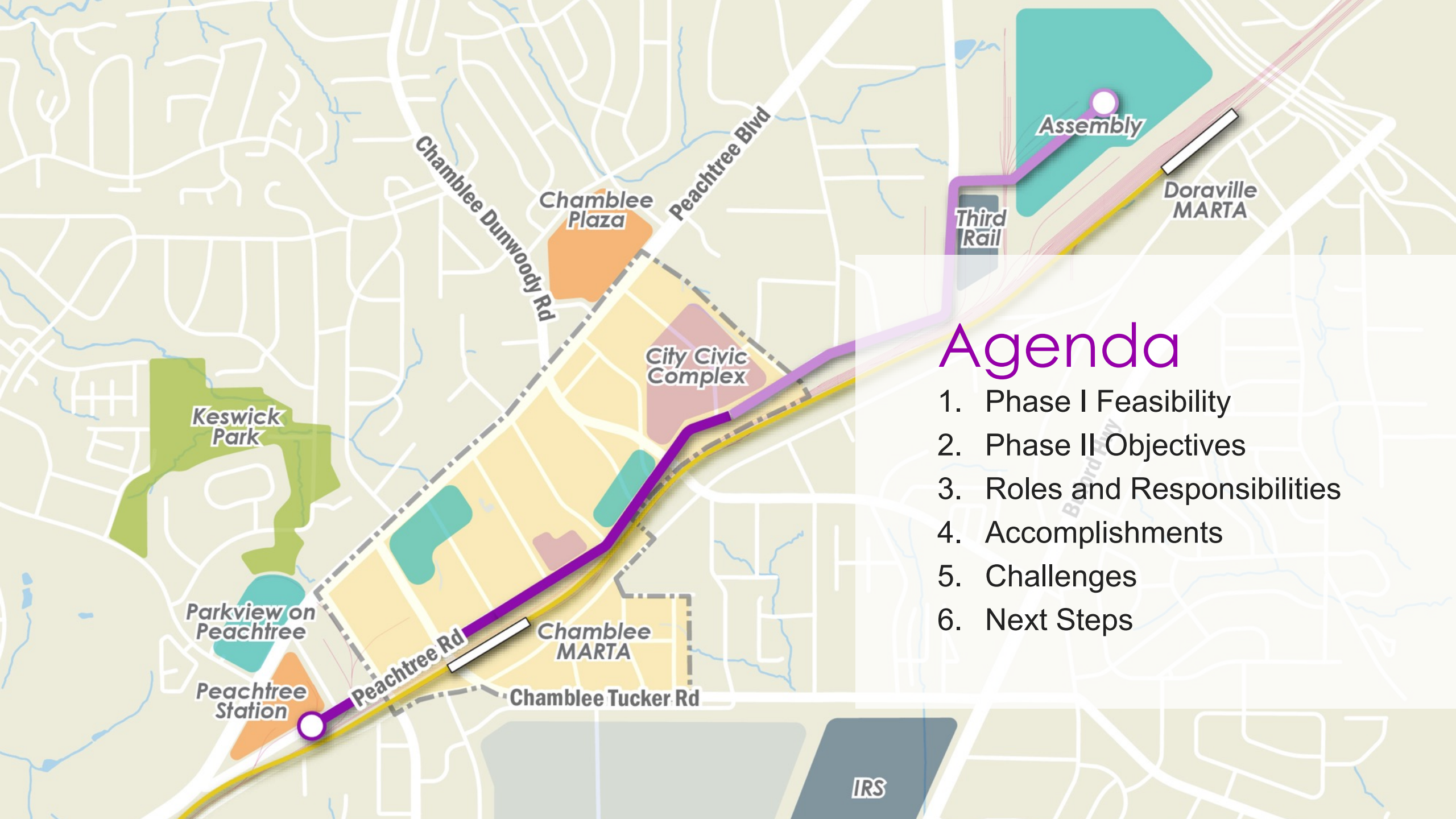
City of Chamblee Shared Autonomous Shuttle

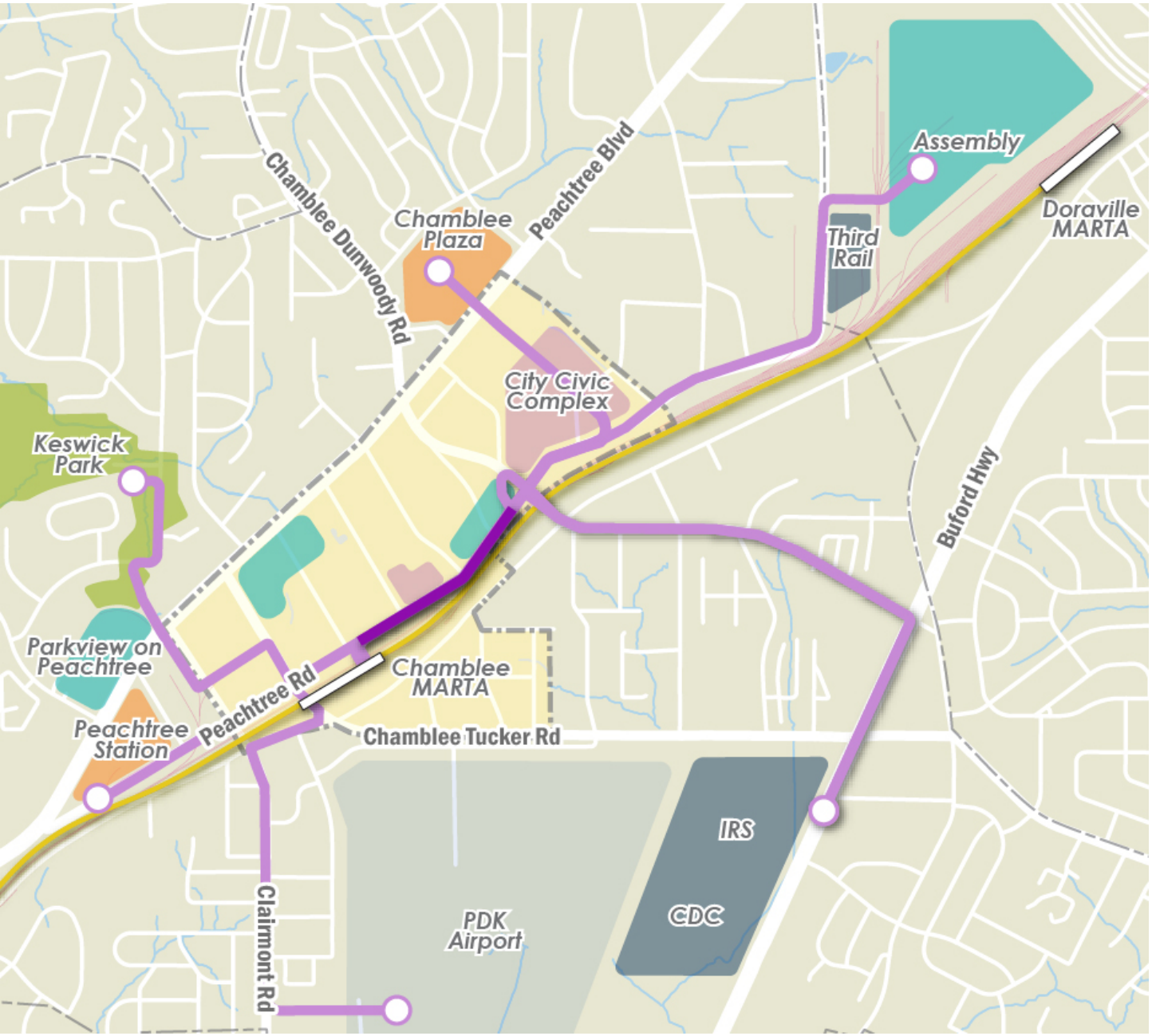
GEORGIA SMART

Georgia Tech
CREATING THE NEXT



Agenda

1. Phase I Feasibility
2. Phase II Objectives
3. Roles and Responsibilities
4. Accomplishments
5. Challenges
6. Next Steps



