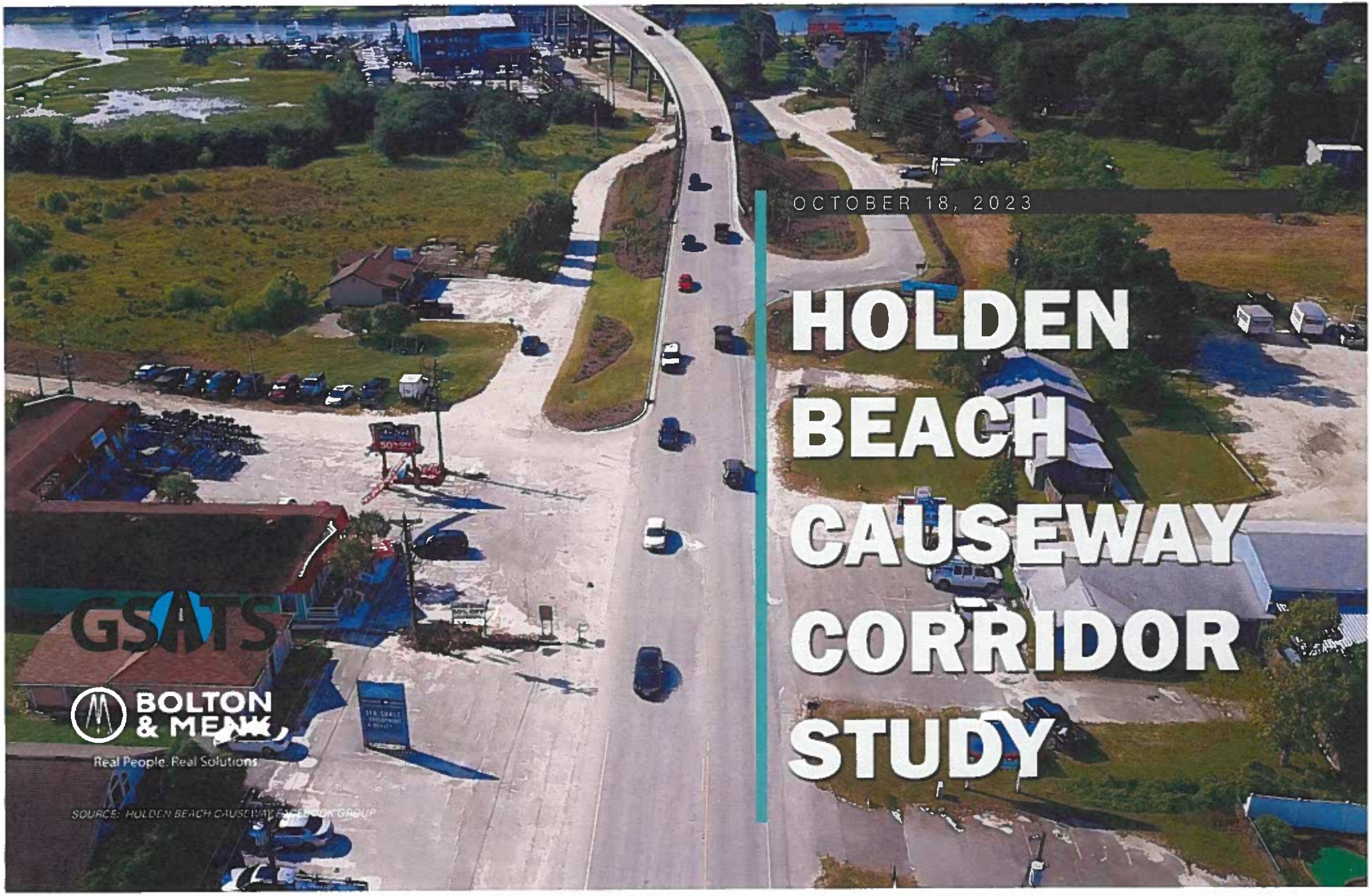


OCTOBER 18, 2023

HOLDEN BEACH CAUSEWAY CORRIDOR STUDY

GSATS

BOLTON & MENK

Real People. Real Solutions.

SOURCE: HOLDEN BEACH CAUSEWAY FACEBOOK GROUP

SOURCE: HOLDEN BEACH CAUSEWAY FACEBOOK GROUP

Change is inevitable. The key is to encourage and develop the changes needed on our Causeway so that we may have a sustainable and prosperous future. Our community's goal with the Holden Beach Road (Causeway) is to create a safe, unified environment that provides economic stability for the future generations. This plan addresses our community's needs and desires by tackling some of the Causeway's most pressing issues:

- ***Safety:*** There are several factors that create safety issues on the Causeway. The crash rating for our Causeway is three times higher than the state average for similar roads. The plan provides recommendations that address safety issues such as ingress/egress design, multiple areas with "blind spots", challenging intersections, and a higher than desired speed limit in an area filled with businesses and people who desire to walk and bike along the Causeway.
- ***Parking:*** Parking has always been an issue on the Causeway. As the area grows, addressing the parking issues needs to be a priority. The plan recommends a unified parking design with on-street parking that addresses the current situation.
- ***Pedestrian and Bike Access:*** The Causeway is in desperate need of a shared use path system. Daily, pedestrians walk the roadside across rocks and other uneven areas to get to businesses. Bikes travel on the road and golf carts travel where they can. A shared use path on both sides of the Causeway will allow for pedestrians to safely travel and enjoy local businesses. Safe pedestrian crossings are needed to allow the shared use paths to be accessible.
- ***Economy:*** The Holden Beach Road Causeway is the commercial heart of the greater Holden Beach, Supply, Varnamtown, and Lockwood areas. We are a tourism economy and every dollar counts to feed our families and keep the community going. Our lack of infrastructure and safety concerns often sends tourists to other areas to enjoy themselves. The plan supports our vision to attract tourists and create economic stability for our businesses and the future generations that will run them.

On behalf of the study Steering Committee, we fully endorse this plan. We are sincere when we say, this plan will help make a positive impact on our community for generations.

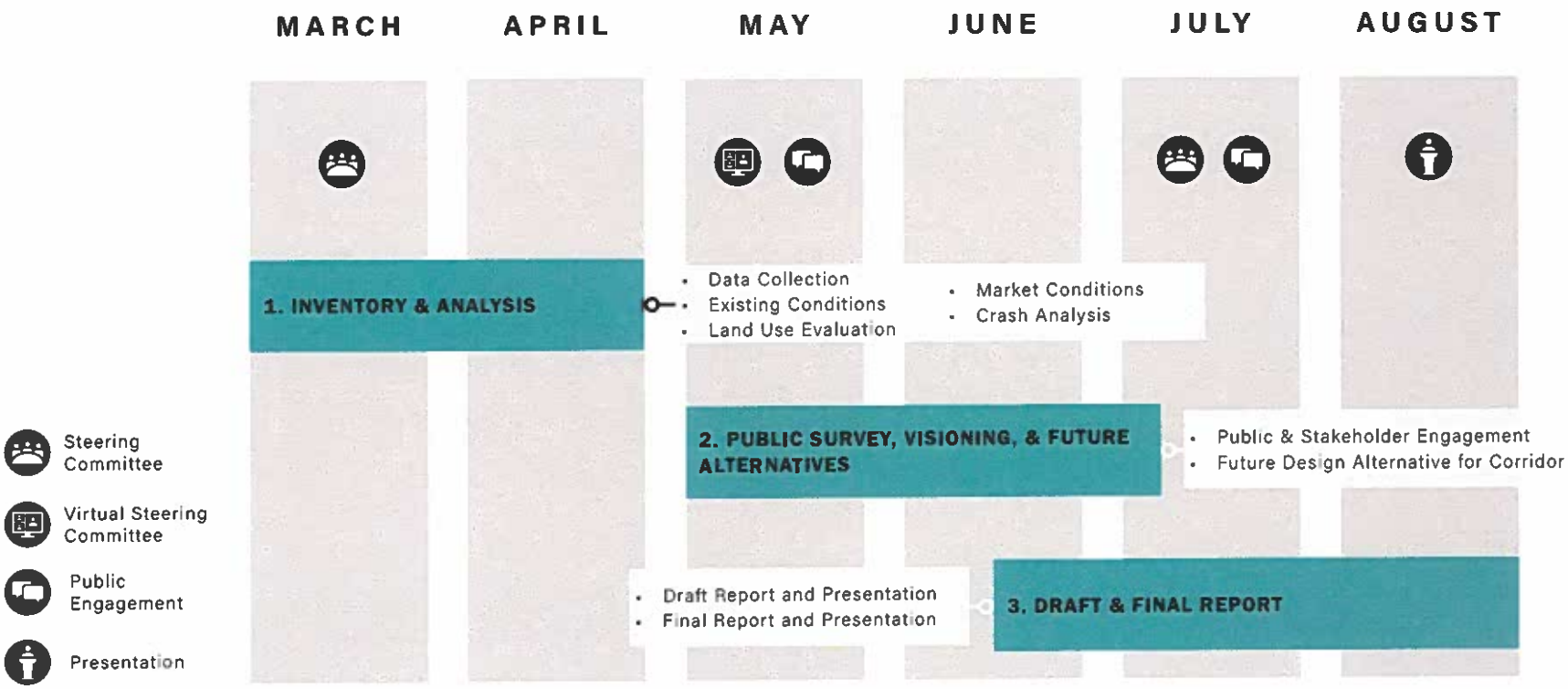
- Holden Beach Causeway Corridor Study Steering Committee

TABLE OF CONTENTS

PROJECT INTRO	4
EXISTING CONDITIONS	12
PROJECT ENGAGEMENT	35
DESIGN OPTIONS	42
RECOMMENDATIONS	48
IMPLEMENTATION GUIDE	60

PROJECT INTRO

PROJECT SCHEDULE



SOURCE: HOLDEN BEACH CAUSEWAY FACEBOOK GROUP

PROJECT SUMMARY

PROJECT SCHEDULE

The project spanned 6 months, with 5 steps:

1. Data collection and existing conditions;
2. Initial public input strategies;
3. Draft recommendations;
4. Follow up public input strategies; and
5. Completion of Final Report.

DATA COLLECTION AND EXISTING CONDITIONS ASSESSMENT

Necessary data was collected to complete a comprehensive evaluation for the study area and all adopted plans and policies relevant to the Holden Beach Road Causeway area were reviewed.

EVALUATION LAND USE & DEVELOPMENT REGULATIONS

Recommendations were developed for future land use patterns and improved development regulations to encourage inter-connectivity, multi-modal transportation choices, and promote safe mobility by analyzing demand and development suitability of properties along the corridor.

ACCESS MANAGEMENT

The existing/proposed access points were evaluated on the Holden Beach Road Corridor and access management recommendations were developed to improve the functionality of the corridor.

CRASH ANALYSIS

Crashes along the corridor for the period of 2017 through 2021 were evaluated and recommendations were developed to reduce the number of crashes and improve safety for both motorized and non motorized travel.

FUTURE DESIGN ALTERNATIVES

Recommended improvements based on the need for safety and what NCDOT will allow within the right-of-way were developed. Illustrations were developed to demonstrate recommended conceptual designs and context-sensitive cross-sections for the corridor from the intersection of Holden Beach Road and Sabbath Home Road to the Atlantic Intracoastal Waterway that provide a sense of place.

COLLECTOR STREET PLANNING

Potential network connections were evaluated and conceptual design guidelines were developed that will serve as a guide for future development. This information will be used by staff to provide the development community with recommended locations for local streets that will improve access, mobility and safety along the Holden Beach Road Causeway.

PUBLIC INVOLVEMENT

The public was engaged throughout the planning process to ensure the recommendations of the final plan are consistent with the community's vision and the Steering Committee's direction by utilizing (3) Steering Committee meetings, (2) online survey and input opportunities, (1) in-person design alternatives workshop, (1) draft plan presentation, and final plan presentations to Brunswick County Board of Commissioners and GSATS MPO TCC and TAC. Just about 1500 people took the survey, and just over 1000 of the participants described themselves as residents.

REPORT

The report identifies the recommendations of the study. It includes the study area maps, design plans of alternatives, illustrative perspective images, detailed cost estimates of proposed roadway improvements, implementation schedule (Short range, mid range and long range), supporting text/ drawings describing the projects, and assignment of lead and supporting entities needed to complete projects.

PROJECT STUDY AREA

188 ACRES SPANNING FROM SABBATH HOME ROAD SW TO THE HOLDEN BEACH BRIDGE

The project site area is approximately 188 acres spanning from Sabbath Home Road SW to the Holden Beach Bridge. While the primary focus of the study was Holden Beach Road SW, and the parcels directly along the corridor, the entire project study area was evaluated from an existing conditions, connectivity, and land use perspective.

COMMUNITY PROFILE

Center of Corridor
Drive time of 5 minutes

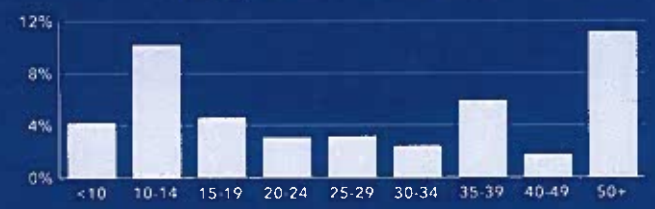
2,358	3.49%	2.11	21.0	58.7	$66,313	$377,778	$291,686	11.9%	52.4%	35.8%
Population Total	Population Growth	Average HH Size	Diversity Index	Median Age	Median HH Income	Median Home Value	Median Net Worth	Age <18	Age 18-64	Age 65+

17.4% Services

31.7% Blue Collar

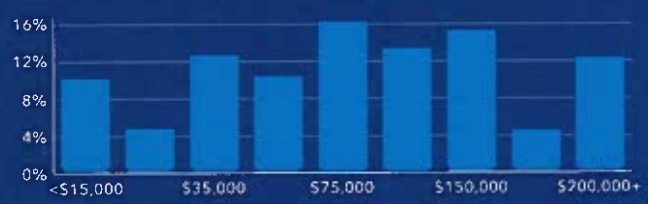
51.0% White Collar

Mortgage as Percent of Salary



Home Value

Household Income



Age Profile: 5 Year Increments

Does show comparison to Brunswick County

Home Ownership

Own Rent

Housing: Year Built

Educational Attainment

Commute Time: Minutes

esri

Source: Esri, ACS, Esri Demographics 2022, 2017, 2021, 2022

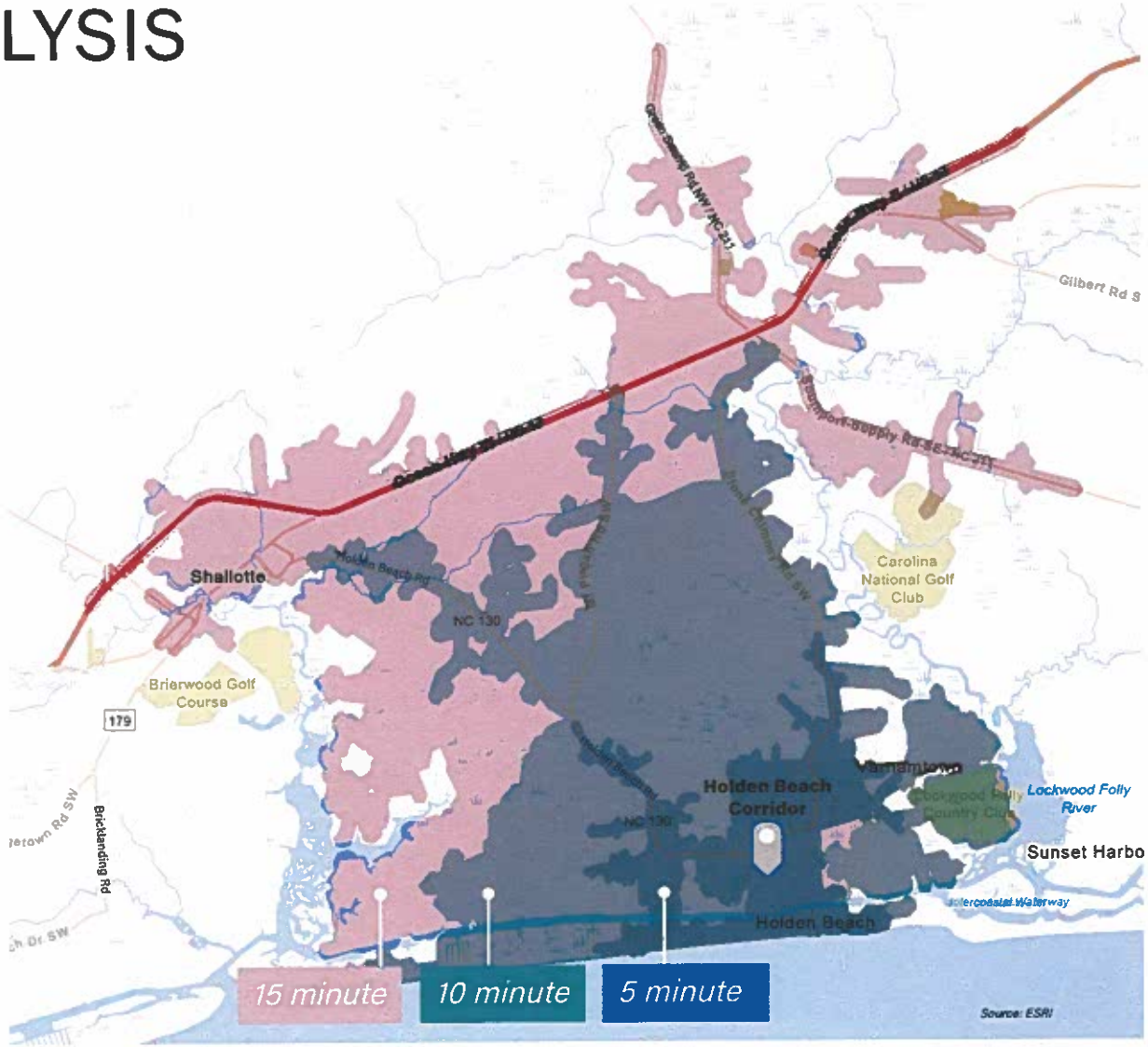
©2023 Esri

DRIVE TIME ANALYSIS

Drive time analysis calculates the area that can be reached within a specified travel time or travel distance along a street network based on travel mode.

