BCDCOG BERKELEY-CHARLESTON-DORCHESTER COUNCIL OF GOVERNMENTS
PLANNING, PARTNERSHIP & PROSPERITY

CHATS LRTP

2040 LONG RANGE TRANSPORTATION PLAN

July 12, 2017

CHATS LRTP
PLAN OVERVIEW

Federally Mandated unifying document in the transportation planning process:

- **Summarizes** goals and performance targets systemwide
- **Assesses** current system performance
- **Inventories** future challenges and needs
- **Analyzes** and **proposes** an investment strategy to be funded over the next 20 years or more
- **Prioritizes** projects under fiscal constraint
- **Connects** to other planning and programming of project (TIP)

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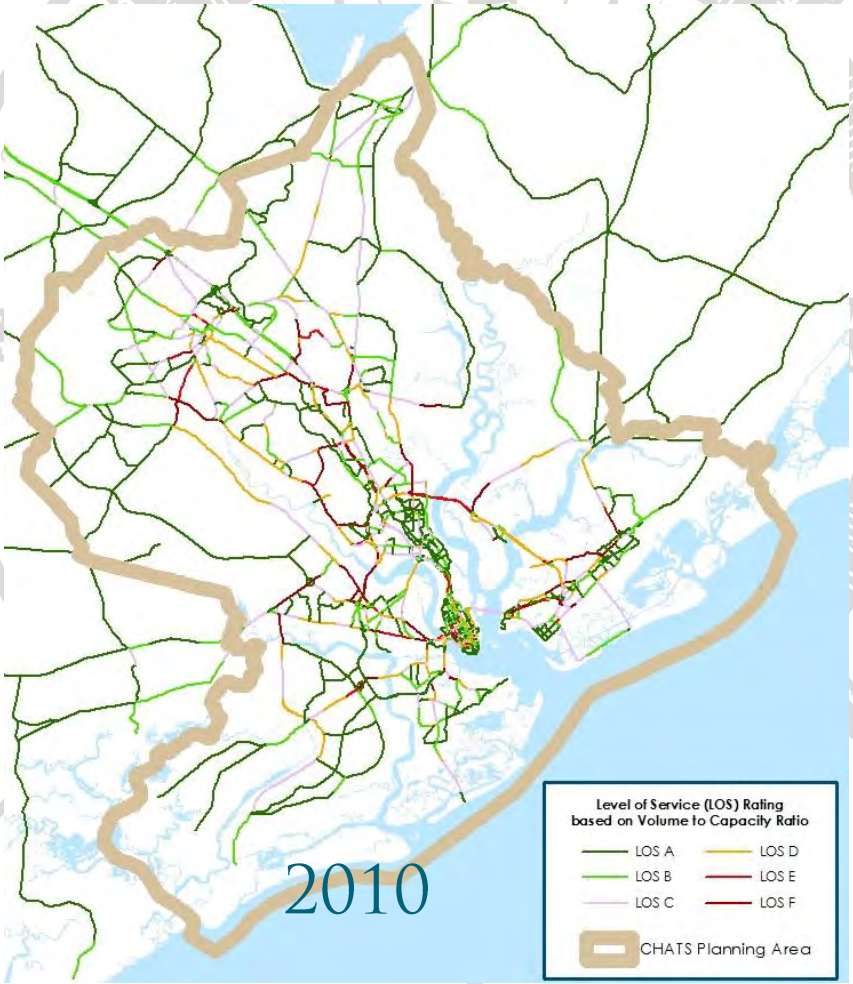
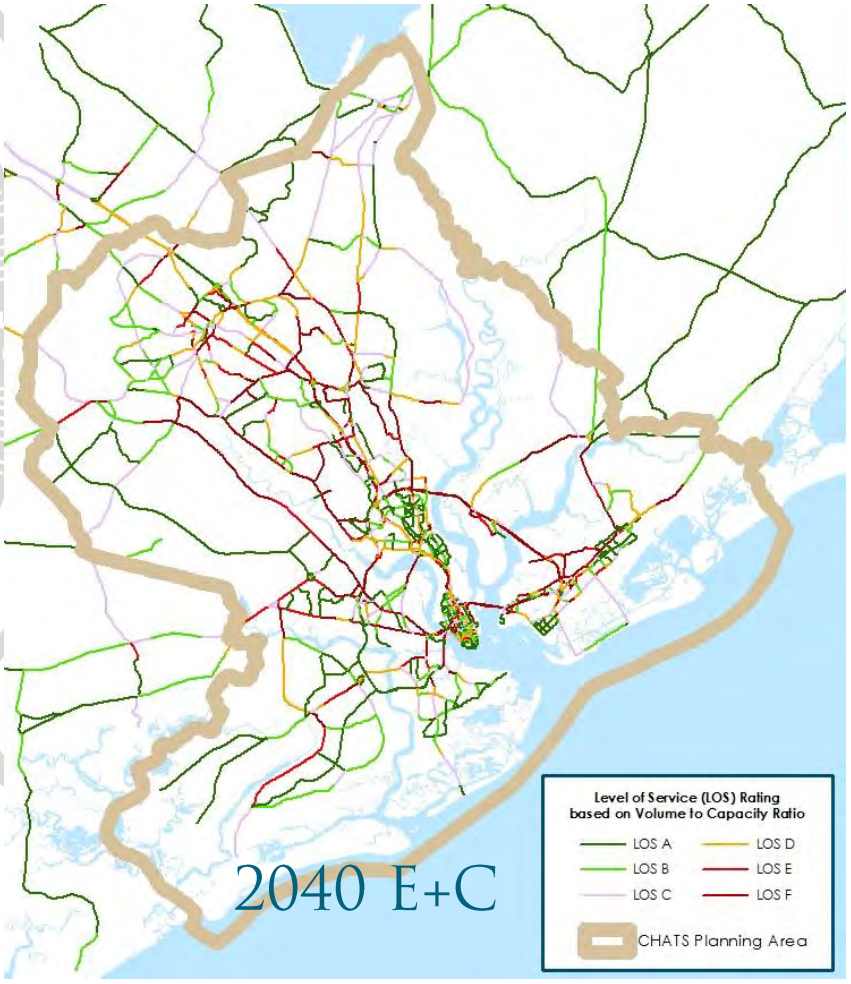
CHATS LRTP

Why Update





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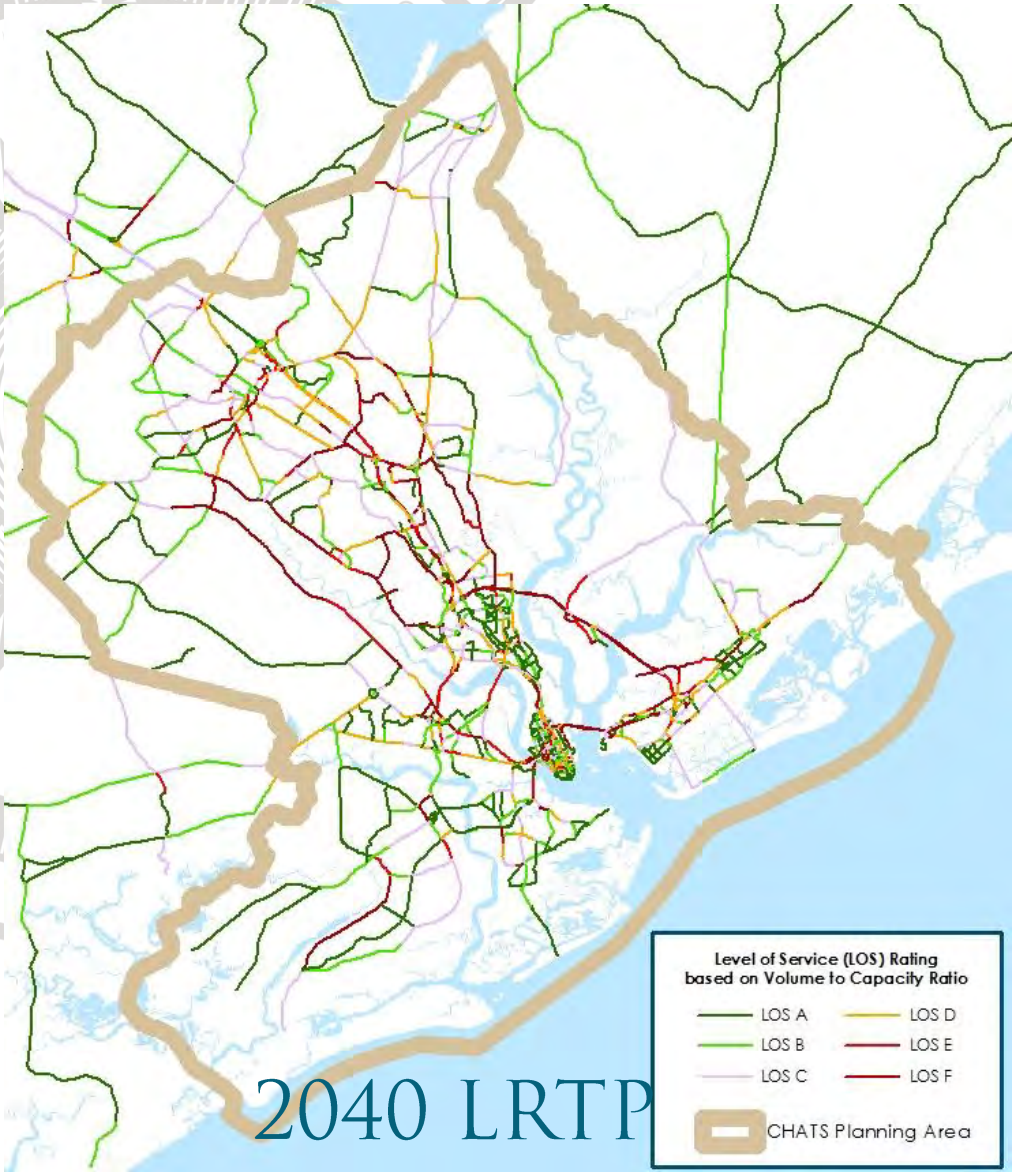
CHATS LRTP

Why Update



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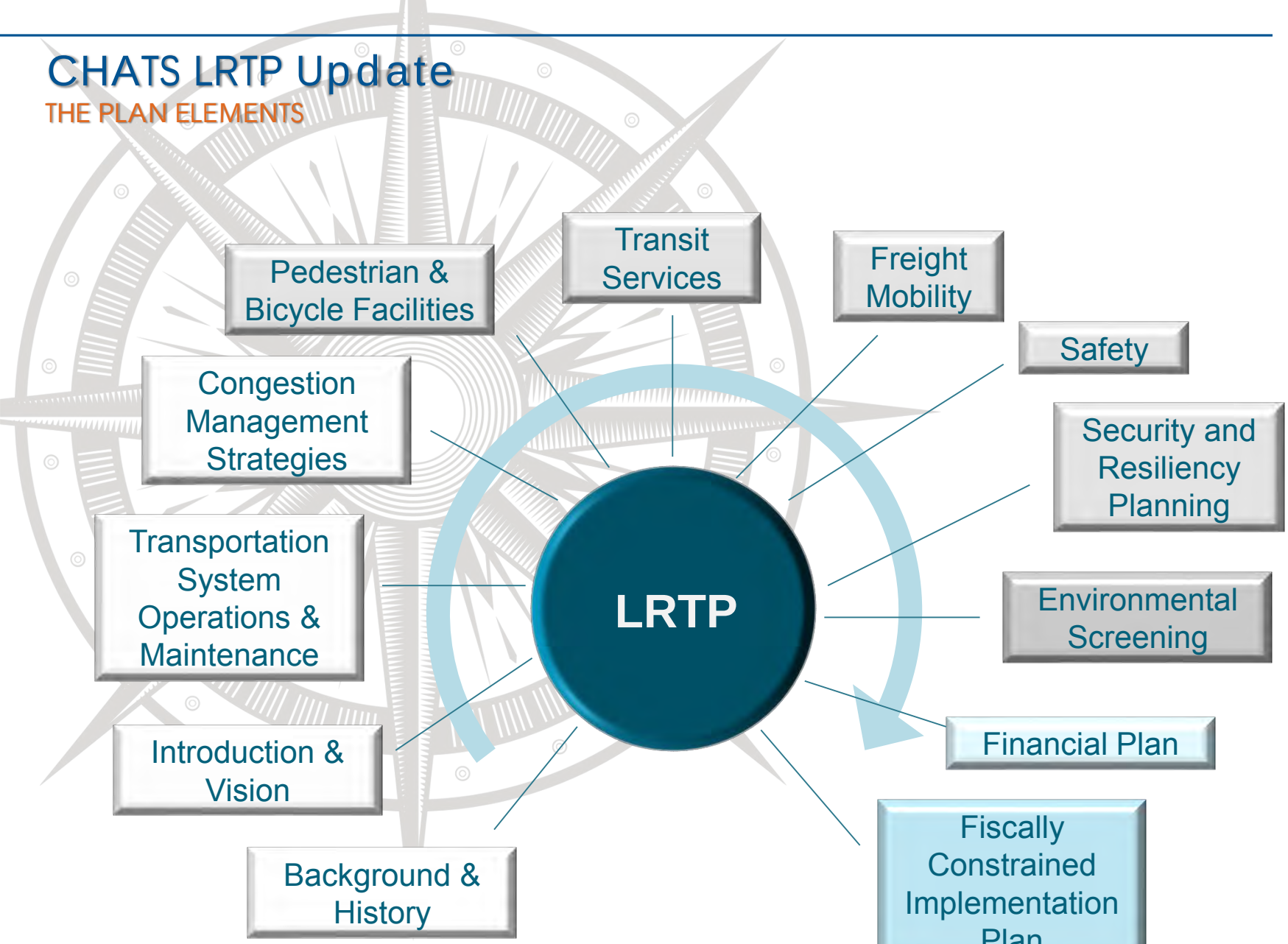
CHATS LRTP Update

THE PLAN ELEMENTS



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City CTP

THE DEEPER DIVE

Background/Current Context

- Existing Plan Policies and recommendations
- Century V Plan, Wappoo/Dupont Study, Folly Road Corridor, Plan West Ashley

Roadway Assessments

- Effectiveness of options for one-two way conversions, traffic signalization, ITS improvements and travel demand reduction strategies.
- Complete Street and/or Access Management concepts for specific corridors and intersections

Multimodal Assessments

- Quality/LOS assessment of major travelways and intersections
- Integration and refinement of inter-neighborhood connections and bridge crossings from WalkBike BCD
- Integration of COG/CARTA Comprehensive Operational Analysis

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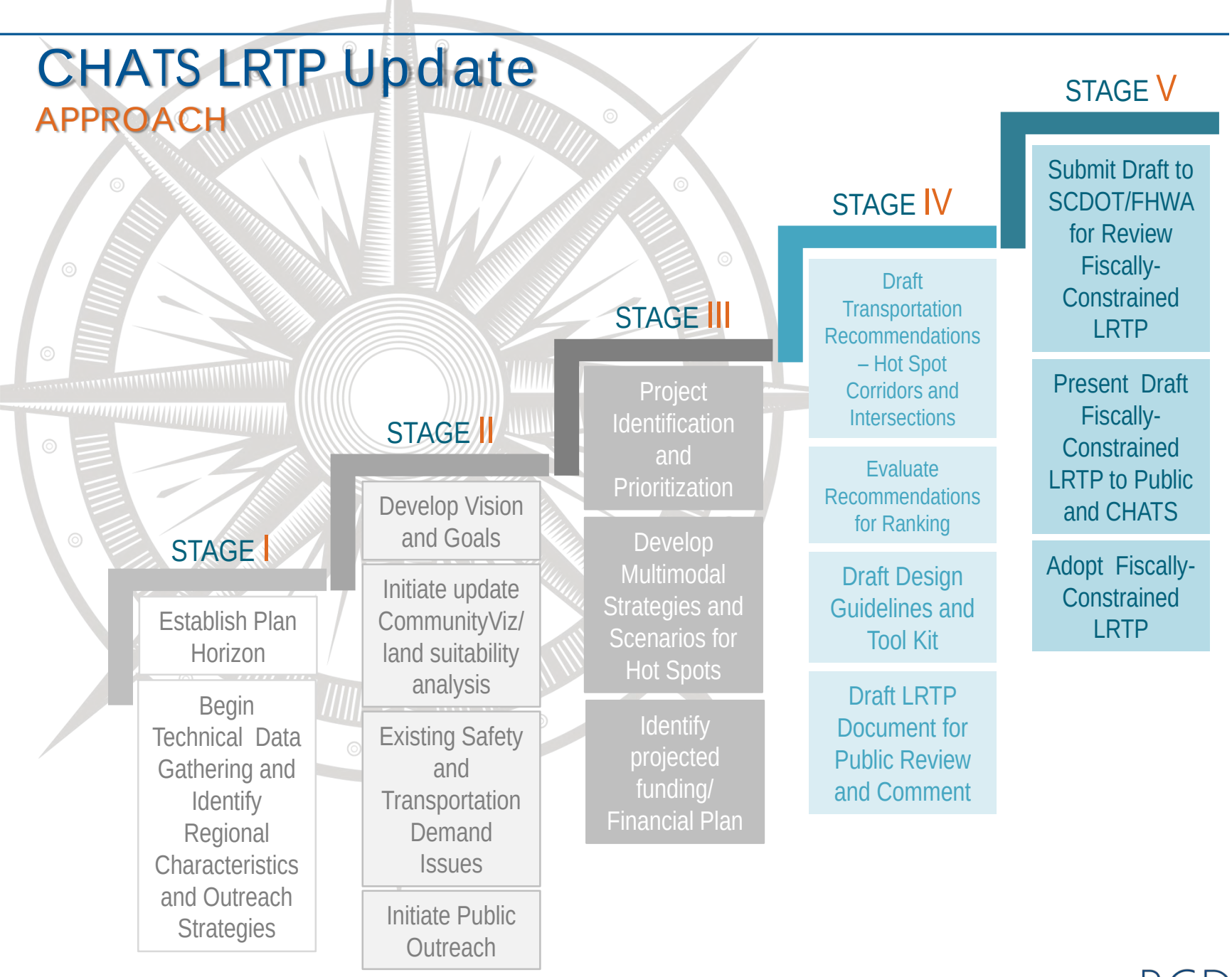
CHATS LRTP Update

APPROACH



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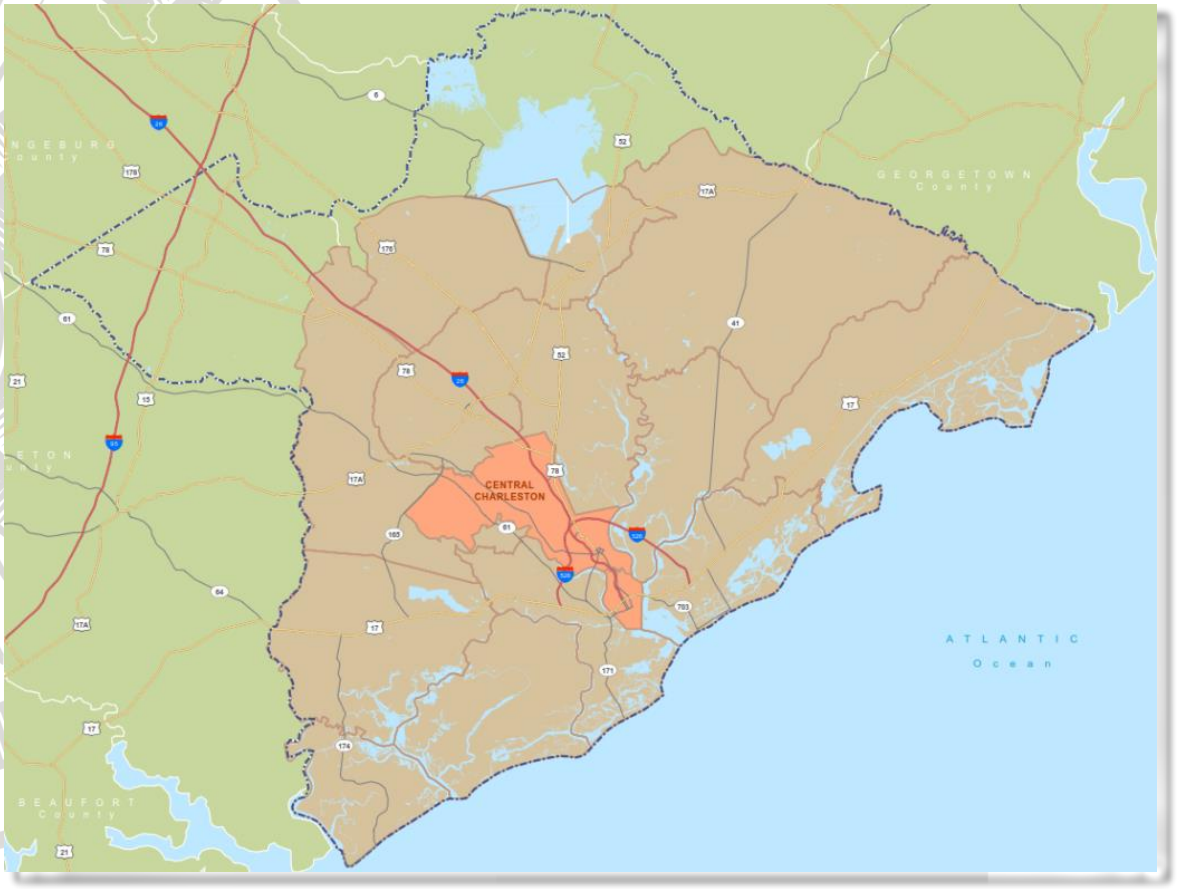
CHATS LRTP Update