1. Phase I

Feasibility Study:

- Description of technology
- Chamblee analysis
- Cost estimates
- Route alternatives
- Recommendations
- Next steps

Peachtree Road Streetscape:

- Road diet
- Safety and operational improvements

Comparative Analysis

	City Civic Complex	PDK Airport	Peachtree Station	Chamblee Plaza	Keswick Park	Third Rail/ Assembly	CDC/ IRS
Number of residents along route	OK	OK	OK	Good	Good	Great	Great
Number of job along route	OK	Great	Great	OK	Good	Great	Great
Number of trips per hour with 2 vehicles	Great	OK	Great	Great	Good	Good	OK
Compatibility with low speed shuttle	Great	OK	Great	Great	Good	Great	OK
Increase in transit service coverage	OK	OK	Good	Good	Good	Good	OK

LEGEND

OK Good Great

2. Project Objectives

1. How can we design the user experience to ensure this project is more than a novelty – it should be a true mobility solution?
2. What utilitarian decisions need to be made to be a leader in this technology and pilot an AV shuttle in Chamblee?

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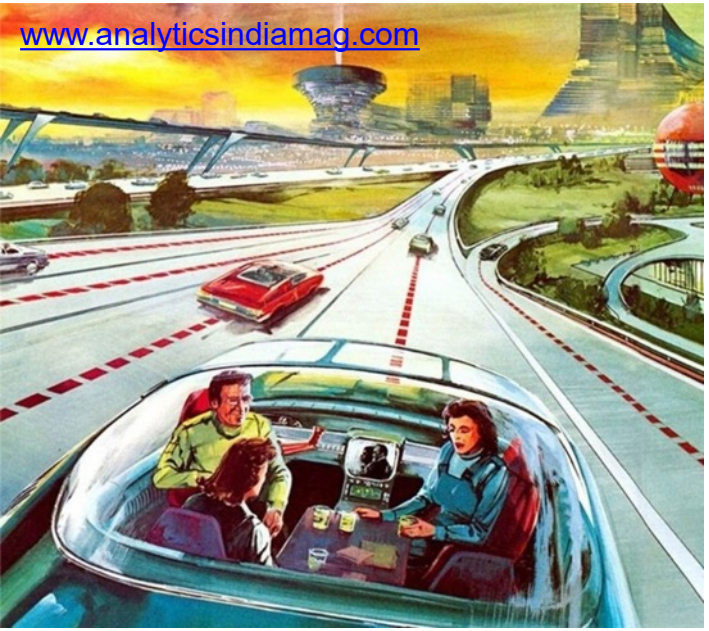
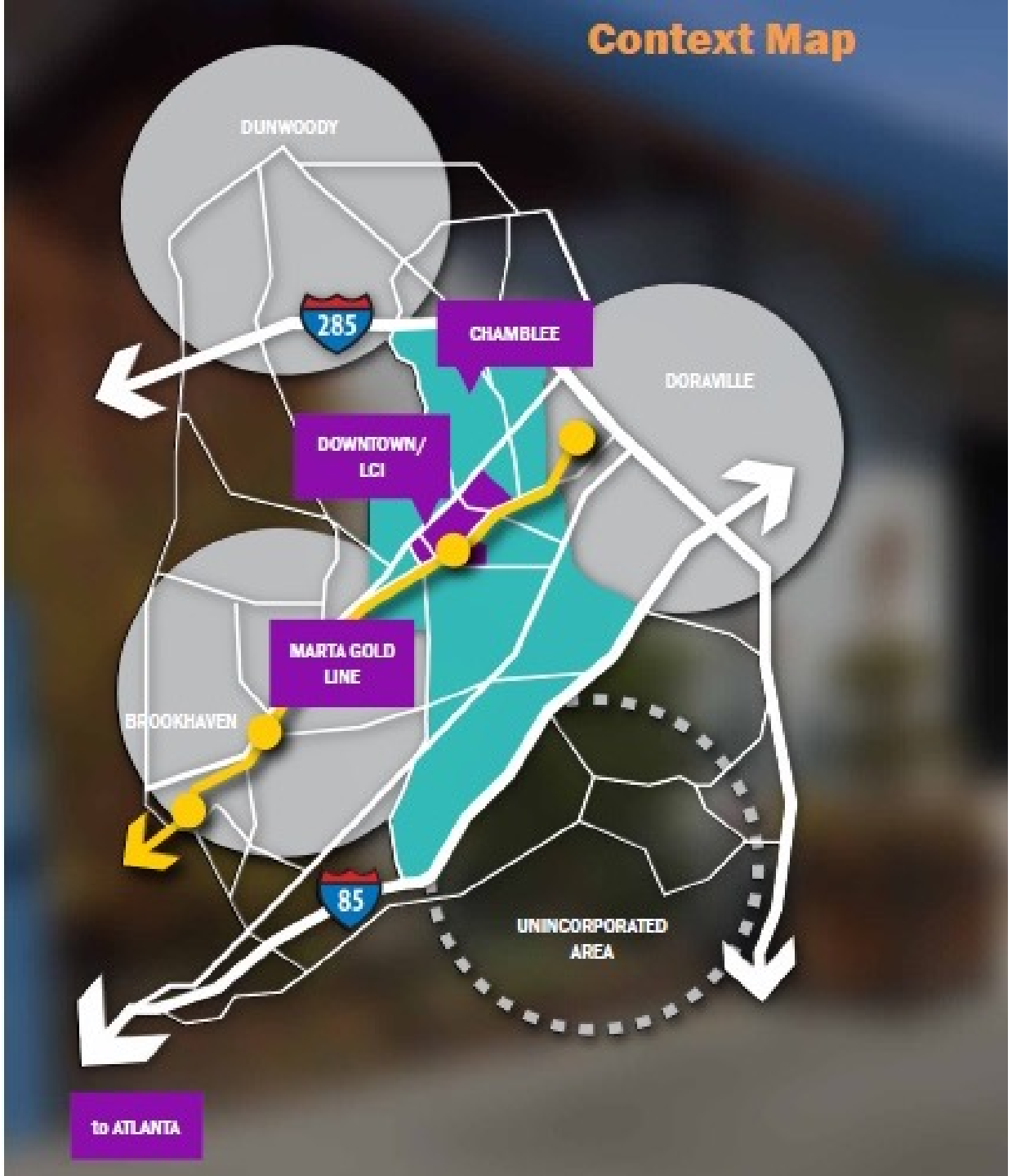


Do we want private AVs to bypass existing communities for more sprawl? Or do we want shared autonomous shuttles to help revitalize existing communities?