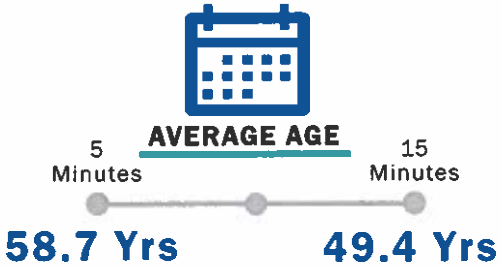
The drive time analysis for the study area was calculated using a vehicles as the mode of travel and mapped for distances that could be reached within 5-, 10-, and 15-minute increments.

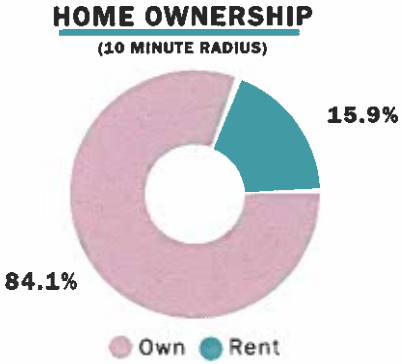
The demographic data, outlined on the following pages, is based off of these 5-, 10-, and 15- minute drive time increments.

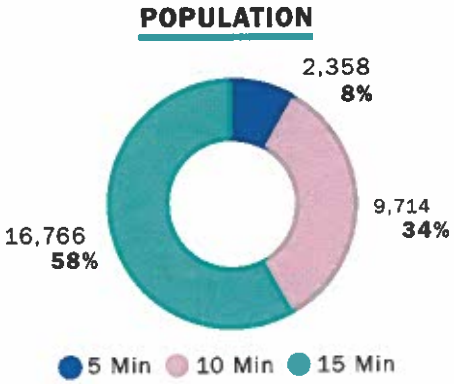


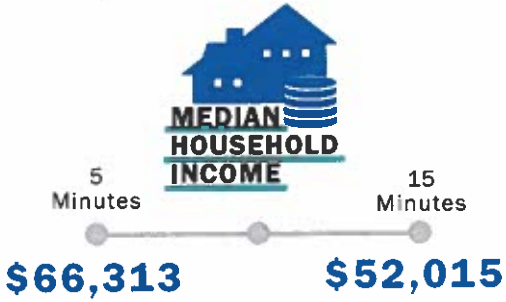
DRIVE TIME ANALYSIS (5, 10, 15 MINUTE)

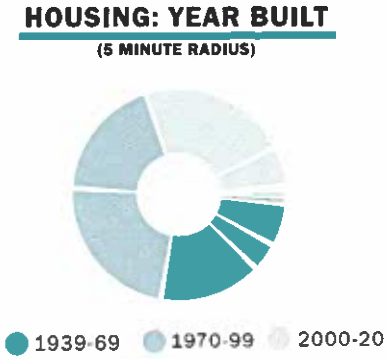
DEMOGRAPHICS







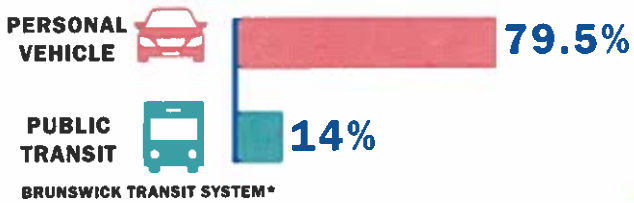




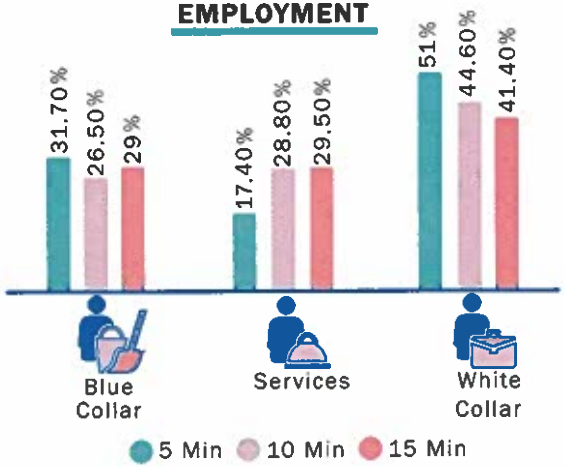
Source: ESRI

DEMOGRAPHICS

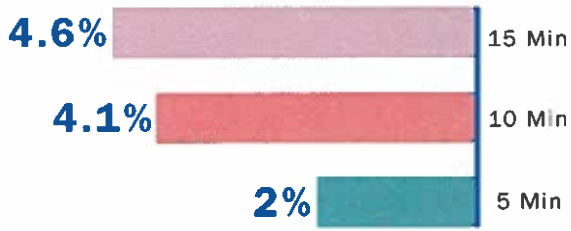
COMMUTE
(15 MINUTE RADIUS)

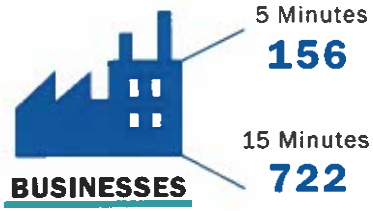


EMPLOYMENT

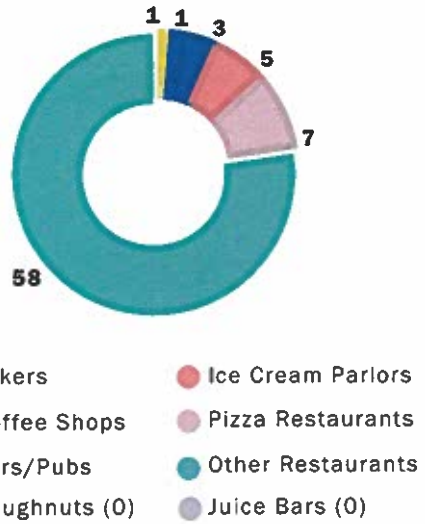


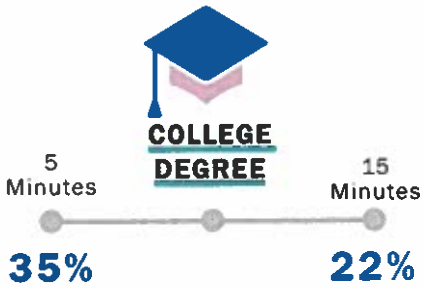
UNEMPLOYMENT RATE

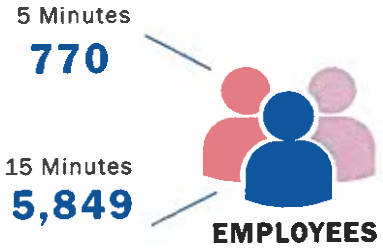




PLACES TO EAT
(15 MINUTE RADIUS)







Source: ESRI

EXISTING CONDITIONS

EXISTING VIEWSHEDS

ARRIVAL GATEWAY

The gateway to the Holden Beach Road Causeway and the island beyond.

BUSINESS DISTRICT

The core of the Holden Beach business community. The Causeway businesses serve the surrounding community with local shopping, entertainment, dining, and services.

WORKING WATERFRONT

Home to the marina, maritime businesses, and local favorite, Provision Company, the waterfront is a vital asset to the Causeway and surrounding community with the potential to become a key destination.

EXISTING CONDITIONS

KEY INTERSECTIONS

Over half a mile in length, the study area has multiple opportunities to connect to surrounding areas.

DRIVEWAYS

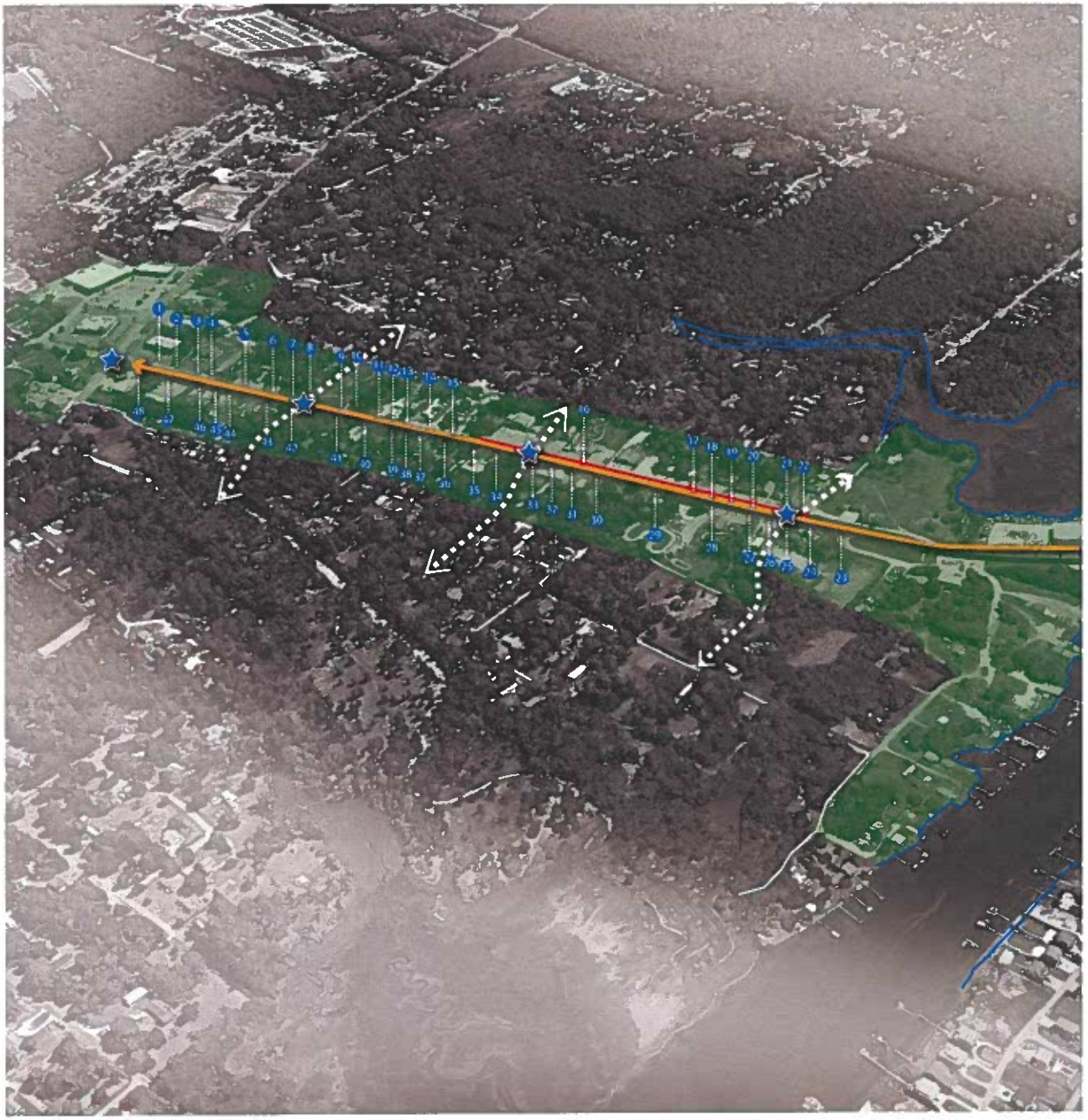
Nearly 50 private driveways access the Causeway. In one location, nearly a quarter mile section does not have defined driveways.

NETWORK CONNECTIONS

Existing and future connections to the Causeway could accommodative new types of travel such as bikes and golf carts.

PEDESTRIAN WALKING

There is very limited and constrained pedestrian facilities along the Causeway.



ZONING

There are three zoning categories found in the study area. The intent of each district as stated in the *Brunswick County Unified Development Ordinance* (UDO) is as follows.

COMMERCIAL LOW-DENSITY (CLD)

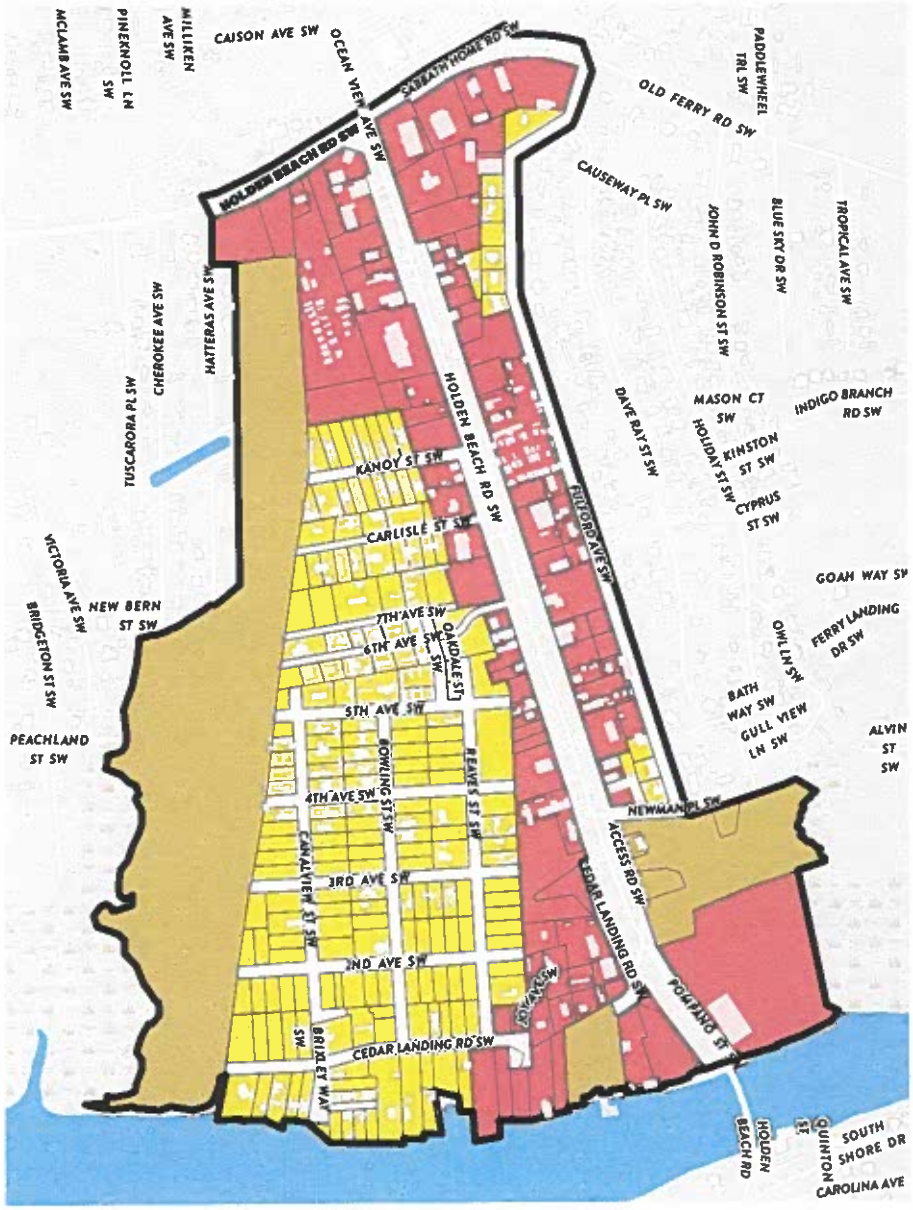
This District is intended primarily to be used in outlying areas, adjacent to major thoroughfares, with yards and other provisions for reducing conflicts with adjacent residential uses, and with substantial setbacks to reduce marginal friction on adjacent major thoroughfares. Commercial uses in this District will serve the needs of residential neighborhoods for auto-dependent commercial facilities and highway oriented tourist business. While traditionally, commercial development has occurred in this zone, because it is a mixed-use zoning district, residential uses are allowed.

MULTIFAMILY RESIDENTIAL (MR-3200)

This district is intended for high density residential purposes, not to exceed fourteen dwelling units per acre. It also provides for the development of less intensive residential uses, as well as for compatible supporting non-residential uses. Due to the higher intensity developments contained in this district, it is intended to be applied only to properties served by public sewer and water systems.

HIGH DENSITY RESIDENTIAL (R-6000)

This district was established to provide for orderly suburban residential development. A limited number of commercial and civic uses are allowed, subject to the restrictions necessary to preserve and protect the residential character of the neighborhood. A special permit process for higher intensity development is also allowed, using discretion to balance issues of higher density with improved amenities. Due to the higher intensity developments contained in this district, it is intended to be applied to properties served by public sewer and water systems.