TRAVEL DEMAND MODEL OVERVIEW

- Covers **2,300** square miles (84%) of the tri-county region
- Encompasses Census defined Urbanized Area (UZA) and all land expected to be urbanized within the next **20+** years
- Divides the region in to small geographic units known as Traffic Analysis Zones (**TAZ**s)



- Year **2010** represents base conditions and Year **2040** represents horizon conditions

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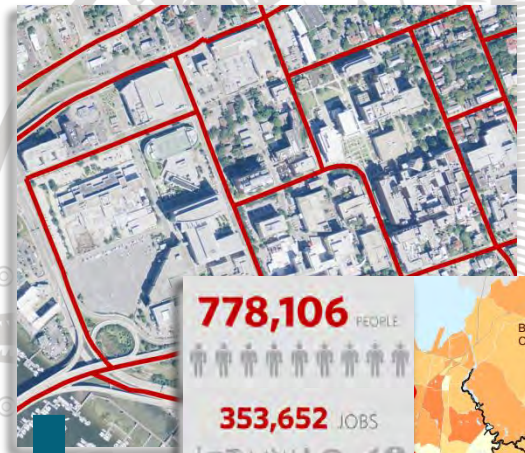
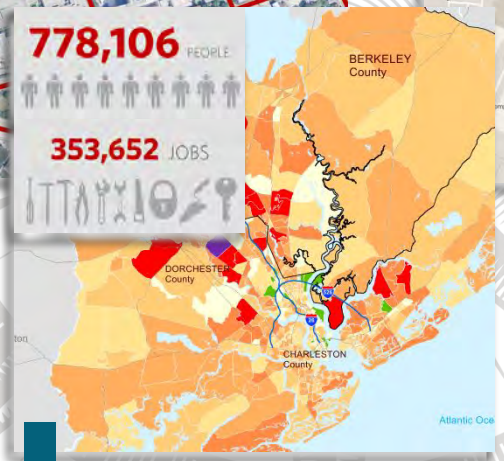
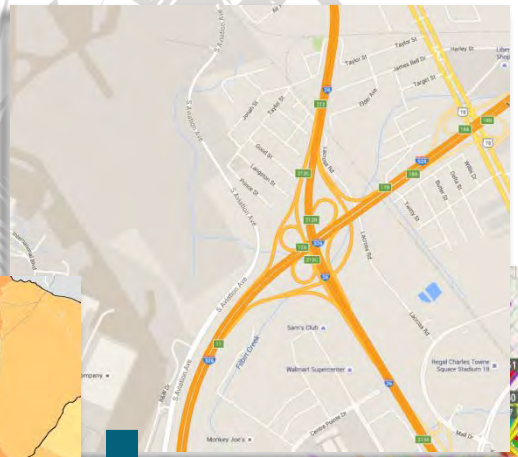
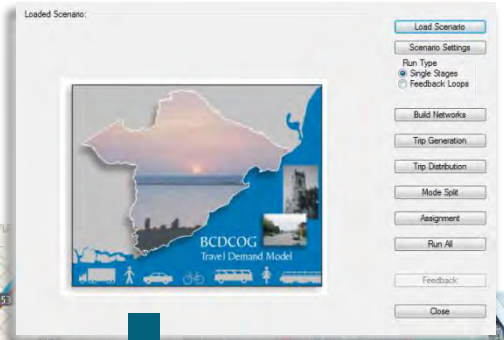
CHATS LRTP Update

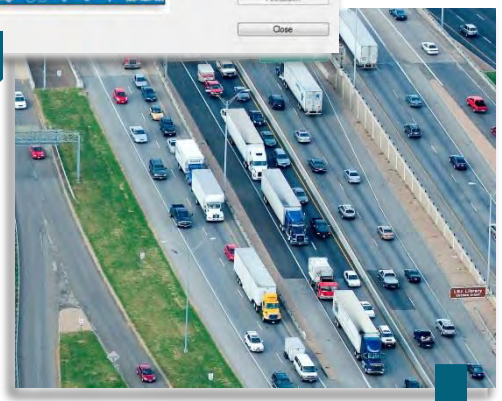
TRAVEL DEMAND MODEL COMPONENTS











TAZs

\+

Socio-Economic Data
- Population
- Households
- Employment
- Auto Ownership

\+

Roadway Network
- Facility Type
- # of Lanes
- Posted Speed

\+

Transit Network
- Headways
- Stops
- Access Paths

\+

Modeling Program
- TransCAD

=

Traffic Forecasts!
- Daily
- AM / PM Peak

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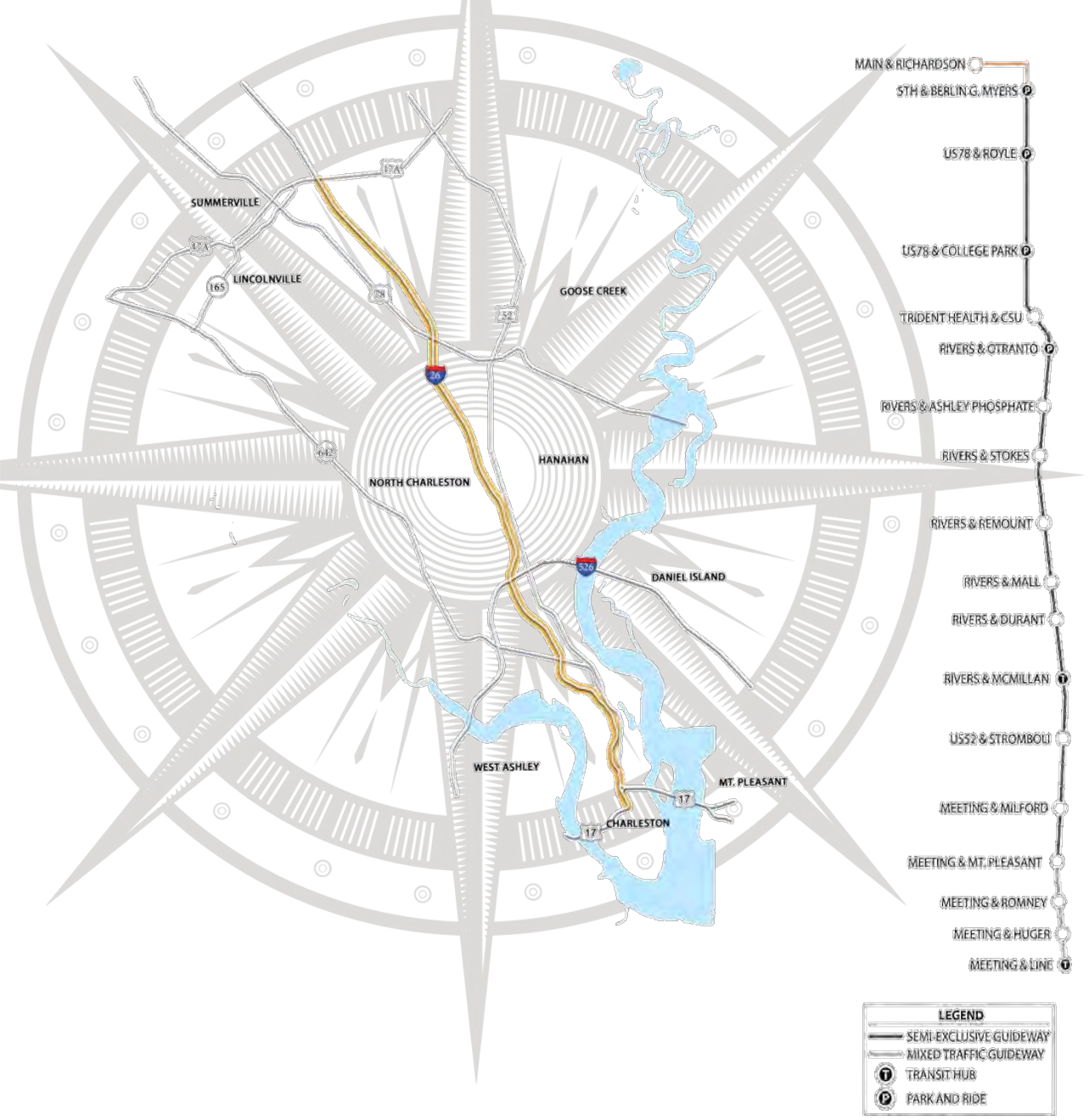

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PLANNING, PARTNERSHIP & PROSPERITY

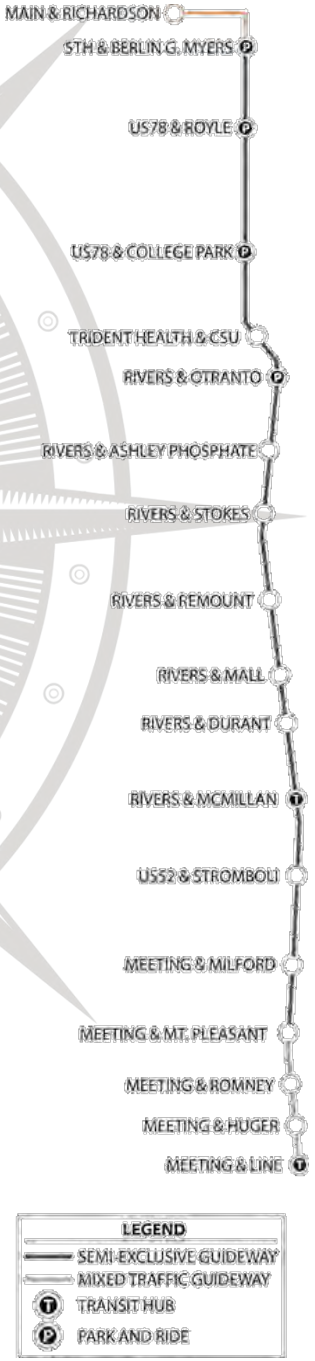
Charleston Regional Bus Rapid Transit (BRT) Project Update Spring 2017

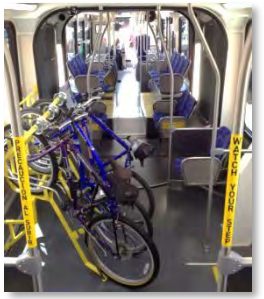
-BRT Update
-Rail Vs. BRT
- What's Next?

Proposed BRT on US 78/US 52?

Bus Rapid Transit (BRT) *is a system of rubber-tired buses that operates like a conventional rail in a reserved guideways or mixed traffic.*

- 23.1 mile corridor
- 18 stations/16 vehicles
- 60-minute travel time
- 2 million annual trips (2015 est.)
  - 6,874 daily transit trips
  - 3,772 "new" daily transit trips
  - 6.5 million CARTA & BRT combined annual trips
  - $5.9M per year estimated operating costs (FY15)
  - $360 million planning level est. capital costs/$15.5 M/Mile (FY15)





* Representative Images of Existing BRT Systems in Eugene, OR & San Bernardino, CA

Why BRT and Not Rail?

1. BRT has a lower cost per rider
   a) *FTA medium or better rating is less than **$10/trip***
2. BRT supports existing and planned local density and land use.
   a) *FTA medium rating for employment is **70,000+ jobs** along Corridor*
   b) *FTA medium rating for station area population density is **5,760+ people per square mile***
3. BRT is scalable and flexible
4. BRT can preserve right-of-way if designed to accommodate light rail in the future

Cost/Rider	BRT	LRT
Ridership (FY2015)	1,986,586	2,671,227
Capital Construction Costs	$360M ($15.5M/Mile)	$2.1B ($90M/Mile)
Annual Operating Cost	$5.8M	$13.6M
Annualized Cost per Trip <$10	$9.12	$36.31

Bus Rapid Transit

- Minimum DUA: 12-16
- Optimal DUA: 30-50+
- Minimum FAR: .5 to 1
- Optimal FAR: 1 to 2

Light Rail Transit

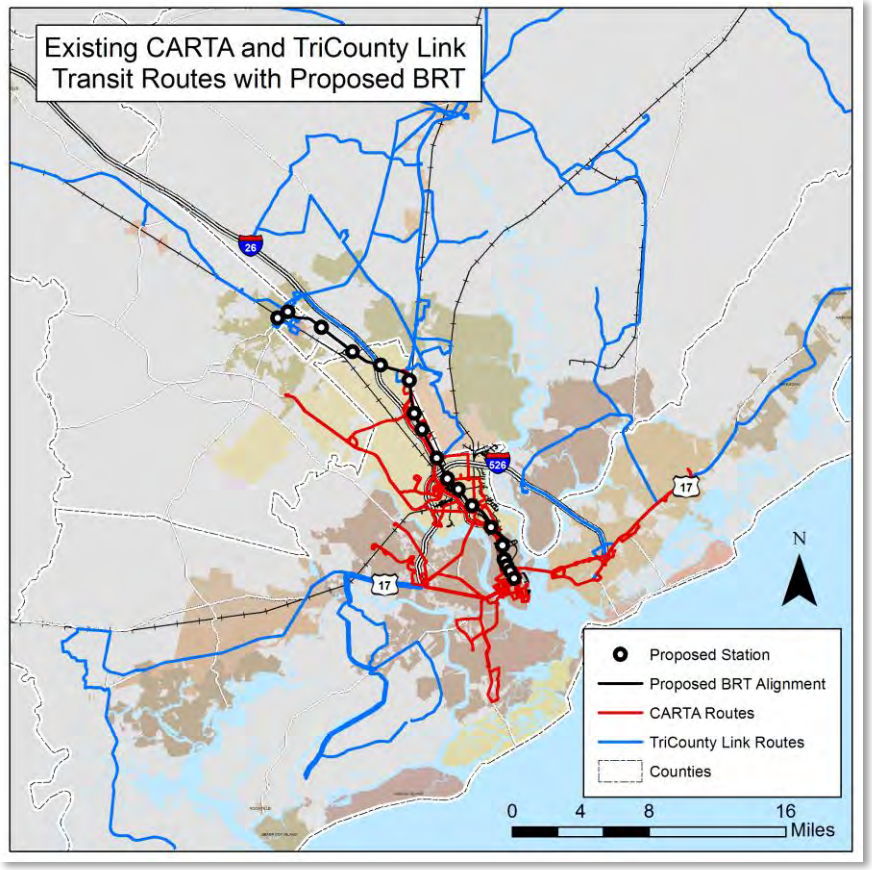
- Minimum DUA: 20
- Optimal DUA: 65+
- Minimum FAR: .5 to 2
- Optimal FAR: 2 to 4

DUA: Dwelling Units Per Acre:
FAR: Commercial Floor Area Ratio
Source: VTA BRT & LRT Design Guidelines

What about Other Transit Corridors?

Regional Transit Framework Plan
(August 2017 – March 2018)

- Build upon BRT study to develop a long range plan for transit throughout the Region:
  - High capacity premium transit corridors (BRT, Commuter Bus, etc.)
  - Expansion of transit services
  - Public day-long transit charrette in Fall
- Set the foundation for transit investment in the Region through 2040.



When will the BRT open?

I. Project Programming: Underway

II. Federal Transit Administration: Capital Investment Grant Program

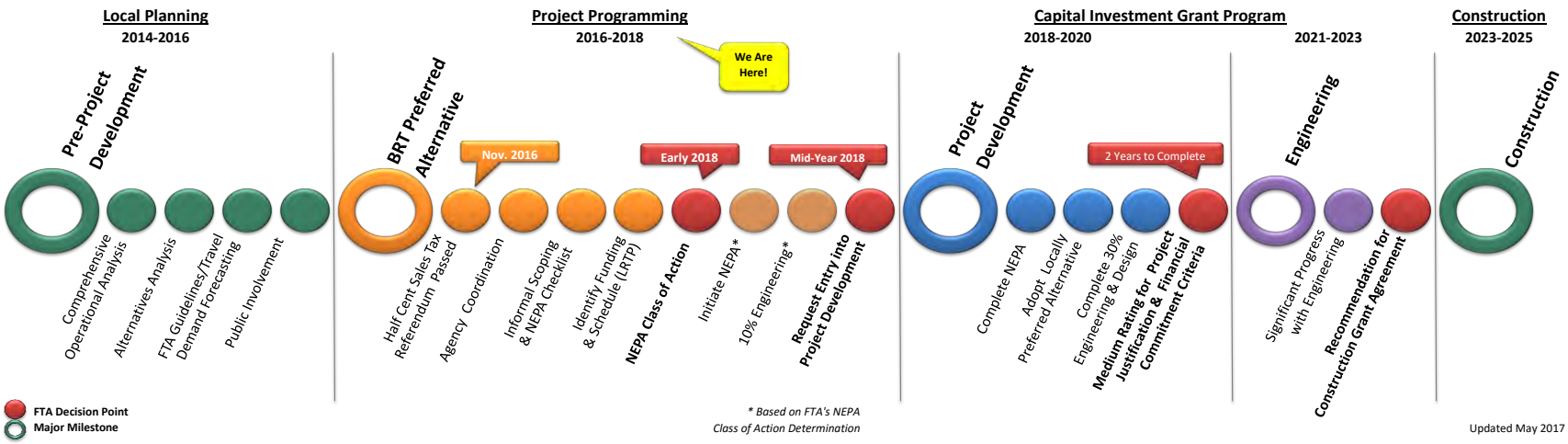
- NEPA & Project Development - 2018 to 2020
- Engineering - 2021 to 2023
- Construction - 2023 to 2025

III. Anticipated Project Completion: 2025

BRT Project Programming

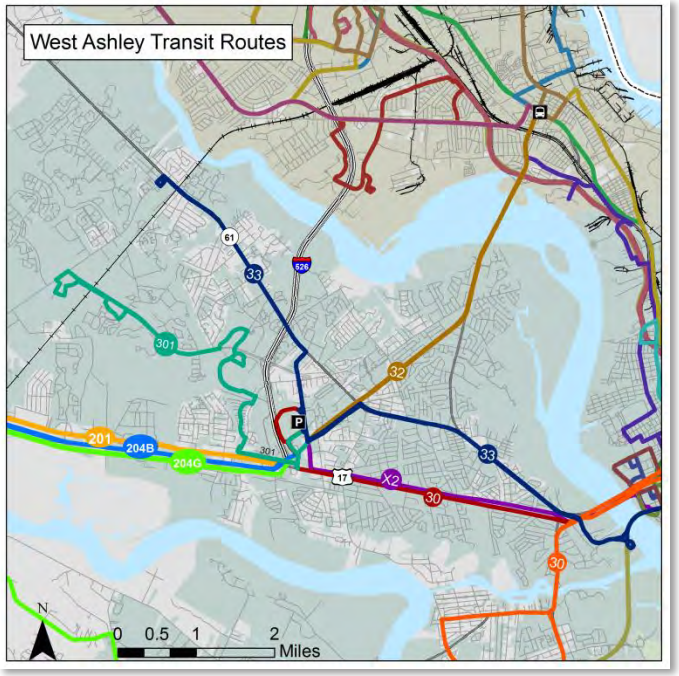
Long Range Transportation Plan	Funding Plan
	Timeline
	Fiscally Constrained Plan
Informal Scoping	NEPA Design Variants
	Station Areas
	Park & Rides
NEPA Class of Action	NEPA Checklist
	Section 106/4(f)
	FTA Determination

Charleston Regional Bus Rapid Transit Project Timeline
(Under New Starts Capital Investment Grant Program Guidelines)



CARTA Update

- Comprehensive Operational Analysis
- Capital Investment
  - New vehicles
  - Wi-Fi on buses
  - New fareboxes
  - Real-time app/website
  - Automated passenger counters
- Transit Infrastructure
  - Bus stop shelters & amenities
  - Park & Ride Study
- Transit Advocacy Committee



For more information:

- www.bcdcog.com
- www.chats2040.com
- https://bcdcog.com/brt/

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West Ashley Revitalization Commission 07.12.17

DOVER, KOHL & PARTNERS
town planning

alta
PLANNING + DESIGN

HORSLEY WITTEN
GROUP

BIHL
ENGINEERING

STRATEGICECONOMICS

CITYFI

what is Plan West Ashley?