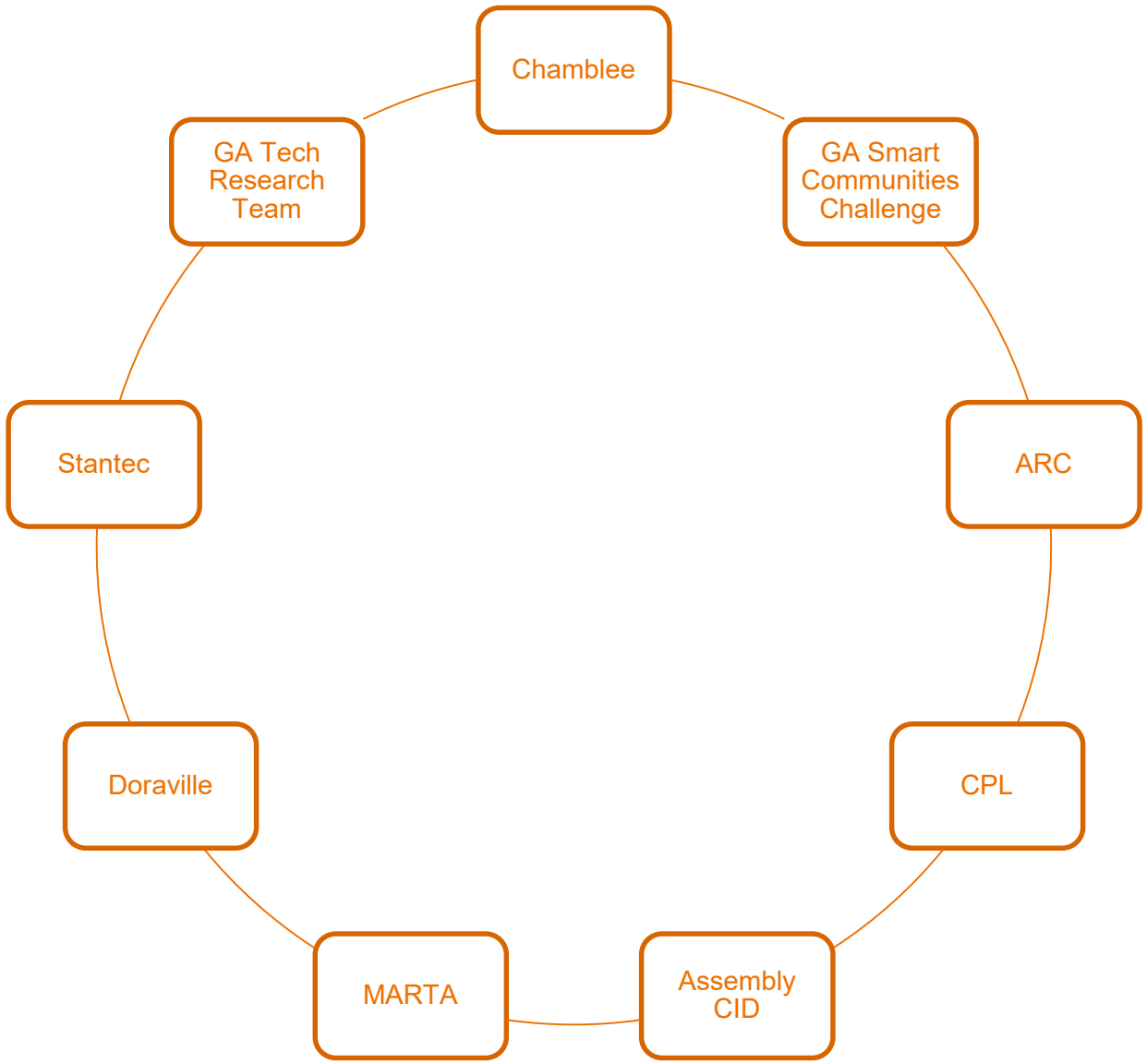
Best Practices Manual

- Study of how to encourage more people to choose shared rides
- Focus on user experience of getting to, waiting for, and riding on autonomous shuttles
- Research on existing and proposed SAV installations and industry expert interviews.
- Recommendations for communities on best practices for land use, bus stop and vehicle design, and future data collection from users



Operations Plan

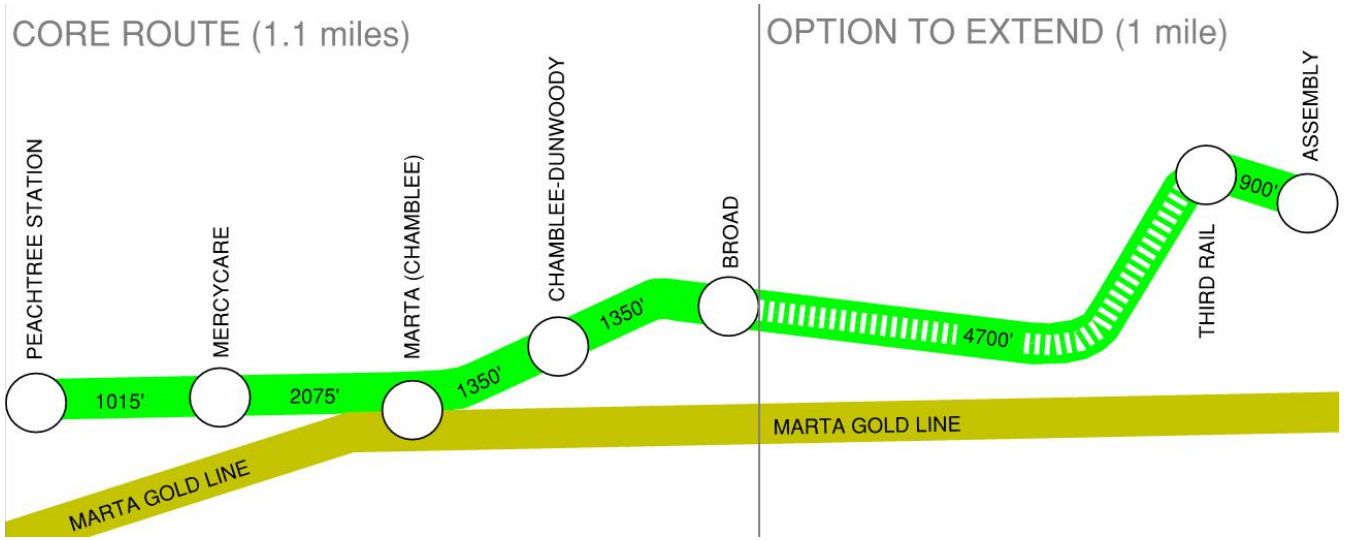
- Project description and schedule
- Charging/Storage/Maintenance plan
- Routing and signage/signalization criteria
- Technology provider(s) and operations team and responsibilities
- Use case scenarios
- Testing and evaluation plan
- Funding (if applicable) and procurement of system/services
- Risk assessment and mitigation strategies
- Emergency response plan
- Licensing requirements
- Cost estimates