Legend

- Building Footprints
- Study Area
- Parcels
- CO-CLD
- CO-MR-3200
- CO-R-6000

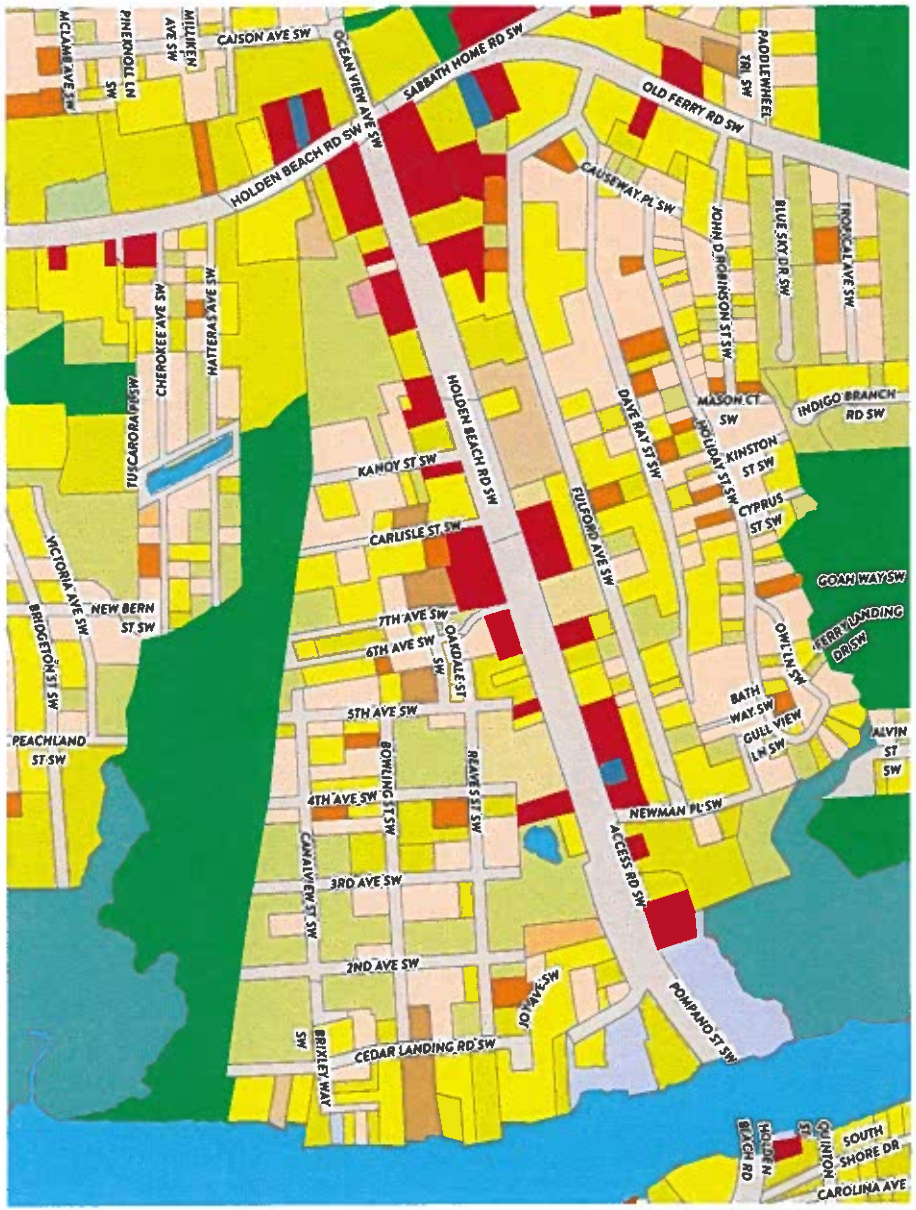
0 400 Feet

Source: Brunswick County, NCDOT, ESRI

Esri Community Maps Contributors, State of North Carolina DOT, © OpenStreetMap, Microsoft, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA

EXISTING LAND USE

The project study area is primarily made up of residential properties. All of the commercial retail is located on Holden Beach Road Causeway. There is a lack of mixed-use development, and an opportunity for more consumer oriented activity. Of the residential properties, there is predominately single family detached and mobile homes. There are a number of residential cleared and residential vegetated lots that provide opportunity for future development. To the east and west of the corridor there are vast wooded and wetland areas.



Legend

- Building Footprints
- Study Area
- Parcels
- Commercial hotel, motel
- Commercial office and professional
- Commercial retail
- Developed Outdoor Recreational, camper, RV parks, putt-
- Mobile Home Park
- Pasture/Clear fields
- Residential, campers, single or grouping
- Residential, cleared lot
- Residential, double-wide mobile home
- Residential, multi-family
- Residential, neighborhood business
- Residential, single family site built detached
- Residential, single-wide mobile home
- Residential, vegetated lot
- Road Right of Way
- Transportation, water-related facilities
- Water
- Wetland, marsh
- Wooded Area

0 400 Feet

Source: Brunswick County, NCDOT, ESRI

FUTURE LAND USE

The Brunswick County comprehensive land use plan, "BluePrint Brunswick 2040" was adopted by the Brunswick County Board of Commissioners on February 20, 2023. The plan is intended to help guide government officials and citizens alike on development and conservation decisions in both the short and long term.

Included within "Blueprint Brunswick 2040" is a future land use map outlining Place Types (land use classifications.) The future land use is based on how the floodplains and wetlands affect the area. All of the parcels within the project study area fall within the Open Space-Conservation 1 or Medium Density Residential- Mixed Place Type. There is an opportunity for more mixed-use residential and open space.

MEDIUM DENSITY RESIDENTIAL-MIXED

- Includes a mix of residential and commercial uses
- Predominantly single-family detached homes but may include single-family units, such as townhomes and duplexes.
- The mix of housing types is intentional to create intergenerational neighborhoods.
- Improved open spaces, such as pocket parks and greenway trails, are interspersed.

OPEN SPACE- CONSERVATION 1

- Includes all the areas within the flood zone
- Although some land is developed within these areas, new development is unlikely.
- New uses are associated with protected open space and natural resource management such as hunting game lands or nature preserves.

Legend

- Building Footprints
- Study Area
- Parcels
- Open Space - Conservation 1
- Medium Density Residential - Mixed
- Town Center - Municipality

0 400 Feet

Source: Brunswick County, NCDOT, ESRI

CONSTRAINTS

Much of the southern portion of the study area and Causeway is constrained by floodplains or wetlands. Generally areas south of 5th Ave SW are within either the 500-year or 100-year floodplain. Wetlands are also found in the southwest and southeast portions of the study area as well as the northwest portion of the study area north of Kanoy Street SW.

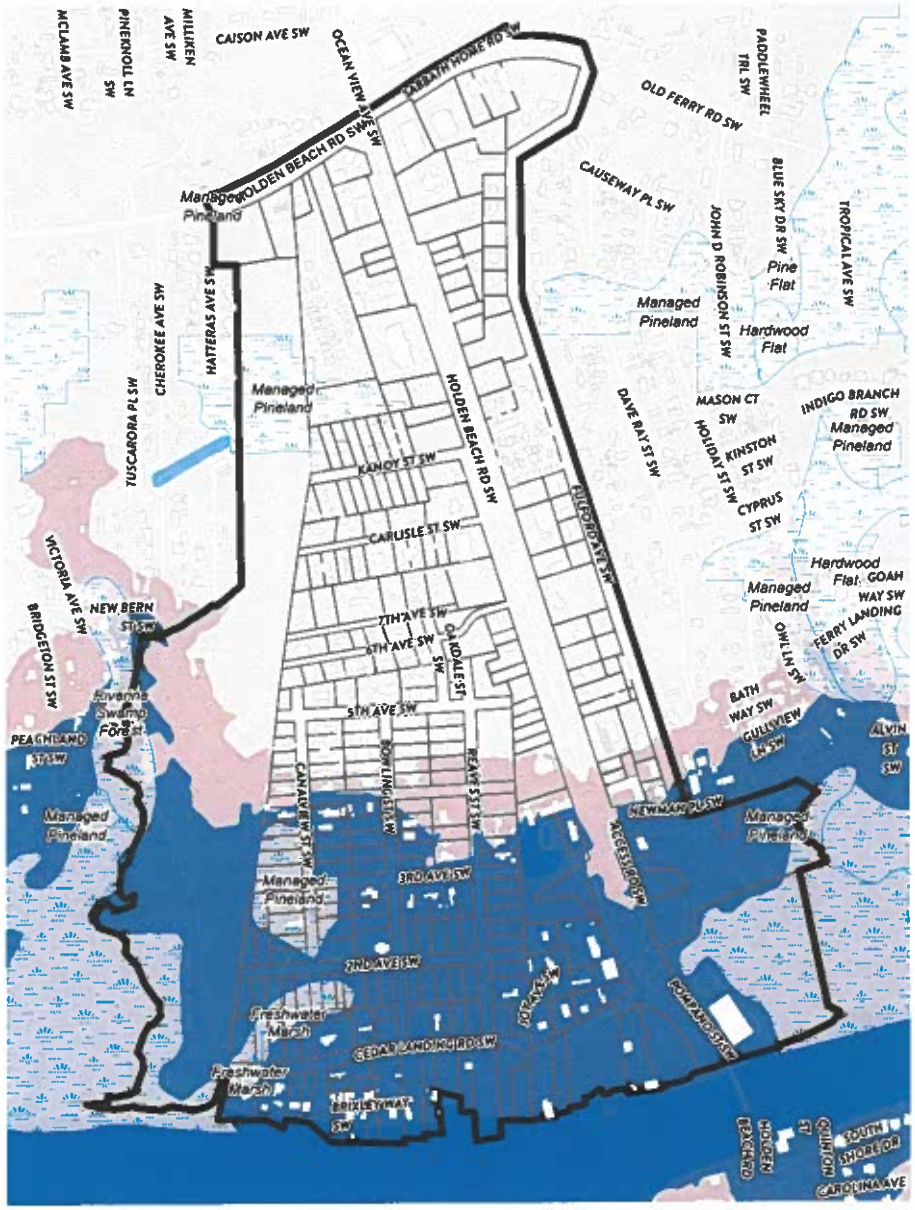
FLOODPLAINS

The Federal Emergency Management Agency identifies the 100-year floodplain as the Special Flood Hazard Area (SFHA), which is the area that will be inundated by the flood event having a 1-percent chance of being equaled or exceeded in any given year. Properties in this area have a one-in-four chance of flooding over the course of a 30-year mortgage. Similarly, the 0.2-percent-annual-chance (or 500-year) floodplain is predicted to flood about five times less frequently than areas in the 100-year floodplain.

WETLANDS

The U.S. Army Corps of Engineers' (Corps) Regulatory Program protects the Nation's aquatic resources while allowing reasonable development through fair and balanced decisions. The Corps evaluates permit applications for essentially all construction activities that occur in the Nation's waters, including wetlands.

The wetlands data mapped here was sourced from Brunswick County GIS Data Viewer and is intended for reconnaissance level information on the location, type and size of wetlands. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground mapping and surveying of wetlands is necessary to accurately identify and delineate wetlands.



Legend

- Building Footprints
- Study Area
- Parcels
- Wetlands
- 500-year Floodplain
- 100-year Floodplain

0 400 Feet

Source: Brunswick County, NCDOT, ESRI

RIPE/FIRM

A Ripe/Firm Analysis determines the likelihood of individual parcels redeveloping. For example, vacant parcels might be more likely to develop than occupied parcels. Each parcel in the study area was classified into one of three categories: Firm, Opportunity, or Ripe. This analysis was used to identify areas that have the potential for change (Ripe) or are unlikely to change (Firm). Often, there are areas that are not clearly one or the other and are identified as Opportunities.

Much of the vacant parcels in the southern portion of the study area classified as Ripe are also constrained by environmental features.

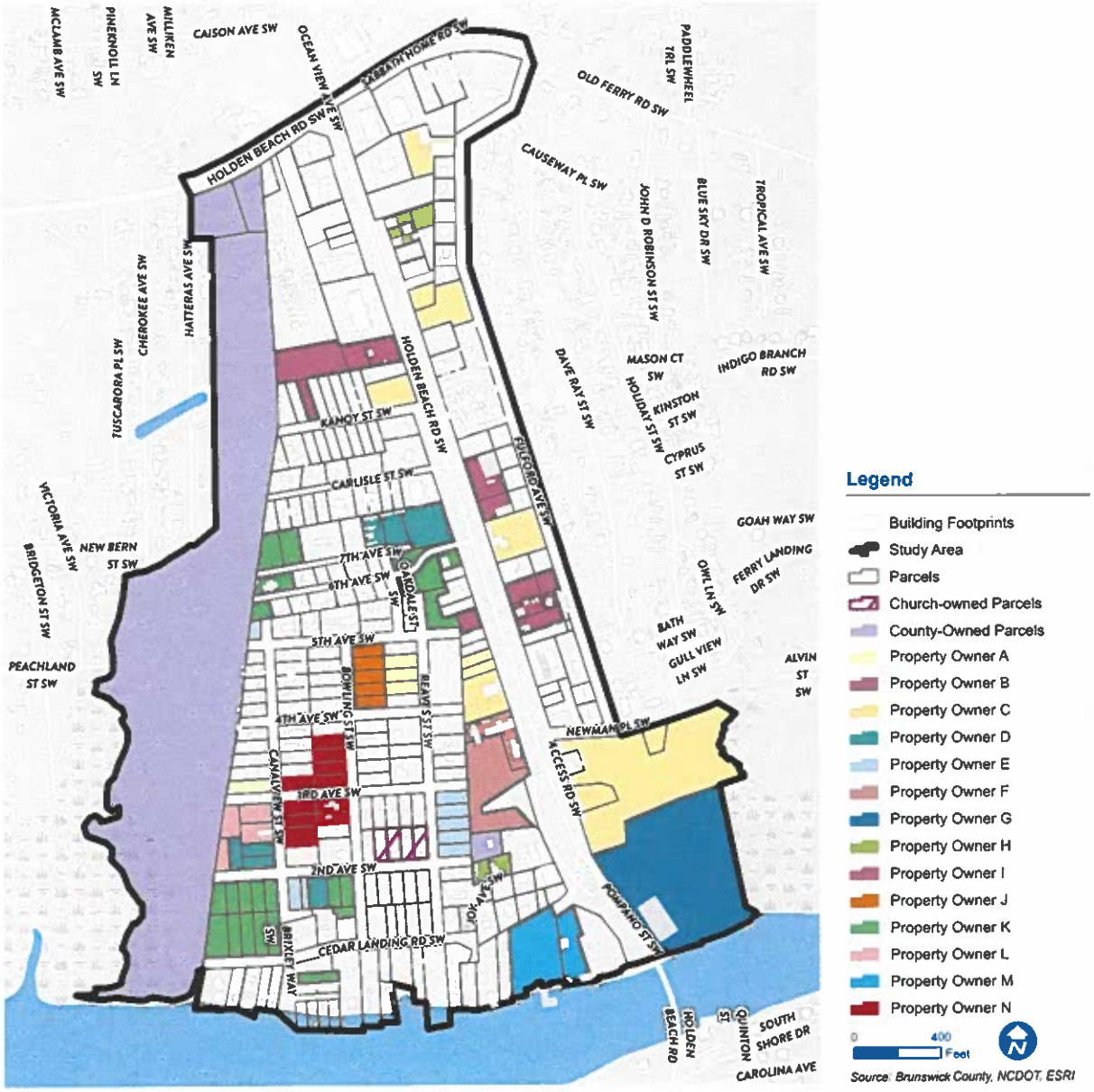
Source: Brunswick County, NCDOT, ESRI

PROPERTY OWNERSHIP

OWNERS OF MULTIPLE PARCELS OR LARGE TRACTS

Parcel ownership is studied to understand if there are ownership patterns within the study area and to identify multiple parcels or larger parcels controlled by the same owner. This is important to identify because it can help understand where significant change could occur within the study area should larger parcels or multiple parcels redevelop.

The study area shows that there are 14 owners of multiple parcels or large tracts. Brunswick County owns three large parcels at the western side of the project area. Working with these owners could allow for future redevelopment. Redevelopment can affect traffic patterns, land use, and existing character or the look and feel of the corridor.



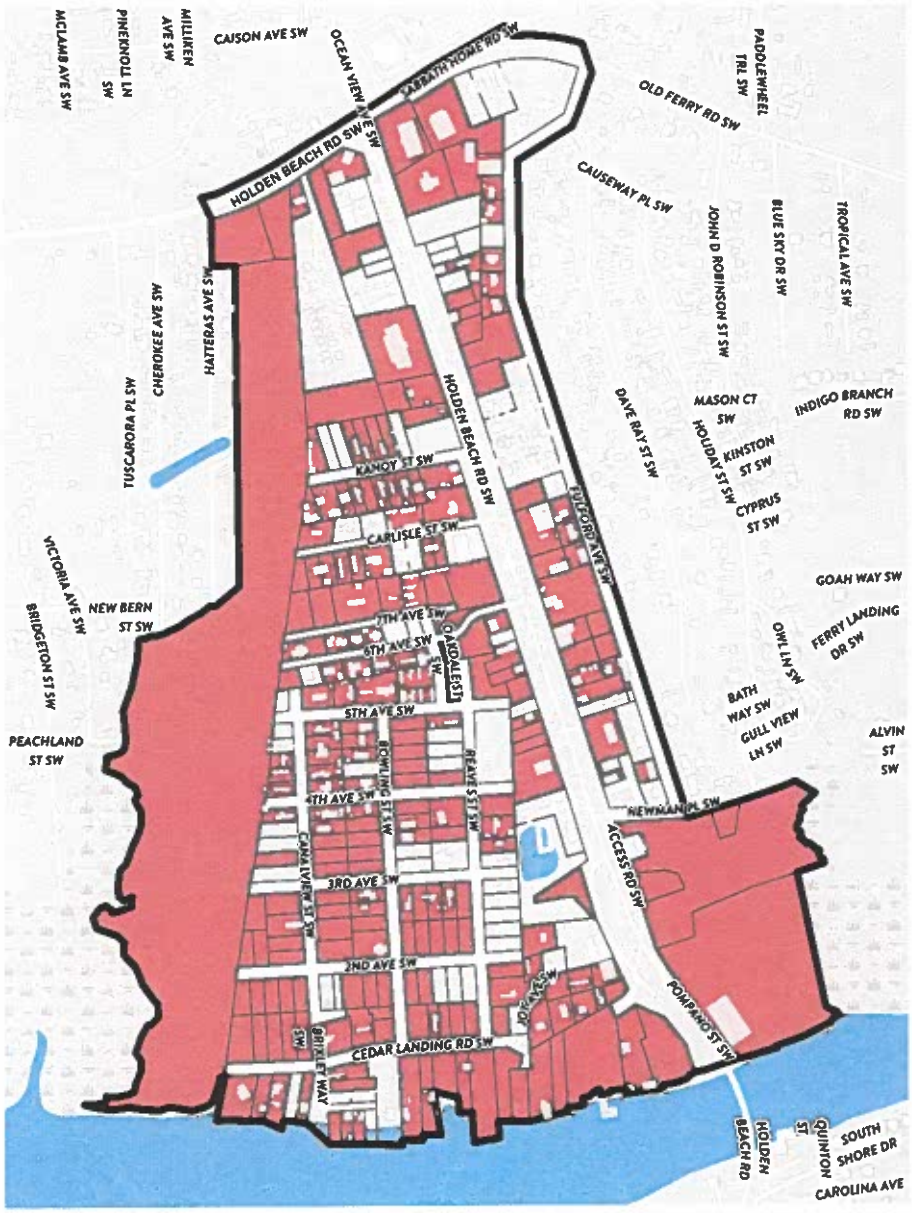
PROPERTY OWNERSHIP

OWNER'S MAILING ADDRESS NOT IN SUPPLY, NC

Every parcel has a physical address and a mailing address. The physical address is the postal address for the parcel. The mailing address is the address registered with the County for tax and ownership.

Physical address and mailing address are not always the same address. When the mailing address differs from the physical address, it may be assumed that the property owner does not use the property as a primary property for business or residence.

Within the study area, the physical address and the mailing address are not the same for the majority of the parcels.



