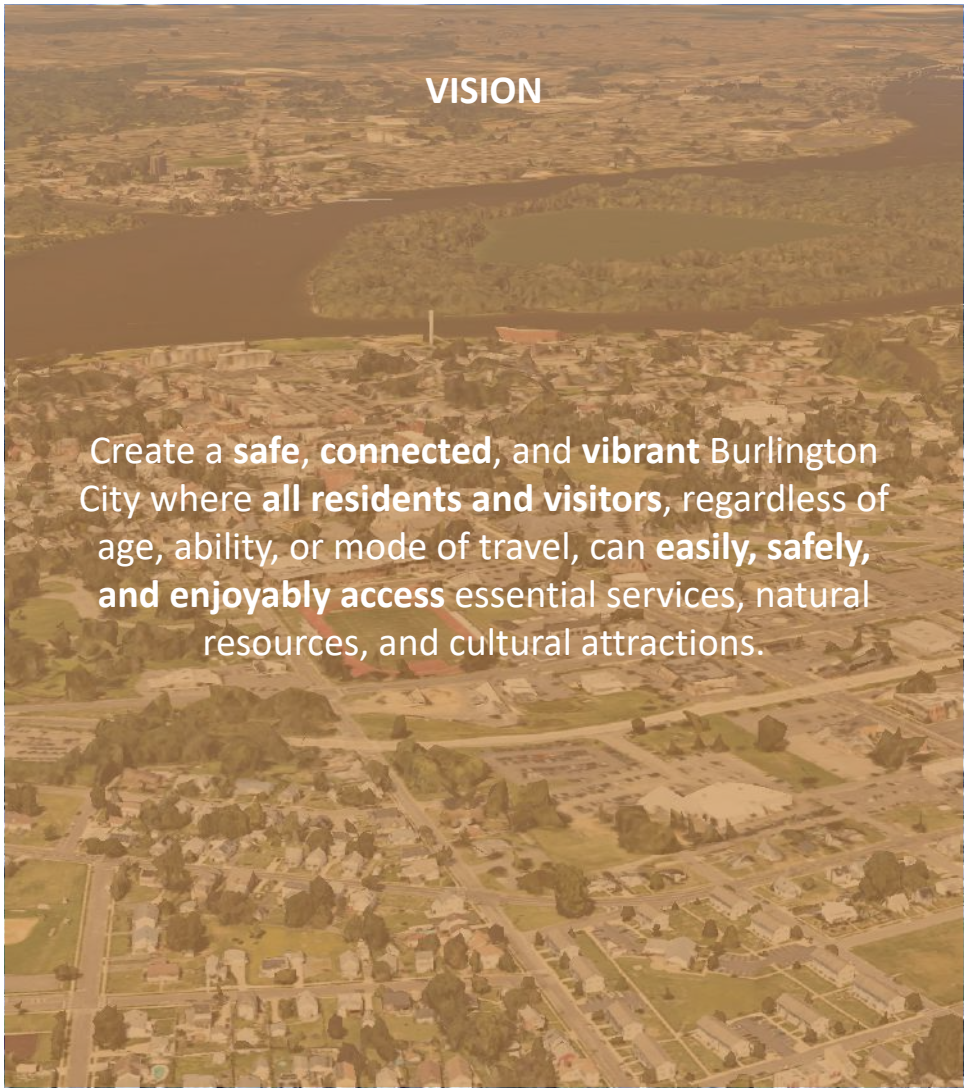
Burlington City's high population of children and elderly, coupled with its school district, highlights the need for kid-friendly infrastructure. Improved pedestrian and bicycle paths could enhance safety and living conditions, fostering a healthier, inclusive environment.

Supportive exisiting plan 7

Burlington's Master Plan 2010 and Downtown Circulation Plan 2020 focus on enhancing non-motorized travel and safety, aiming to transform the U.S. 130 corridor into a pedestrian-friendly area and to integrate natural resources, improving accessibility and safety for all.

03. Goals and Improvements

Visions and Goals



GOAL 1. Enhance Sustainable and Multimodal Transportation

Enhance the city's transportation ecosystem by increasing the use of sustainable travel options, including biking and walking. Integrate these modes seamlessly with public transit to provide accessible, convenient, and eco-friendly transportation solutions for all residents, thereby promoting healthier lifestyles and reducing environmental impact.

GOAL 2. Enhance Safety

Implement comprehensive safety measures to protect cyclists and pedestrians. This includes the creation of dedicated bike lanes, safe pedestrian crossings, and effective traffic calming strategies to reduce accidents and encourage more residents to choose non-motorized transportation options confidently.

GOAL 3. Enhance Accessibility and Connectivity for All Ages

Develop an inclusive, connected infrastructure that caters to individuals of all ages and abilities, enhancing access to key destinations such as commercial areas, cultural sites, and natural landscapes. Aim to boost local commerce and tourism by creating a more navigable and welcoming urban environment.

GOAL 4. Foster Community Interaction and Inclusivity

Create public spaces that encourage interaction among residents from diverse backgrounds, including racial, immigrant, and low-income communities. Prioritize the development of shared paths, trails, and gathering areas that facilitate social connections, promote inclusivity, and strengthen the community's social fabric.

Improvement Plans

Create safer and more accessible environments for walking and cycling, considering specific zones and practical implementation