vision

rules & policies

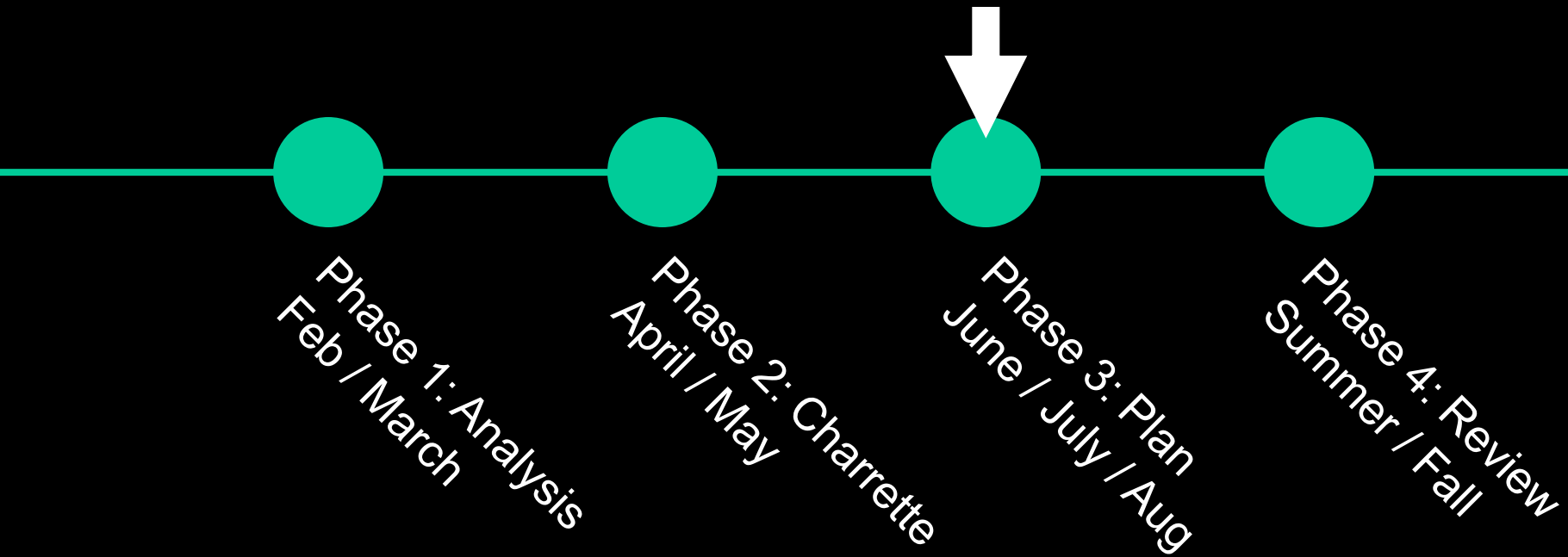
communications device

instructions

Purpose (from City of Charleston RFP)

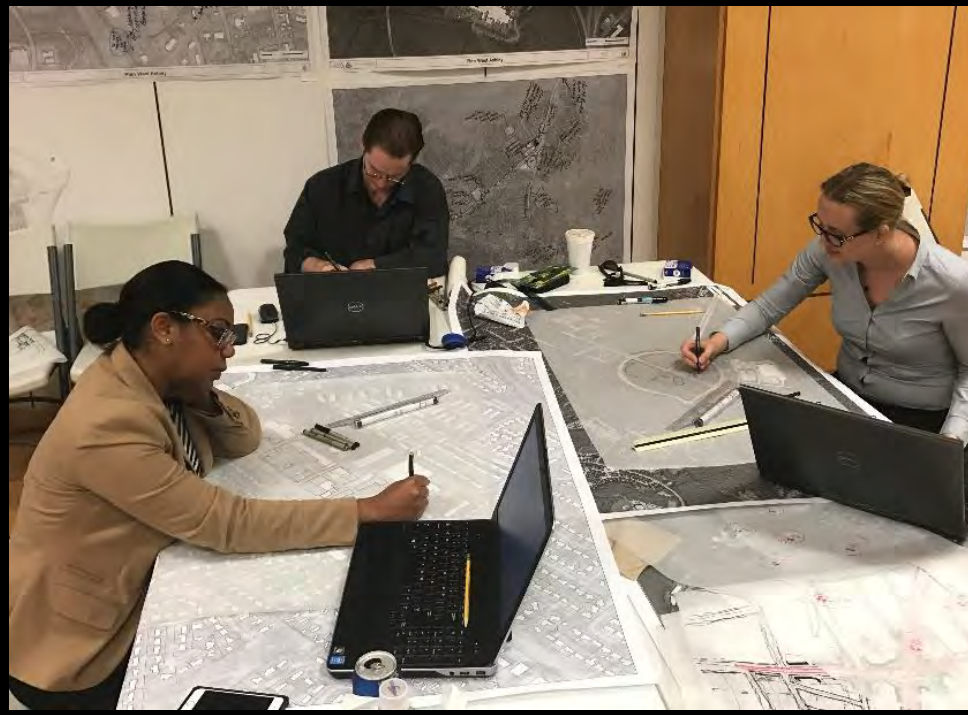
- The Master Plan will be used as a guide for *establishing policies and priorities* for coordinated development / redevelopment, land use planning, and budgetary preparation.
- It should *include policy statements, goals, objectives, guidelines, maps and graphics* that can serve as a foundation for future land use decisions. It should serve as both a guide and the impetus for an anticipated update to the City's Zoning, Land Use, and Development Ordinances.
- The plan should *provide strategies and goals to encourage economic development, quality residential and commercial growth, revitalization of obsolete commercial areas*, and general improvements for the protection of the quality of life for West Ashley's residents and businesses.
- At last, the West Ashley Master Plan should *coordinate City policies* so that the plan can guide the efforts of the City's many stakeholders and decision makers at every level.

timeline



Draft Plan Report for review: August 2017

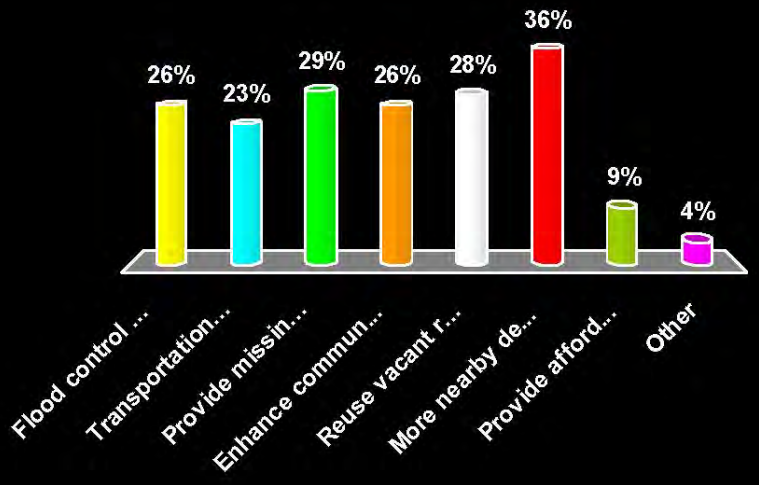
planning charrette



May 2017

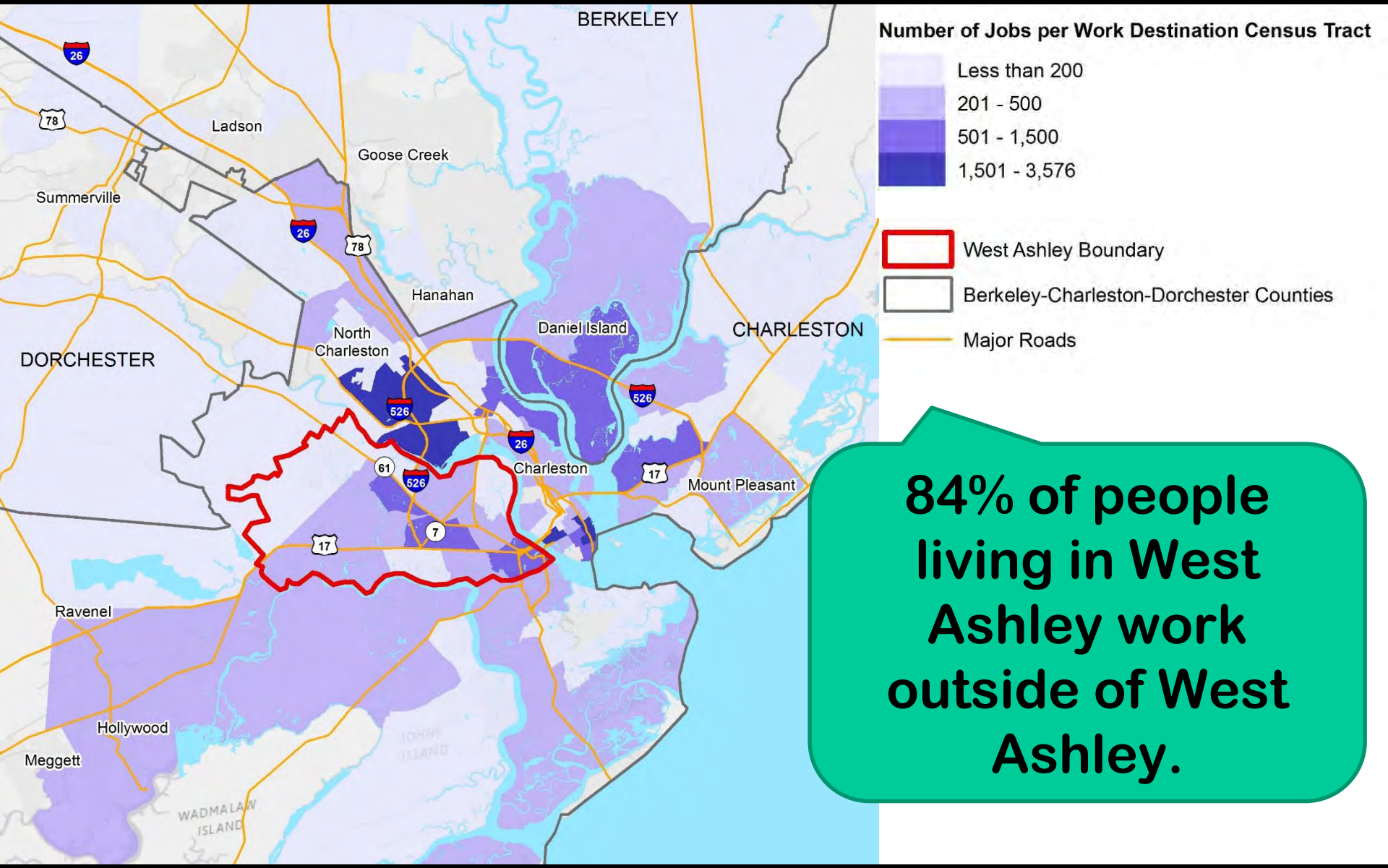
Of the many ideas you have heard so far, which are you most excited about? (pick 2)

1. Flood control / resilience
2. Transportation choices
3. Provide missing connections
4. Enhance community brand/identity
5. Reuse vacant retail
6. More nearby destinations (places to work, shop, etc)
7. Provide affordable housing
8. Other



Input from participants at charrette Work-in-Progress Presentation, May 2017

commute patterns

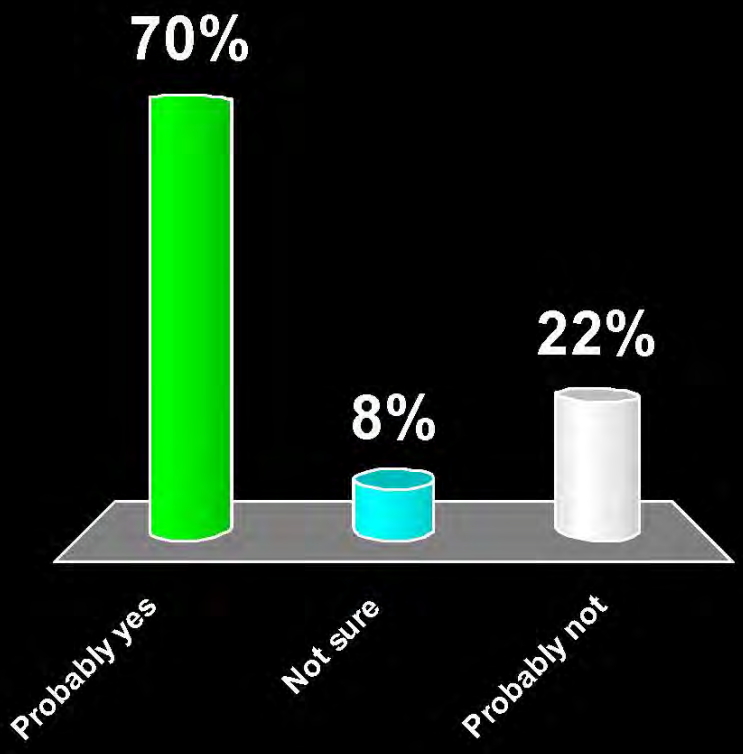


84% of people living in West Ashley work outside of West Ashley.

Where employed residents of West Ashley go to work, by census tract, 2014

Are there any car trips that **you** would rather walk or bike for, if safe/improved routes were available?

1. Probably yes
2. Not sure
3. Probably not



Input from participants at charrette Work-in-Progress Presentation, May 2017

vision for West Ashley

1. community design & land use
2. transportation
3. infrastructure & sustainability
4. economic development
5. housing

Plan West Ashley report:

Introduction / Executive Summary

- Plan West Ashley purpose / intent
- Vision
- Planning process recap (brief)

TOPIC (Community Design and Land Use, Transportation, Green Infrastructure & Sustainability, Economic Development, Housing)

- Existing Conditions
- Community Concerns
- Vision (strategies to address community concerns)
- Implementation (short term, long term)

community design & land use *vision*

upgraded

grow in the right places, in the right ways: preserve neighborhood / community character, enhance community brand/identity, reuse vacant sites, shorten trips with new destinations (work, entertainment, recreation), focus development in clear areas, proper infrastructure to support the population

transportation *vision*

connected

connected to the region and neighborhoods, pedestrian and bike safety, bikeway/greenway, transit enhancements and upgrades, connect across the river

infrastructure & sustainability *vision*

resilient

path to resilience: grow within lower-risk areas, decrease overall impervious area, address drainage & prioritize maintenance, keep natural areas natural, grow and connect the green network

economic development

vision

complete

bring more jobs to West Ashley, transform Citadel Mall into a mixed-use center, recruit and support small and local businesses, add more recreational, cultural, and civic facilities to the area, reinvest in existing shopping centers, establish small-scale shopping west of I-526

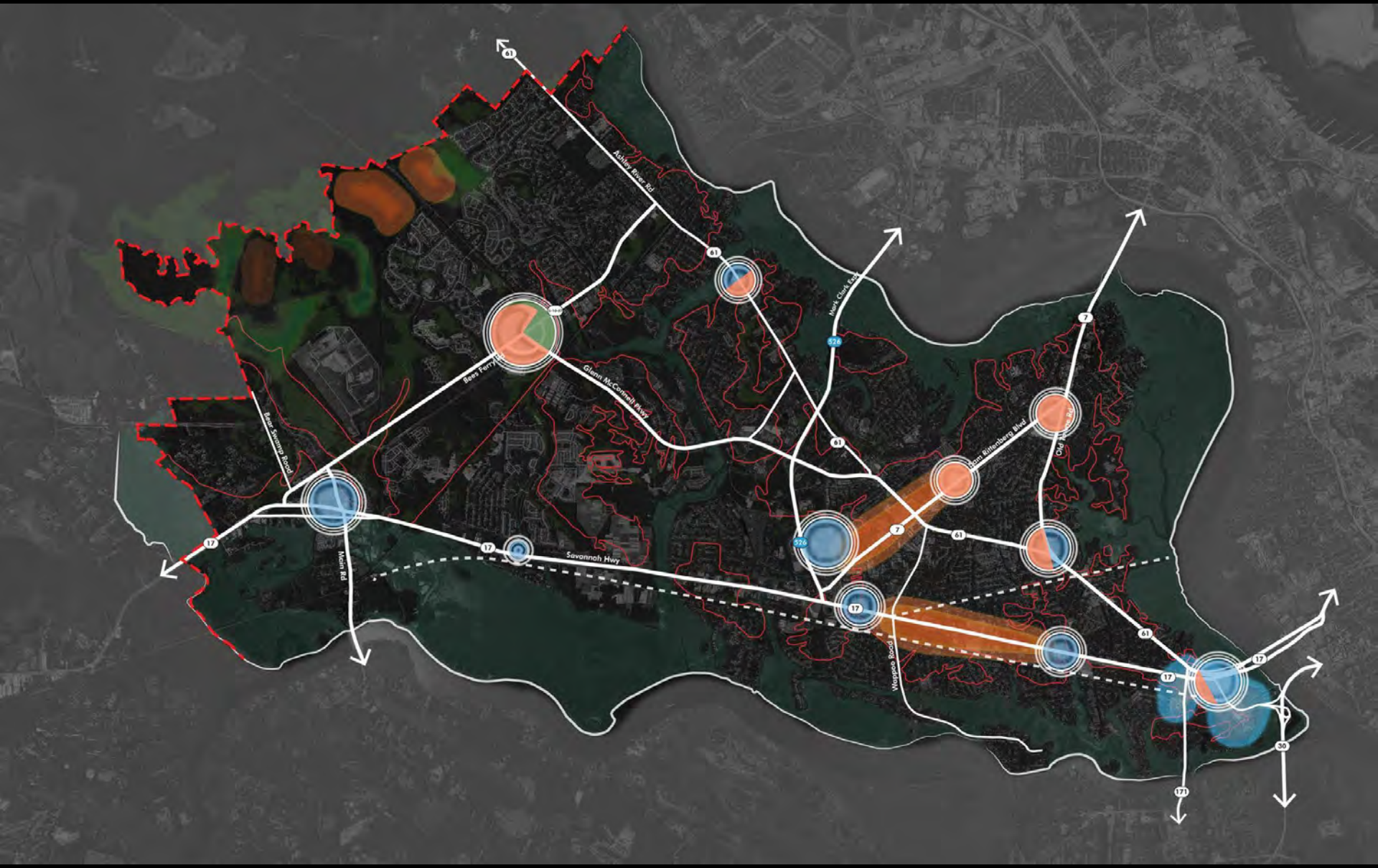
housing *vision*

affordable

maintain affordability, preserve community character, add more housing options, provide supportive infrastructure – mobility, parks and open space, community facilities

growth strategies

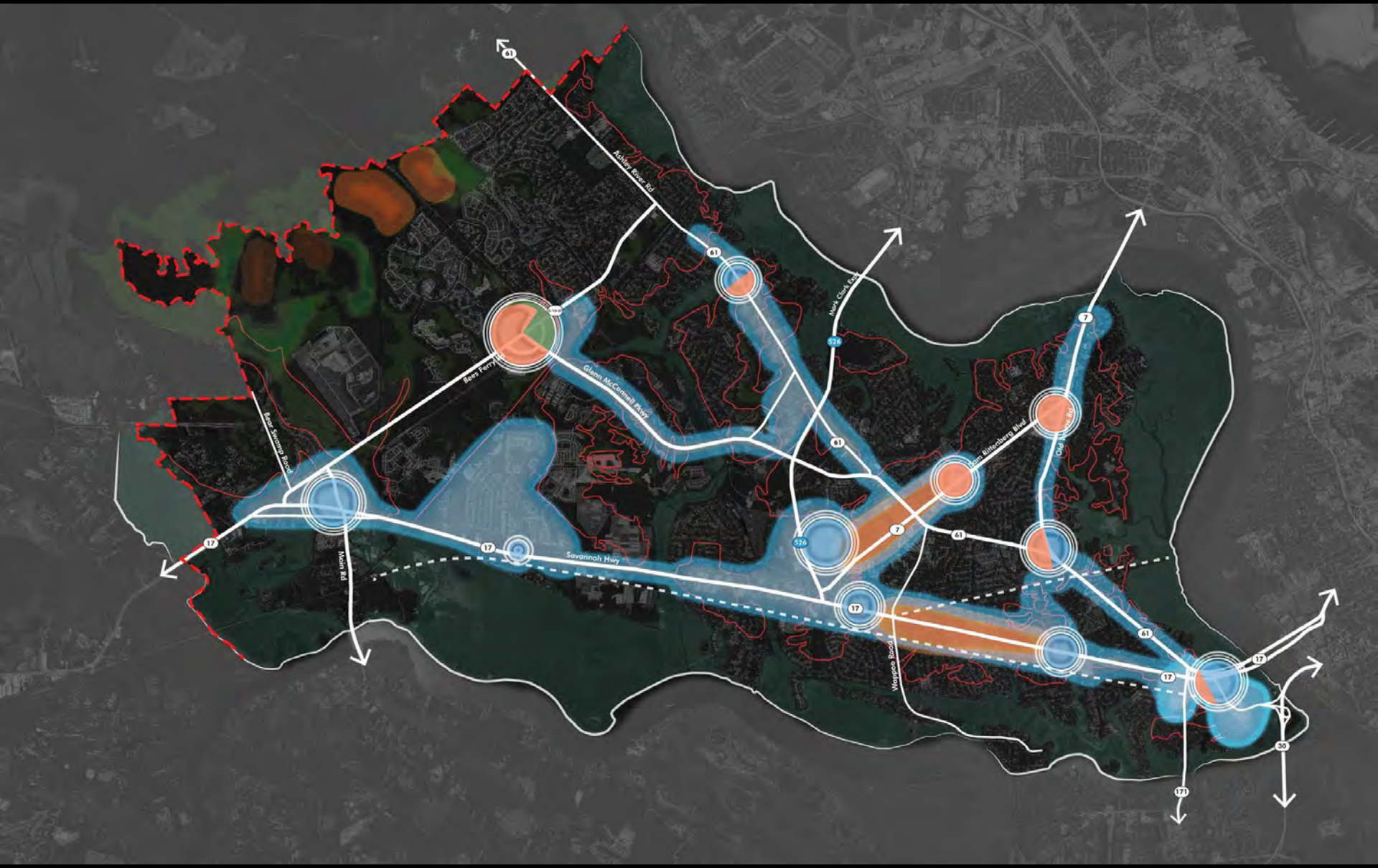
progress draft



GROW in the right places, in the right ways

growth strategies

progress draft



GROW & ADAPT

design & land use strategies

progress draft

Illustrations to test strategies on sample sites:

- preserve neighborhood / community character
- enhance community brand/identity
- reuse vacant sites
- shorten trips with new destinations (work, entertainment, recreation)

design & land use strategies

Reuse vacant and underutilized sites on key corridors

design & land use strategies

progress draft

Reuse vacant and underutilized sites on key corridors

design & land use strategies

progress draft

The plan/vision establishes potential for change-over-time

design & land use strategies

progress draft

The plan/vision establishes potential for change-over-time

design & land use strategies

progress draft

The plan/vision establishes potential for change-over-time

design & land use strategies

progress draft

The plan/vision establishes potential for change-over-time

design & land use strategies

progress draft

Shorten trips with new destinations

design & land use strategies

progress draft

Shorten trips with new destinations

growth strategies

progress draft

PROTECT & HEAL

GREEN INFRASTRUCTURE MENU

Techniques to mimic predevelopment, hydrologic conditions.