Legend

- Building Footprints
- Study Area
- Parcels
- Mailing Address Not Supply, NC

0 400 Feet

Source: Brunswick County, NCDOT, ESRI

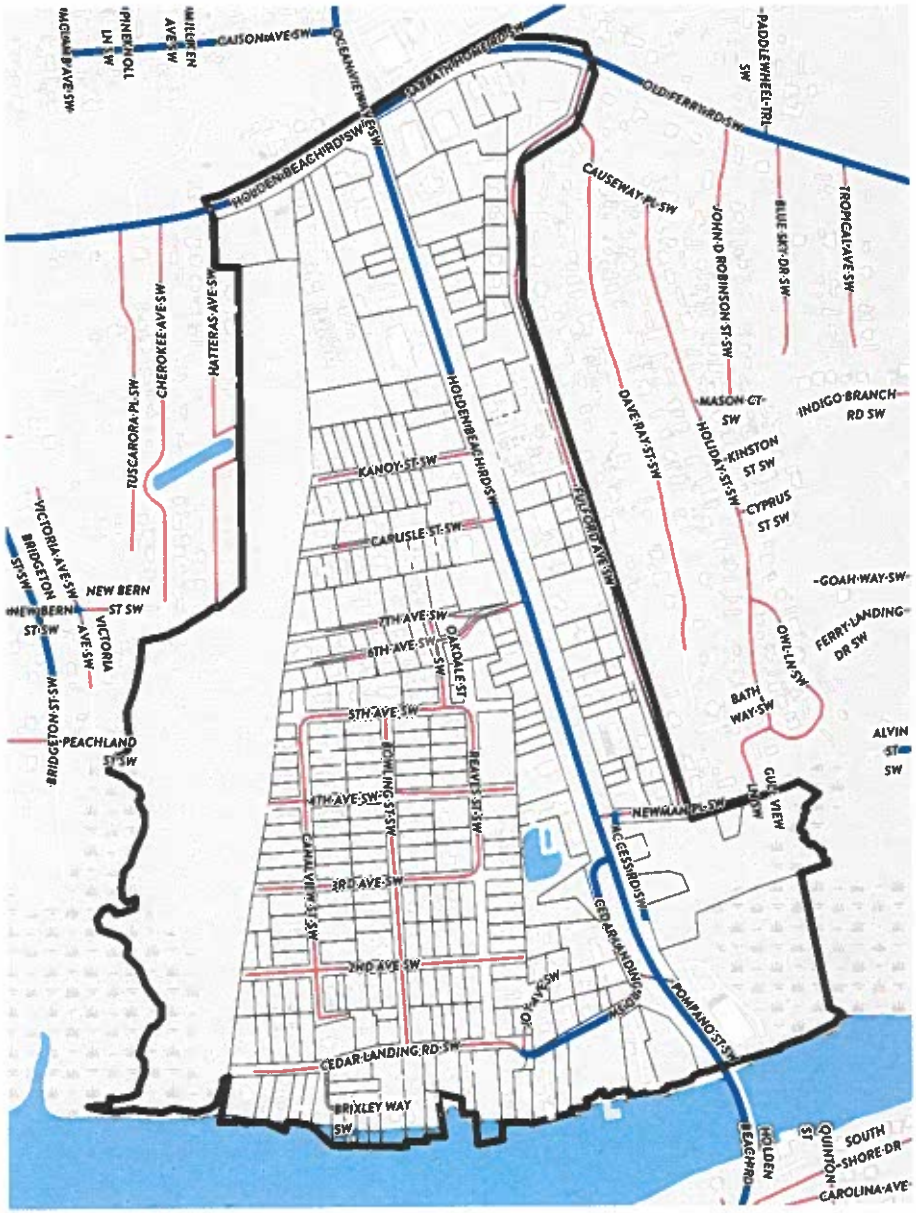
ROADWAYS

OWNERSHIP

- Holden Beach Road Causeway is NCDOT-owned.
- The other roads are classified as private or public but they have an undetermined ownership.

DESIGN CHARACTERISTICS

- They are broadly understood to be side-street stop-controlled, but in many cases, no stop sign is present on the side street, a condition that could make for unsafe operation.
- Most intersections along the Causeway are informal and composed of a dirt/gravel side-street road that approaches and meets Holden Beach Road Causeway.
- Many properties along the Causeway have multiple driveways and parking lots that entirely open onto the roadway. These configurations can create dangerous interactions between high-speed through vehicles and vehicles entering, exiting, or moving around a parking lot.
- The density of access points on the corridor is very high. There are nearly 50 distinct driveways onto Holden Beach Road within approximately three-thousand feet near the center of the study area, in addition to a handful of public street accesses. This level of access creates a high number of conflict points between vehicles traveling along the road and those entering and exiting, which can create unsafe conditions.
- Minor street intersections are informal, with the unpaved roads intersecting sometimes without traffic control (stop signs or similar tools), and often with trees or other features blocking the view of one approach from another. These features may make it challenging to safely navigate for those unfamiliar with the area.
- There is one traffic signal in the study area, at the northern limit, where Holden Beach Road (NC 130) intersects with Ocean View Avenue and Sabbath Home Road. At this intersection, there are dedicated westbound left and right turn lanes, a northbound right turn lane, and a westbound left turn lane. Signal heads at this intersection do not include backplates and the eastbound signal features the traditional five-section signal head as it has not been updated to instead use a flashing yellow arrow to denote permissive-left turn phases. These conditions likely contribute to this intersection's crash history, presented later.



Legend

- Building Footprints
- Study Area
- Parcels

Responsible Agency

- None
- NCDOT

0 400 Feet

Source: Brunswick County, NCDOT, ESRI

ROADWAYS

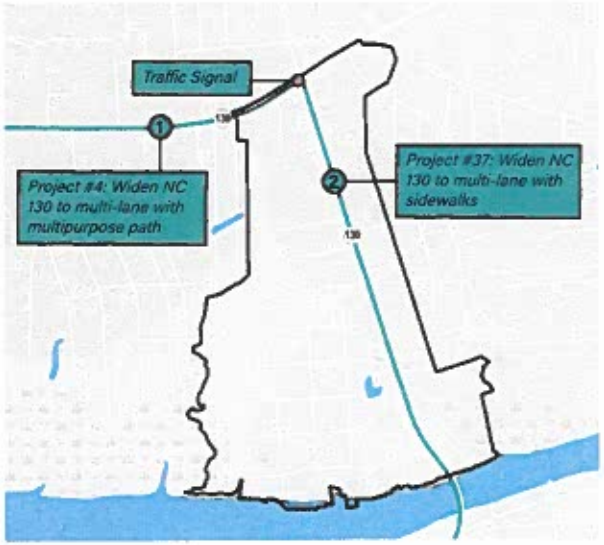
SURFACE TYPE

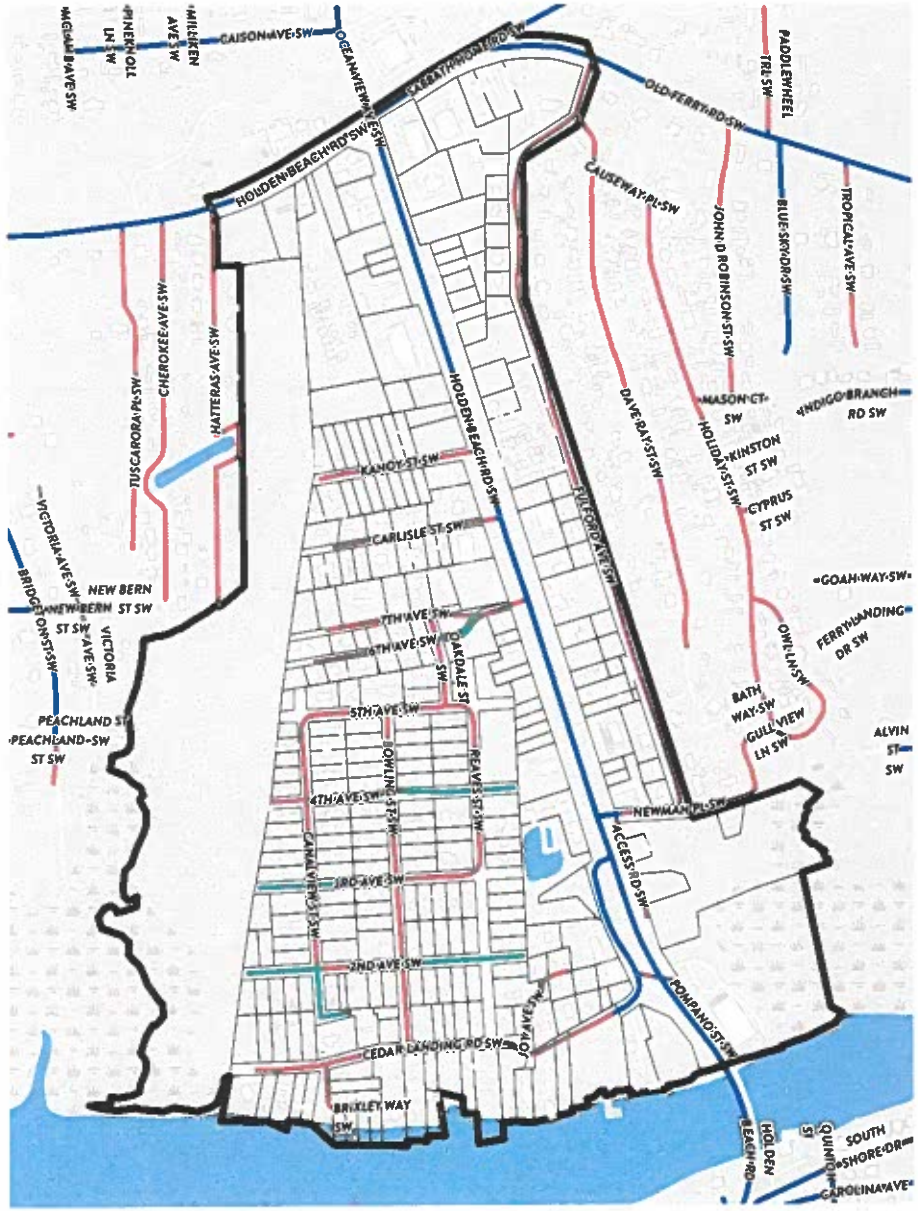
Aside from NCDOT roadways, the study area is predominately composed of unpaved roads and some "impassible" roads.

PLANNED IMPROVEMENTS

There are no planned improvements for the study area in NCDOT's current Statewide Transportation Improvement Plan (STIP). There are two planned improvements in GSATS 2040 Metropolitan Transportation Plan (MTP).

1. Project #4: Widen Holden Beach Road (NC 130) to a multi-lane facility from Smith Street to Sabbath Home Road Intersection with multipurpose path
2. Project #37: Widen Holden Beach Road Causeway to a multi-lane facility from Sabbath Home Intersection to the end of state maintenance with sidewalks





Legend

- Building Footprints
- Study Area
- Parcels

Surface Type

- IMPASSIBLE
- PAVED
- UNKNOWN
- UNPAVED

Source: Brunswick County, NCDOT, ESRI

ROADWAYS

DESIGN CHARACTERISTICS

Most intersections along Holden Beach Road Causeway in the center of the study area are informal and composed of a dirt/gravel side-street road that approaches and meets Holden Beach Road. While these intersections are broadly understood to be side-street stop-controlled, in many instances no stop sign is present on the side street, a condition that could make for unsafe operation.

Driveways on Holden Beach Road Causeway are numerous and not standardized. Many properties have parking lots that are entirely open to the roadway. These kinds of parking lot configurations can create dangerous interactions between high-speed through vehicles and vehicles entering, exiting, or moving around a parking lot. In addition to this poor design, the density of access points on the corridor is very high. There are over fifty distinct driveways on Holden Beach Road Causeway within approximately three-thousand feet near the center of the study area, in addition to a handful of public street accesses. This level of access creates a high number of conflict points between vehicles traveling along the road and those entering and exiting, which can create unsafe driving conditions.

Minor streets are similarly informal, with unpaved roads intersecting without traffic control (stop signs or similar tools), and often with trees or other features blocking the view of one approach from another, which are safety issues.

There is one traffic signal on the Causeway, where Holden Beach Road (NC 130) intersects with Ocean View Avenue and Sabbath Home Road. There are dedicated westbound left and right turn lanes, a northbound right turn lane and a westbound left turn lane. Signal heads at this intersection do not include backplates and the eastbound signal uses the traditional five-section signal head, as it has not been updated to use a flashing yellow arrow to denote permissive-left turn phases. These conditions likely contribute to the intersection's crash history.

The intersection of Holden Beach Road and Sabbath Home Road at the northern edge of the Causeway (Source: Brunswick County GIS)

The intersection of Holden Beach Road and Kanoy Street SW (Source: Brunswick County GIS)

TRAFFIC

CURRENT TRAFFIC VOLUMES

Holden Beach Road Causeway had an average daily volume of approximately 10,000 vehicles per day in 2021 according to NCDOT. While volumes have changed over time, since 2003 (the earliest year NCDOT provides information) daily traffic volumes have typically varied between 7,500 and 10,000 vehicles. Traffic volumes have not changed much over the years thanks to the generally slow growth of Holden Beach itself, which was already largely built out twenty years ago.

PROJECTED TRAFFIC VOLUMES

Without significant development in surrounding areas, traffic volumes are not expected to change significantly from the pattern they've maintained over the past 20 years.

ANNUAL AVERAGE DAILY TRAFFIC ON HOLDEN BEACH ROAD SOUTH OF HOLDEN BEACH ROAD/ SABBATH HOME ROAD (VEHICLES PER DAY)

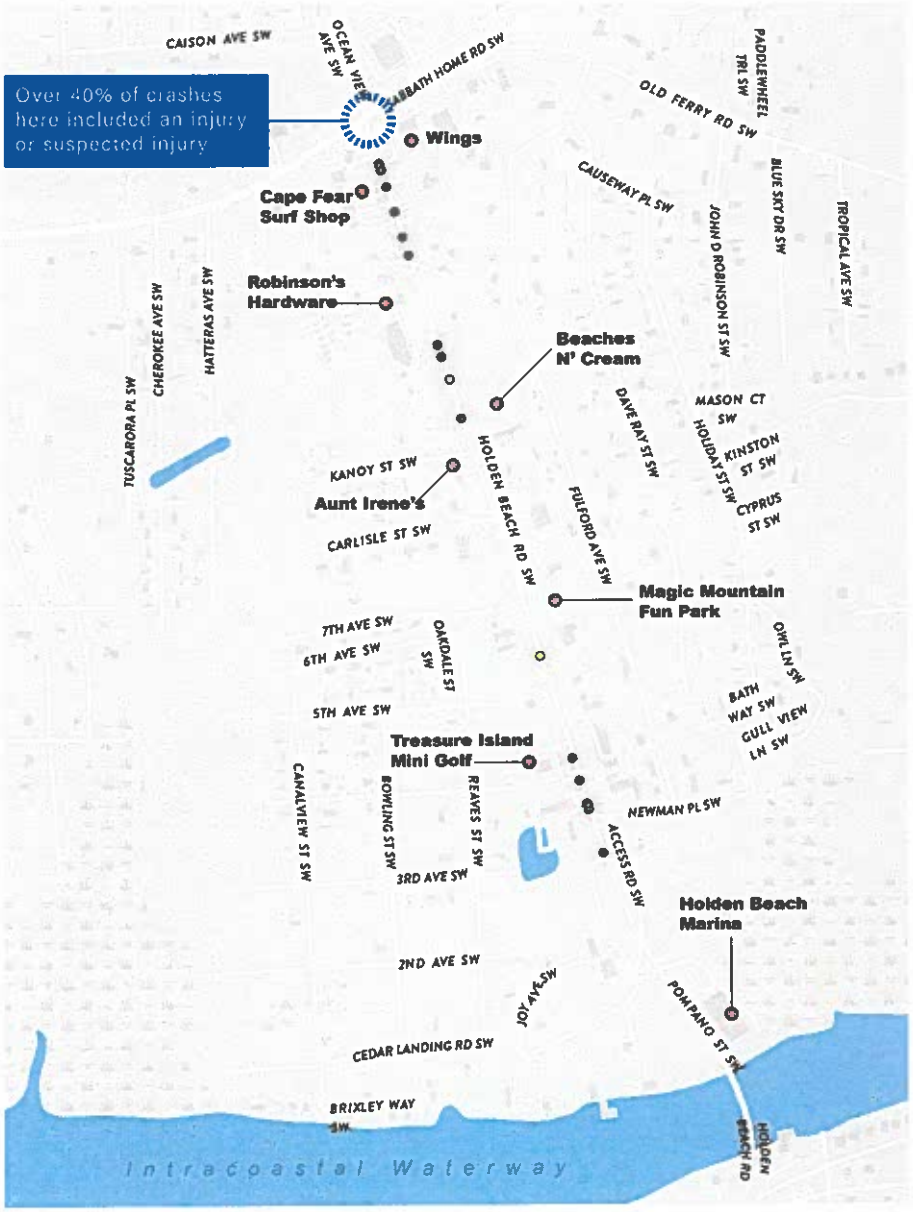
CRASHES

CRASH SEVERITY

Holden Beach Road Causeway within the study area was host to fifty-seven crashes from February 2018 through January 2023. Remarkably, thirty-nine of those crashes happened at the northern intersection with Sabbath Home Road and Ocean View Avenue, while only eighteen occurred on the remainder of the corridor. In general, those at the northern intersection have been more severe than in other locations, with over forty percent of crashes including an injury or suspected injury. On the remainder of the corridor, about eleven percent of crashes involved an actual or suspected injury. When taken together, the corridor has a crash rate of approximately 540 crashes per hundred million vehicle miles traveled, which is about three times the statewide average rate for similar roads (primary NC routes) from 2017-2021 (173 crashes per hundred million vehicle miles traveled).

CRASH RATE: THE CORRIDOR HAS THREE TIMES THE STATEWIDE AVERAGE FOR SIMILAR ROADS

OVER 40% OF CRASHES AT HOLDEN BEACH/ SABBATH HOME RD INTERSECTION INCLUDED AN INJURY OR SUSPECTED INJURY



CRASHES

CRASH TYPE

At the northern intersection of the study area, numerous crashes were related to left turning vehicles (forty-six percent). This could suggest visibility problems for left-turning vehicles or could be a response to frustrated drivers who cannot get a gap to turn left, and so try to squeeze through insufficient gaps and cause crashes.