Objectives

A: Reconnect neighborhoods segregated by the highway Route 130

B: Support multimodal transportation along the High and Broad Street corridors

C: Create Integrated Multimodal Network

D: Provide Riverbank Recreational Infrastructure

E: Improve Active Transportation in Residential Areas

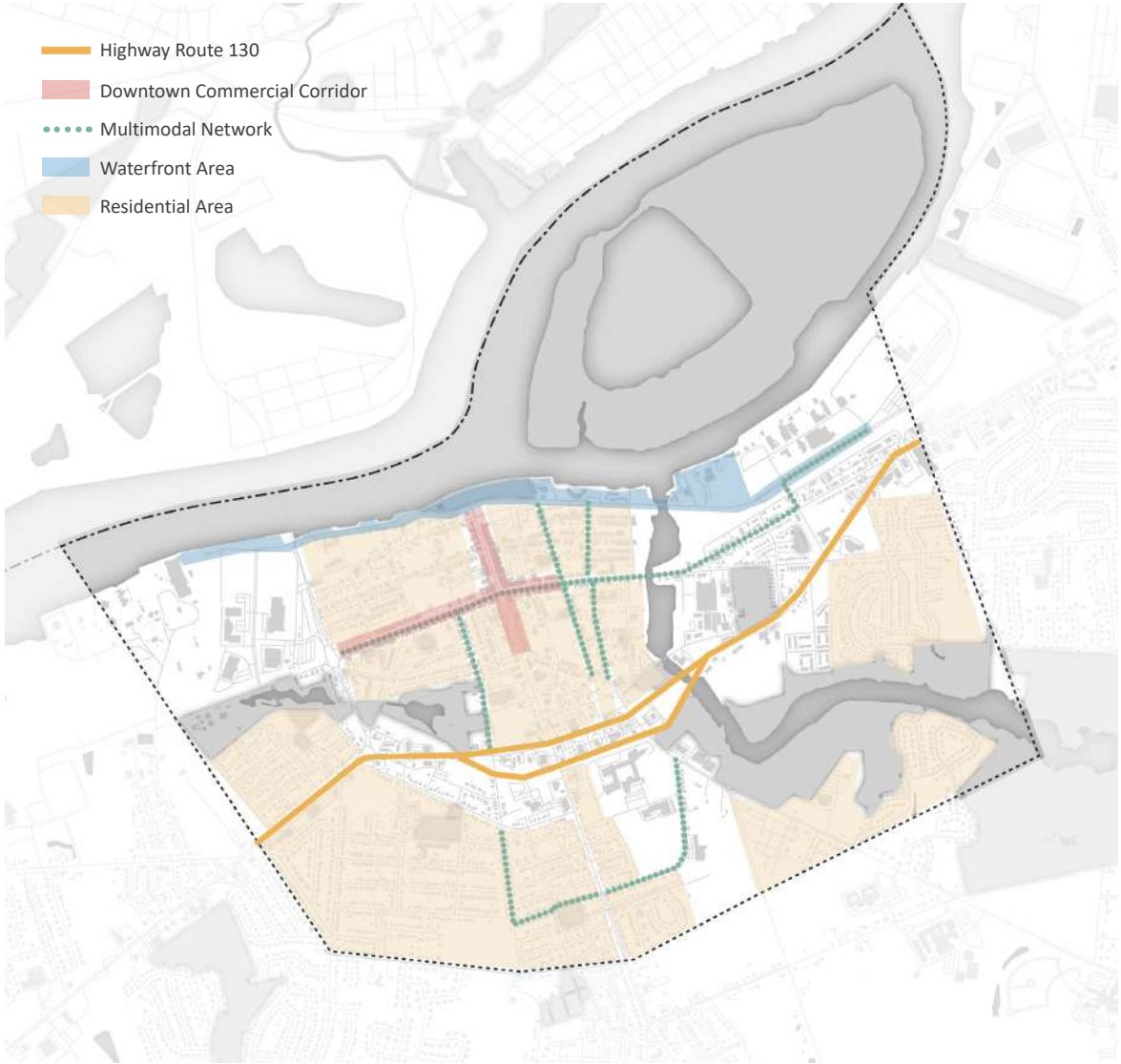
Plans

Comprehensive Sidewalk Improvement

Comprehensive Bike Network Improvement

Target Zone Improvement

In alignment with our vision and goals for enhancing pedestrian and cyclist infrastructure, we've identified five key objectives, each linked to specific zones detailed on the right. To address these systematically, we propose a comprehensive sidewalk improvement plan and a bike network enhancement strategy, tailored to current conditions. Furthermore, we are developing detailed, area-specific plans that consider both the time and cost required for implementation. This integrated approach ensures a cohesive and practical roadmap for creating safer, more accessible environments for walking and cycling.

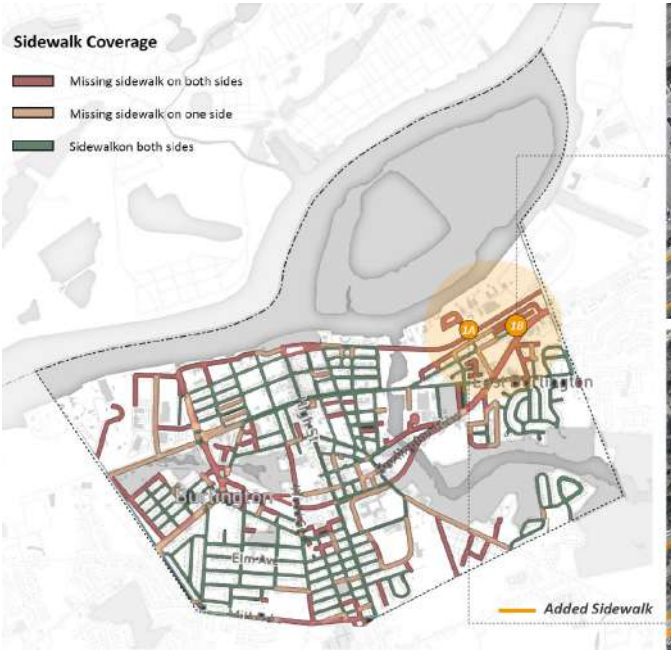


Sidewalk Improvement

Create safer and more accessible pedestrian environments by adding sidewalks, installing curb ramps, addressing surface issues, and enhancing lighting

1. Residential Area

a. Add Sidewalk in residential area on both side of the street
b. Install curb ramps at intersections and crosswalks to make sidewalks accessible for people with mobility impairments, strollers, and wheeled luggage.
c. Fix cracks, potholes, and uneven surfaces to ensure safe and comfortable walking conditions.
d. Improve lighting along sidewalks to enhance visibility and safety for pedestrians during evening and nighttime hours.

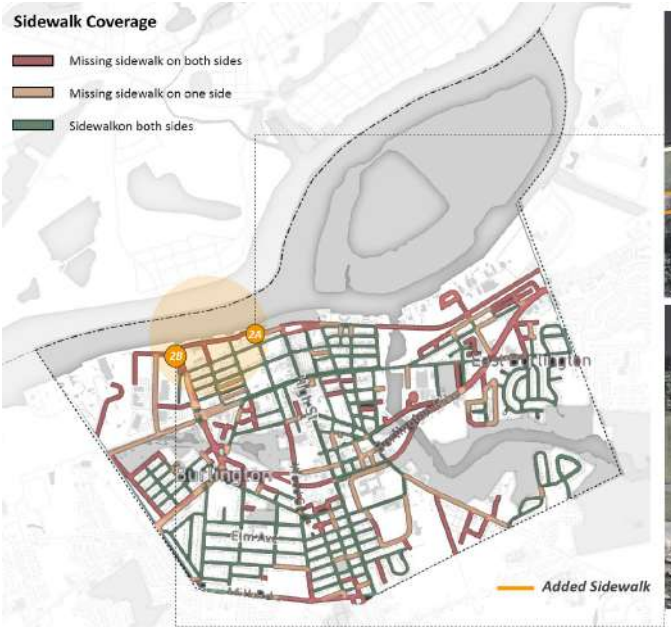


Add crosswalk in the entrance and exit of the parking lots

Enhance consistency and continuity by extending sidewalks into less residential areas.

2. Waterfront Area

1. Install sidewalks on both sides of the street to enhance pedestrian accessibility.
2. Connect existing waterfront trails with the new sidewalks through well-designed public spaces, creating a cohesive pedestrian network.
3. At the endpoints, develop public spaces and extend the sidewalks beyond the waterfront area to improve continuity with neighboring regions.
4. Ensure safe navigation by installing lighting along the pathways.