3. Project Partners

1. Chamblee – Lead
2. Stantec – Consultant
3. GA Tech – Research
4. Other stakeholders and supporters

4. Accomplishments



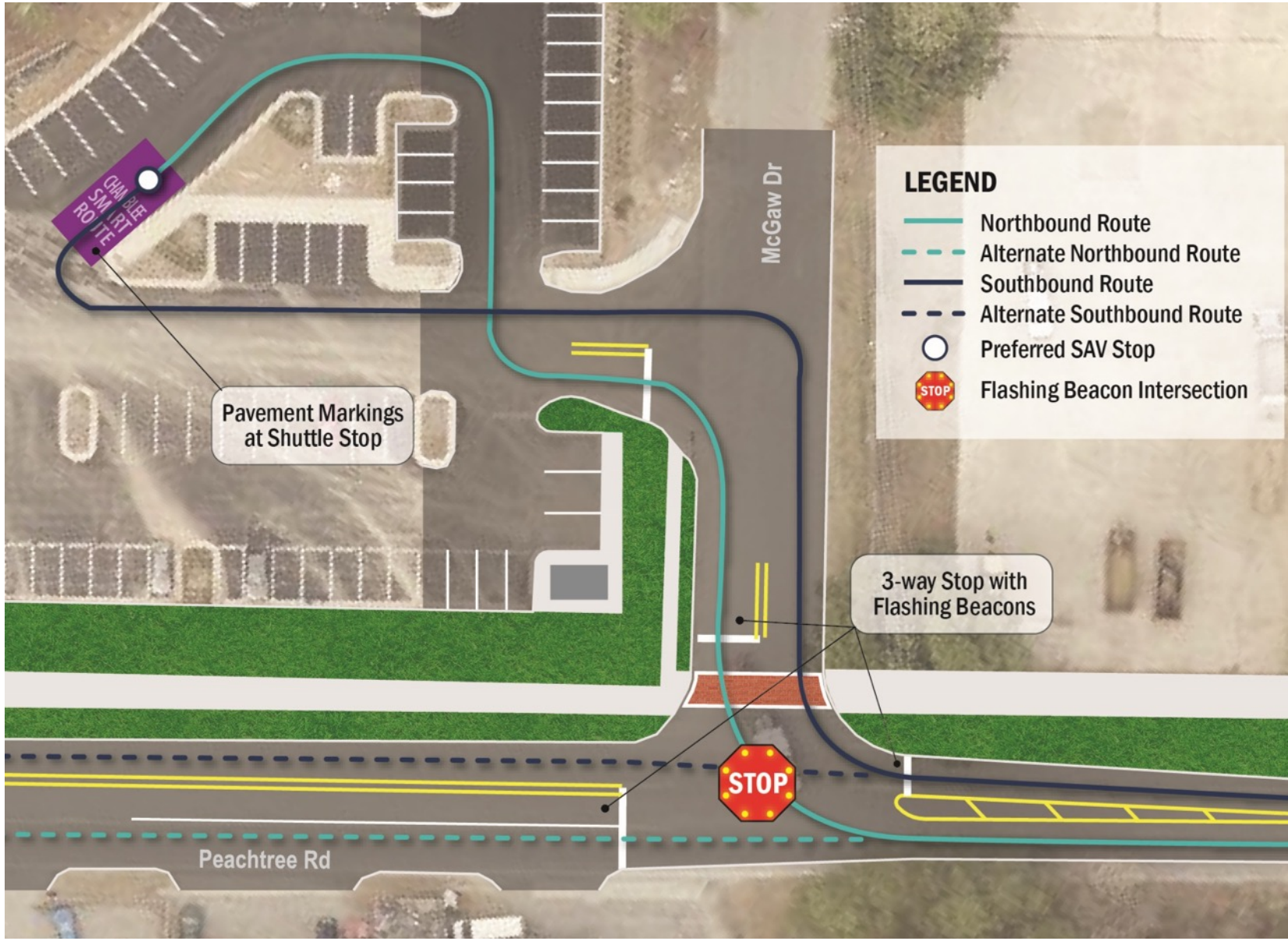
1. Operations Plan draft under review
2. USDOT Autonomous Driving Demonstration Grant submitted

Core Route

1. Mercy Care
2. MARTA (Chamblee Station)
3. Entertainment District (Chamblee Dunwoody Way)

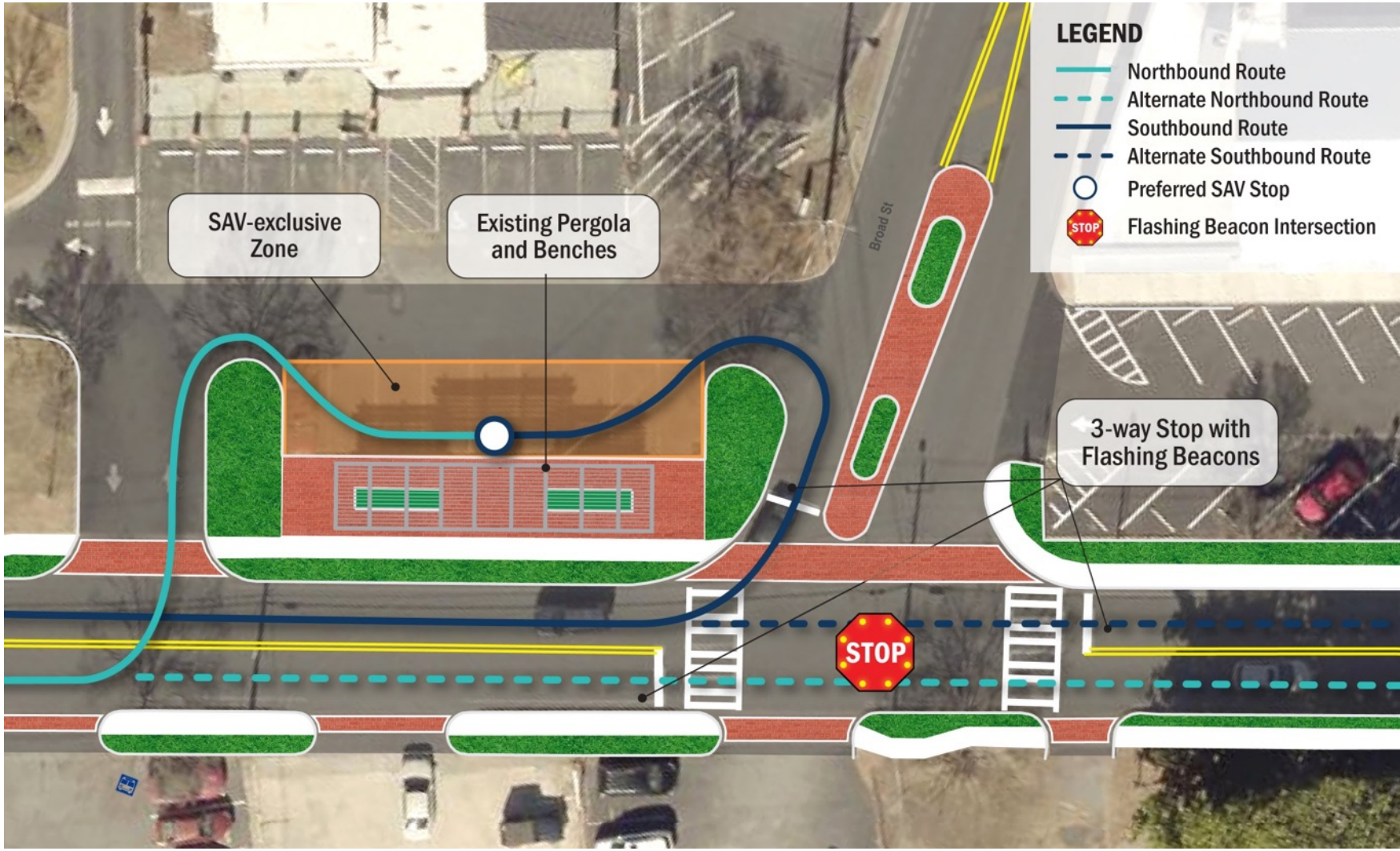
Southern Terminus (Peachtree Station)