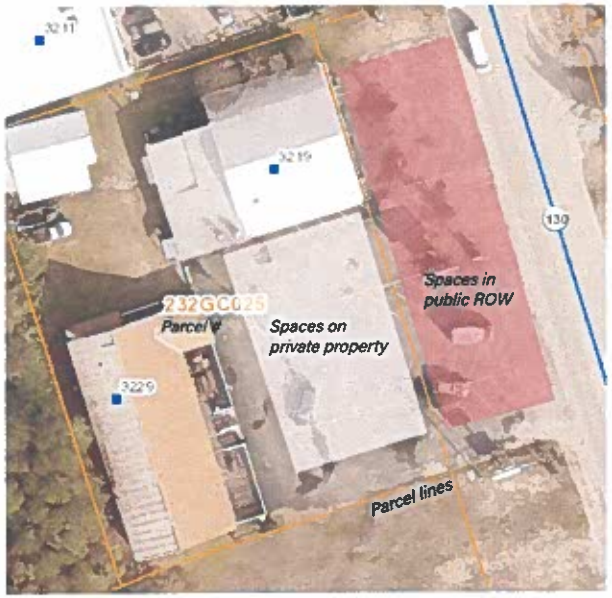
On the remainder of the corridor, about half of all crashes are also related to left turns. This may be due to vehicles from side streets or driveways making left turns across traffic without any kind of traffic control. The center-running, continuous, two-way left-turn lane is also as narrow as nine feet in some areas, which may give left-turning vehicles less maneuvering space and make them more vulnerable to crashes in those areas.

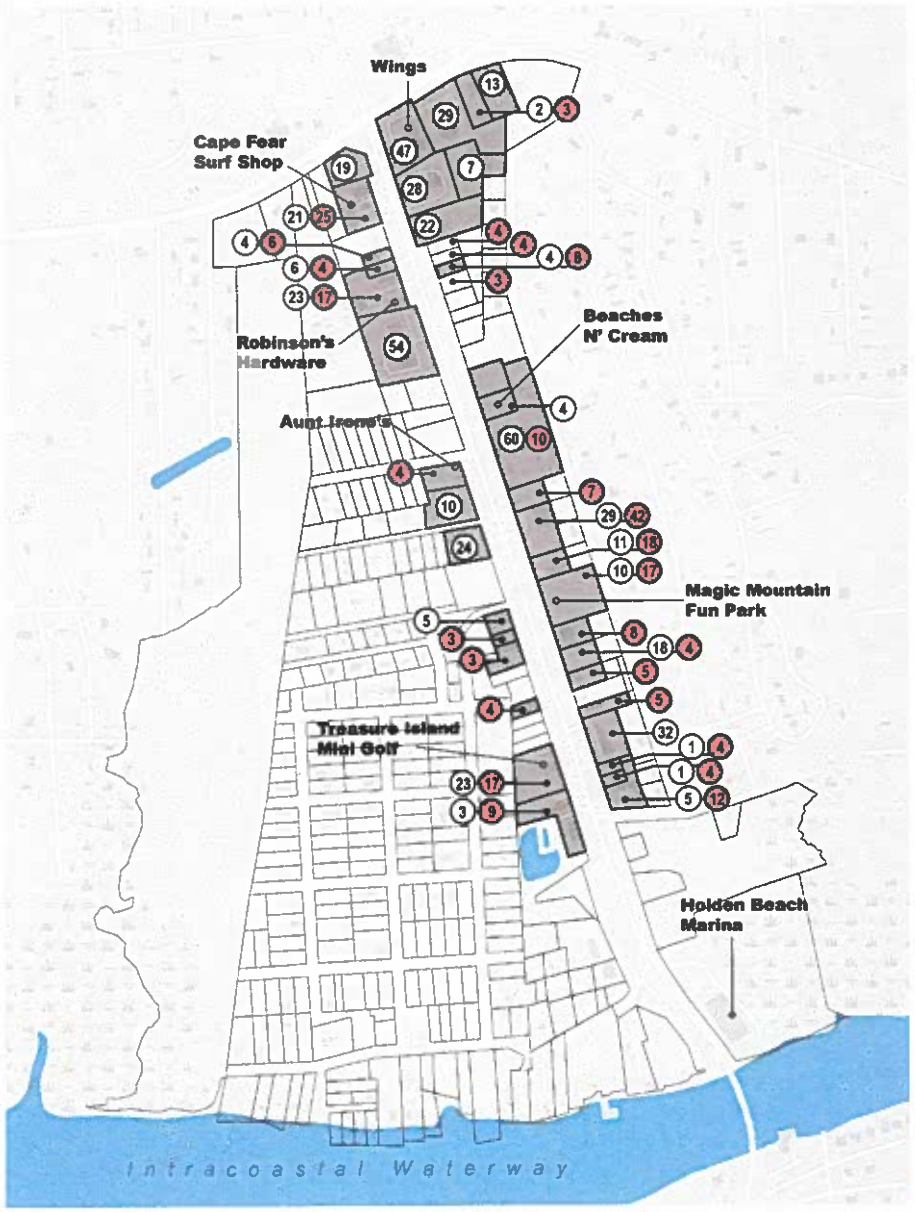
ABOUT HALF OF ALL CRASHES ALONG THE CAUSEWAY ARE RELATED TO LEFT TURNS

PARKING

A Parking Analysis was completed for properties fronting the corridor. High-resolution aerial imagery and Google Streetview Imagery were used to estimate numbers of available parking spaces (marked and unmarked) for each property. Spaces were counted by property as well as whether they were located within the parcel or within the public ROW. The image below illustrates a common condition along the corridor in that several properties have established marked parking spaces in the public ROW.

795 total spaces **543** on private property **252** in public ROW





Legend

- Parking on private property
- Parking in public ROW
- Properties with parking

**Parking counts were collected by reviewing 2021 high-resolution aerial imagery and Google Street View imagery.*

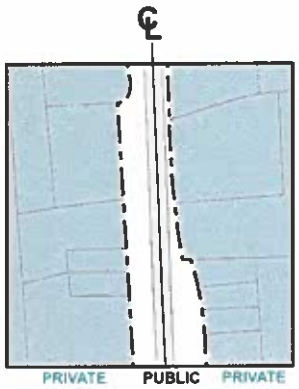
0 400 Feet

RIGHT-OF-WAY

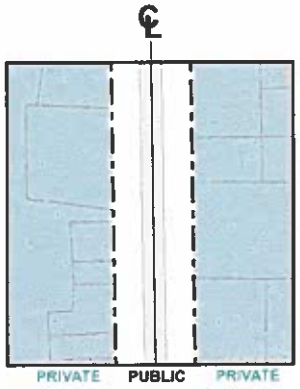
Right-of-Way (ROW) is the real property (land and improvements) and rights therein acquired for public use to construct roads for the betterment and safety of the public. It is under the control of the North Carolina Department of Transportation. The ROW width varies along the Causeway corridor and is regular and symmetrical in some areas and very irregular and asymmetrical in other areas. More ROW might be available on one side of the corridor or the other.

So, what does that mean?

Equal amounts of public ROW may not be available on both sides of the street. To achieve symmetrical improvements for both sides of the road, realignment of the road's center line or property acquisition might need to be evaluated.



ASYMMETRICAL
RIGHT-OF-WAY



SYMMETRICAL
RIGHT-OF-WAY

Legend

- Building Footprints
- Study Area
- Parcels
- Centerlines

0 400 Feet

Source: Brunswick County, NCDOT, ESRI

NC OneMap, NC Center for Geographic Information and Analysis, NC 911 Board, Esri Community Maps Contributors, State of North Carolina DOT, © OpenStreetMap, Microsoft, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA

EXISTING ROW USAGE

The ROW along the corridor is utilized in a variety of ways:

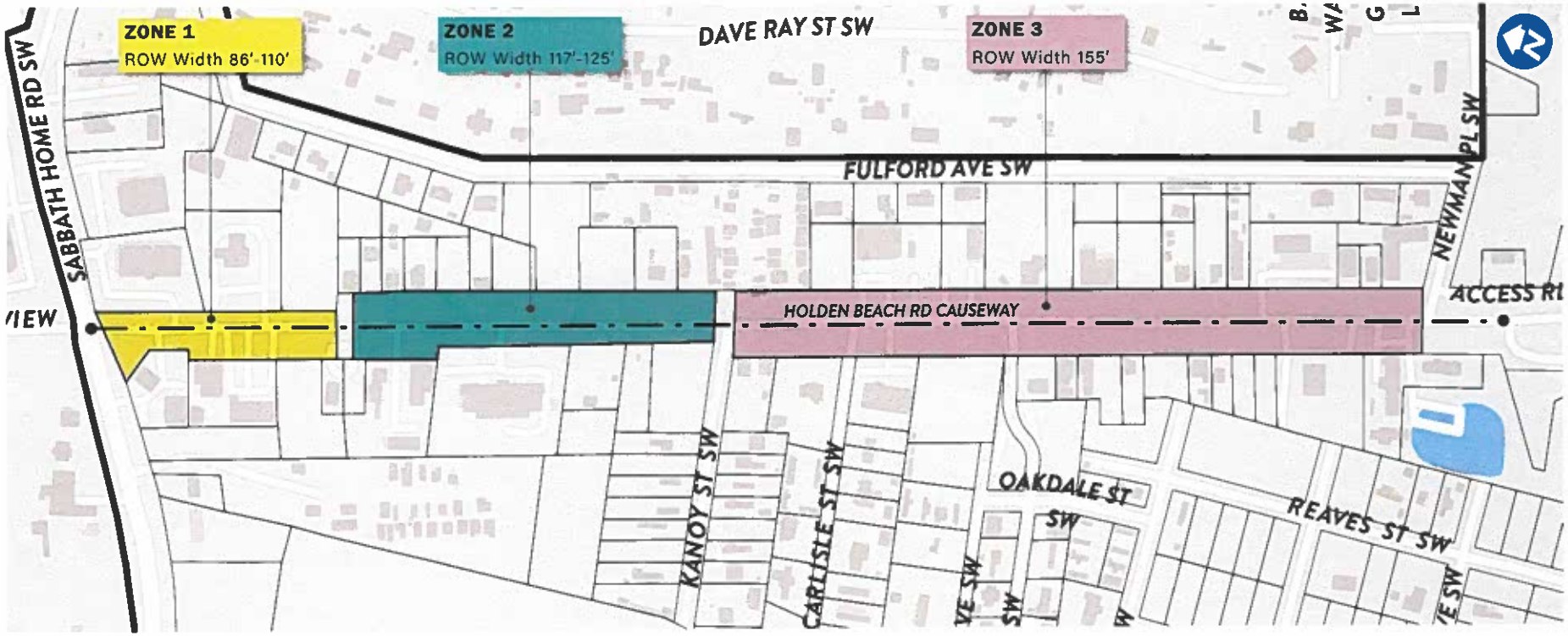
- Parking for adjacent private businesses
- Utility poles
- Stormwater drainage swales
- Signage for adjacent businesses
- Roadway signage
- Waste management

Parking for private businesses can be found within the ROW

Signage and utility poles are found within the ROW

Drainage swales occur within the ROW and manage stormwater

Waste management can occur within the ROW

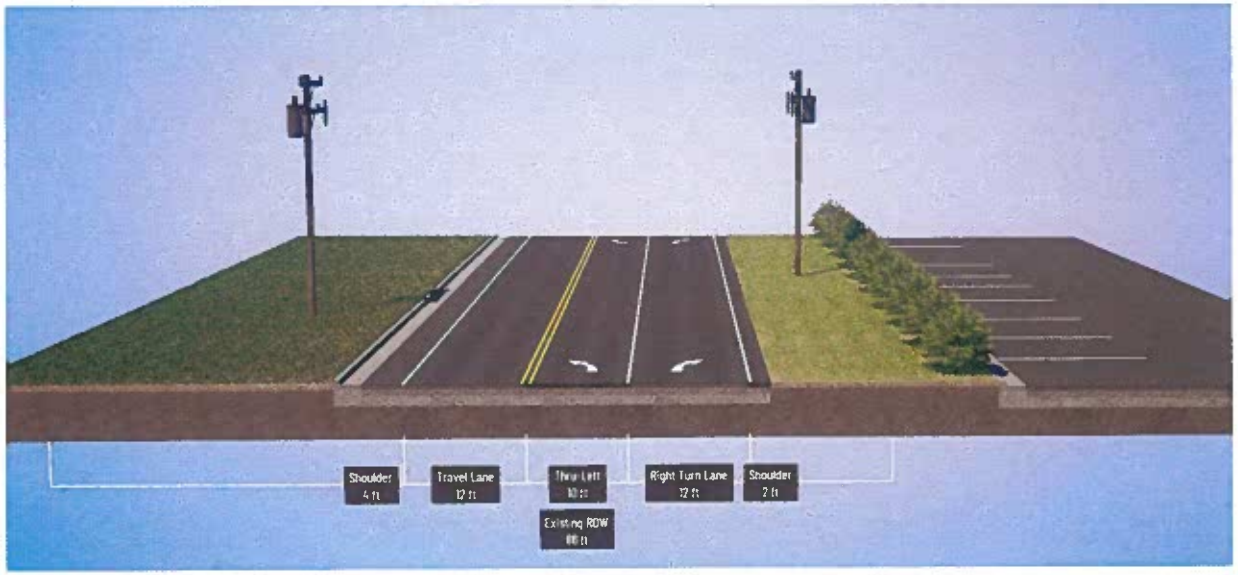


ROW ZONES

Due to irregular ROW boundaries along the corridor, zones were identified for the purpose of the study to help determine potential ROW impacts and to organize ROW and streetscape priorities.

ZONE 1

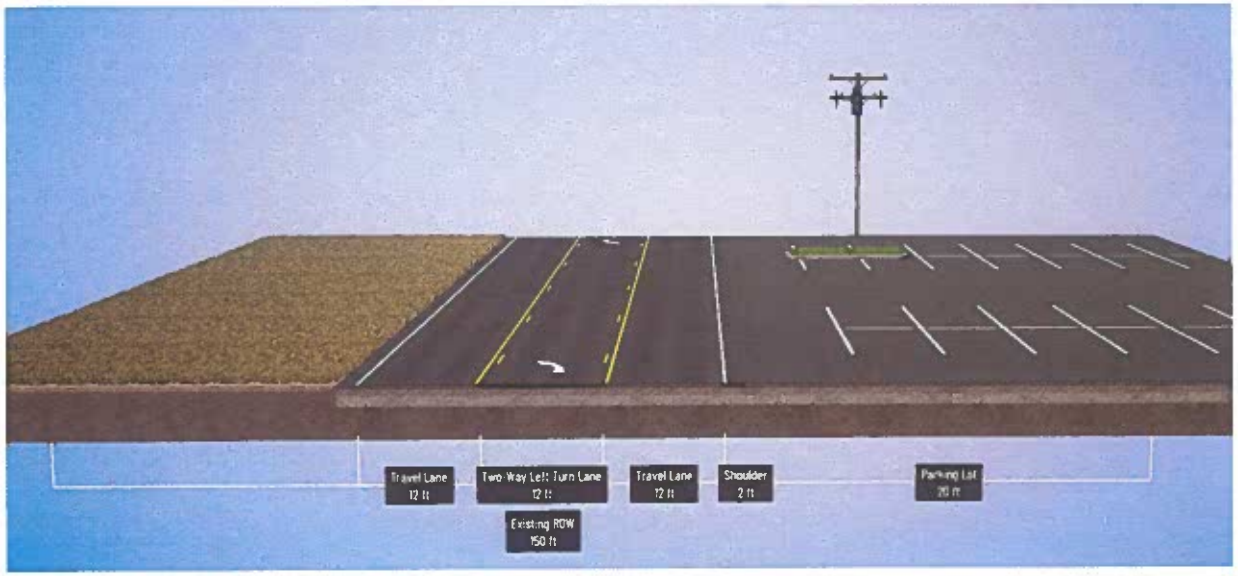
SABBATH HOME ROAD
& HOLDEN BEACH ROAD
(CAUSEWAY)
86-110 FOOT RIGHT-OF-WAY



IMAGES: GOOGLE EARTH

ZONE 2

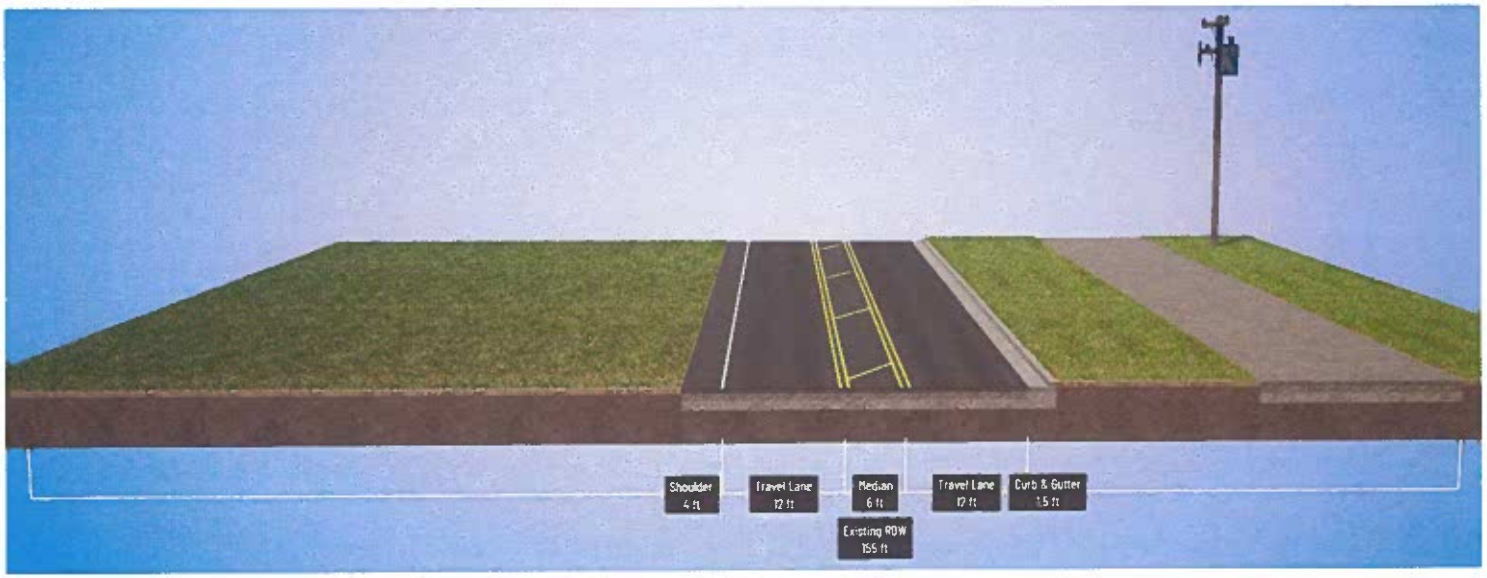
CARLISLE STREET
& HOLDEN BEACH ROAD
(CAUSEWAY)
117-125 FOOT RIGHT-OF-WAY



IMAGES: GOOGLE EARTH

ZONE 3

NEWMAN PLACE & HOLDEN BEACH ROAD (CAUSEWAY) 155 FOOT RIGHT-OF-WAY



PROJECT ENGAGEMENT

PROJECT ENGAGEMENT

Over the four month process, valuable input, experience, and perspective on the Causeway was received from the community. Insight was gathered from steering committee meetings, a corridor tour, two community open houses, a property owners meeting, and a community survey.