Install sidewalks along the road and integrate them with riverside pathways by creating public spaces that seamlessly connect the two.

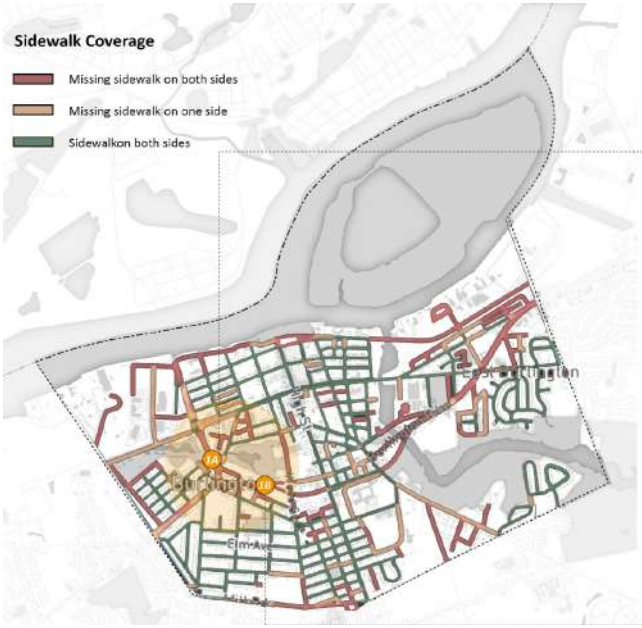
Extend the trails and sidewalks at their endpoints to ensure seamless continuity with surrounding areas.

Sidewalk Improvement

Ehancing pedestrian safety through strategic sidewalk installations, well-marked crossings, and protective barriers, especially near highway junctions and bridge approaches

3. Highway Junction

a. Install sidewalks at highway junctions to improve the continuity of the walking experience and create a cohesive pedestrian network.
b. Install well-marked and signalized pedestrian crossings at strategic points within the junction to provide safe passage across roads.
c. Install barriers or guardrails between sidewalks and vehicular lanes to protect pedestrians from traffic, particularly in areas where vehicles are moving at higher speeds.

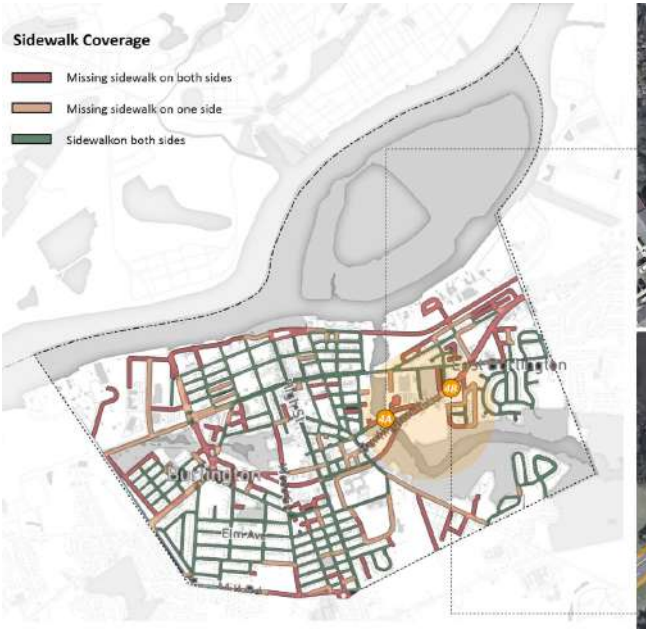


Add sidewalk around the roundabout

Add sidewalk on the sides of the highway

4. Bridges

1. Create seamless connections between bridge sidewalks and existing pedestrian pathways, ensuring smooth transitions and continuity of the walking network
2. Implement traffic calming measures on bridge approaches to slow down vehicles and enhance pedestrian safety.



Expand the sidewalk to bridges to connect to other area of the city,

Bike Network Improvement

Enhancing multimodal transportation, connecting different areas of the city, and prioritizing safety for vulnerable groups through improved biking infrastructure

1. Enhance the Waterfront Touring Experience

Construct a leisure biking network along the Delaware River and JFK Parks to improve the integration of people with the natural landscape and optimize the use of scenic resources. Additionally, utilize water-resilient materials for the bike lanes to mitigate the impact of flooding.

2. Integrate Biking with Public Transit

Develop bike lanes along Riverline trails and bus routes, and establish bike-sharing and storage facilities to create seamless connections between cycling and public transit, effectively addressing the last-mile issue.

3. Bridge Different Areas of the City

Implementing bike lanes across Highway Route 130 and bridges can significantly enhance multimodal transportation, allowing people to travel more easily between areas separated by high-speed roads and rivers. This connectivity not only promotes cycling as a viable transportation option but also fosters greater integration between different parts of the city, encouraging exploration and interaction across neighborhoods.

4. Enhance Connectivity and Safety in the Neighborhood

Given the significant presence of children and elderly residents in the area, improving biking infrastructure can offer a more accessible and safe transportation option within the residential neighborhood. By prioritizing the needs of these vulnerable groups, we can create a more inclusive and secure environment for all residents to navigate and enjoy their community.

Zone 1: Highway Route 130

Objective A: Reconnect Neighborhoods Segregated by the Highway Route 130

A-1 Add Designated Waiting Area

Time ○○
Cost $$

A designated waiting area should be established for pedestrians and cyclists to ensure their safety and convenience while they wait for traffic signals or transit services.

A-2 Establish Bike lanes

Time ○○
Cost $

Bike lanes should be established along the routes to provide a safe and dedicated space for cyclists, and designated bike crosswalks should be implemented to ensure a secure crossing for cyclists at intersections.

Zone 1: Highway Route 130

Objective A: Reconnect Neighborhoods Segregated by the Highway Route 130

A-3 Install Sidewalks with Elevated Bumps and Greenways

Time ○○
Cost $$

Image from Google Street View

Enhance pedestrian safety and comfort along Route 130 by installing sidewalks with elevated bumps and greenways to create a protective barrier between pedestrians and high-speed traffic.

In areas adjacent to parks and sports fields, prioritize the development of sidewalks and integrate trails within these open spaces to encourage outdoor activities and connectivity.

Image from Google Earth

Zone 1: Highway Route 130

Objective A: Reconnect Neighborhoods Segregated by the Highway Route 130

A-4 Add Traffic Calming Facilities

Time ○○○
Cost $$$

1. Implementing and enforcing lower speed limits to reduce the risk of collisions.

2. Speed Bumps
These can be used in areas where lower speeds are critical, such as near toll booths or rest areas.

3. Landscaping: Aesthetic enhancements like trees or shrubs can create a visual narrowing of the road, encouraging drivers to slow down.