WATER QUALITY PRACTICES

Local, site specific solutions designed to capture and treat the first flush from small and frequent rain events.

RAIN GARDEN

HOW IT WORKS	Rain gardens collect, treat and recharge groundwater reserves.
BENEFITS	Filters stormwater through soil, plants and microbes. Creates wildlife habitat and encourages infiltration on site.

SAND FILTER

HOW IT WORKS	Sandy soils are the planting medium making this practice ideal for coastal settings.
BENEFITS	Filters stormwater through soil, plants and microbes. Creates wildlife habitat and encourages infiltration on site.

BIOSWALE

HOW IT WORKS	Runoff is diverted by site specific curb cuts to relieve storm drains.
BENEFITS	Filters stormwater through soil, plants and microbes. Fits in tight spaces and encourages infiltration on site.

STORMWATER PLANTER

HOW IT WORKS	Redirected downspouts puts rain into above ground planters for irrigation.
BENEFITS	Filters stormwater through soil, plants and microbes. Fits in tight spaces and encourages infiltration on site.

TREE FILTER PITS

HOW IT WORKS	An inlet allows runoff to enter the soil and root zone. Carefully selected trees will absorb stormwater.
BENEFITS	Filters stormwater through soil and gravel layers. Fits in tight spaces, and encourages infiltration on site.

EXTENSIVE GREEN ROOF

HOW IT WORKS	Replace black top with green plants; outfitted extensive green roofs contain very shallow soil and gravel layers.
BENEFITS	Filters stormwater through soil and gravel layers. Reduces impervious cover, and provides building energy savings.

GREEN INFRASTRUCTURE MENU

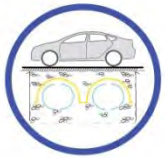
Techniques to mimic predevelopment, hydrologic conditions.

HYBRID PRACTICES

These specialized forms of green infrastructure perform both water quality treatment and provide a degree of storage capacity during more significant rain events.

CONSTRUCTED WETLAND

HOW IT WORKS	Set into the water table, plants and micro-organisms do a majority of the pollutant removal.
BENEFITS	Filters stormwater through plants and microbes. Creates wildlife habitat, improves air and water quality.

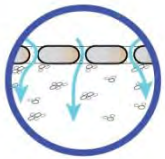


SUBSURFACE CHAMBERS

HOW IT WORKS	Chambers store excess stormwater and can be placed under parking lots, park and even under other forms of G.I.
BENEFITS	Filters stormwater through gravel. Provides flood control storage and encourages infiltration on site.

BIORETENTION

HOW IT WORKS	A more engineered rain garden, with special soil requirements and outlet pipes to improve the system's safety.
BENEFITS	Filters stormwater through soil, plants and microbes. Creates wildlife habitat and encourages infiltration on site.



PERMEABLE PAVEMENT

HOW IT WORKS	Porous void space allows stormwater to drain down instead of running off.
BENEFITS	Filters stormwater through gravel and soil, fits almost anywhere pavement can and encourages infiltration on site.

ENHANCED TREE TRENCH

HOW IT WORKS	Runoff is diverted into the soil and root zone. Trees will help absorb stormwater.
BENEFITS	Filters stormwater through soil and gravel layers. Absorbs pollutants, and encourages infiltration on site.

INTENSIVE GREEN ROOF

HOW IT WORKS	Replace black top with green plants; outfitted intensive green roofs contain deep soil and gravel layers.
BENEFITS	Filters stormwater through soil and gravel layers. Reduces impervious cover, and provides building energy savings.

transportation *vision*

connected

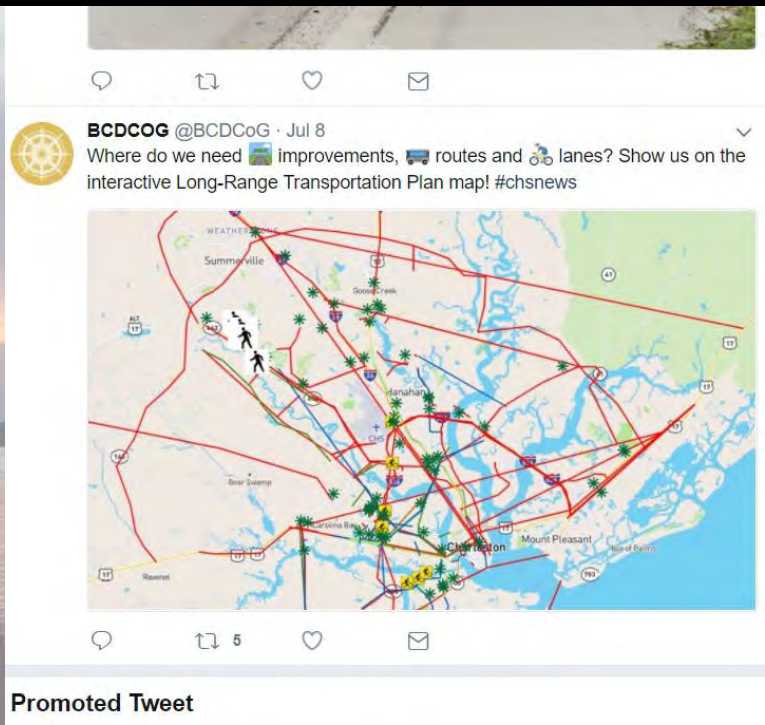
Connected to the region and neighborhoods, pedestrian and bike safety, bikeway/greenway, transit enhancements and upgrades, connect across the river

menu of transportation enhancements

- **Connectivity**
  - Complete regional network - I-526, Glenn McConnell Extension
  - Access management – reducing driveways, connecting parking lots
  - Intersection spacing
- **Intersection + Safety Improvements**
  - Signal Timing + Coordination
  - Turn Lanes
  - Speed management
- **TDM – Travel Demand Management**
  - School Accessibility + Circulation/Safe Routes to School
  - Employer Incentives for transit + carpool (coordination with existing initiatives)
- **Mode Shift**
  - More people riding transit, walking, and biking
- **Land Use/Urban Design**
  - Mixed and varied land uses
  - Closer services and employment
  - High quality public spaces

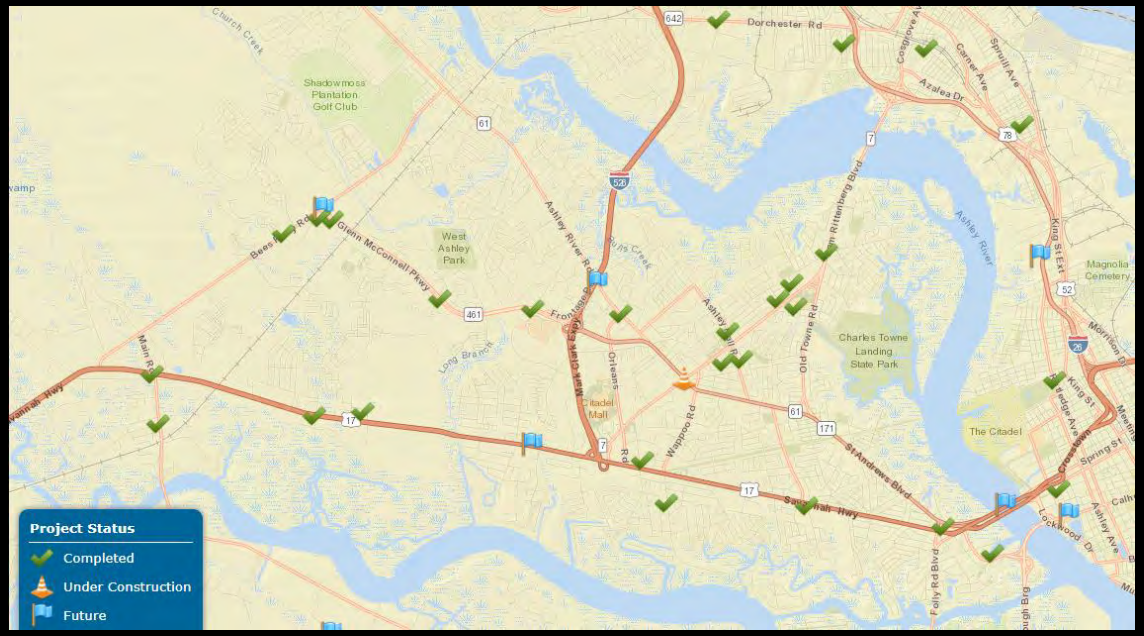
ongoing efforts

- **Regional Planning Efforts**
  - Long Range Transportation Plan (LRTP) CHATS/BCDCOG
  - Walk Bike BCD BCDCOG
  - Bus Rapid Transit Plan (I-26 corridor to peninsula) BCDCOG
  - I-26 and I-526 Corridor Transportation Demand Education, Marketing and Promotion Plan BCDCOG
  - (CTP) CHATS City of Charleston City-wide Transportation Study



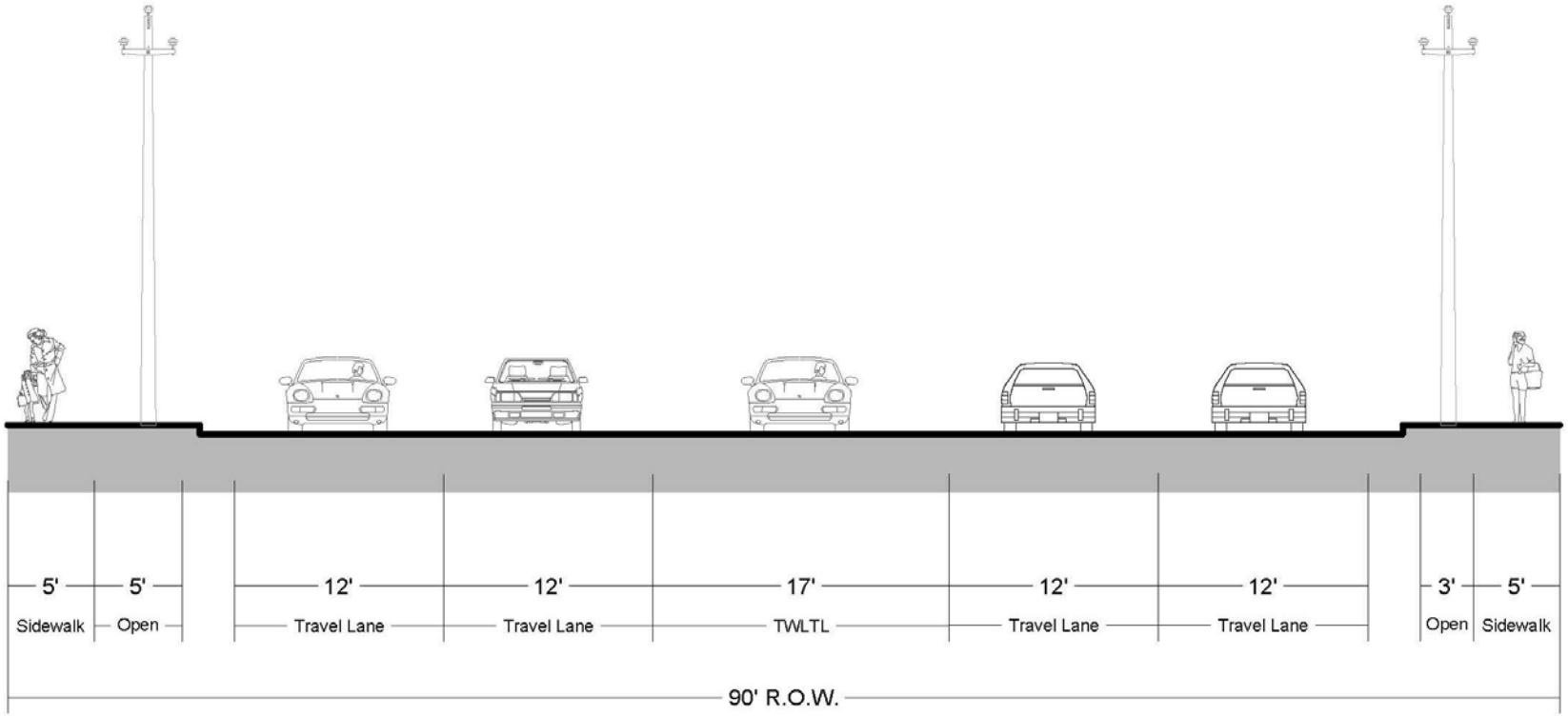
ongoing efforts

- Sample of Previous Projects



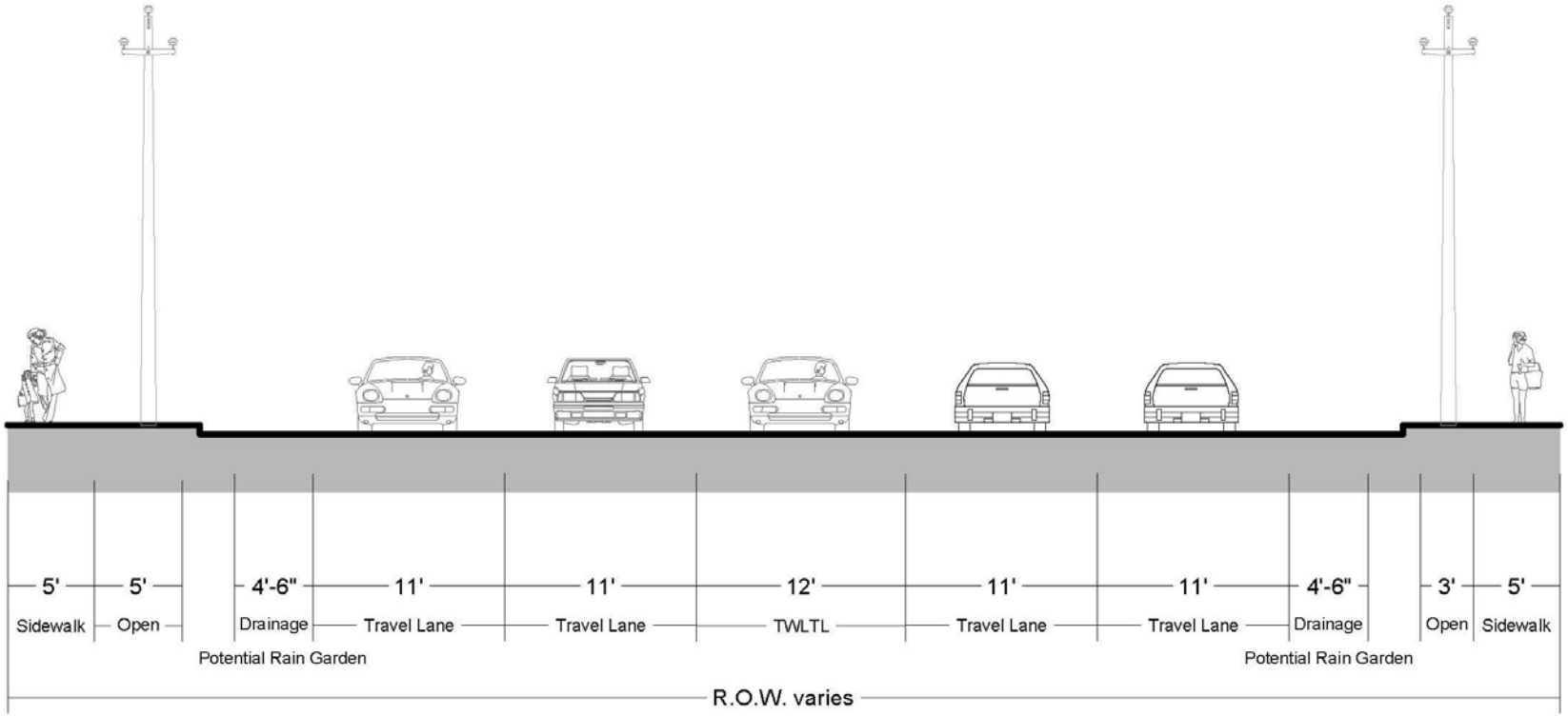
- Current or Planned Projects
  - US 17 at Main Road and Main Road Widening
  - Glenn McConnell Parkway Widening
  - US 17/Crosstown Study
  - Savannah Highway Capacity and Intersection Improvements
  - SC 7/SC 61 - Sam Rittenberg/Ashley River Rd
  - SC 7/SC 171 Area Study
  - Existing I-526 Improvements

example enhancements – Savannah Hwy



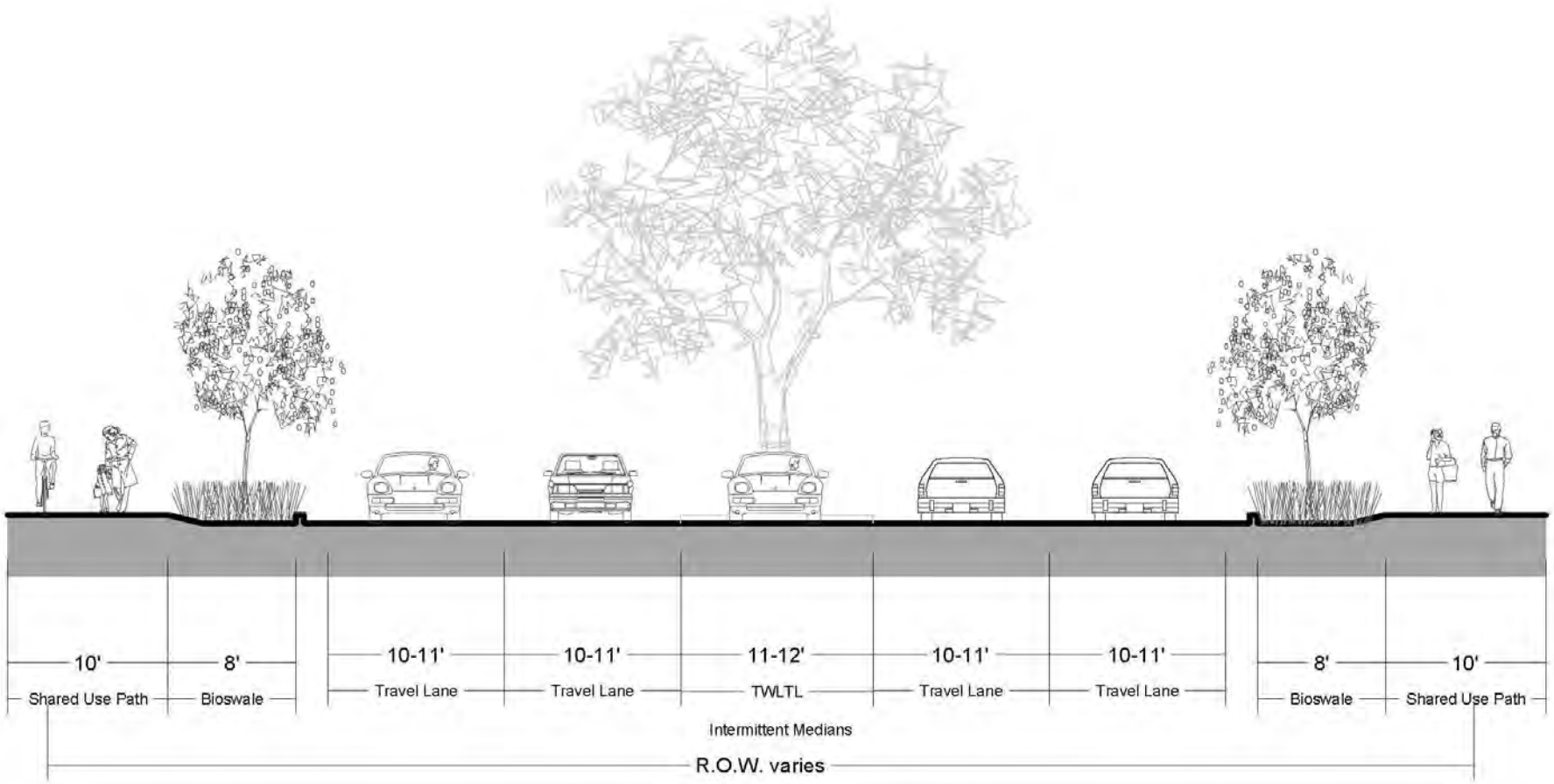
West US 17 / Savannah Highway
(Existing)