STEERING COMMITTEE

The Steering Committee consisted of corridor business and or/property owners. The committee members included: Jabin Norris, Andrew Robinson, Lyndon Holden, Joseph Shannon, Steven Parrish, and Gina Robinson.

Throughout the three meetings, the steering committee worked to identify assets and opportunities on the corridor and ultimately provided feedback on their preferred alternative design.

ENGAGEMENT MEETINGS

- Steering Committee Kickoff Meeting and Corridor Tour March 2, 2023
- Steering Committee Meeting (Virtual) June 8th 1:00-3:00 P.M.
- Public Engagement Workshop #1 June 22, 5:00-7:00 PM, Sabbath Home Baptist Church
- Causeway Property Owners Meeting (In-Person) July 13th 9:00-11:00 A.M., Sabbath Home Baptist Church
- Steering Committee Meeting (In-Person) July 27 10:00-12:00, Brunswick County Govern. Center
- Public Engagement Workshop #2 July 27 5-7 PM, Sabbath Home Baptist Church

3 STEERING COMMITTEE MEETINGS

1 CORRIDOR TOUR

1 PROPERTY OWNERS MEETING

2 OPEN HOUSES

1 FINAL PRESENTATION

CORRIDOR TOUR

At the Steering Committee Kickoff on March 2, 2023 committee members participated in an issues and opportunities mapping exercise. Following the activity, the project team embarked on a walking tour of the Causeway to see these assets and opportunities first hand.

Some of the assets and opportunities raised at the initial Steering Committee Meeting include:

- Intersection Improvements: Newman Pl SW & NC 130, Sabbath Home Rd SW/Ocean View Ave SW / NC 130, 7th Avenue and Magic Mountain Waterpark
- Pedestrian access along the Causeway and bridge
- Traffic concerns: bottleneck at bridge, speeding, cut through roads (Fulford Ave SW)
- Consolidate driveways and reduce widths of existing driveways
- Stormwater concerns as it relates to the existing ditch infrastructure
- Desire for better landscaping and lighting along the streets
- Praise for the amount of local businesses that serve the community well
- Formalize delivery entrances/exists and parking

COMMUNITY OPEN HOUSES

COMMUNITY OPEN HOUSE #1

The first Community Open House was held on June 22, from 5:00-7:00 PM at Sabbath Home Baptist Church. The meeting was promoted on the Brunswick county website and fliers were also provided to Brunswick County for distribution. There were approximately 50 community members in attendance.

The project team shared documentation of the findings so far. This included: the existing conditions analysis, survey results, and the street design alternatives.

COMMUNITY OPEN HOUSE #2

The second Community Open House was held on July 27, from 5:00-7:00 PM at Sabbath Home Baptist Church. The meeting was promoted on Brunswick County's website. There were around 40 community members in attendance.

The project team gave a brief presentation updating the community on the work to date. Boards were displayed with the following information: study area, scope, schedule, statistical data, right-of-way conditions, proposed design alternatives, and survey information. Members were asked to provide feedback on their preferred design alternative.

HOLDEN BEACH CAUSEWAY CORRIDOR STUDY

The Grand Strand Area Transportation Study (GSATS) is soliciting public comment on the Holden Beach Causeway Corridor Study. The public is invited to attend a drop-in style meeting hosted on Thursday, June 22nd, 2023 between the hours of 5PM and 7PM at the Sabbath Home Baptist Church Recreation Building.

SABBATH HOME BAPTIST CHURCH RECREATION BUILDING
THE SABBATH HOME RD
SUPPLY, NC
28462

JUNE 22, 2023
DROP IN FROM 5PM-7PM

PROJECT STUDY AREA

Attendees are invited to learn about the project, provide comments, and ask questions of the consultants conducting the study. The Holden Beach Causeway Survey is also available to the public to provide input. Point your smart phone at the QR code to scan it and the QR code is also on the website.

SURVEY HERE!

COMMUNITY SURVEY

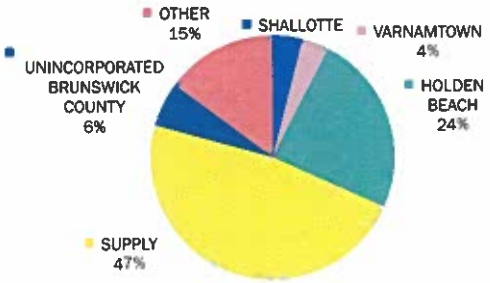
A survey was available to the community for 8 weeks to further understand participants relation to the study area and preferences for transportation safety, beautification, and connectivity improvements. Nearly 1,500 participants provided input through the survey.

1,490
PARTICIPANTS

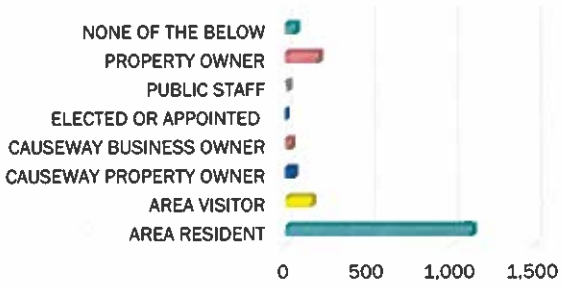
454
COMMENTS

WHO RESPONDED TO THE SURVEY

PARTICIPATING FROM

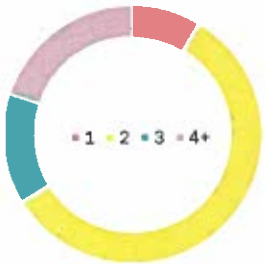


PARTICIPANT'S DESCRIPTION

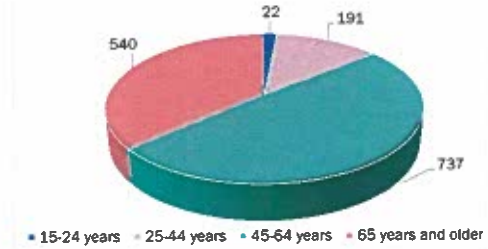


PARTICIPANT'S RELATIONSHIP

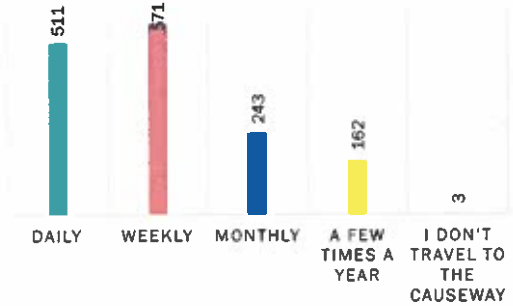
SIZE OF HOUSEHOLD



PARTICIPANT'S AGE



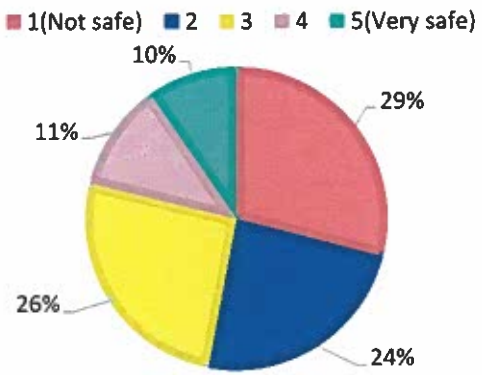
TIME SPENT IN CAUSEWAY



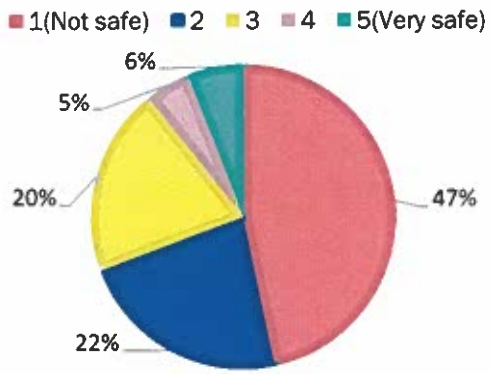
SURVEY

PARTICIPANT'S TRAVEL

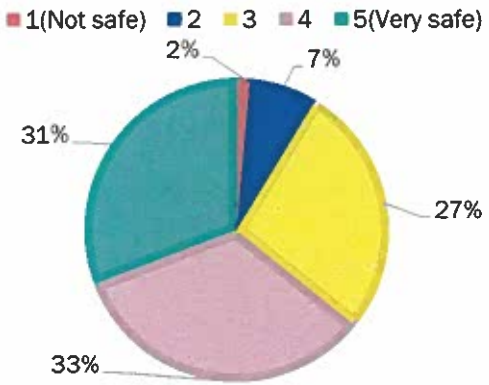
SAFE FEELING AS A PEDESTRIAN



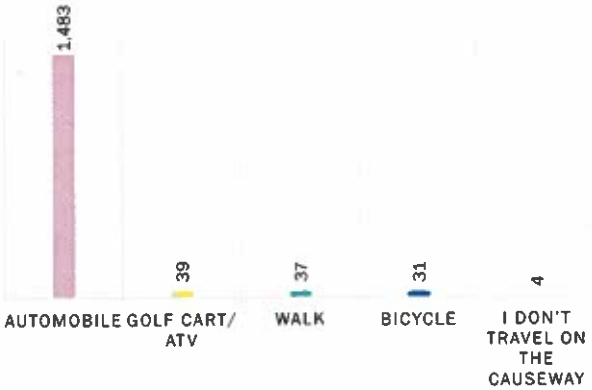
SAFE FEELING AS A CYCLIST



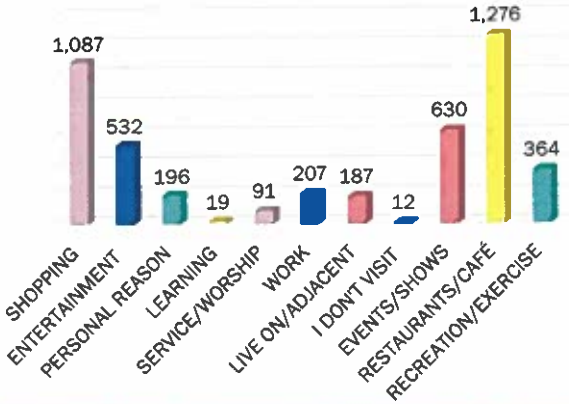
SAFE FEELING AS A DRIVER



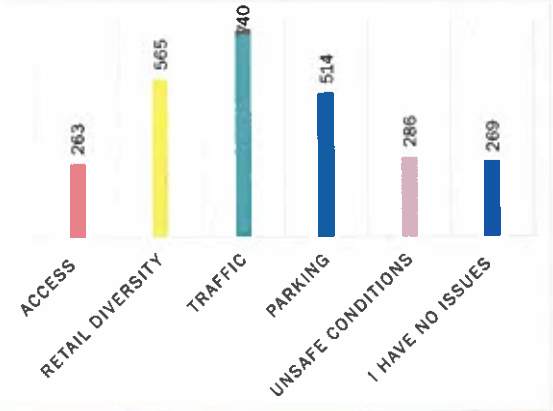
METHOD OF TRAVEL



REASONS YOU VISIT THE STUDY AREA



REASONS TO NOT VISIT THE STUDY AREA

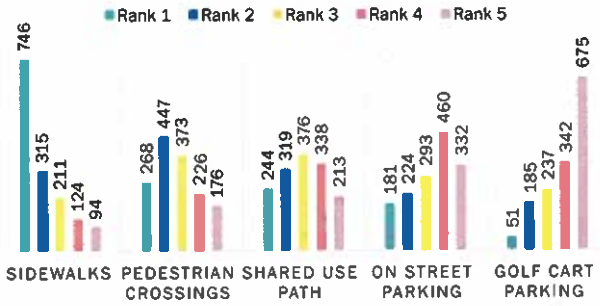


SURVEY SUMMARY

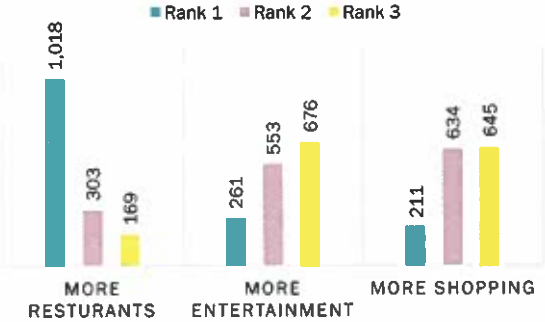
- Majority of participants are between ages of 45-64, full time residents, residing in Supply and household size of 2 people
- A heavy majority of participants travel to the Causeway by automobile and visit for shopping and restaurants
- Reasons participants may not visit the study area is majorly because of traffic
- Most people do not feel safe traveling the Causeway as a pedestrian or cyclist
- The survey showed that more restaurants in the study area would make the participants visit the Causeway more
- Participants ranked trees, vegetation and street lighting along the Causeway as their preferred change to see
- Increasing accessibility and circulation with new and improved sidewalks is favored
- Preference for on-street parking type on the Causeway varied

CHANGE WANTED BY PARTICIPANTS

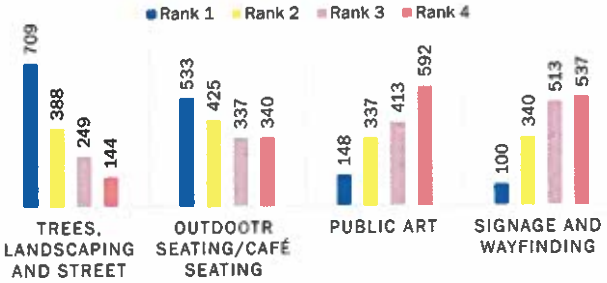
RANKINGS OF PARTICIPANTS PREFERRED CHANGES IN THE FUTURE CAUSEWAY



RANKINGS OF WHAT WOULD MAKE PARTICIPANTS VISIT MORE



RANKINGS OF WHAT PARTICIPANTS WANT TO SEE IN THE FUTURE CAUSEWAY



RANKINGS OF PARTICIPANTS PREFERRED PARKING FOR CAUSEWAY

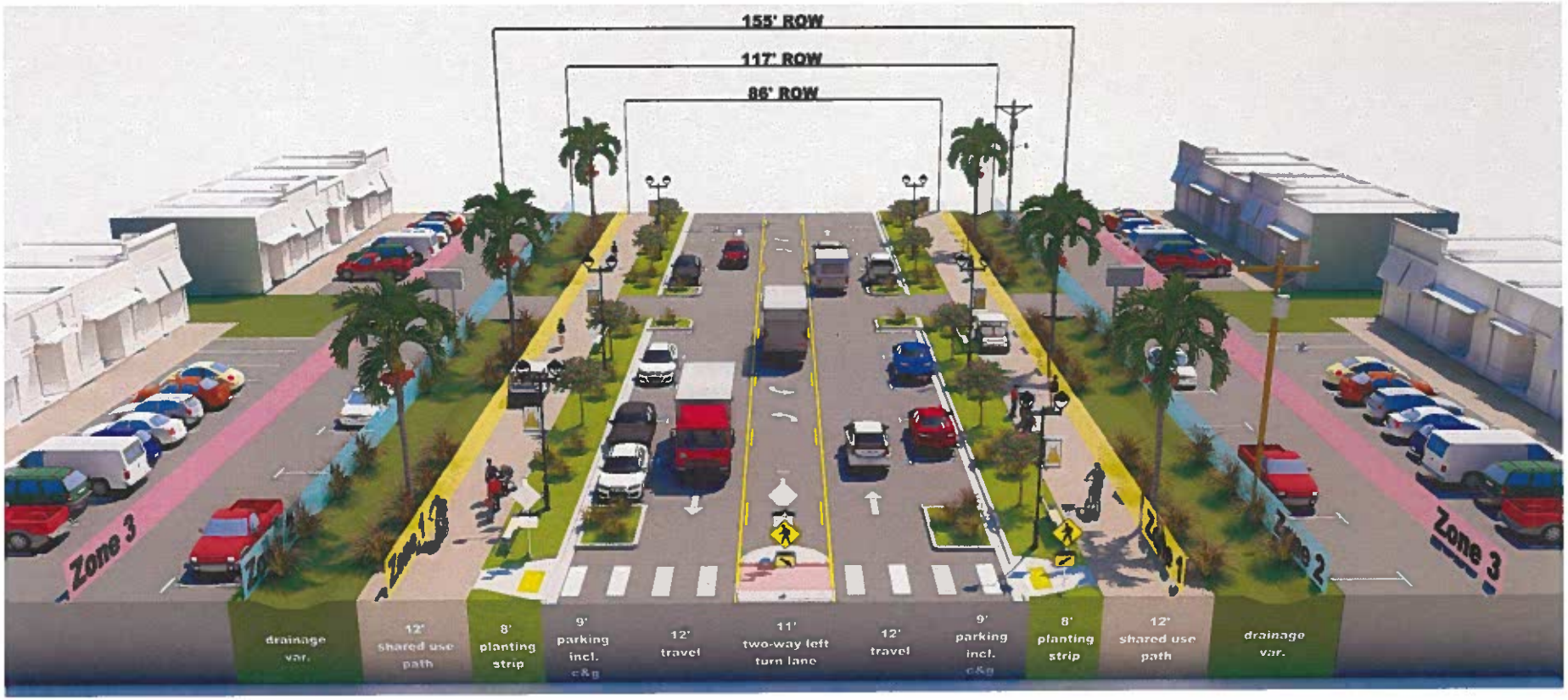
DESIGN OPTIONS

DESIGN OPTIONS

Three different improvement options for the Causeway design were considered. Each option illustrates a two-lane roadway with a designated two-way left turn lane, an 8' wide planting strip, and a 12' shared-use path on either side. What varies is the type of parking and the area available for additional landscaping and drainage.