4. Enforcement: Regular patrolling and the use of speed cameras can deter speeding and enforce traffic laws.

By slowing down vehicle traffic, pedestrians are at a lower risk of being hit by a car, and the severity of any potential accidents is reduced. Traffic calming measures like raised crosswalks and curb extensions (bulb-outs) improve the visibility of pedestrians to drivers, making it easier for drivers to see and yield to pedestrians. The presence of traffic calming measures can make pedestrians feel safer and more comfortable walking, which can encourage more walking and contribute to a more active and healthy community. Slower-moving traffic tends to be quieter, leading to a more pleasant pedestrian environment.

A-5 Add Wayfinding Signature

Time ○
Cost $

On the right-hand side of Route 130, there is a school. Utilizing the school signal can serve as a reminder to drivers to slow down, especially when school children are present.

At the intersection of Route 130 with Klein Blvd, Mott Ave, Lincoln Ave, and Taylor Ave, the current signal orientation is confusing and difficult to discern. To enhance visibility and prevent collisions, larger and clearer wayfinding signage should be installed to display the traffic flow and directions at this junction effectively.

Zone 2: Downtown Commercial Corridor

Objective B: Support Multimodal Transportation Along the High and Broad Street Corridors

High Streets attracts residents and tourists to dine in and shop. It is also the main connecting street that lead to the Riverfront Promanade. Broad Street are mainly for local residents and residents to live along Broad Streets to take advantage of the River Line light rail commute. Both corridors have pedestrian and bike traffic volume.

B-1

Time ○○○
Cost $

Photo by Anna Wu

Install Designated Bike Lanes to replace existing street parking on both High and Broad Streets. Ample parking is available in downtown and near the South Rail Line Station of Burlington.

B-3

Time ○○○
Cost $

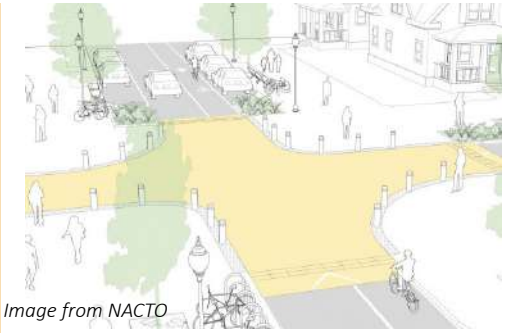


Image from NACTO

NoMoZo on High Street (Between Pearl Street and Broad Street) Between 5-8 pm. Encourage non-vehicular use, allowing people to enjoy the outdoors and cross the street freely. Union Street, Pearl Street, Pearl Blvd, and the roundabout should remain open and follow existing circulation for cars to pass without significant traffic congestion, but **implement raised intersections** to slow down traffic. **Temporary closures for festivals or pop-up events** can further enhance High Street's vibrancy.

B-2

Time ○○○
Cost $$$

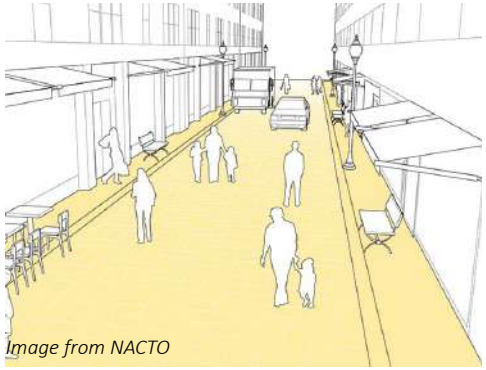


Image from NACTO

Enhance Road Surfaces for Pedestrians and Cars. Extend the red brick sidewalk design from pedestrians to car lanes, encouraging slower driving speeds. Remove curbs along original street parking to create a more welcoming environment for pedestrians and cyclists on High and Broad Streets.

B-4

Time ○○
Cost $$

Photo by Anna Wu

Install Bike Racks or Storage. Place them near bus stops and light rail stations to promote biking and provide secure bike storage. This encourages commuters to choose cycling over driving, even if they don't reside on Broad Street.

Zone 2: Downtown Commercial Corridor

Objective B: Support Multimodal Transportation Along the High and Broad Street Corridors

BEFORE

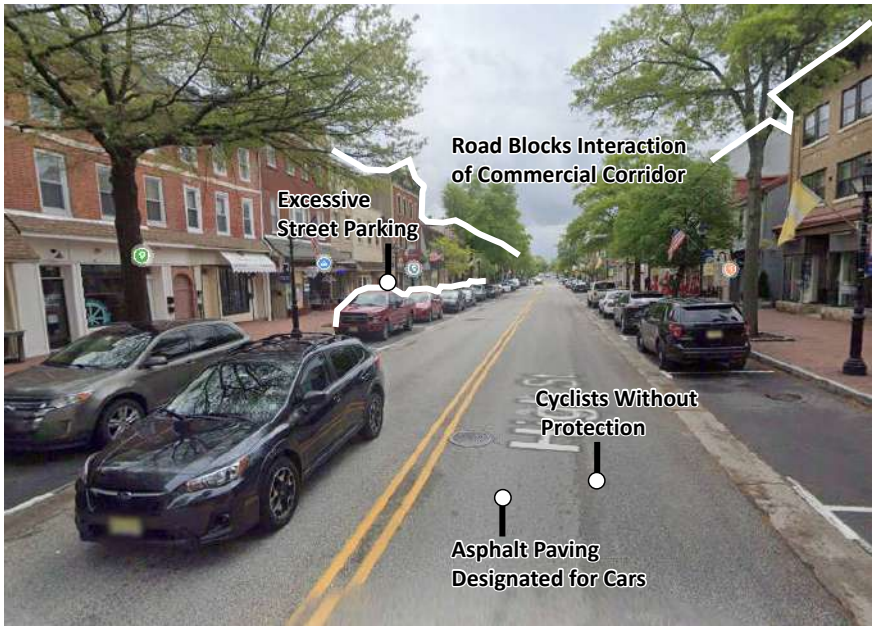


Photo from Google Street Maps

High Street

AFTER

Photo from NACTO

Adding bike lanes on both sides as well as making the road only open for non-motorized use between 5-8pm. This will bring more people into the commercial core by encouraging families to use the public space.