example enhancements – Savannah Hwy



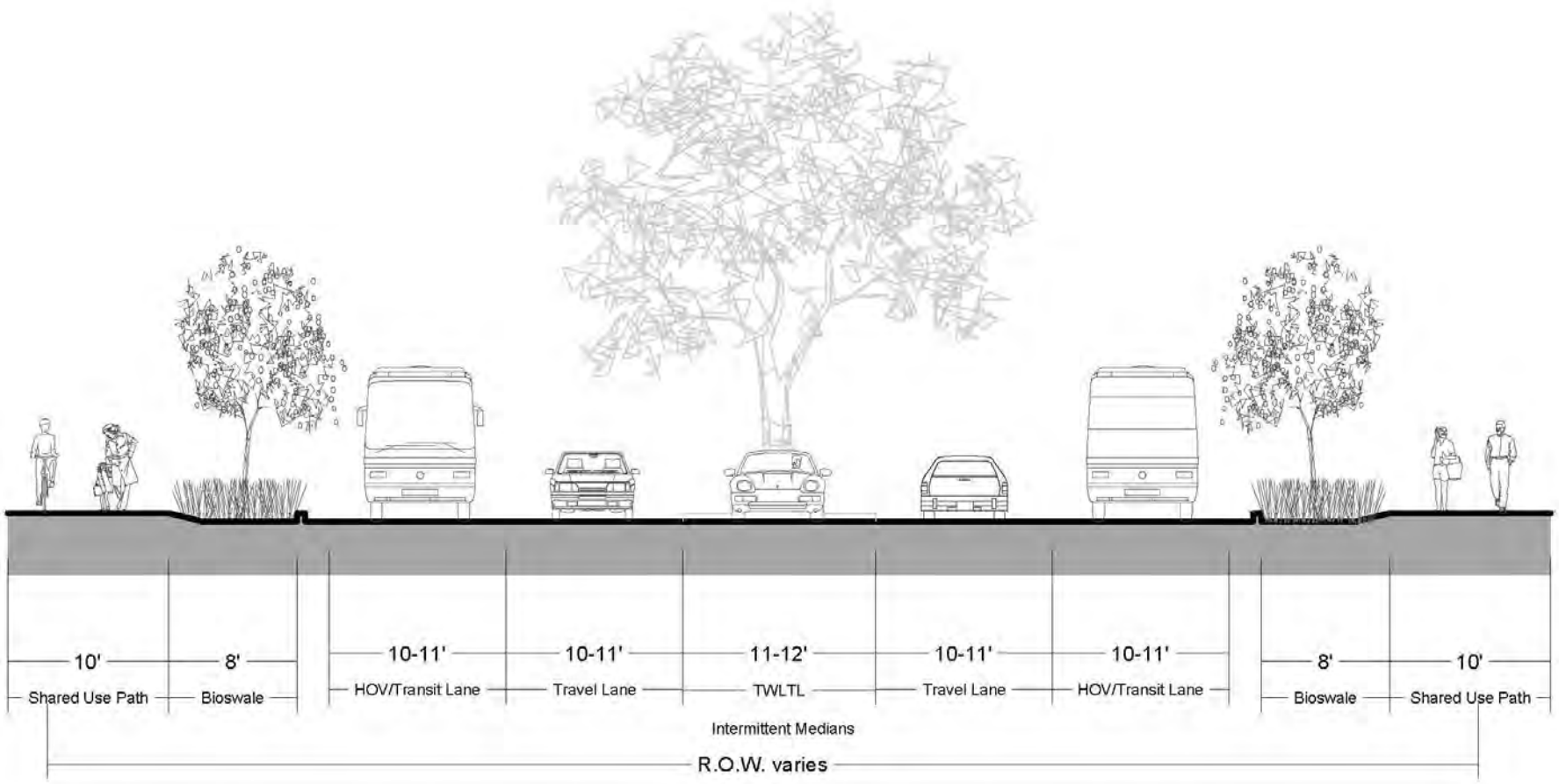
West US 17 / Savannah Highway
(Interim)

example enhancements – Savannah Hwy



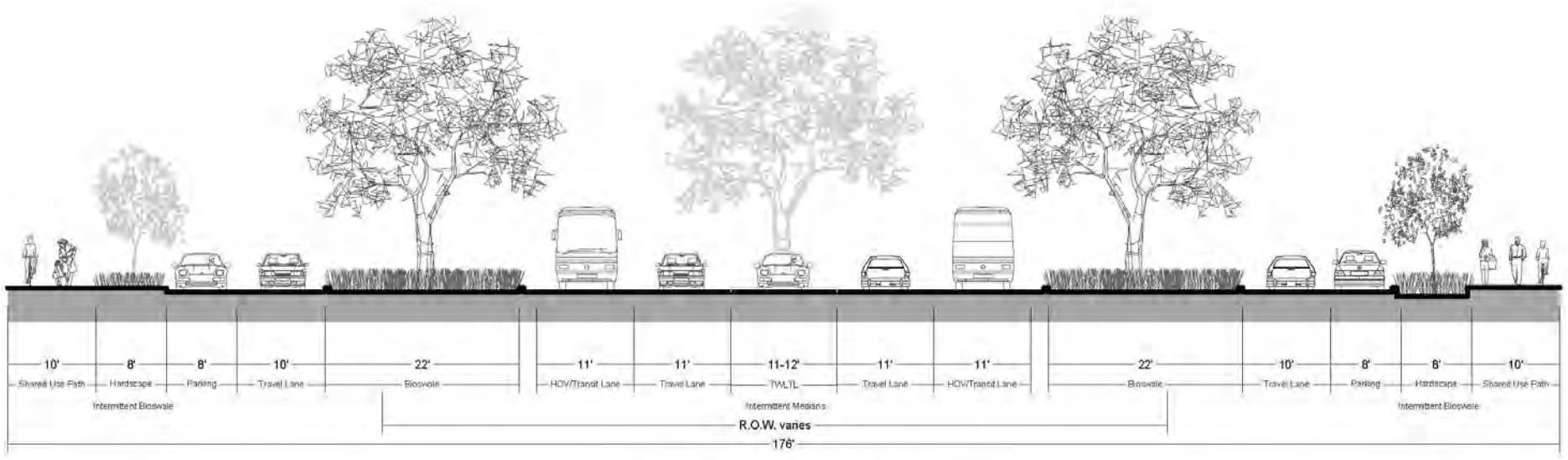
West US 17 / Savannah Highway
(Ultimate A)

example enhancements – Savannah Hwy



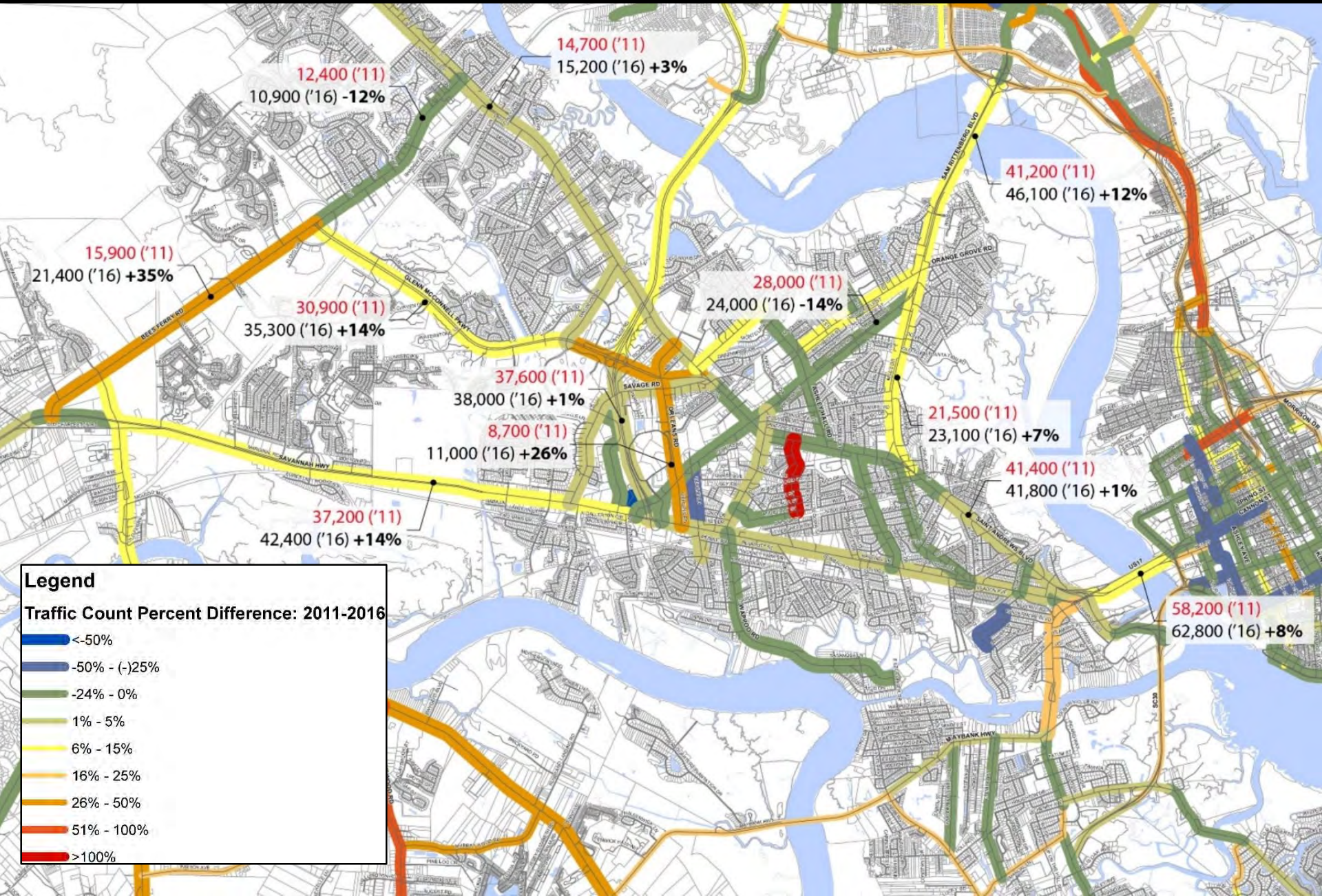
West US 17 / Savannah Highway
(Ultimate B)

example enhancements – Savannah Hwy

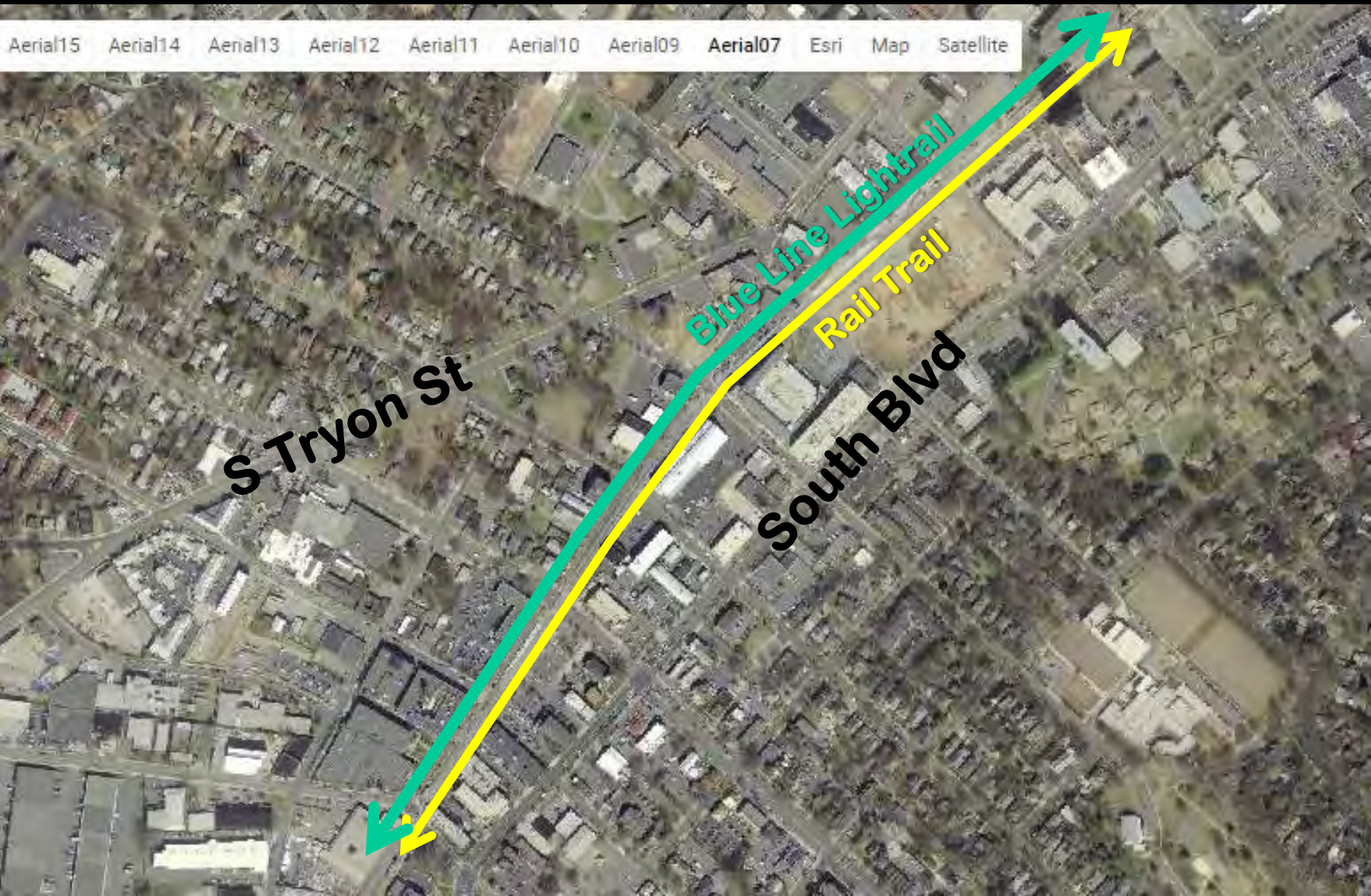


West US 17 / Savannah Highway
(Ultimate C: Boulevard)

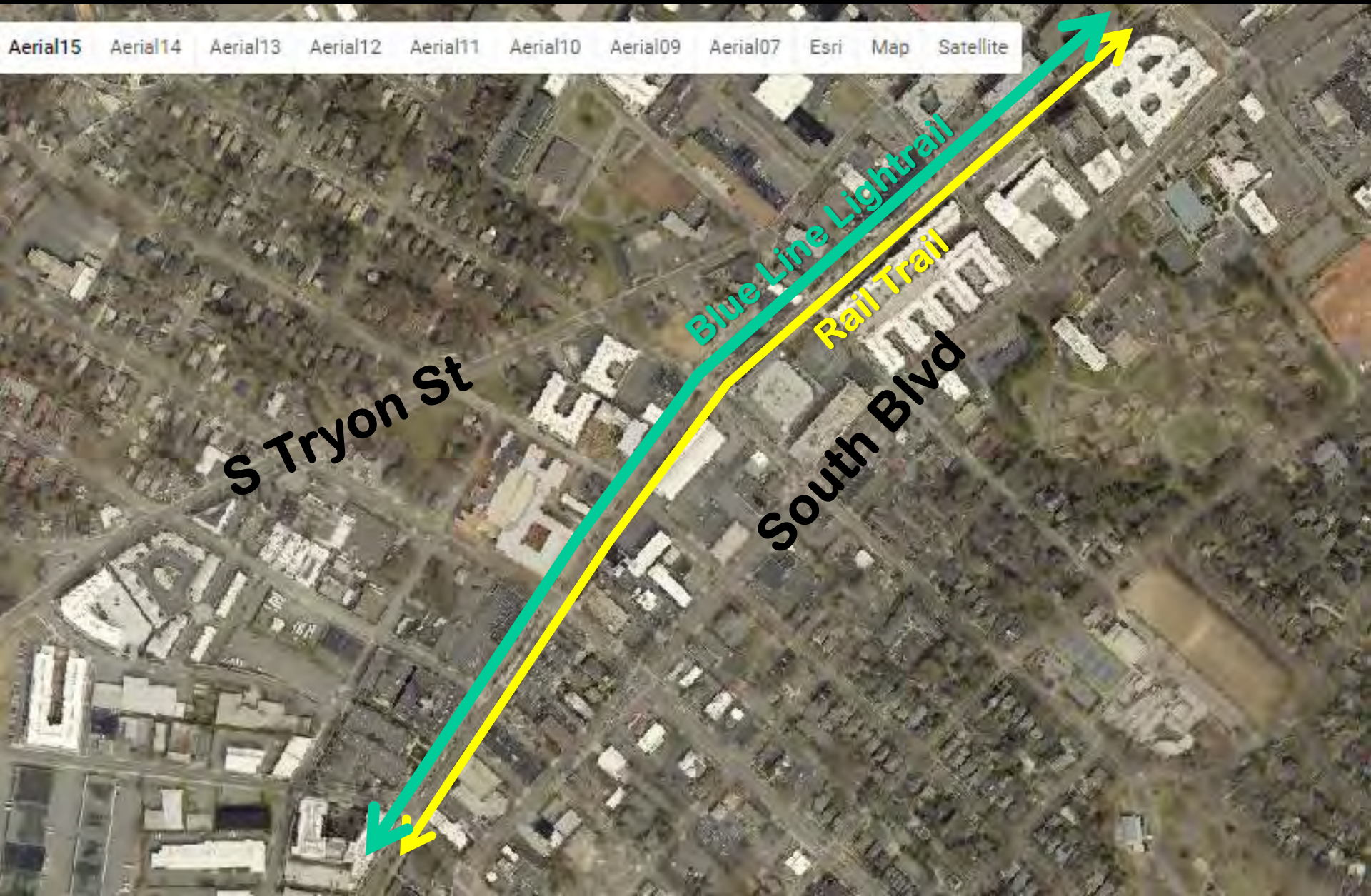
west ashley growth



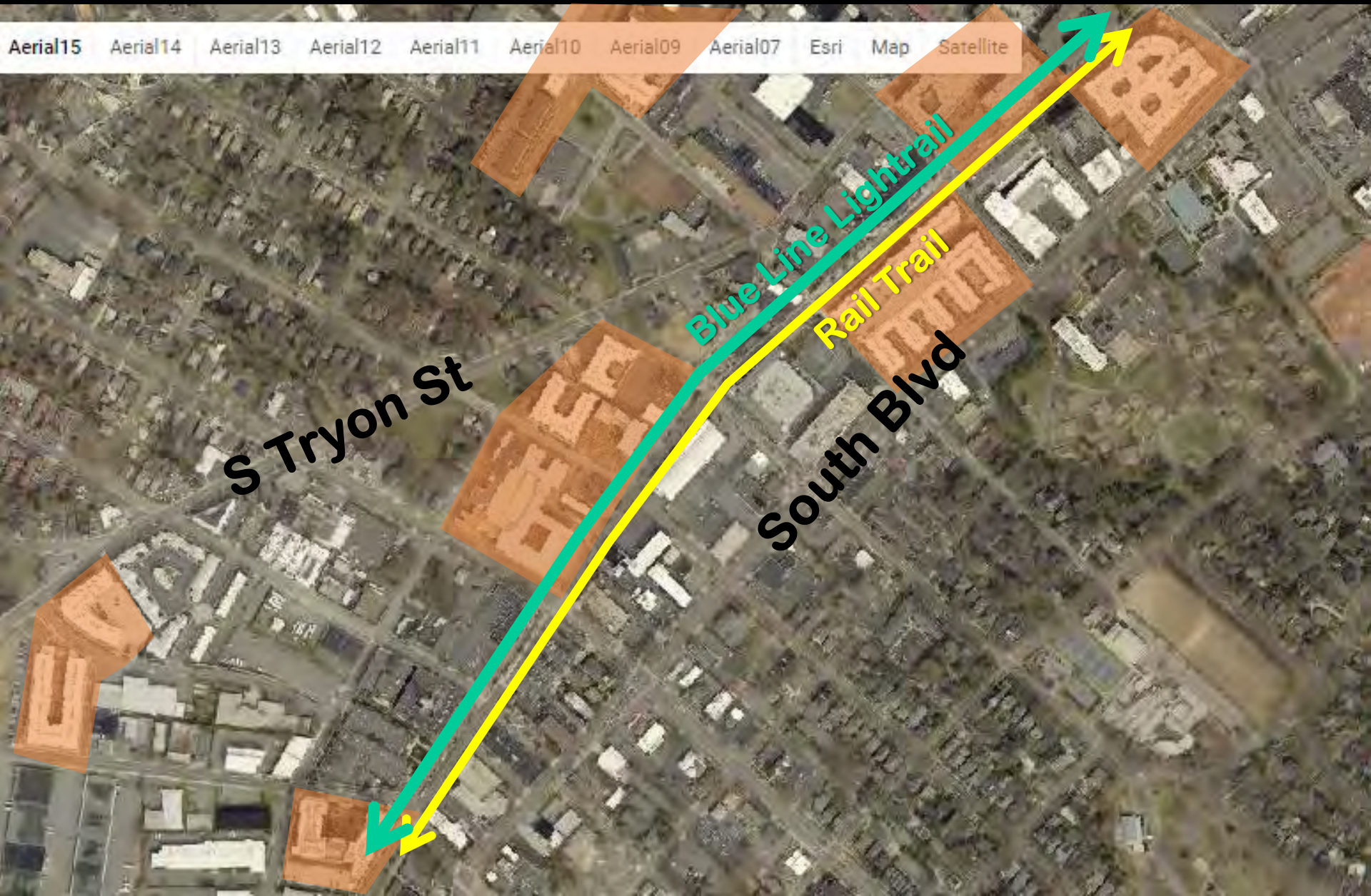
Impacts of regional transit – Charlotte 2007