OPTION A: THREE LANES WITH ANGLED PARKING

Option A is the widest cross-section, but does allow for the highest amount of on-street parking. A trade off is the reduced area for landscaping/drainage within the right-of-way.

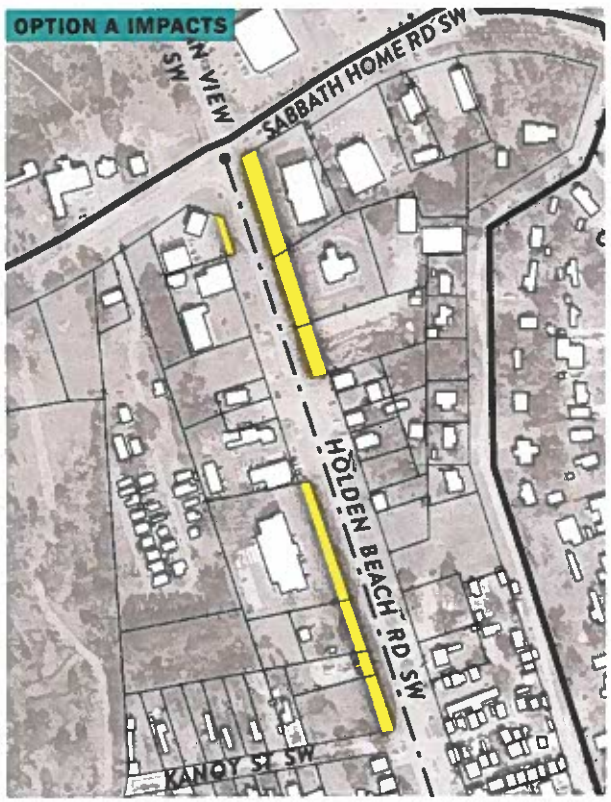


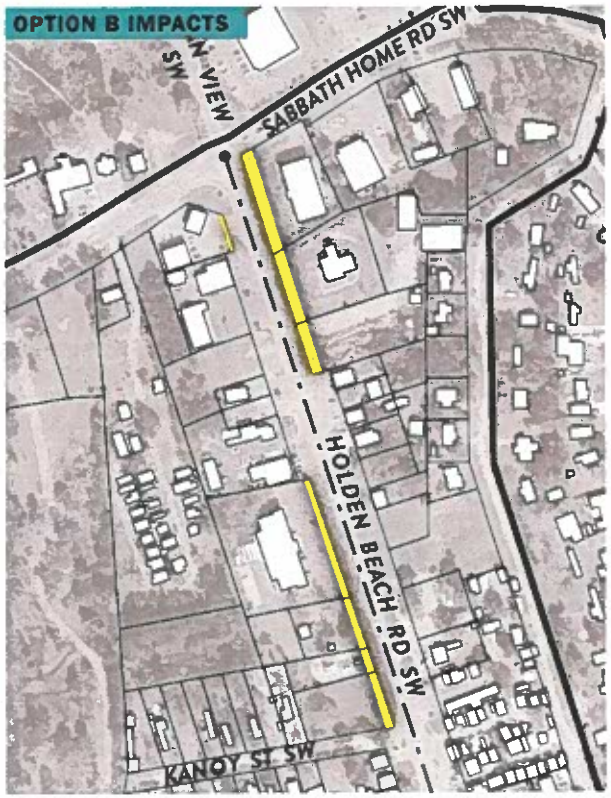
OPTION B: THREE LANES WITH PARALLEL PARKING

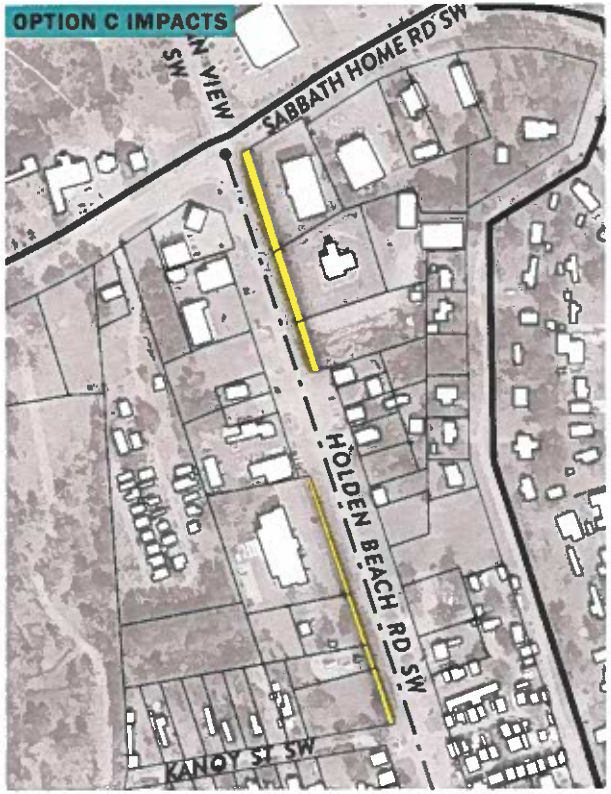
Option B still provides on-street parking but takes up less overall space. This allows for additional landscaping/drainage at the back of the shared use path.

OPTION C: THREE LANES WITHOUT ON-STREET PARKING

Option C is the narrowest proposed cross-section. It includes no on-street parking but still includes a 8' wide planting strip and 12' wide shared use path on both sides of the street.







POTENTIAL PROPERTY IMPACTS

In the diagrams above, the yellow sections represent property impacts based on each option. It is evident that Option A is the most impactful in comparison to Option B and to the least impactful option, Option C. These impacts were analyzed against the narrowest Right-of-Way Zone A. Therefore the diagrams above represent the most severe scenario, since the right-of-way widens out as you move south towards the bridge.

CAUSEWAY ALTERNATIVE DESIGNS

Based on survey feedback, available space within the right of way, and in effort to minimize impacts to private properties, two alternatives were developed. Alternative one has a mix of angled parking plus parallel parking. Alternative two has no parking within the right of way.

ALTERNATIVE 1 - ON-STREET PARKING

ALTERNATIVE 2 - NO ON-STREET PARKING

RECOMMENDATIONS

PREFERRED ALTERNATIVE

ALTERNATIVE 1 - MODIFIED

The preferred alternative is a modified version of Alternative 1. This alternative includes a mix of parallel and diagonal on-street parking, oversized vehicle parking, 12' wide shared use paths, and an 8' wide planting strip.

The addition of on-street parking adds 235 spaces to the Causeway within the public ROW. This approach would alleviate demand put on private business parking. The addition of on-street parking would provide traffic calming benefits for the Causeway. It is recommended the speed limit be reduced from 45 mph to 30 mph. A reduced speed limit is critical in making the Causeway a safer, more pedestrian-oriented district.

The installation of a 12' wide shared use path on both sides of Holden Beach Road Causeway would provide safe multi-modal options for pedestrians and cyclists that are not currently provided. Street trees, benches, and additional streetscape amenities provide a comfortable, welcoming environment for residents and visitors along the Causeway. Pedestrian style lighting is recommended along the path to accommodate evening travelers.

Redesign of parking located at private businesses is recommended for efficiency and the ability to accommodate oversized vehicles. Planting bulbouts should be utilized in parking lots and within the ROW to provide additional vegetation and opportunities for stormwater mitigation.

The Causeway is envisioned as a place more accessible to all modes of travel: pedestrians, cyclists, golf carts, cars, and oversized vehicles. The road is itself a destination serving residents, visitors, and business alike.

ALTERNATIVE 1 MODIFIED

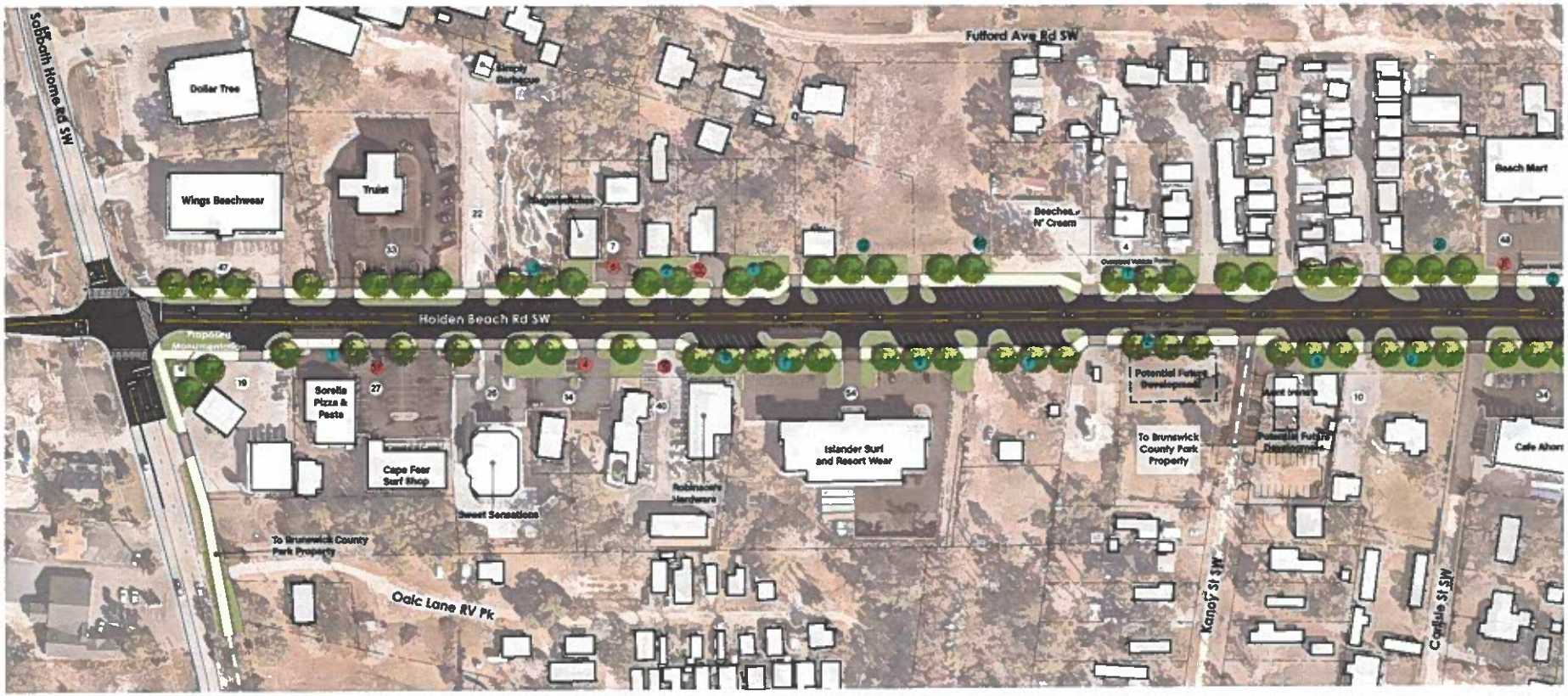
EXISTING

PRIVATE PARKING:	449
PARKING IN ROW:	237

PROPOSED

PRIVATE PARKING:	584
PARKING IN ROW:	324

ROW ZONE 1	ROW ZONE 2	ROW ZONE 3
ROW Width 86'-110'	ROW Width 117'-125'	ROW Width 155'

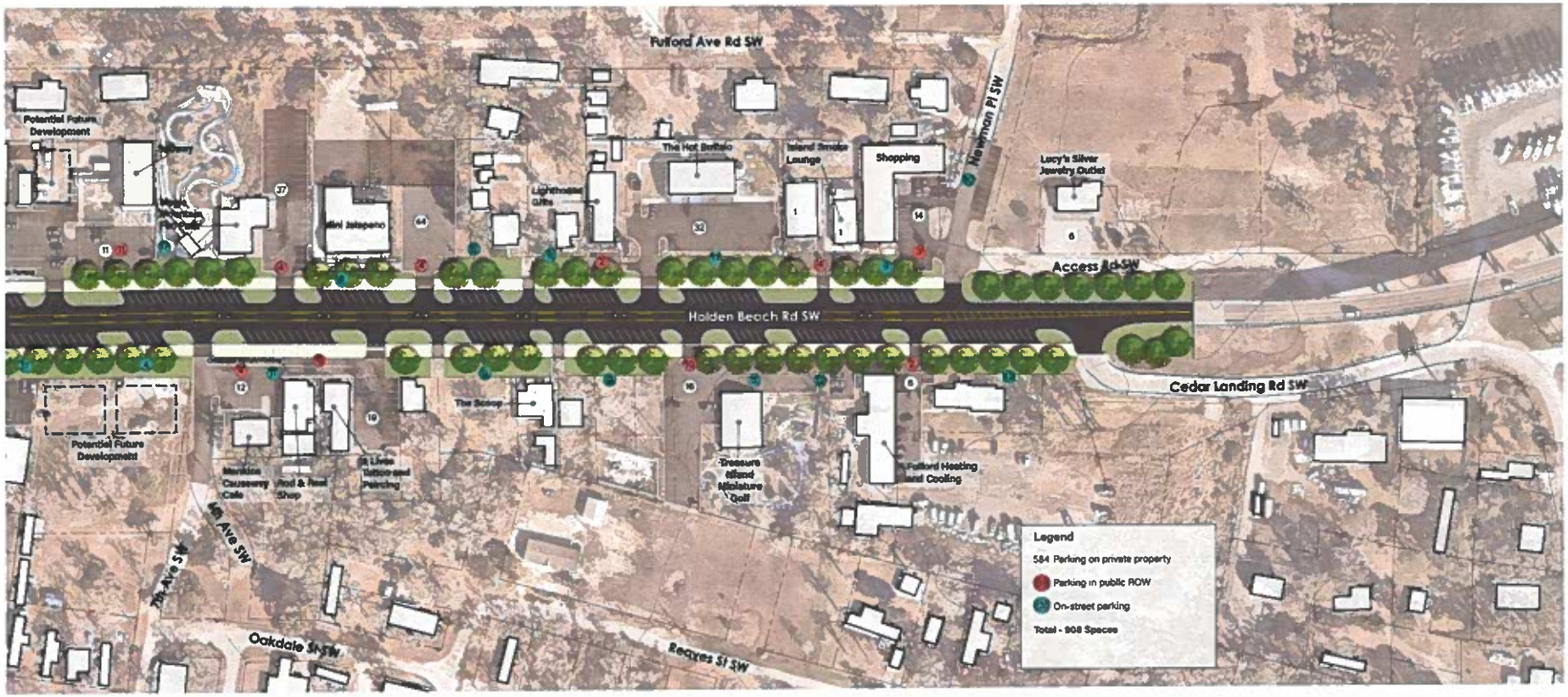


PREFERRED ALTERNATIVE:

The preferred alternative includes a mix of parallel and diagonal on-street parking, oversized vehicle parking, 12' wide shared use paths, and an 8' wide planting strip.

ROW ZONE 3

ROW Width 155'



PROPOSED CROSS-SECTION:

The final design is a mix of all three options based on feedback and individual property impacts. The cross-section above models only the angled parking section of the street, but there are sections of Holden Beach Road Causeway with parallel on-street parking and no on-street parking as well. One modification in the final design, is the location of the planting strip and multi-use path. The path is at the back of the on-street parking. This is so people walk on pavement directly after exiting their vehicle versus having to walk through a planting strip to get to the shared use path.

RECOMMENDATIONS

ON-STREET PARKING:

On-street parking serves visitors and businesses along the corridor. A "park once and walk" approach creates a more vibrant, pedestrian-oriented district which benefits businesses along the corridor. Visitors are more inclined to visit multiple destinations if there is a safe, convenient way to park and walk.

- Implement on-street parking in the form of parallel and diagonal spaces.
- Study reverse-angle parking as an alternative to traditional diagonal on-street parking.
- Dedicate on-street parallel parking spaces for oversized vehicles with adjacencies to compatible businesses and at regular intervals.
- Proposed on-street parking improvements should be designed per NCDOT standard.

NUMBERS REPRESENT PARKING COUNTS AS INDICATED ON PAGE 49

ON-STREET PARKING CASE STUDY: SOUTHPORT, NC

Along N. Howe Street (an NCDOT maintained roadway) in Southport, NC there are both on-street parallel and diagonal parking spaces. Southport is a regional destination with a walkable downtown district. The publicly provided on-street parking accommodates visitors and in turn supports local businesses.

SOURCE: INTRACOASTAL REALTY CORPORATION

RECOMMENDATIONS

TEMPORARY USES WITHIN THE ROW:

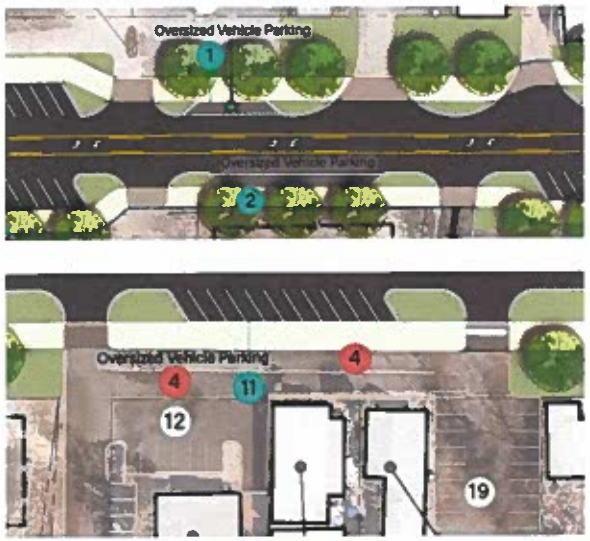
- Excess ROW should be considered for additional temporary parking needs for Causeway properties to include oversized parking, standard parking, and parking maneuvering.
- For properties with building frontages within the ROW or adjacent, excess ROW should be considered for temporary uses such as outdoor dining, seasonal goods display, etc.