Zone 2: Downtown Commercial Corridor

Objective B: Support Multimodal Transportation Along the High and Broad Street Corridors

BEFORE

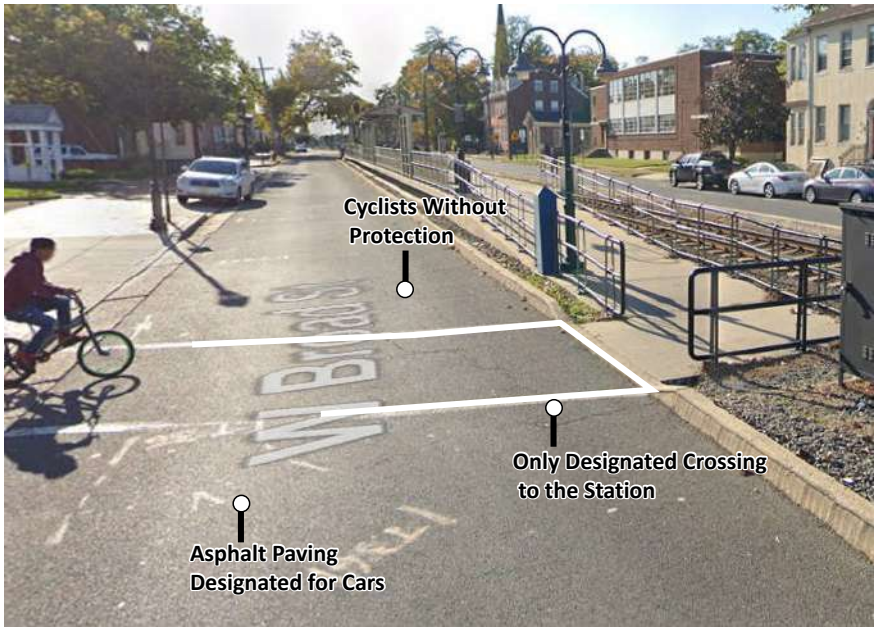


Photo from Google Street Maps

Broad Street

AFTER

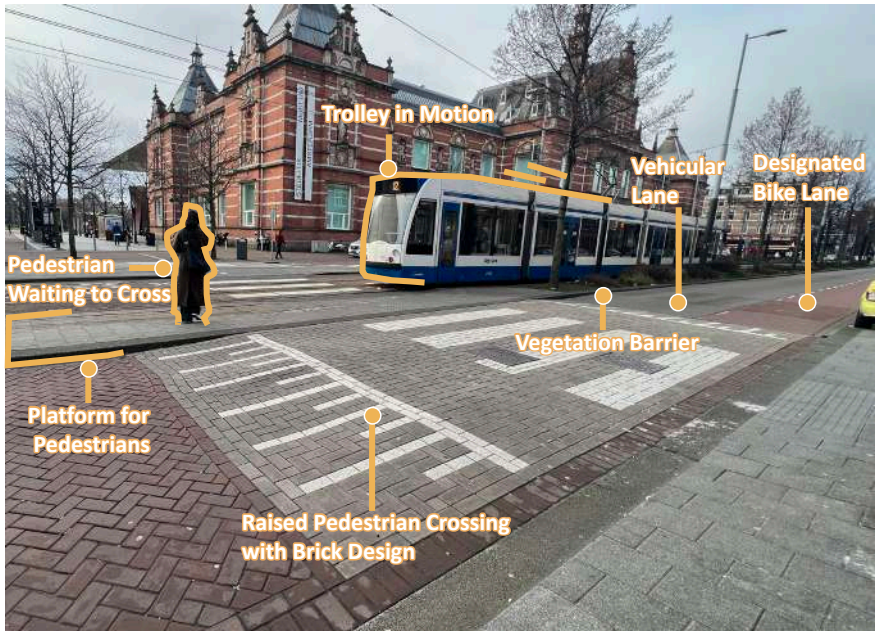
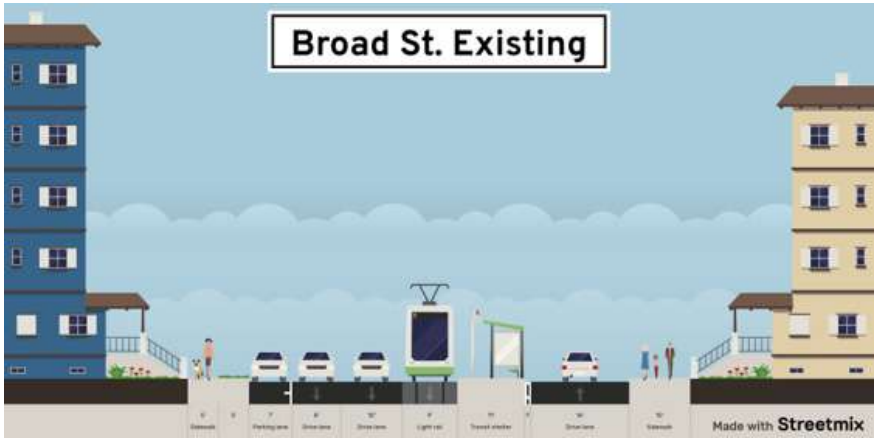


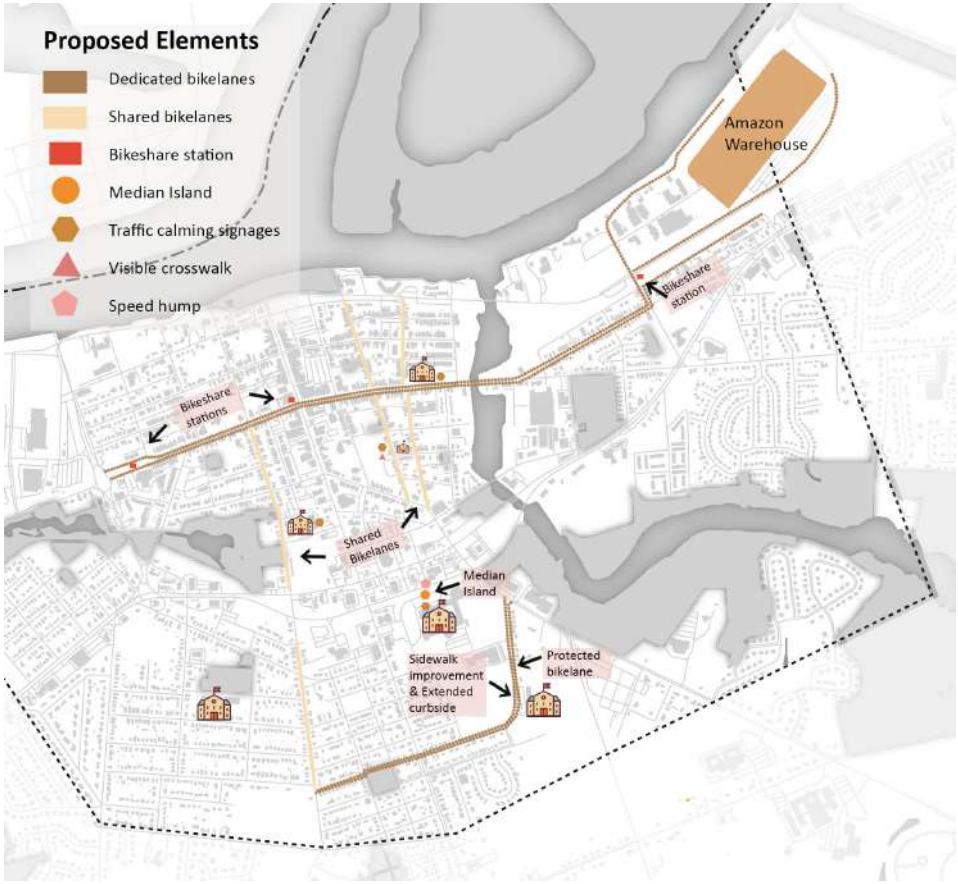
Photo by Anna Wu



Adding bike lanes on both sides as well as adding a green barrier next to the Riverline. Installed a bikeshare station outside the light rail station to encourage multimodalilty.