Impacts of regional transit – Charlotte 2015



impacts of regional transit – Charlotte 2015



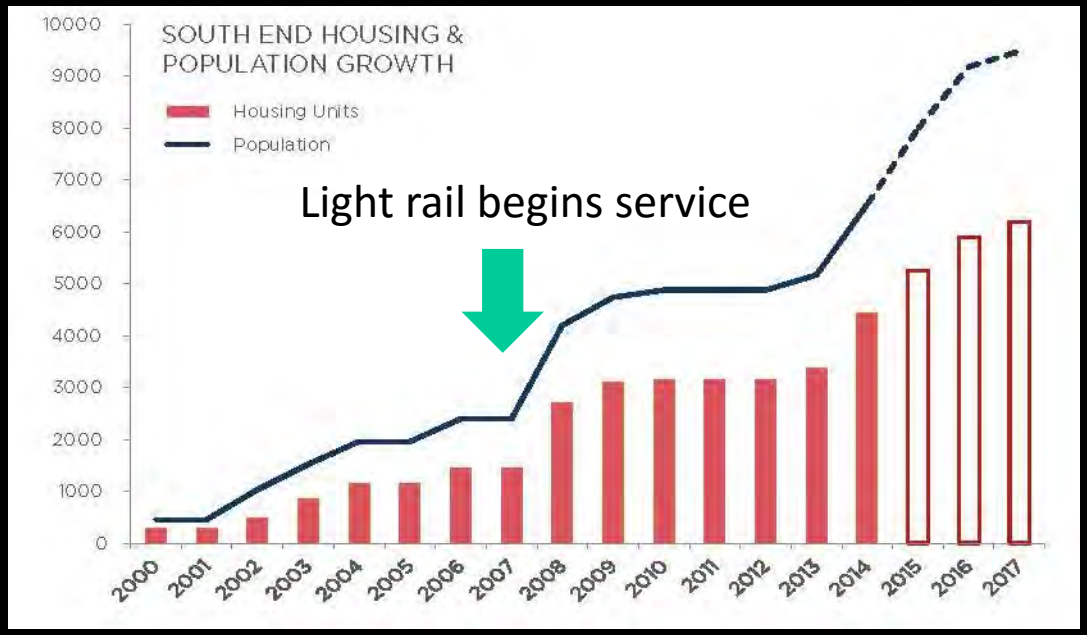
impacts of regional transit – Charlotte 2015

Traffic counts

South Blvd north of East Blvd
2000 = 31,500
2012 = 30,100
2016 = 31,900
Change = +1.2%

Population

South End
2000 = 1,436
2010 = 2,761
2016 = 5,562
Change = +287.3%



Anticipated traffic growth vs. actual

+ 4,126 people = ~2,063 housing units = 13,822 trips / day (6.7 / MF unit)
+ 1 grocery store = 6,138 trips / day (102.3 weekday trips per 1,000 sq ft)
Expected traffic increase: 19,960 new trips (gross trip generation)
Actual traffic increase: 400 ADT increase

emerging modes in west ashley

	Supportive Density (Adjacent to transit stop 1/2 mi-rail or 1/4 mile-bus)	Cost		Dedicated ROW	Can Exist within current Frameworks	Technology + Partnerships
		Capital	Operating			
Supported by current West Ashley Framework						
Walking		$	-	no	✓	Potential public/private partnership.
Biking/ Bike Share		$	-	no	✓	Potential public/private partnership.
Ride Share		N/A	N/A	no	✓	Potential public/private partnership. Existing options in WA.
Autonomous Vehicles		N/A	N/A	no	X	Potential public/private partnership. Technology in testing.
Trolleys (bus)		$-$$	$$	no	✓	Potential economic development partnership. Potential new technologies.
Bus		$-$$	$$	no	✓	Existing operating framework. Signal preemption, cue jumping, real-time route information, etc.
Water		$-$$	$	no	✓	Potential public/private partnership. Interim bike/ped connector.
Ded. Transit Lanes/BRT		$$-$$$$	$-$$$	ideally	X	Dedicated lane + enhanced stations: potential shared use with HOV, autonomous vehicles, ride share, etc.
PRT		$$-$$$$	$-$$$	yes*	X	Potential public/private partnership. Emerging technology. Unproven as urban transport solution.
Light Rail		$$$$$+	$$$	yes	X	Requires regional transportation network, + partnerships.

BRT (Bus Rapid Transit)

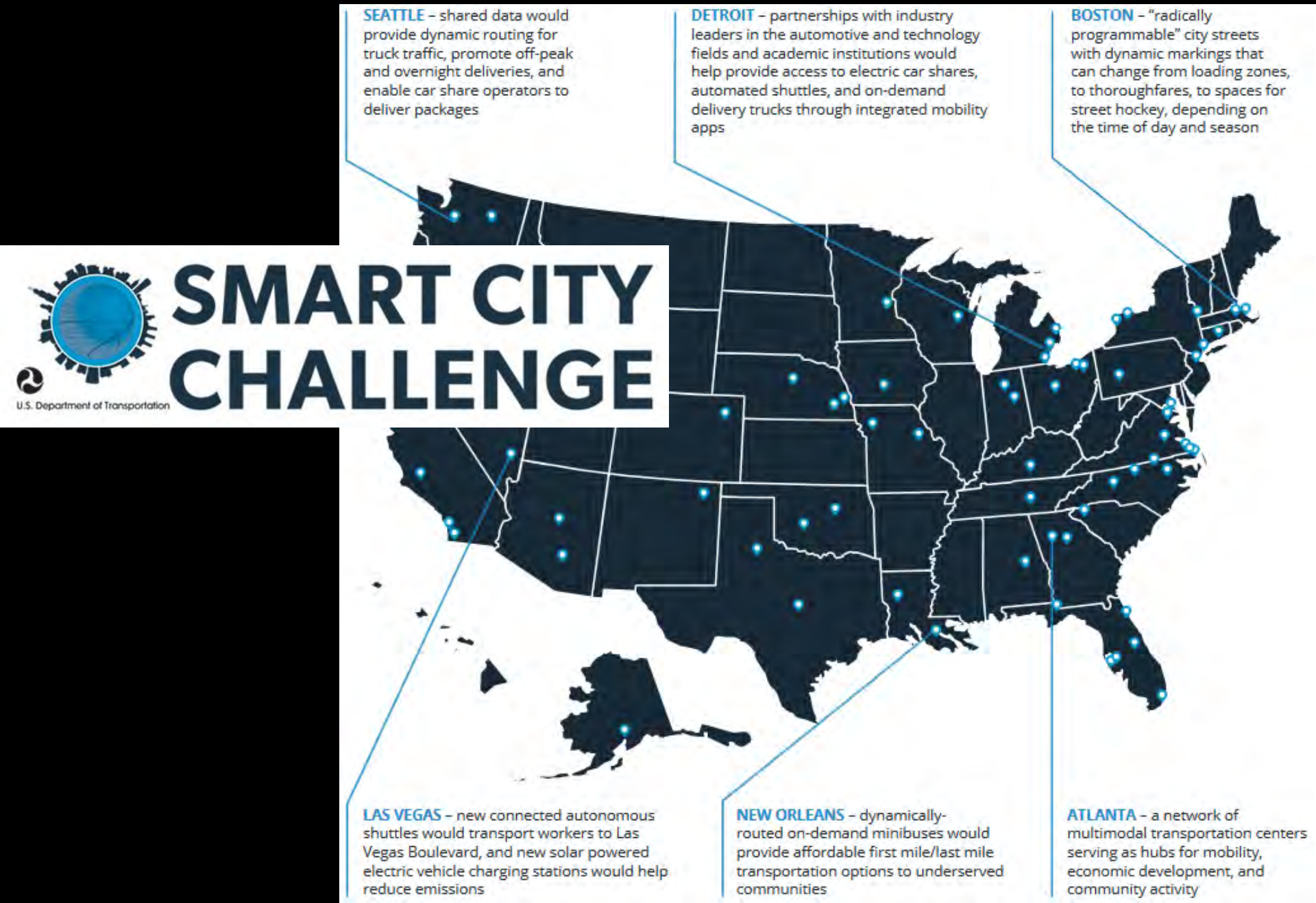
PRT (Personal Rapid Transit)

other emerging technologies

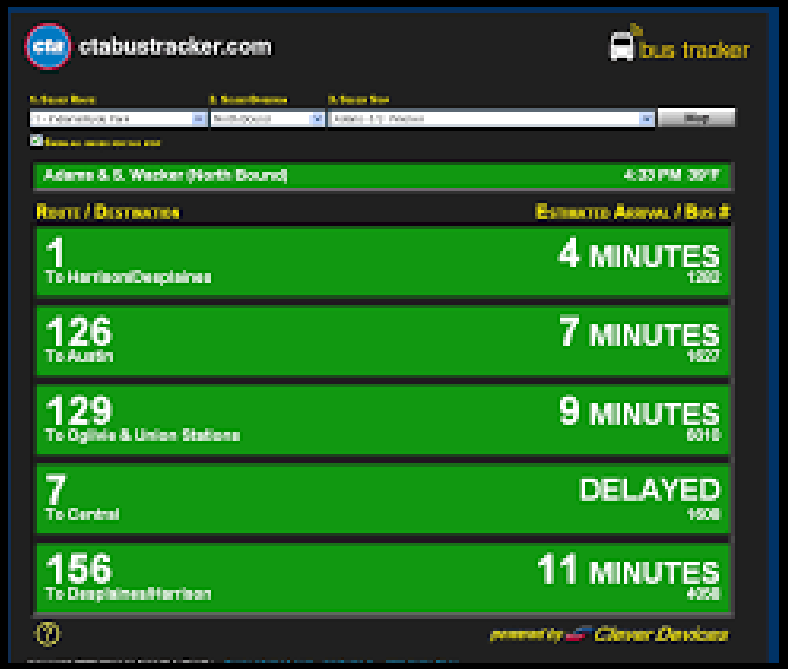
NEWS & TECHNOLOGY 5 July 2017

UK's first public autonomous taxi trial to begin soon

potential support for future research

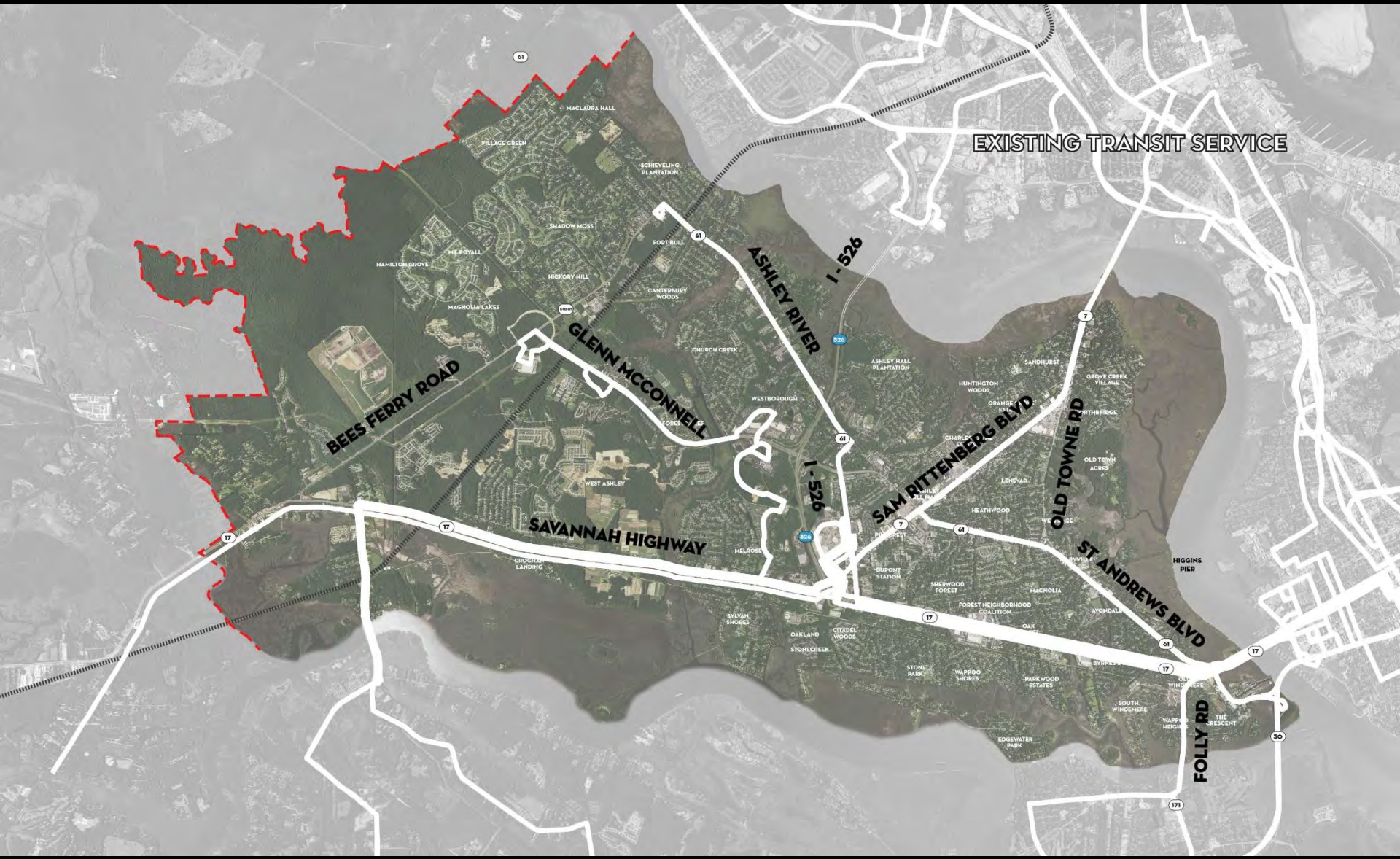


menu of near-term transit options

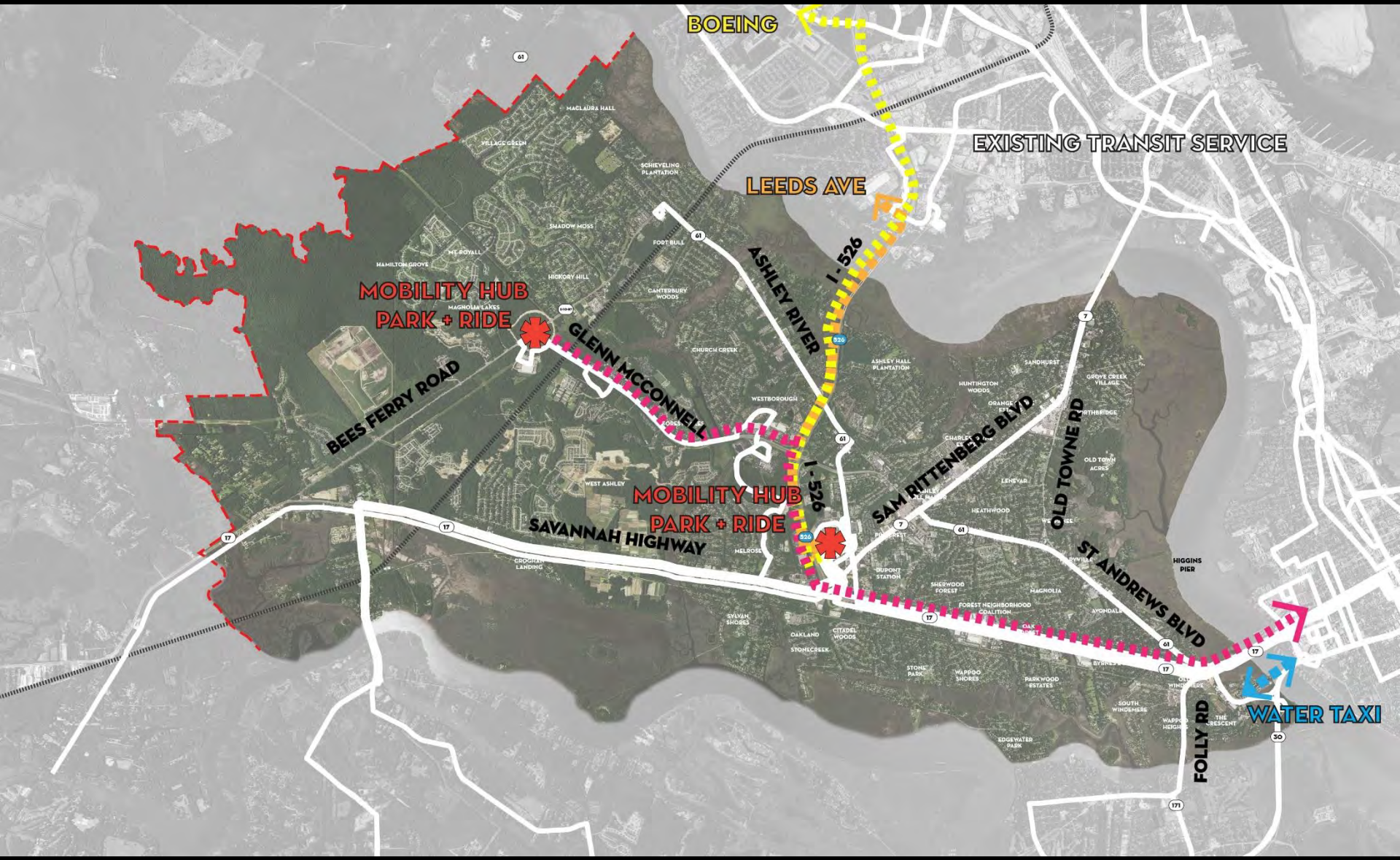


- Lower headways (15/30min express/local)
- Real time schedule information
- Transit stop amenities
- First and last mile connections
- New express to Boeing/Leeds Avenue centers

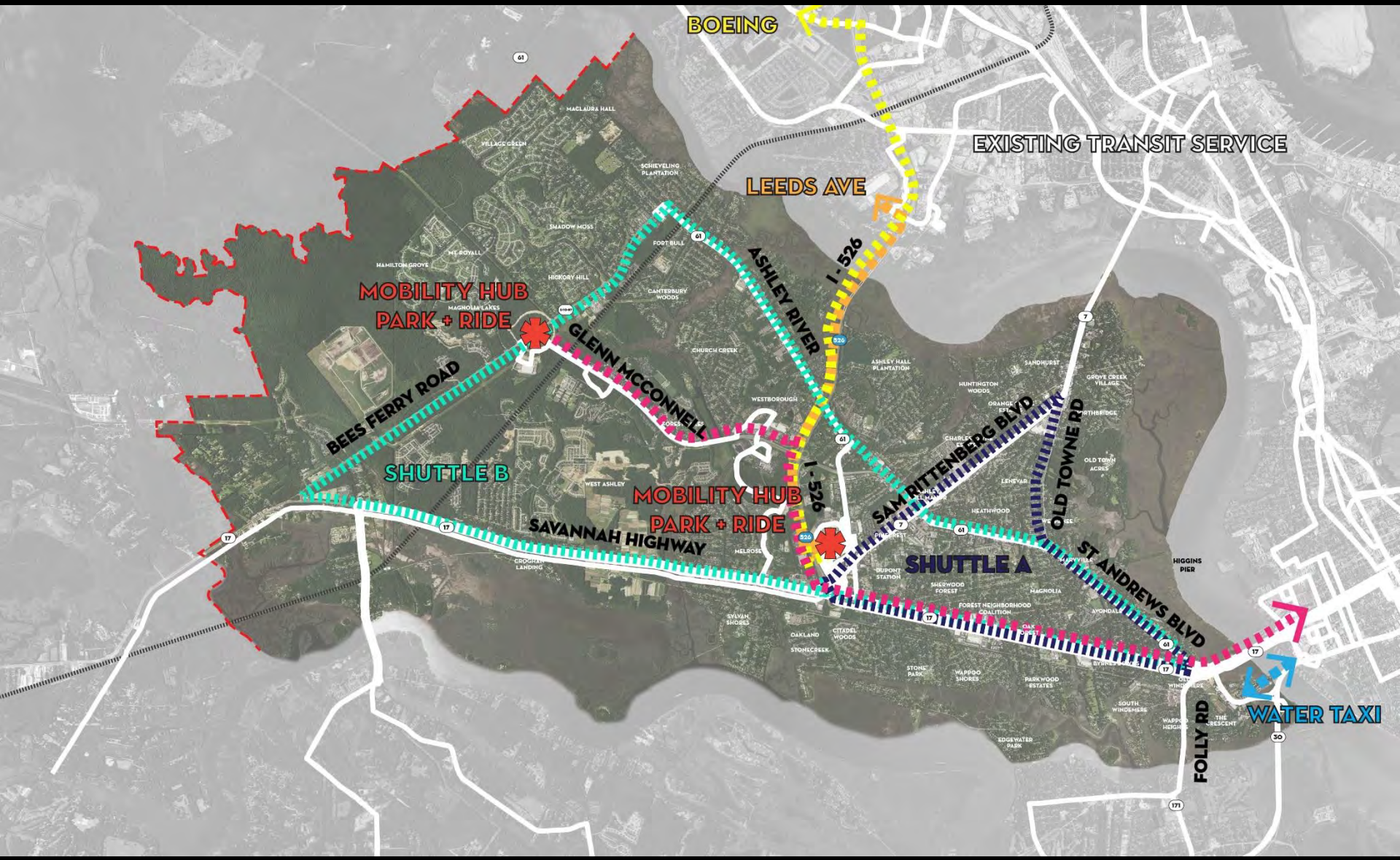
existing transit network



potential additional commuter bus transit



potential shuttle bus routes (public or private)



mobility hubs

Mobility Hubs are a transit access point with frequent transit service, high development potential and a critical point for trip generation or transfers within the transit system.