- Turnaround at McGaw Drive 3-Way Stop



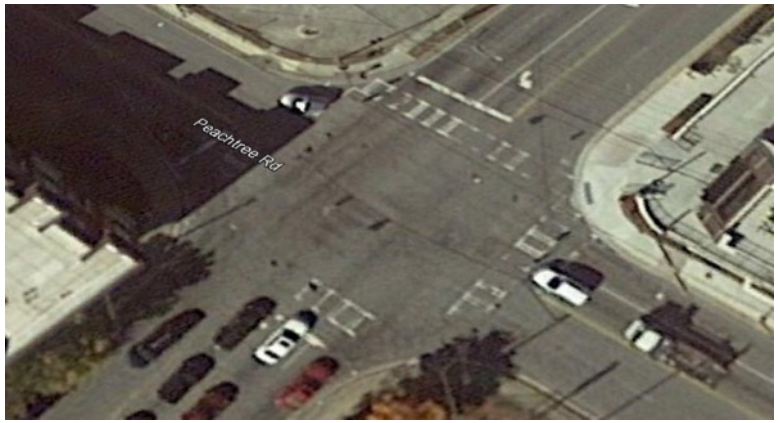
Northern Terminus (Broad Street)

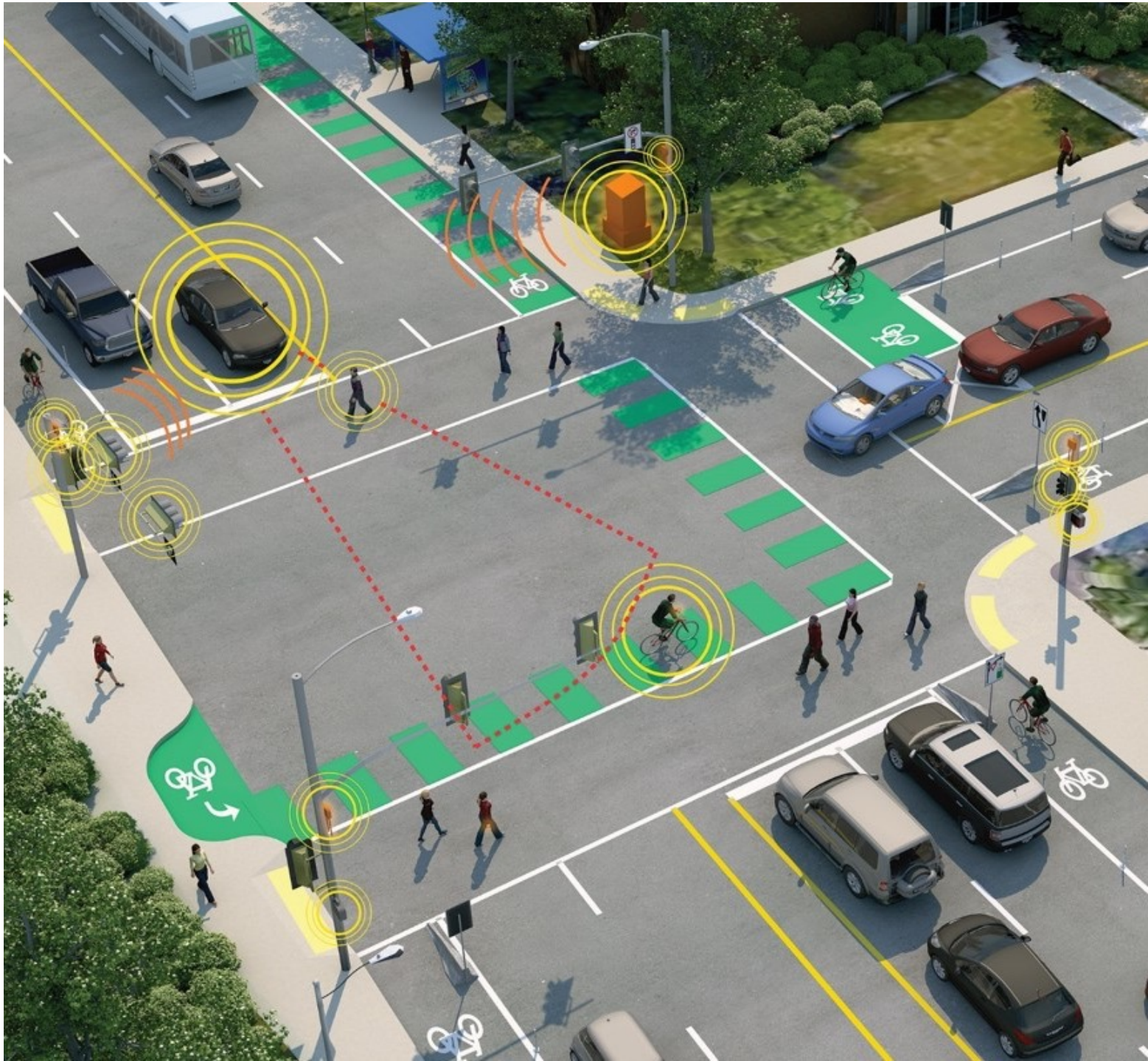
- Turnaround in pergola / parking lot area
- Flashing Beacon Stop Signs & Warning Signage



Chamblee Tucker Intersection

- Required: Connected Intersection





SAV Stops

Requirements:

1. ADA concrete landing pad
2. Sidewalk connectivity
3. Signage

Recommendations:

4. Passenger amenities
5. Road painting

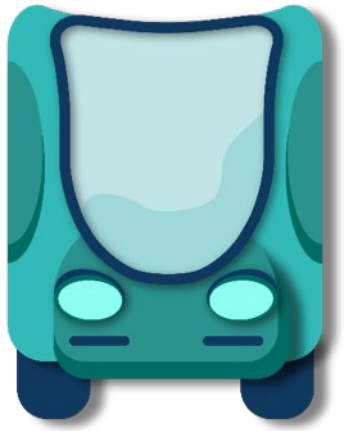
Optional:

6. Interactive map

Operations

Peachtree Station - Assembly
Length = 2.2 miles

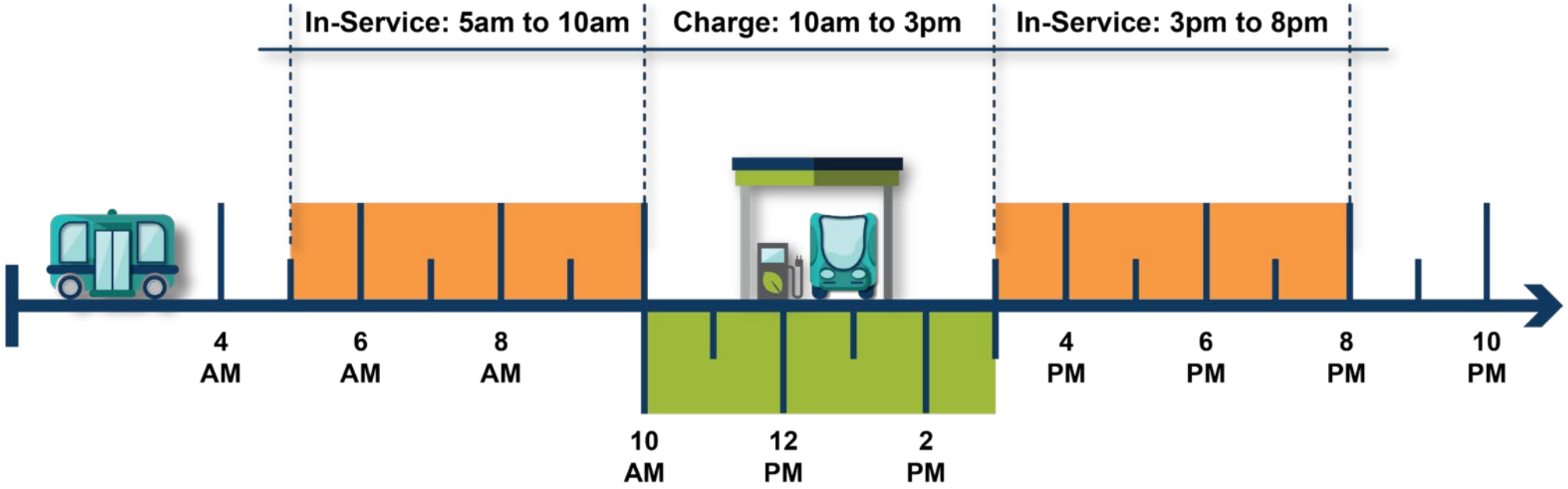
10 hour service day /
7 days / week



Single SAV (no spare)
= 15-minute headway

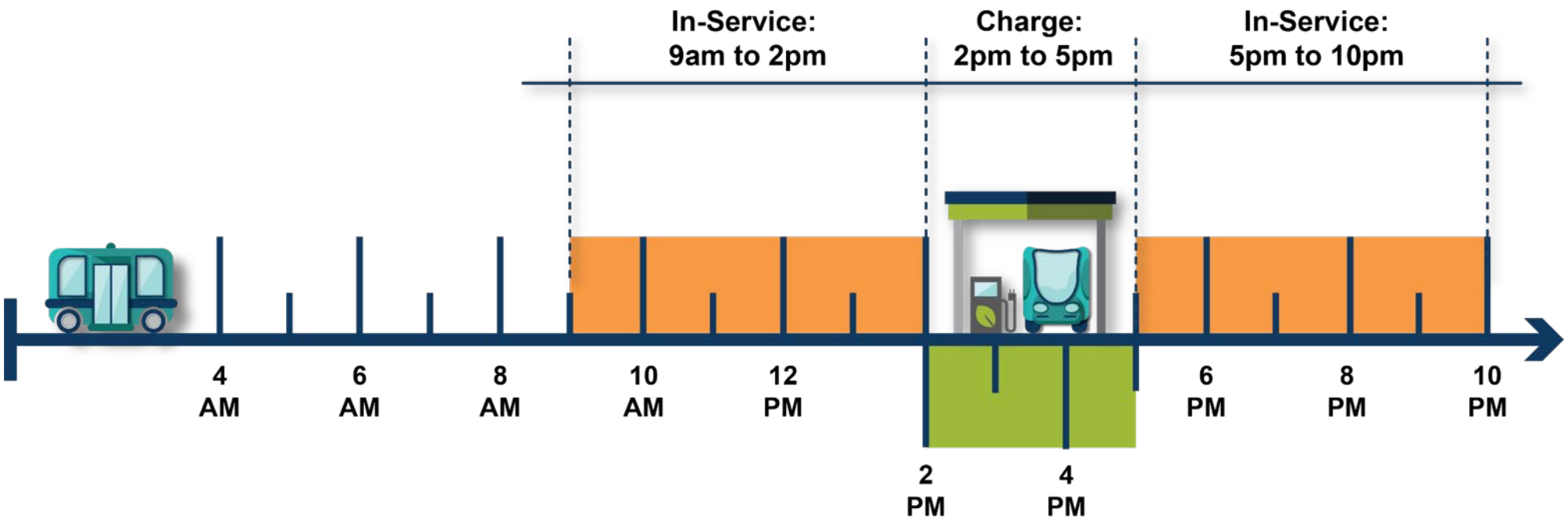
Service Profile

- Commuter / Last Mile Service



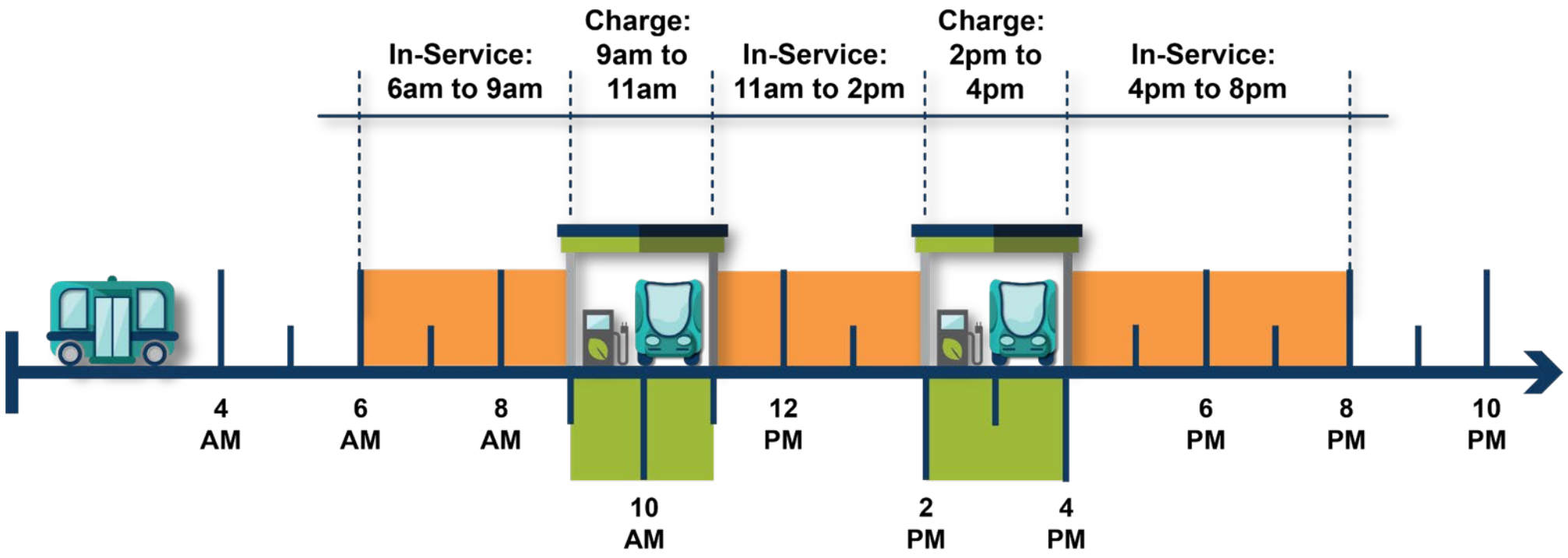
Service Profile

- Leisure / Entertainment Service

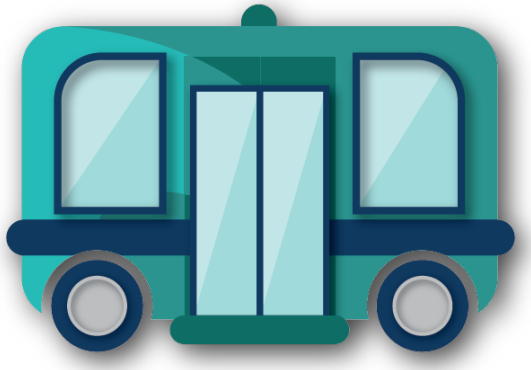


Service Profile

- Hybrid Service



Estimated Cost to Implement



<u>Infrastructure Improvements</u>

$75,000 - $100,000

- Connected infrastructure
- Flashing beacon stop signs
- Benches
- Sidewalk connectivity
- Lane painting / signage