Zone 3: Multimodal Network

Objective C: Create Integrated Multimodal Network to Encourage Residents to Walk and Bike More



A 1 square mile Amazon warehouse with 600 workers is located between Burlington City and Burlington Township. Most workers commute by cars or Amazon shuttle service. According to the Burlington Circulation Plan 2020, the 7 schools are among the largest generators of foot and bicycle traffic. Despite this, the Safe Route to School Program in the city has only focused on putting up signage and crosswalk. Children who walk or bicycle to school are more attentive, better able to concentrate, and have mental alertness one-half school year more advanced than their less active peers. Building a bike lane along these routes will encourage workers as nearby students to bike the short distance instead.

C-1
Time ○○
Cost $

Create a Dedicated Bike Lane from public transit stop along Broad St to encourage workers to bike to

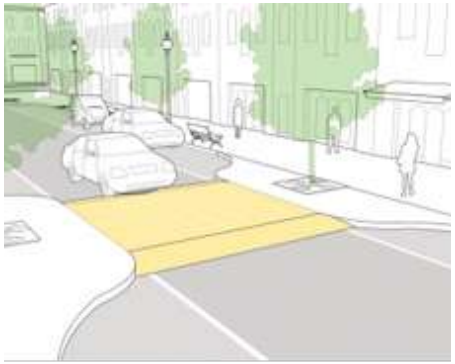
C-3
Time ○○
Cost $$

Install Bike Lockers and Bikeshare Stations along Broad St as well as near schools to make biking more convenient and integrated into the city infrastructure.

C-4
Time ○○
Cost $

Install Permanent Barriers along bike lanes as well as sidewalks dedicated use by children. This will improve the perceived safety and encourage students to bike.

C-2
Time ○○○
Cost $$$



Enhance Traffic Calming Measures, Curb Extensions and Bike Boxes to create a safe bicycling and walking route to Burlington city schools and improve visibility though .

Zone 3: Multimodal Network

Objective C: Create Integrated Multimodal Network to Encourage Residents to Walk and Bike More

BEFORE **AFTER**

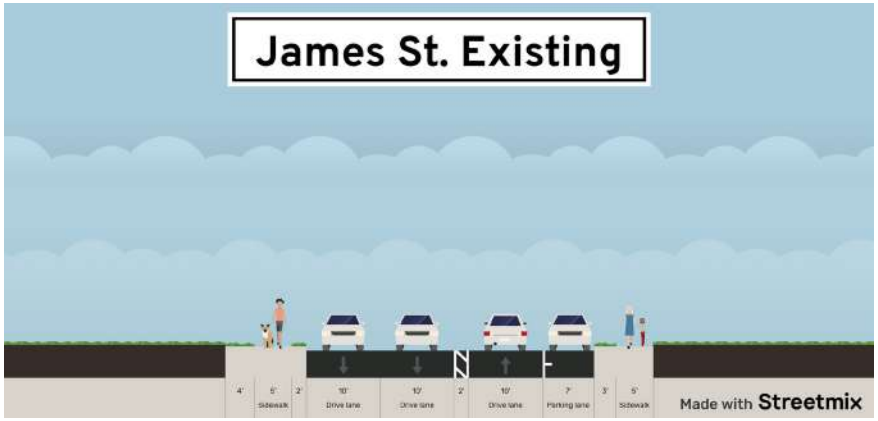
James Street

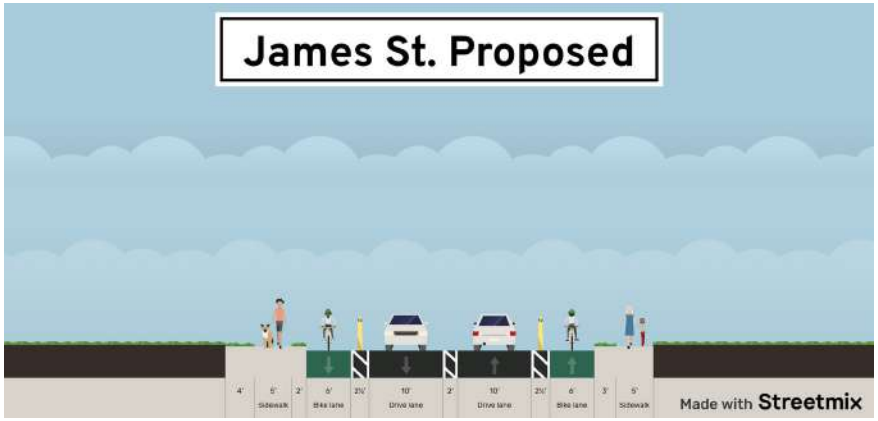
W 2nd Street

Zone 3: Multimodal Network

Objective C: Create Integrated Multimodal Network to Encourage Residents to Walk and Bike More

High street witnesses high volume of fast-moving traffic daily. The existing crossings are few and inadequate. As part of Safe routes to school in our proposal we have provided a median island with signage to alert the drivers of students as their visibility is improved.

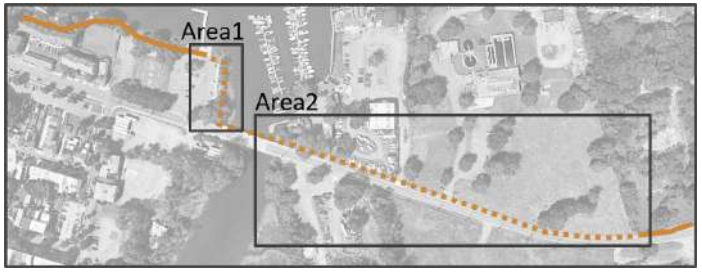




James St. Is adjacent to St Paul's Parochial School. To encourage walking and biking to school, we propose installing 6ft wide protected bike lanes on both sides in place of parking that is only used for drop off. The lanes and sidewalk are protected with bollards to increase the perception of safety.

Zone 4: Waterfront Area

Objective D: Provide Riverbank Recreational Infrastructure



The current pathway along Burlington City's riverbank terminates abruptly at a parking lot on the west end, creating a disconnect from the existing bike lane further west. To improve this situation and enhance overall connectivity, we have devised two distinct proposals: one addressing the challenges posed by the parking lot area (Area 1) and the other focusing on the road section (Area 2).