They may include the following:

- Mixed use development
- Transit stops/transfers
- Park + Ride
- Bikeshare
- Rideshare pickup/dropoff

typical bus stop

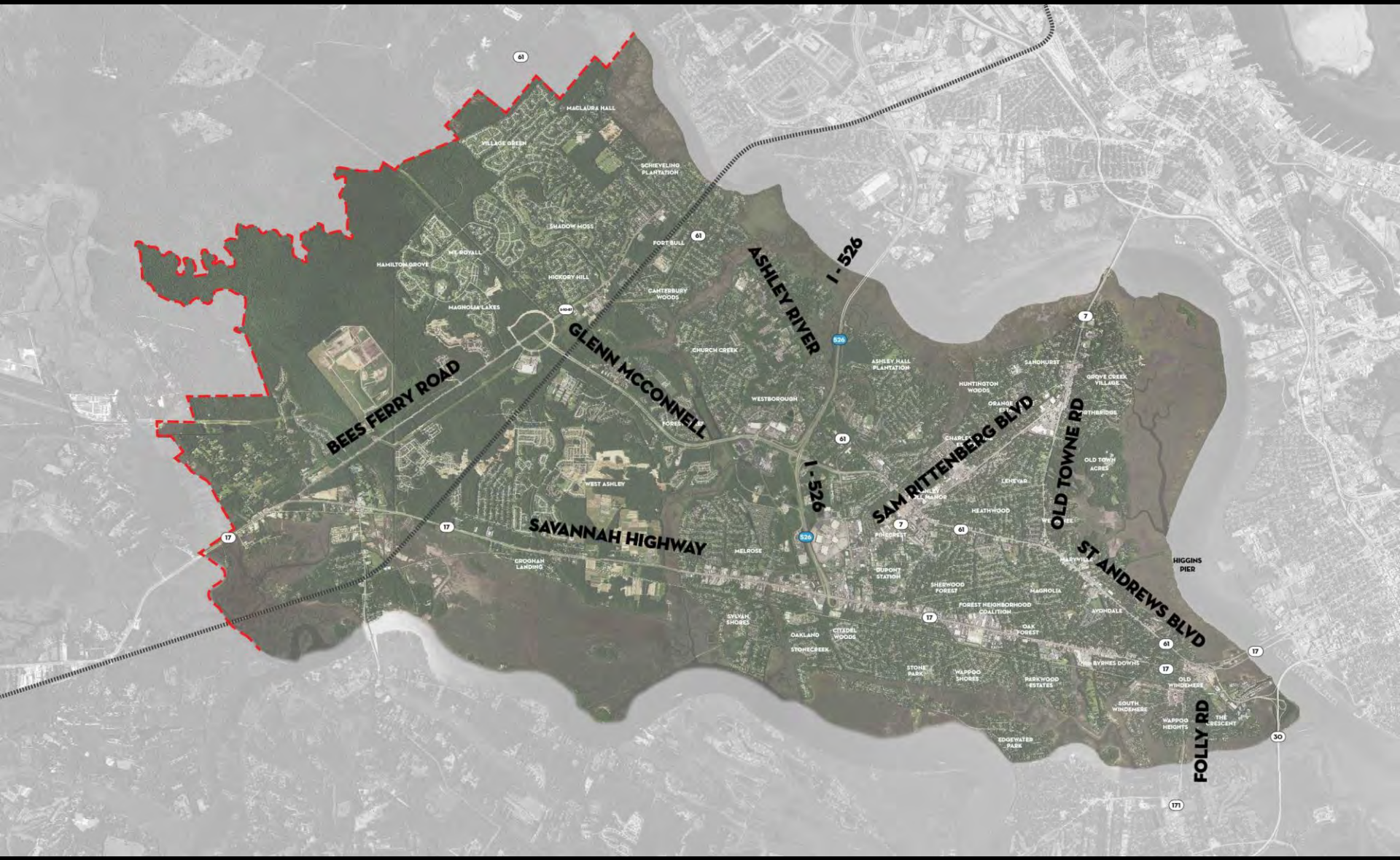
- no landing pad
- no bench
- no shelter
- no information

what if...

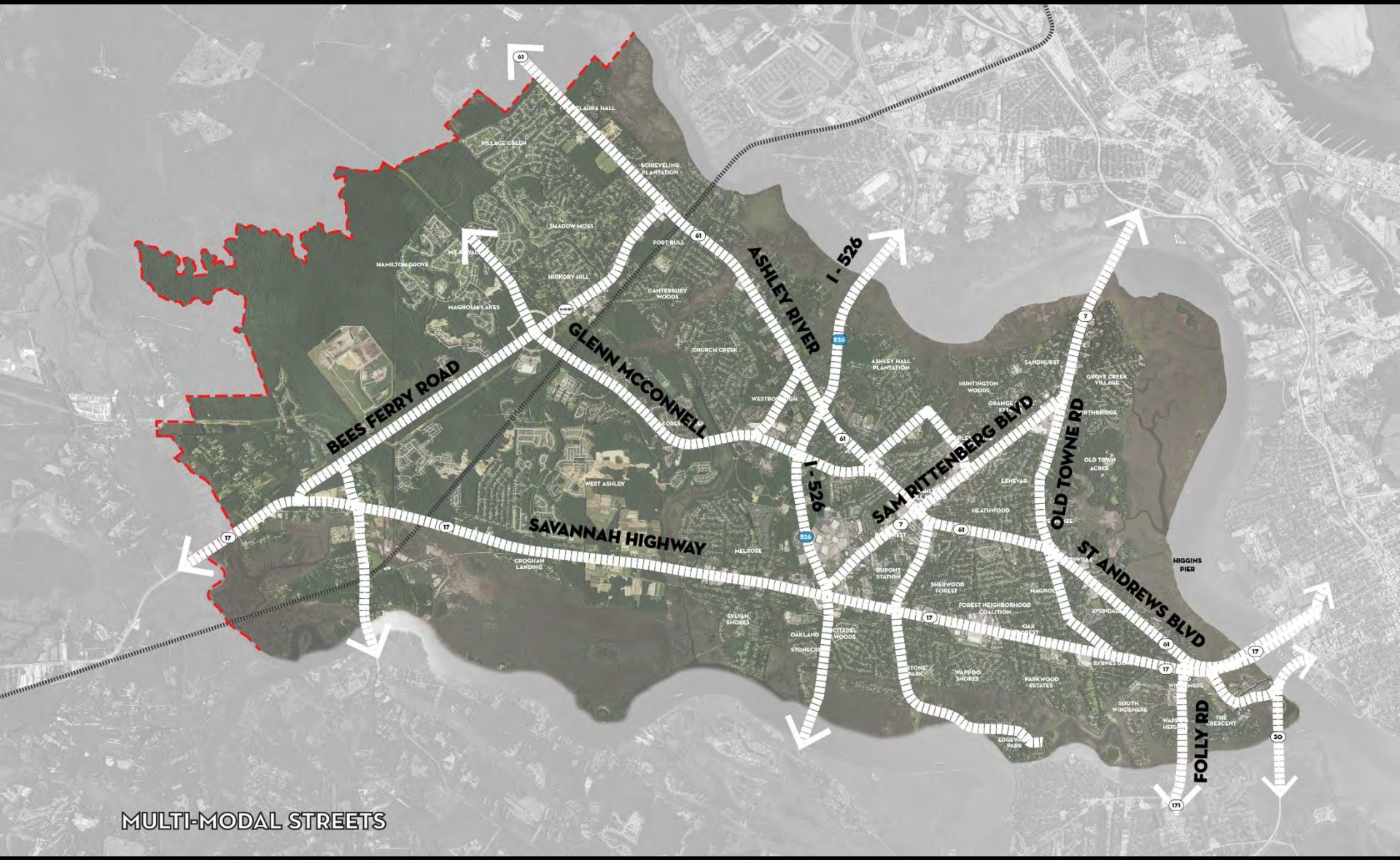
- bus shelter
- bench
- information
- landing pad
- right size lanes

what if…

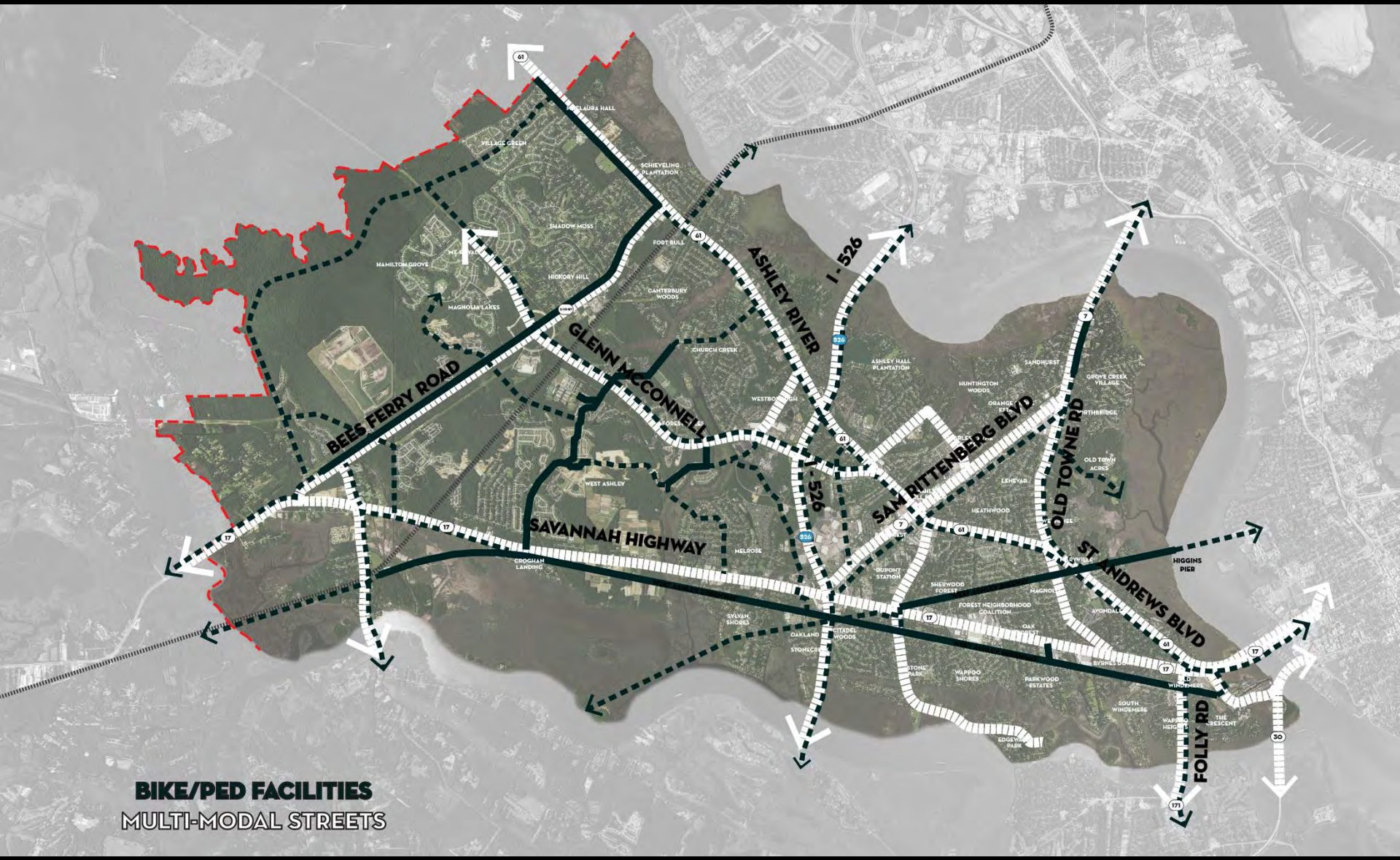
- HOV/transit lane
- shared use path
- wayfinding


MACLAURA HALL
VILLAGE GREEN
SCHIEVELING PLANTATION
SHADOW MOSS
FORT BULL
MT ROYALL
HAMILTON GROVE
HICKORY HILL
CANTERBURY WOODS
MAGNOLIA LAKES
ASHLEY RIVER
I - 526
GLENN MCCONNELL
BEES FERRY ROAD
CHURCH CREEK
ASHLEY HALL PLANTATION
SANDHURST
HUNTINGTON WOODS
GROVE CREEK VILLAGE
WESTBOROUGH
FOREST
SAM RITTENBERG BLVD
OLD TOWNE RD
OLD TOWN ACRES
LEHEVAR
WEST ASHLEY
HEATHWOOD
PINECREST
SAVANNAH HIGHWAY
MELROSE
CROGHAM LANDING
DUPONT STATION
SHERWOOD FOREST
MAGNOLIA
FOREST NEIGHBORHOOD COALITION
AVONDALE
ST ANDREWS BLVD
HIGGINS PIER
SYLVAN SHORES
OAKLAND
CITADEL WOODS
STONECREEK
OAK FOREST
BYRNES DOWNS
STONE PARK
WAPPOO SHORES
PARKWOOD ESTATES
OLD WINDEMERE
SOUTH WINDEMERE
WAPPOO HEIGHTS
THE CRESCENT
EDGEWATER PARK
FOLLY RD