<u>Capital Expenditures</u>

$10,000 - $35,000 (monthly lease)

$250,000 - $425,000 (own)

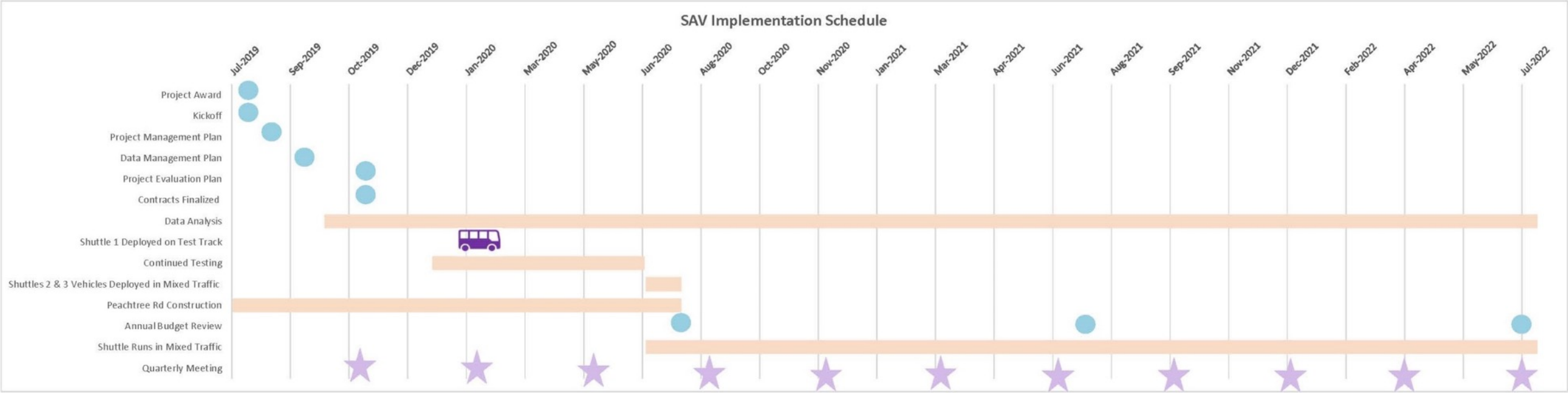
- Vehicle
- Start up training & programming

<u>Annual Operating Costs</u>

$250,000 - $350,000

- Software licensing
- Insurance
- Maintenance
- Onboard attendant
- Program management

USDOT Grant


SAV Implementation Schedule
Jul-2019
Sep-2019
Oct-2019
Dec-2019
Jan-2020
Mar-2020
May-2020
Jun-2020
Aug-2020
Oct-2020
Nov-2020
Jan-2021
Mar-2021
Apr-2021
Jun-2021
Aug-2021
Sep-2021
Nov-2021
Dec-2021
Feb-2022
Apr-2022
May-2022
Jul-2022
Project Award
Kickoff
Project Management Plan
Data Management Plan
Project Evaluation Plan
Contracts Finalized
Data Analysis
Shuttle 1 Deployed on Test Track
Continued Testing
Shuttles 2 & 3 Vehicles Deployed in Mixed Traffic
Peachtree Rd Construction
Annual Budget Review
Shuttle Runs in Mixed Traffic
Quarterly Meeting

Press

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Could Self-Driving Shuttles be Coming to Chamblee?

POSTED ON AUGUST 7, 2018

Written by
JIM JAQUISH

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Imagine tapping an app on your phone and just a few minutes later, a car shows up to take you wherever you want to go at an affordable price.

Oh right. You can already do that.

Now imagine that the vehicle pulling up to your curb has no driver. The city of Chamblee, along with several partners, is preparing for just that.

Chamblee is one of four cities across Georgia to win a grant from Georgia Tech's Smart Communities Challenge. Chamblee will study how shared, autonomous vehicles – think a self-driving Uber or Lyft – and other autonomous and connected technologies may shape the future of the North DeKalb County city.

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https://whatsnextatl.org/could-self-driving-shuttles-be-coming-to-chamblee/

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Initiative on Cities and Autonomous Vehicles About

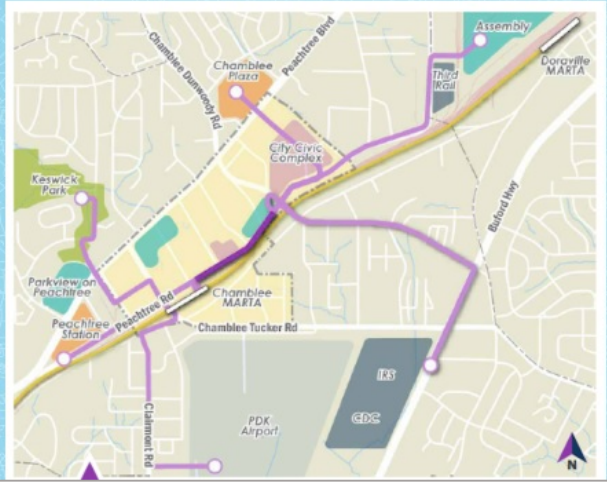
World / Americas / United States

Chamblee, US is preparing

Policy and Planning Priorities:

Land Use and Transit Planning, Pilot Zone Identification

In 2017, Chamblee, Ga. (pop: 28,000) began exploring the possibility of a shared autonomous vehicle pilot to provide first/last mile connections at the city's MARTA rail station. The $45,000 study is being conducted by Stantec, an engineering firm, whose Urban Studio is engaged in several AV projects throughout North America. A draft of the completed feasibility study, which involved community group discussions and an online survey was adopted by city council in March 2018, and proposes a number of possible driverless shuttle routes serving the city's main throughway of Peachtree Road, including employers such as the Center for Disease Control, Internal Revenue Service, and the Peachtree-Dekalb Airport. Key findings include an estimated operating cost of $12,000 to $14,000 per month per vehicle, some 70 percent less than conventional human-driven, full-size buses on the same routes.



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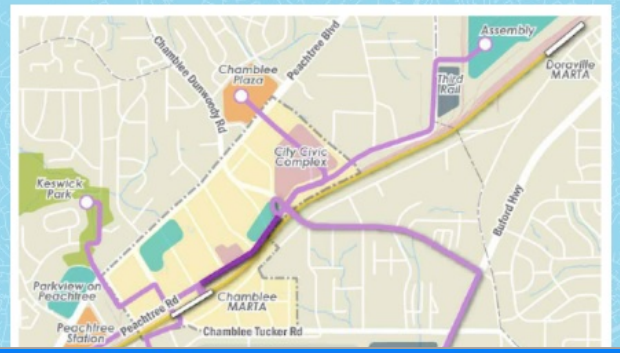

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Driverless shuttles could be coming to DeKalb County city

By: Steve Gehlbach

Updated: Mar 18, 2019 - 6:47 PM

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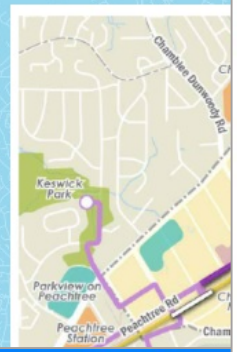

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Chamblee eyes launching autonomous vehicle shuttle routes (Video)

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Consulting firm Stantec last fall began a feasibility study of how Chamblee, a rapidly developing

Driverless shuttles could be coming to DeKalb County city

By: Steve Gehlbach

Updated: Mar 18, 2019 - 6:47 PM

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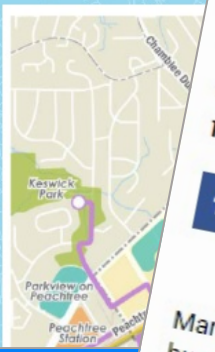

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GA: What would a self-driving shuttle on Peachtree Road look like?