D-1

Time ○

Cost $

Area1: **Connect the Trail and Bike Lane** by the 8-foot space adjacent to the parking area. Ensure it links directly with the northern end of the existing riverbank trail and extends southward to connect with the sidewalk along the road.

D-2

Time ○○○

Cost $$$

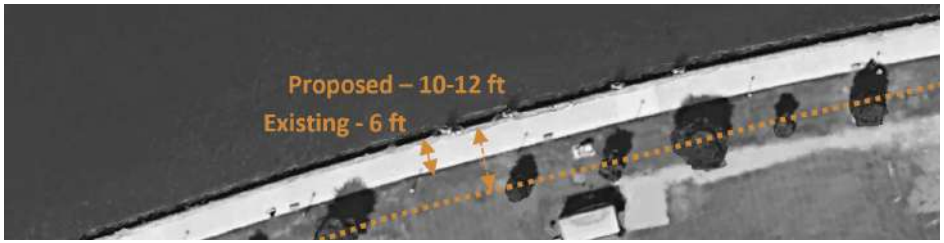
Area2: **Elevate and Expand the Sidewalks** to a width of 8-10 feet, accompanied by a 2-foot grass buffer to enhance safety and accessibility for both walkers and cyclists without impeding traffic flow. Currently on East Pearl Street where the speed limit is 40mph, the existing 6-foot-wide sidewalk is directly adjacent to the vehicle lane and lacks a protective barrier. Additionally, adding shared sidewalk bikes yield signs to inform that cyclists are also allowed on the sidewalks but must give priority to pedestrians.

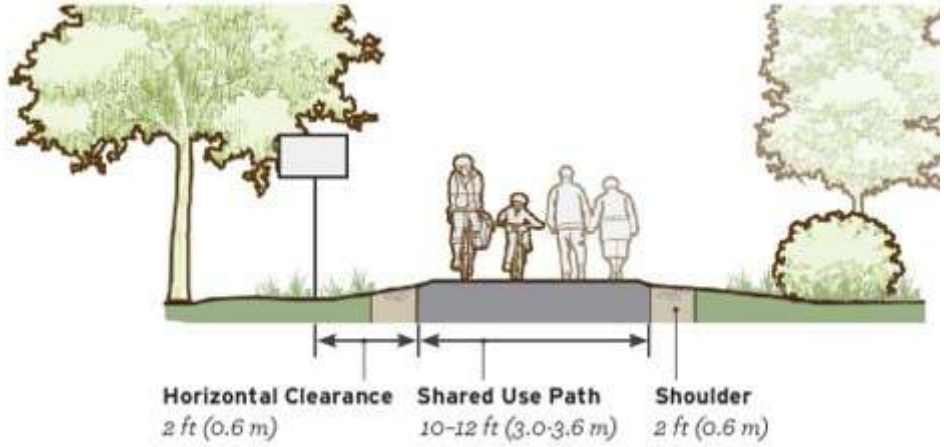
Zone 4: Waterfront Area

Objective D: Provide Riverbank Recreational Infrastructure

D-3 Widen Trails for Multi-use

Time ○○○
Cost $$$





The current 6-foot-wide waterfront path in Burlington City is inadequate for safe and comfortable passing, especially given its mixed-use by both pedestrians and cyclists. In such high-traffic and scenic areas, users frequently stop to enjoy views, necessitating a broader pathway to prevent congestion and ensure safety. Urban guidelines typically recommend a width of 10 to 12 feet for multi-use trails to accommodate the variety of users and to ensure ADA accessibility. Consequently, to enhance safety, usability, and accessibility for all, we propose widening the existing path to a more suitable width of 10-12 feet, providing ample space for passing and a safe distance from the water's edge.

D-4 Install Street Furniture and Lighting

Time ○○
Cost $$

Streetlamps *Benches* *Fitness Facilities*

Installing street furniture along trails encompasses adding streetlamps, benches, and fitness facilities to enhance the usability, safety, and appeal of the pathways. Streetlamps increase visibility during early morning and evening hours, significantly improving safety for users and extending the usable hours of the trail. Benches provide resting spots for walkers, joggers, and cyclists, making the trails more accessible, especially for older adults, individuals with disabilities, or families with young children. Furthermore, incorporating fitness facilities or stations along the trail can encourage users to engage in varied physical activities, promoting healthier lifestyles within the community. Together, these improvements not only augment the functionality and comfort of the trails but also foster a more active, inclusive, and community-oriented outdoor environment.

Zone 5: Residential Areas

Objective E: Improve Active Transportation in Residential Areas

E-1 Introduce Shared Lanes

Time ○
Cost $

Given the limited width of roads in residential areas, we propose to convert them into shared lanes for cyclists fosters a more bike-friendly environment, promoting healthier lifestyles and reducing vehicular traffic and emissions in residential areas. This typically includes marking the lanes with shared-lane symbols, or "sharrows," and installing the shared road signs, which indicate to drivers that cyclists may use the full lane and have the right to be there. By implementing shared lanes, we aim to slow down traffic, making the streets safer for all users while encouraging cycling as a viable and convenient mode of transportation. This approach not only raises driver awareness of cyclists' presence but also helps to reduce the potential for conflicts between vehicles and bicycles. Furthermore, converting existing roads into shared lanes can be a cost-effective way to improve bicycle infrastructure without the need for constructing new bike paths.

E-2 Organize Educational Events

Time ○○○
Cost $

Organizing annual community events and workshops aimed at promoting cycling and active living represents a dynamic strategy to foster a culture of health and sustainability within the community. Events like a Bike Safe Day, Bike to School initiatives, and other cycling-centric activities can significantly raise awareness about the benefits of biking and encourage residents of all ages to participate in active transportation. These events serve not only as educational platforms, providing safety tips, maintenance workshops, and cycling etiquette, but also as opportunities to showcase the practicality and joy of cycling as a daily mode of transport. By involving local schools, businesses, and organizations, these programs can create a broad community engagement, fostering a sense of unity and shared purpose.

04. Implementation

Implementation Details

Execution

This Pedestrian and Biking Improvement Plan (2024-2034) outlines a strategic approach to enhance infrastructure, focusing on operational timelines, costs, and priorities. We've grouped initiatives into three categories: low-cost, quick projects like lane markings; medium-scale projects like bike racks and street furniture; and high-cost, extensive projects like traffic calming and street widening. Additionally, policy changes and event planning, though less costly, may take longer to implement due to approval processes.

The plan addresses urban mobility by first reconnecting neighborhoods, then enhancing multimodal transport in commercial areas, developing a comprehensive travel network, improving recreational areas along the waterfront, and upgrading residential zones for better quality of life and safety. Strategies within each objective are prioritized based on urgency and cost-effectiveness, ensuring practical and financially sustainable implementation. This approach aims for immediate improvements and lays the groundwork for future developments.