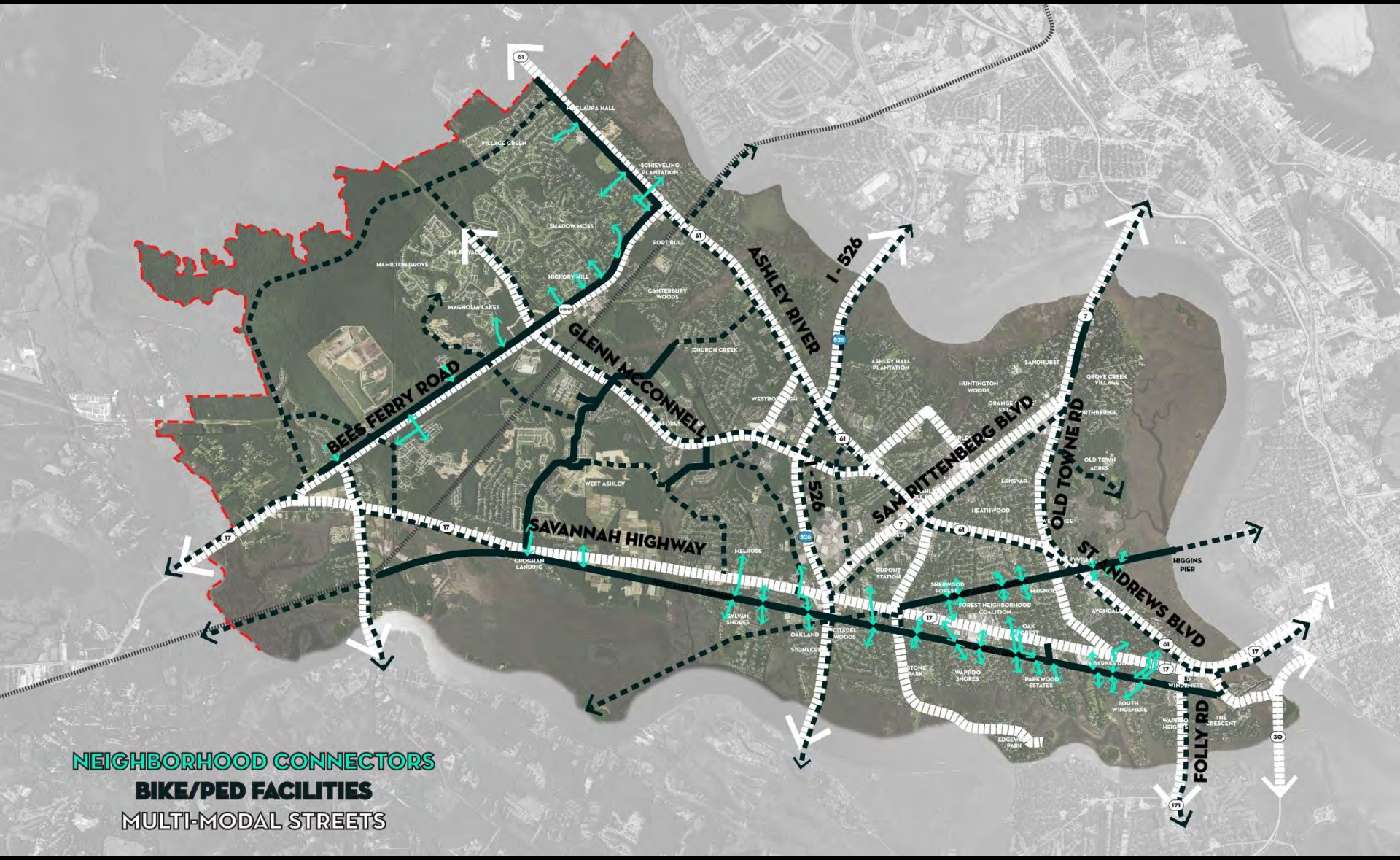
potential multimodal network



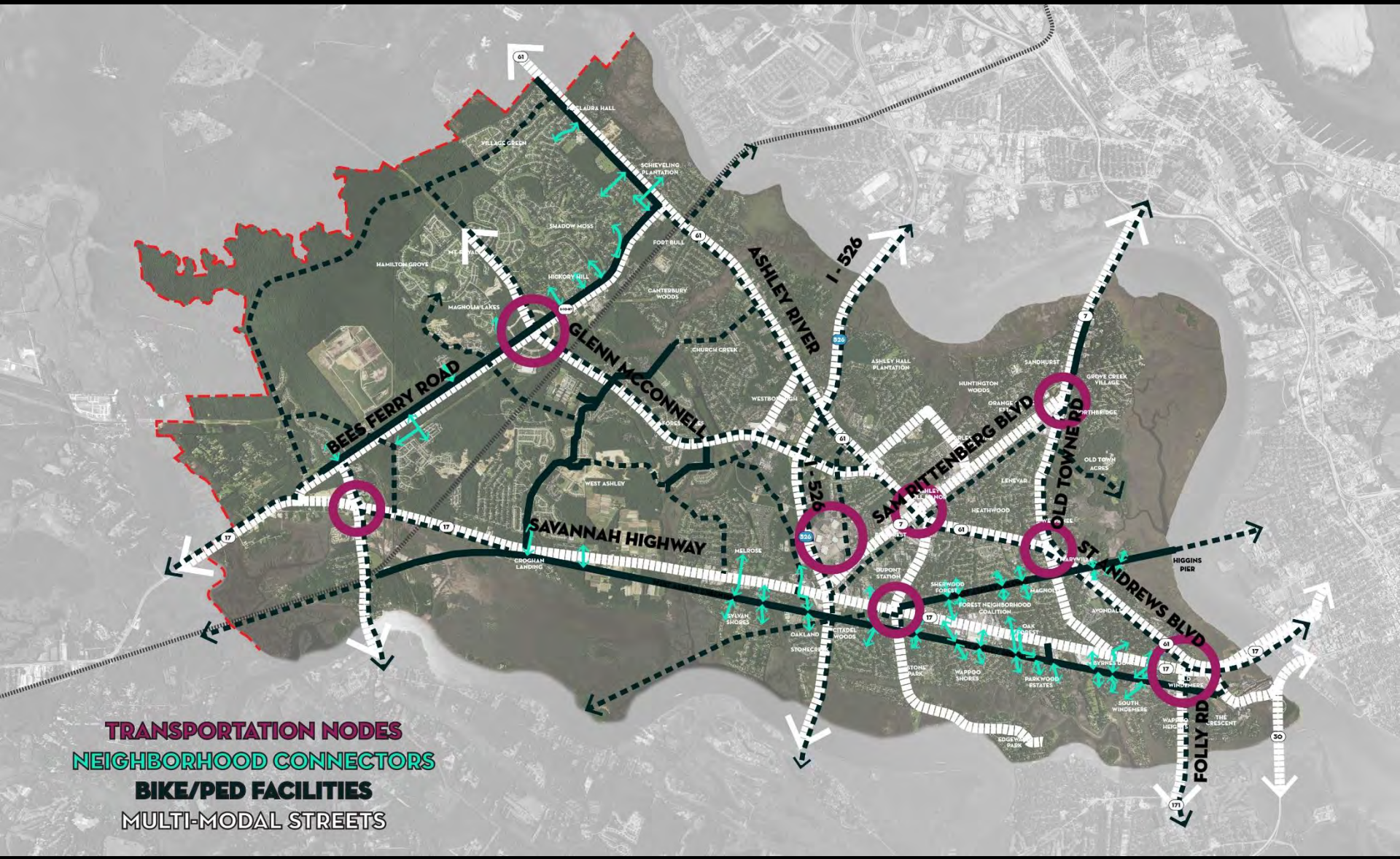
potential dedicated bike/ped network



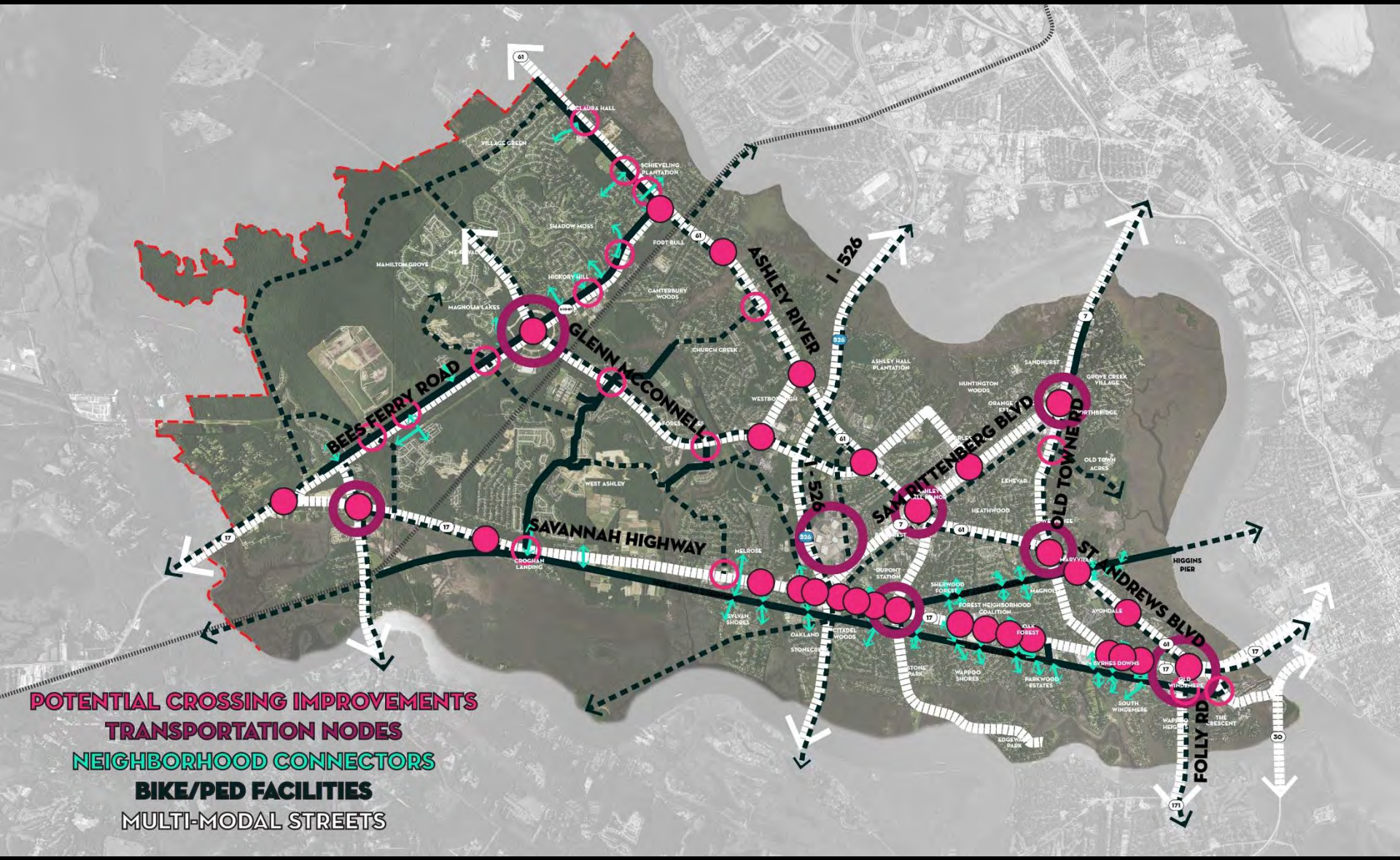
enhanced neighborhood connectors



nodes of modal shift / transportation focus



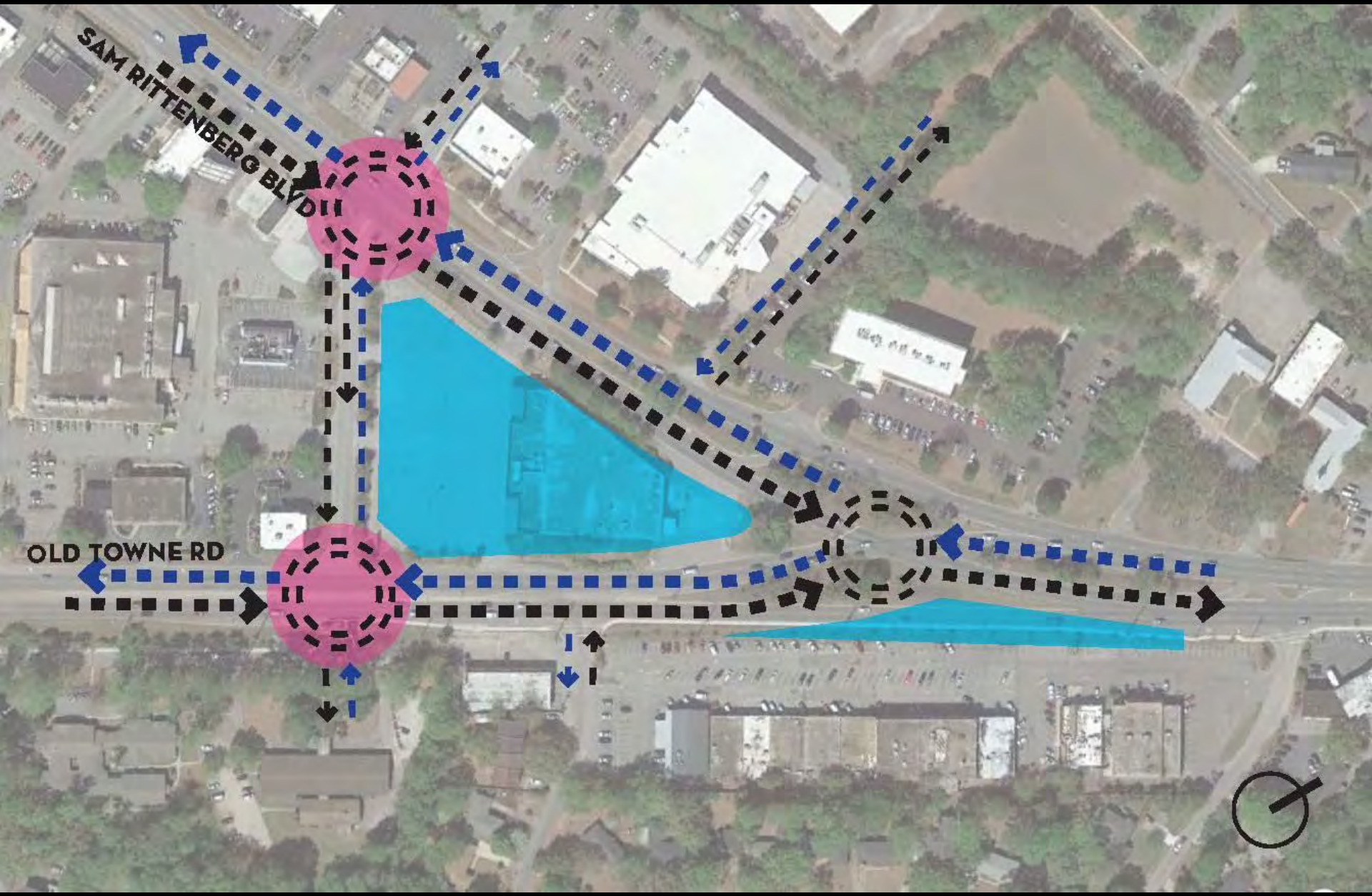
crossing/intersection improvement areas



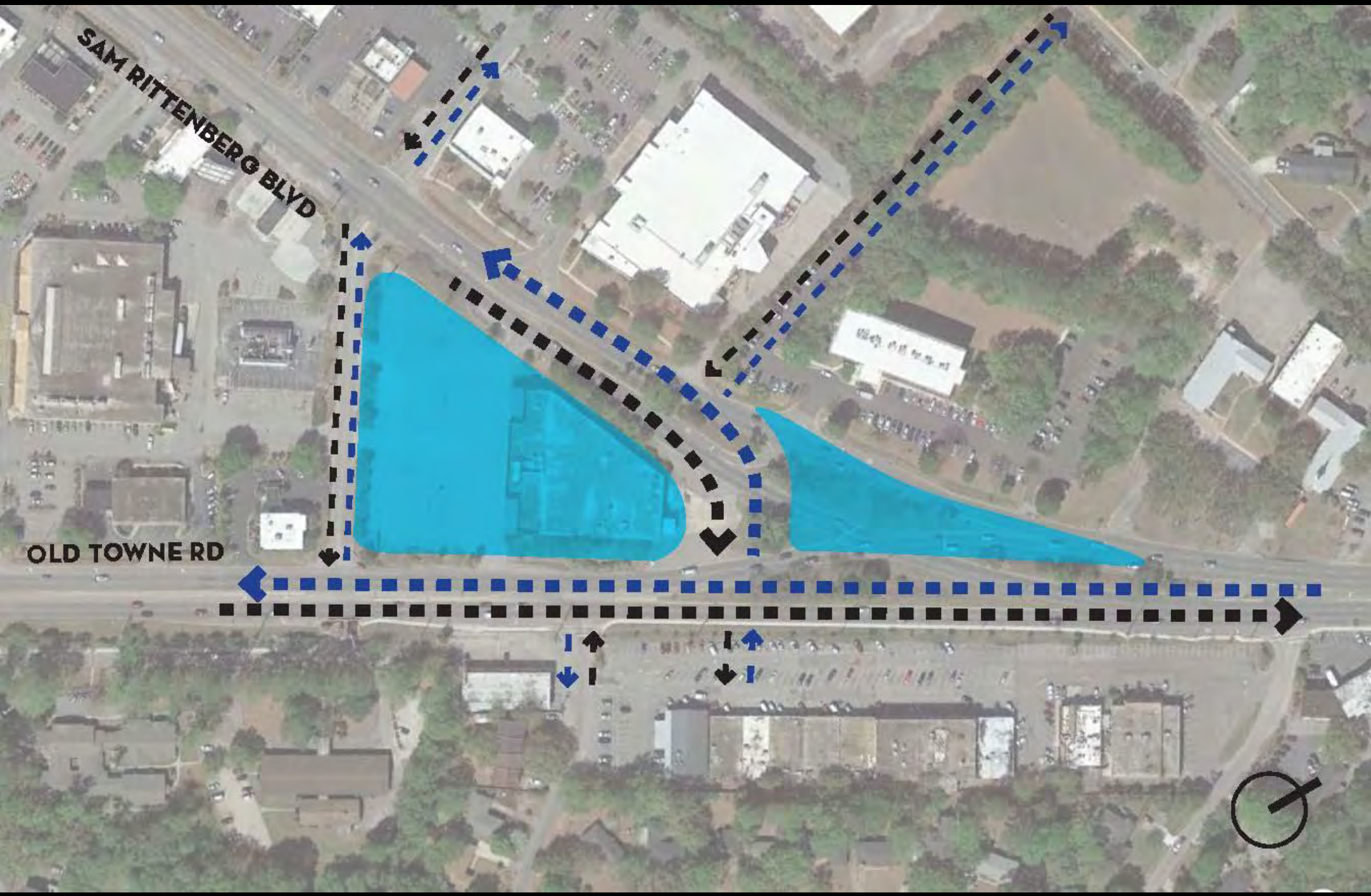
menu of intersection crossing options

- signal timing + coordination
- turn lanes
- high visibility crossings
- ¼ mile pedestrian crossing spacing
- reduced crossing distance
  - Bump outs
  - Pedestrian islands
- separation from travel lanes
- landscaping
- lower speeds
- count down pedestrian buttons
- midblock crossing locations
  - Hawk signals
  - Rectangular flashing beacons

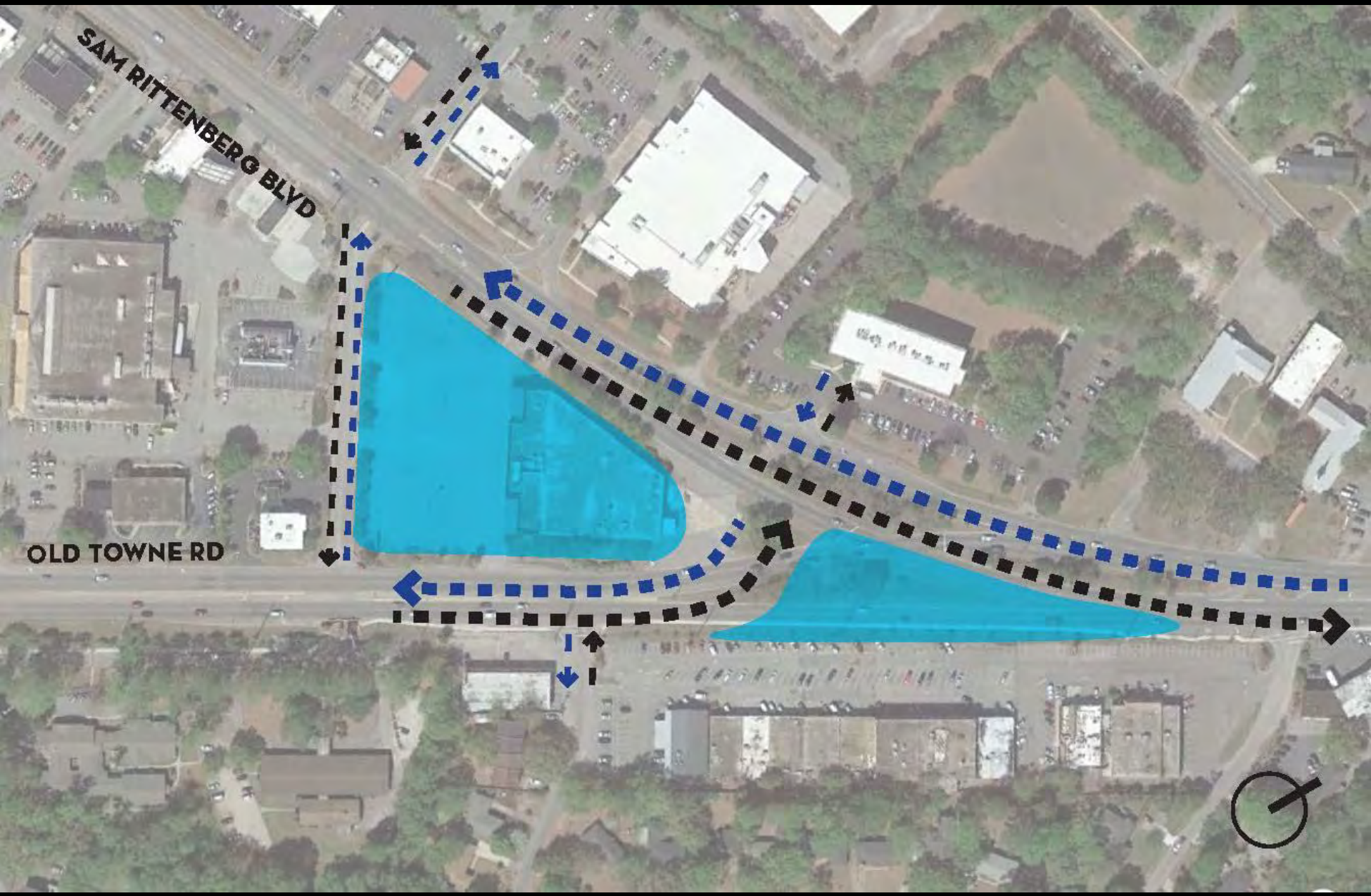
Old Towne + Sam Rittenberg



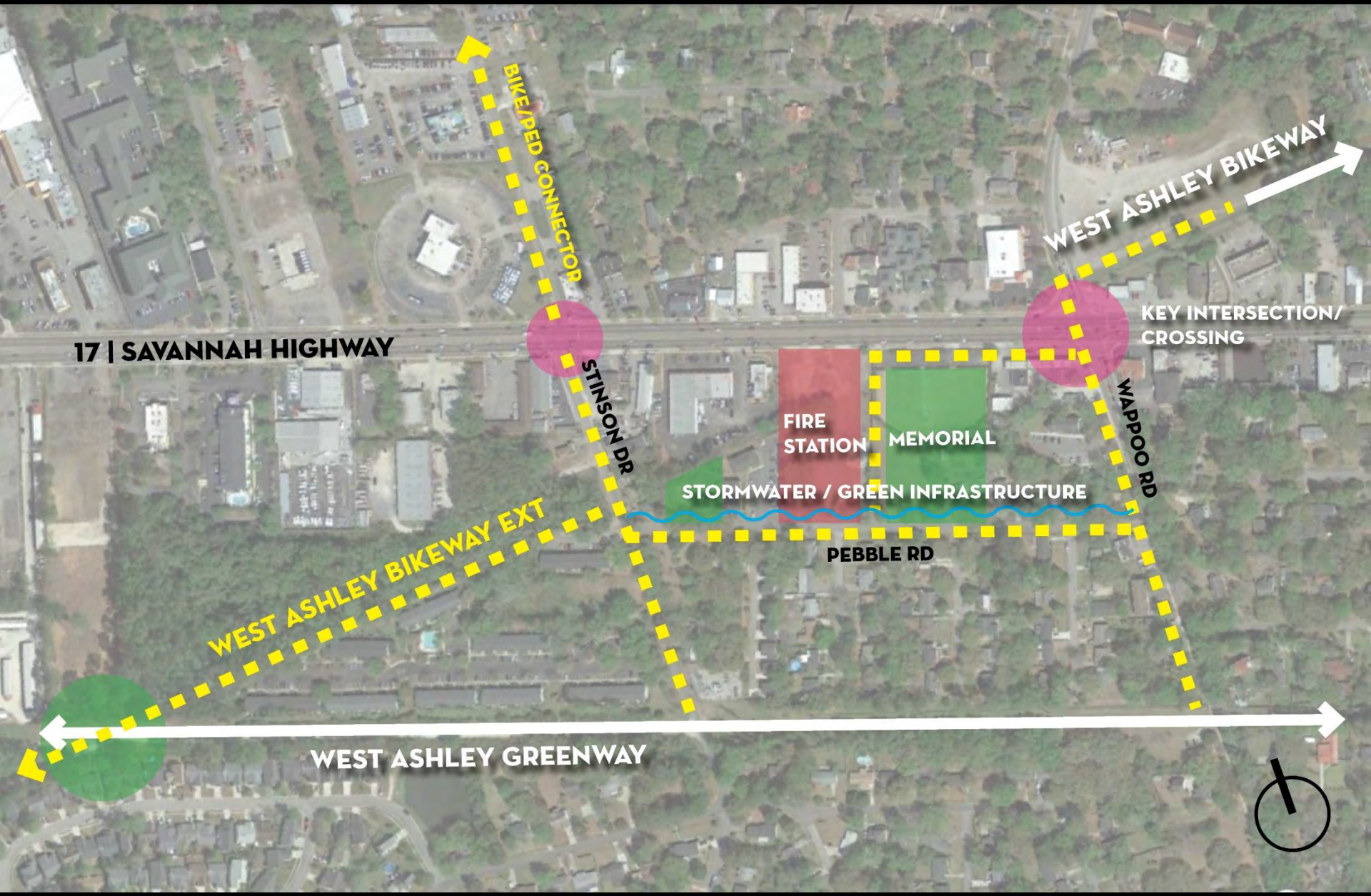
Old Towne + Sam Rittenberg



Old Towne + Sam Rittenberg



Bikeway + Greenway connection



Savannah @ Wappoo

- High traffic volumes and speed
- Long distance to cross

high visibility crossing

- Clear bike/ped crossing
- Pedestrian refuge
- Aesthetic improvements: landscaping, etc.

implementing the vision – future studies

Data Collection

- Regional commuter data
  - Where are people coming from and where are they going at peak hours?
  - Origin and destination surveys (motor vehicle, bus interviews)
- Local trips data
  - When people travel within WA, how far are they traveling and how often?
  - Interviews or online surveys

Studies

- Regional Transit Feasibility
  - May include transit lanes, BRT, PRT, or Lightrail
  - Premium transit service would require MIS
- Districtwide Traffic Management Study
  - Heavy on data collection for all modes
  - Take into account land use changes and mode/network additions recommended in this and other studies
  - Use as framework for decision-making on various initiatives
- District-wide School Accessibility + Circulation
  - Include Safe Routes to School Opportunities

discussion.