PRIVATE PROPERTY PARKING:

- Existing parking on private properties should be improved through paving, striping, and screening from the street. Screening should be consistent with Brunswick County's UDO.
- Parking on private property should be improved and expanded where appropriate to maximize parking availability.
- Property owners should consider parking agreements with adjacent property owners to share parking. Existing businesses that serve day-time customers could share parking with adjacent businesses that serve evening customers.

STORMWATER/DRAINAGE:

- At present, there is a high amount of impervious area along the Causeway. The addition of planting strips and enhanced landscaping should be considered to reduce site runoff.
- Implement curb and gutter with streetscape improvements.
- The future street improvements will affect existing drainage infrastructure. Stormwater improvements will need to be studied and designed before implementing the proposed streetscape.



NUMBERS REPRESENT PARKING COUNTS AS INDICATED ON PAGE 49

NUMBERS REPRESENT PARKING COUNTS AS INDICATED ON PAGE 49

RECOMMENDATIONS

SHARED USE PATH:

- A shared use path allows for safe alternative modes of travel along the Causeway including bicycles, pedestrians, and golf carts.
- Implement a 12' wide shared use path on both sides of Holden Beach Road Causeway.
- Consider future expansion opportunities along Sabbath Home Rd. to the future Brunswick County park, and across the Holden Beach bridge.
- Identify a standard design and materials for the shared use path to ensure continuity if implemented in phases.
- Ensure shared use path design can accommodate multiple modes and prioritizes pedestrians.

DRIVEWAY CONSOLIDATION:

- Develop a standard driveway configuration for the Causeway properties that accommodates land use needs, but minimizes multiple driveways per property.
- Identify opportunities where shared driveways can minimize curb cuts and interruptions of the shared use path.
- Encourage the connection of connecting parking lots to minimize need for additional or redundant driveways.
- Case Study: Sunset Beach, NC

NUMBERS REPRESENT PARKING COUNTS AS INDICATED ON PAGE 49

PEDESTRIAN CROSSINGS:

- Modes of travel, other than cars, need to be accounted and designed for. Adding protected pedestrian crossings at key locations is critical to creating a truly walkable district.
- Study the addition of crosswalks along the Causeway with Pedestrian Hybrid Beacons to further enhance pedestrian connectivity along the Causeway.

RECOMMENDATIONS

STREETSCAPE:

- Implement consistent street tree planting along the Causeway. Plant trees in the planting strip and proposed bulb outs along the corridor.
- Add pedestrian scaled lighting along the corridor adjacent to the shared use path.
- Add street furnishings such as benches along the side path.
- Encourage businesses along the corridor, who directly front the side path, to have cafe tables and seating.
- Study burying utilities.

INTERSECTION IMPROVEMENTS:

- Work with NCDOT, GSATS, and Brunswick County to conduct a full intersection study of Holden Beach Road SW and Sabbath Home Road SW to identify safety and operational improvements.
- Evaluate the removal of the right-turn slip lane onto the Causeway, reduction of turning radius, and the addition of crosswalks to accommodate pedestrians. Ensure trucks can still navigate reduced turning radius.
- Consider monument signage at the corner of Sabbath Home Rd and Holden Beach Rd SW.

NUMBERS REPRESENT PARKING COUNTS AS INDICATED ON PAGE 49

BRIDGE ACCESS STUDY:

- Currently access at the southern portion of the Causeway/northern portion of the Holden Beach Bridge consists of competing intersections creating complexity and safety concerns. Travelers are also utilizing minor side streets not equipped for through traffic to access the bridge. The area under the bridge is being utilized as a turnaround although no formal street design exists.
- Work with NCDOT to conduct a feasibility study to improve safety and access to the Holden Beach Bridge.

RECOMMENDATIONS

FUTURE LAND USE:

- Develop an Overlay District to direct future redevelopment and phased improvements for properties outlined in the diagram below.
- Overlay District should promote a mixed use, walkable district and should include standards for land use, street/shared use path connections, buildings, parking/driveways, landscaping, trees, screening, and signage.
- Existing uses within the proposed Overlay District should be considered to ensure continuation until redevelopment occurs.
- Overlay District will have positive impacts on redevelopment by removing barriers, having corridor-specific standards, and accommodating challenges.

FUTURE DEVELOPMENT OPPORTUNITIES:

- Mixed-use development does not currently exist along the Causeway, but it is allowed in the Brunswick County UDO as there are options of any residential building types occurring in the CLP Zoning District.
- Mixed use, infill redevelopment should be considered to accommodate a mix of commercial, hospitality, residential, and office uses.
- New redevelopment should prioritize connectivity through development and to Causeway with sidewalks and street connections.

NUMBERS REPRESENT PARKING COUNTS AS INDICATED ON PAGE 49

FUTURE CONNECTIONS:

- Add future parking on county-owned property
- Create connections from the Causeway to the future Brunswick County park property.
- Connections might be in the form of roadways, shared-use paths, or trials.
- Holden Beach Rd SW and Kanoy St SW are priority connections to be made.
- Future connections along waterfront and across Holden Beach Bridge should be further studied.

IMPLEMENTATION GUIDE

IMPLEMENTATION GUIDE

Category			Recommendations	Partners	Priority		
					Short (0-5 yrs)	Mid (5-10 yrs)	Long (10+yrs)
Streetscape	Shared Use Path	1.1	Design and implement a 12' Shared Use Path on both sides of the Causeway to accommodate pedestrians, bicyclists, and golf carts.	NCDOT, Brunswick County, GSATS			○
	Design Guidelines	1.2	Develop Design Guidelines to guide future development. Guidelines should address business signage along the corridor.	Brunswick County	○		
	Driveway Construction	1.3	Modify driveway access to 1-2 driveways per parcel based on land use. Consider utilizing shared driveways where feasible to achieve a more seamless and safer streetscape design.	NCDOT, Brunswick County			○
	Planting	1.4	Design and implement a landscape plan with an 8' wide planting strip along the Causeway with consistent street tree planting.	NCDOT			○
	Amenity	1.5	Add pedestrian scaled lighting and site furnishings along the corridor adjacent to the shared use path. Encourage businesses along the corridor, who directly front the side path, to have cafe tables and seating.	NCDOT, Business Owners			○
	Stormwater	1.6	Install curb and gutter along the Causeway in accordance with the proposed street design. Study stormwater Improvements as they relate to this proposed street plan. Consider introducing Best Management Practices (BMPs) for stormwater mitigation where appropriate.	NCDOT, Brunswick County			○

Category			Recommendations	Partners	Priority		
					Short (0-5 yrs)	Mid (5-10 yrs)	Long (10+ yrs)
Parking	ROW Parking	2.1	Reduce the amount of private business parking within the Public Right-of-Way. Implement the preferred Alternative street design which adds public on-street parking benefiting all businesses along the Causeway.	NCDOT, Property Owners, Business Owners			○
Parking	Oversized Vehicle Parking	2.2	Design and implement oversized parking spaces throughout the corridor adjacent to locations where there is a business need. Spaces can serve as loading zones for service vehicles or parking for trucks and trailers.	NCDOT, Business Owners			○
Parking	Shared Parking	2.3	Look for opportunities for shared parking agreements among property owners along the Causeway.	Property Owners, NCDOT, Brunswick County	○		
Parking	Reverse Angled Parking	2.4	Study the use of reverse-angle parking as an alternative to traditional diagonal on-street parking as shown in the Preferred Alternative.	NCDOT	○		
Traffic	Speed Limit	3.1	Reduce speed limit to 30 mph along Holden Beach Road Causeway	NCDOT	○		
Traffic	Roadway Design	3.2	Study alternative roadway designs at key intersections along Holden Beach Road Causeway and Sabbath Home Road SW to improve safety and function.	NCDOT, Brunswick County		○	
Traffic	Island Traffic	3.3	Study traffic calming and mitigation for traffic congestion associated with the island traffic.	NCDOT, Brunswick County, Town of Holden Beach	○		

Category		Recommendations		Partners	Priority		
					Short (0-5 yrs)	Mid (5-10 yrs)	Long (10+yrs)
Big Ideas	Waterfront District	4.1	There is an opportunity to explore future public space and development as it relates to the marina and properties along the Intracoastal Waterway. Conduct a future study on how a "Waterfront District" might connect to the county's park land and create a cohesive, connected public space for the community.	Brunswick County, GSATS, NCDOT		○	
Future Connections	Bridge Pedestrian Access	5.1	Consider opportunities to connect the shared use path over the bridge with a future bridge study.	NCDOT		○	
	Crosswalks	5.2	Study the addition of crosswalks along the Causeway with Pedestrian Hybrid Beacons to further enhance pedestrian connectivity.	NCDOT	○		
	Brunswick County Park Connections	5.3	Create connections from the Causeway to the future Brunswick County park property. Connections might be in the form of roadways, shared-use paths, or trails. Holden Beach Rd SW and Kanoy St SW are priority connections to be made."	Brunswick County, GSATS, NCDOT		○	
Future Land Use	Overlay District	6.1	Brunswick County to develop an Overlay District for the Causeway to achieve desirable future development standards. Develop design guidelines associated with the overlay district.	Brunswick County	○		
	Public Parking	6.2	Consider installing a public parking lot on vacant land within the study area to serve visitors. A potential location is the Brunswick County park land should it develop.	Brunswick County		○	

Category		Recommendations		Partners	Priority		
					Short (0-5 yrs)	Mid (5-10 yrs)	Long (+10 yrs)
Future Land Use	Mixed-Use Development	6.3	Consider the design and construction of infill mixed-use development along the Causeway. There are a number of vacant parcels suitable for this type of development.	Property Owners			○
Future Studies	Bridge Access Study	7.1	Work with NCDOT to conduct a Feasibility Study to study access to the Holden Beach Bridge. Study the following locations: Newman Pl Rd SW & Holden Beach Rd SW, Cedar Landing Road SW & Holden Beach Rd SW, Fulford Avenue SW, and the area under the bridge.	Brunswick County, GSATS, NCDOT		○	
	Old Ferry Road SW & Sabbath Home Road SW	7.2	Work with NCDOT, GSATS, and Brunswick County to conduct a full intersection study of Old Ferry Road SW and Sabbath Home Road SW to identify safety and operational improvements.	Brunswick County, GSATS, NCDOT	○		
Public Engagement	Community Opportunities	8.1	Consider setting up an organization that interested residents could be a part of, giving members opportunities to become leaders on the actions of what will happen on the Causeway. This would build relationships for a common cause, and there will have to be more structure in the implementation steps to create this organization	Property Owners, Brunswick County, GSATS, NCDOT	○		

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DRAFT SEPTEMBER 25, 2023

TRI-BEACH VOLUNTEER FIRE DEPARTMENT

Roy D. Todd, Jr.
Chief

854 SABBATH HOME ROAD SW
SUPPLY NC 28462
Phone (910) 842-2333

William C. Todd
Deputy Chief

February 19, 2026

To the NCDOT, Brunswick County, Holden Beach, Project Planning Committee and Stakeholders, please accept this letter as support for the Holden Beach Causeway Redevelopment Project. As Chief of the Tri-Beach Fire Department, a priority is ensuring that our emergency response teams can navigate the corridor safely and efficiently to protect the lives and property of our residents and visitors. I have conducted a review of the completed Corridor Study dated 8/29/2023 associated with this project. Based on the current site plans and traffic flow proposals, I have found no elements that would hinder or negatively impact the access of emergency operations to Holden Beach or the surrounding Causeway businesses. Specifically, the proposed infrastructure improvements appear to maintain the necessary clearances and maneuverability required for our fire apparatus and EMS vehicles. We are confident that these enhancements will support a more organized flow of traffic without compromising our ability to respond to emergency situations in a timely manner.

Sincerely,

Roy Todd
Chief - Tri-Beach Fire Department

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Charlotte, NC 28202

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MEMORANDUM

Date: 8/29/2023

To: Mark Hoeweler and Elizabeth Tucker, Grand Strand Transportation Study

From: Abby Williams, PE

Subject: Holden Beach Causeway Corridor Improvements – Engineer's Cost Estimate

Project No.: 4919, 0M0.130128

Background

The Waccamaw Regional Council of Governments dba Grand Strand Transportation Study (GSATS) plans to improve Holden Beach Road SW, from Sabbath Home Road SW to the Intercoastal Waterway, with a multiuse path on both sides and on-street parking. Also included in the project are pedestrian crossings at the existing traffic signal at Sabbath Home Road SW and Holden Beach Road SW and three median protected midblock crossings along the corridor. This project is planned to provide an estimated 908 total parking spaces, including 584 parks on private property, 89 parks in the public right-of-way, and 235 on-street parks. Holden Beach Road SW is currently a 3-lane roadway with ditches. There are no facilities for bicycle or pedestrian access and many driveway access points onto the corridor. The future typical section of Holden Beach Rd is depicted in Figure 1. The total cost of the project is estimated at **$8,143,000.**

Figure 1. Proposed Typical Cross Section

Cost Estimate

A concept level Engineer's Estimate of Probable Cost was created for the Holden Beach Causeway Corridor Improvements based on the assumptions below. Prices and quantities are provided on page 3 and supplied using 2023 regional costs.

Roadway

- The existing roadway will be milled and overlayed, with some full-depth pavement removed for changes in the driveway location.
- Full-depth pavement will be added in new parking locations and in some cases where driveways are relocated, up to the existing right-of-way line. The pavement schedule is assumed as 3" of S9.5C, 4" of I19.0C, and 5" of B25.0C, combined with grade PG 64-22 asphalt binder plant mix.
- 2'6" curb and gutter will be added to the roadway and was quantified along driveways and parking within the public right-of-way only.
- Medians will be 5" monolithic concrete islands extending 15' in both directions from each midblock pedestrian crossing.
- The roadway will be restriped with 4" thermoplastic pavement markings. Parking spaces will also be delineated with 4" thermoplastic pavement markings.

Pedestrian Improvements

- The multiuse paths are assumed to be constructed with 4" of concrete on top of 6" of class 6 aggregate base course.
- ADA compliant concrete curb ramps will be added along the multiuse paths at every driveway and crossroad.
- The traffic signal at Sabbath Home Road SW and Holden Beach Road SW will have crosswalks added and will be updated with accessible pedestrian signals (APS) push buttons crossings.
- High visibility crosswalk striping costs were estimated by each using national averages. Medians for crosswalks are listed as 5" monolithic concrete islands, above.

Placemaking

- Trees and pedestrian scale lighting are assumed to be placed an average of 60' apart along the corridor on both sides of the roadway.
- Site furnishings are assumed to be benches placed an average 120' apart along the corridor on both sides of the roadway.

Right-of-Way

- While efforts were made to contain improvements within the existing right-of-way, 3 properties will require construction easements. Current property values on the corridor are approximately $20 per square foot, and the easement cost is 10% of property cost.

Contingencies

Due to the conceptual level of this study, many engineering details have yet to be determined. To assure an appropriate final cost, several lump sum estimations are applied. Earthwork grading, surveying, erosion control, signing, utility coordination, traffic signal upgrades, and contractor mobilization are all provided as lump sum estimates. Drainage and Traffic Control are listed according to the *NCDOT Conceptual Construction Cost Estimation Guidelines* as cost per mile. The costs to underground electric service and other aerial utilities are not included in the cost estimate but should be contemplated and discussed with Brunswick Electric.

A 20% planning contingency factor and a 2.3% annual inflation rate for 10 years are applied to the final line-item cost. The cost of engineering is assumed to be 6% of the total construction cost.

Engineer's Cost Estimate				
Holden Beach Causeway Corridor Improvements				
Holden Beach Rd SW & Sabbath Home Rd SW				
COUNTY:		Brunswick		
PROJECT NO.:		4919		
DATE:	8/29/2023	BY:	APW	
REVISED:		RVW:	TF	

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PROJECT COST: $ 8,143,000.00

Description	Quantity	Unit	Price	Amount
Mobilization	1	LS	$ 153,000.00	$ 153,000.00
Grading	1	LS	$ 106,000.00	$ 106,000.00
Aggregate Base Course, Class 6	3,090	TON	$ 55.00	$ 169,950.00
Asph. Base Course B25.0C	2,520	TON	$ 90.00	$ 226,800.00
Asph. Intermediate Course I19.0C	810	TON	$ 90.00	$ 72,900.00
Asph. Surface Course S9.5C	1,940	TON	$ 90.00	$ 174,600.00
1.5" Asphalt Milling	49,105	SY	$ 4.00	$ 196,420.00
Asph. Binder - PG64-22	270	TON	$ 600.00	$ 162,000.00
2'6" Curb & Gutter	12,280	LF	$ 31.00	$ 380,680.00
4" Concrete Trail	30,020	SY	$ 54.00	$ 1,621,080.00
5" Monolithic Concrete Island	360	SY	$ 95.00	$ 34,200.00
4" Thermoplastic Pvmt Mkg. Line	19,400	LF	$ 4.00	$ 77,600.00
Crosswalks	6	EA	$ 2,600.00	$ 15,600.00
Concrete Curb Ramps	86	EA	$ 3,500.00	$ 301,000.00
Full Depth Pavement Removal	6,720	SY	$ 15.00	$ 100,800.00
Drainage	0.63	MI	$ 750,000.00	$ 472,500.00
Traffic Control	0.63	MI	$ 150,000.00	$ 94,500.00
Street Trees	120	EA	$ 1,000.00	$ 120,000.00
Pedestrian Scale Lighting	120	EA	$ 3,000.00	$ 360,000.00
Benches	60	EA	$ 650.00	$ 39,000.00
Easements	11,500	SF	$ 2.00	$ 23,000.00
Surveying	1	LS	$ 46,000.00	$ 46,000.00
Erosion Control	1	LS	$ 92,000.00	$ 92,000.00
Signing	1	LS	$ 25,000.00	$ 25,000.00
Utility Coordination	1	LS	$ 47,000.00	$ 47,000.00
Traffic Signal Upgrades	1	LS	$ 150,000.00	$ 150,000.00

Length	**0.63 Miles**	**Line Item Cost**	$ 5,261,630.00
		2.3% Inflation over 10 years	$ 6,629,653.80
		20% Planning Contingency Factor	$ 1,052,326.00
		Construction Cost	$ 7,681,979.80
		Engineering Cost 6%	$ 460,918.79
		Total Cost	**$ 8,142,898.59**

SAY $ 8,143,000.00