Evaluation

Objective	Indicators and Targets
A - Reconnect Neighborhoods Segregated by the Highway Route 130	- Ensure all intersections along Route 130 have visible crossings by 2025. - Reduce serious crashes (resulting in injuries and fatalities) along Route 130 by 50% by 2030 and by 90% by 2034.
B - Support Multimodal Transportation along Commercial Corridor	- Boost foot traffic in the commercial corridor by 5% annually. - Provide an all ages and abilities bicycle route on both Highway Street and Broad Street by 2028. - Install a minimum of five bike racks or storage facilities by 2032.
C - Create Integrated Multimodal Network	- Decrease the city-wide crash rate by 5% annually. - Boost the percentage of active transportation trips (walking/biking) from 8% to 10% by 2030 and to 15% by 2034. - Increase transit ridership by 30% by 2030 and by 50% by 2034.
D - Provide Riverbank Recreational Infrastructure	- Increase recreational foot traffic along the waterfront by 5% annually. - Ensure the entire waterfront trail is equipped with benches and lighting by 2032.
E - Improve Active Transportation in Residential Areas	- Provide an all ages and abilities bicycle route within 0.5 mile of all 75% households, workplaces, and destinations by 2030.

Community Engagement

Community participation is vital to the success of any bike-pedestrian planning implementation. Therefore, we suggest to hold active community engagement sessions and promotional events.

Website and Online Presence: Provide an interactive map displaying all new biking facilities. Users should have the ability to post reviews, encouraging others to bike.

Pop-up Event: Host mobile workshops or pop-up events in popular public spaces to engage people directly and encourage spontaneous participation.

Publicity Campaign: Initiate a publicity campaign through local newspapers, radio stations, community newsletters, and social media to communicate key updates of the bike-ped plan. Emphasize how the plan benefits the community and enhances overall well-being.

Community Meetings and Workshops: Organize public meetings, workshops, and open houses to inform about the bike-ped plan, address questions, and collect feedback from residents.

Presentations to Community Groups: Offer presentations on the bike-ped plan to local community groups, including neighborhood associations, schools, business organizations, and civic clubs, to increase awareness and gather feedback.

Informational Materials: Develop brochures, flyers, posters, and fact sheets detailing the bike-ped plan's objectives, proposed infrastructure upgrades, and opportunities for community involvement.

Educational Campaigns: Initiate educational campaigns to promote the advantages of walking and biking, offer safety advice, and highlight the significance of backing active transportation efforts. Distribute educational materials in schools, libraries, and community centers.

Implementation Plan

Objective	STRATEGY	TIME	COST	PHASING (2024-2034)
A - Reconnect Neighborhoods Segregated by the Highway Route 130	A-1: Add designated waiting area at intersections	○ ○	$ $	
	A-2: Establish Bike lanes along the roads across Route 130	○ ○	$	
	A-3: Install sidewalks with elevated bumps along Route 130	○ ○	$ $	
	A-4: Add traffic calming facilities at certain section of Route 130	○ ○ ○	$ $ $	
	A-5: Add wayfinding signature to help people across Route 130	○	$	
	A-6: Repaint or create more visible crosswalks across Route 130	○	$	
B - Support Multimodal Transportation along Commercial Corridor	B-1: Install designated bike lanes to replace existing street parking	○ ○ ○	$	
	B-2: Extend the red brick sidewalk design from pedestrians to car lanes	○ ○ ○	$ $ $	
	B-3: Promote NoMoZo section on High Street between 5-8pm	○ ○ ○	$	
	B-4: Install bike racks or storage near bus stops and light rail stations	○ ○	$ $	
C - Create Integrated Multimodal Network	C-1: Create a dedicated bike lane from public transit stop along Broad St	○ ○	$	
	C-2: Install traffic calming measures, curb extensions and bike boxes	○ ○ ○	$ $ $	
	C-3: Install bike lockers and bikeshare stations along Broad St and near schools	○ ○	$ $	
	C-4: Install permanent barriers along bike lanes as well as sidewalks	○ ○	$	
	C-5: A-6: Repaint or create more visible crosswalks	○	$	
	C-6: Establish safe routes to school program	○ ○ ○	$	
D - Provide Riverbank Recreational Infrastructure	D-1: Connect the trail and bike lane by through parking area	○	$	
	D-2: Elevate and expand the sidewalks on riverbank roads	○ ○ ○	$ $ $	
	D-3: Widen trails for multi-uses including walkers, cyclists, runners and so on	○ ○ ○	$ $ $	
	D-4: Install street furniture and lighting along riverband trails	○ ○	$ $	
E - Improve Active Transportation in Residential Areas	E-1:Introduce shared lanes on local roads in residential areas	○	$	
	E-2: Organize educational events to promote cycling and active living	○ ○ ○	$	

Resources:

1. Google Street Maps
2. Sidewalk Gap Analysis Exlporer
3. Land Use 2020 for New Jersey, NJDEP Bureau of GIS; Statewide Parcel MOD-IV, NJGIN
4. Burlington Data. https://datausa.io/profile/geo/burlington-nj
5. The Impact of Amazon Facilities on Local Economies: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4116645
6. Safe Routes to School:
    - https://www.saferoutesnj.org/wp-content/uploads/2020/06/SRTS_strategicPlanUpdate_Final.pdf
    - https://driveless.com/school-programs-services/safe-routes-to-school/
    - http://guide.saferoutesinfo.org/pdf/SRTS-Guide_full.pdf
7. Street section: https://streetmix.net/
8. Sidewalk analysis: https://www.dvrpc.org/webmaps/sidewalk-gaps/
9. Bike LTS: https://www.dvrpc.org/webmaps/bike-lts/#:~:text=LTS%20is%20a%20road%20classification,facility%20on%20the%20road%20segment.
10. Plan reference:
    - Burlington Circulation plan, 2020
    - City of Austin Bicycle Plan, 2023
    - City of Burlington Master Plan, 2010
    - Passyunk Pedestrian & Bicycle Improvement Plan, 2022
    - Coastal Vulnerability Assessment Report, 2017
11. American Trails: https://www.americantrails.org/resources/trail-planning-hub
12. Images:
    - Google photos
    - Google earth
    - Jeffery Tseng
    - Anna Wu
13. Walk Bike to School: https://www.walkbiketoschool.org/
14. Trail Width Design: https://ruraldesignguide.com/physically-separated/shared-use-path
15. Trail Bench and Lightings : https://www.pinterest.com/pin/318137161148877080/
16. Section online drawing: Streetmix: https://streetmix.net/
17. Data source:
    - 2011-2021 ACS-5 years
    - DVRPC 2012 Household Travel Survey
    - Longitudinal Employer-Household Dynamics Data from OnTheMap
18. National Association of City Transportation Officials: National Association of City Transportation Officials | National Association of City Transportation Officials (nacto.org)
19. CPLN 600 Studio 1 Existing Conditions Reports


Thanks!