Shuttles without a driver behind the wheel could be rolling onto a busy DeKalb County corridor.

J.D. CAPELOUTO MARCH 15, 2019

THE ATLANTA JOURNAL-CONSTITUTION

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March 15-- Mar. 15--Shuttles without a driver behind the wheel could be rolling onto a busy DeKalb County corridor.

At a meeting next Tuesday, Chamblee City Council is set to vote on a resolution to apply for a grant from the U.S. Department of Transportation that would fund a set of self-driving shuttles.

The city has looked into the possibility of autonomous shuttles, which would take passengers up and down Peachtree Road, since 2017.

"This whole idea of an autonomous shuttle for last-mile connectivity seemed intriguing," Chamblee Mayor Eric Clarkson said in an interview. "We could really be on the leading edge of this."

The federal grant can be up to $10 million; if Chamblee applies and is chosen, the city would provide $100,000 toward the pilot program. Clarkson said he expects the resolution to pass Tuesday.

DRIVERLESS SHUTTLES

Craig Lucie

ACTION NEWS

Press

3/24/2019

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DRIVERLESS SHUTTLES
Craig Lucie
ACTION NEWS

5. Challenges

1. Tempering community expectations
2. Engaging project partners
3. Identifying alternative funding sources

6. Project Next Steps

1. Project Open House April 16th – additional survey research and operations plan feedback
2. Operations Plan in process to be adopted May 2019
3. Late Summer/Fall Adoption of Best Practices Manual

THE AUTONOMOUS ENVIRONMENTS GROUP
Professor Ellen Dunham-Jones
PhD Research Assistant Zachary Lancaster

AV USER AUTONOMY

Urban Design Best Practices For Autonomous Transportation in Periurban Communities

In Cooperation With
City of Chamblee
Stantec

With Support From
Georgia Institute of Technology
Georgia Smart Communities Challenge

RESEARCH GOALS:

1. Help communities leverage AVs to reach their larger economic, environmental and mobility goals
    - *focus on users and SHARED mobility*
    - *help Chamblee build a mobility asset, not a “pilot”*
2. Advance understanding of design considerations to improve usage of AV shuttles
    - *compete for riders by enhancing the user experiences of getting to, waiting for, and riding on AV shuttles*
    - *establish a data plan for future user feedback*
3. Understand both the impacts of urban areas on AV shuttles and vice versa
    - establish means to benchmark the impact of Chamblee’s densification and urban improvements on local ridership and vice versa
4. **Produce a Best Practices Manual for User Experience on AV Shuttles**

PROPOSED BPs:

PREPARING FOR

GROWING SAV USERS & DESTINATIONS

- Zoning Reform to shift from auto-oriented to denser, walkable/bikable development
- Investment in trails, streetscaping, and a better quality public realm
- Incentives for private redevelopment of under-used properties and parking lots

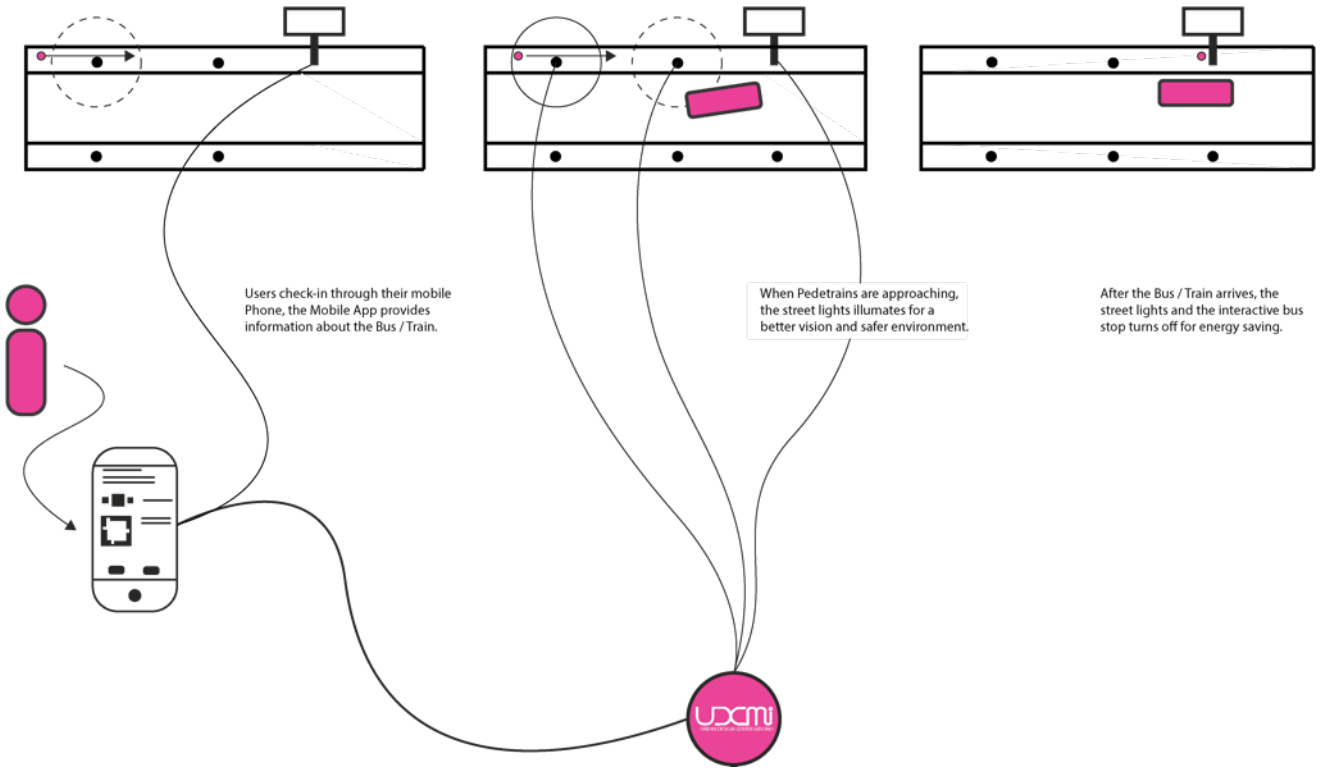
Chamblee's past and ongoing planning and redevelopment efforts exemplify how to lay the groundwork for change

PROPOSED BPs:

Getting To

CREATE SAFE, DIVERSE PLACES & NETWORKS

- Create networks connecting hubs, bus stops, and neighborhoods
- Improve routes to hubs and bus stops for safe and pleasant active transportation and diverse mobility modes
- Plan for diverse uses near hubs and bus stops of the right scale in the right place



Proposed connection of smart phone to smart street lights and bus stop lights to turn on and off as needed

PROPOSED BPs

Waiting For:

MAKE WAITING A PLEASURE FOR ALL

- Build Bus Stops as Community Infrastructure: info about community events, neighborhood-specific info, recycling, little libraries, pop-up retail opportunities, etc.

- Provide Digital Infrastructure: wifi, on-time bus info, device charging, interactive games, etc.

- Insure Accessibility and Safety for All

musical swingset in Montreal

possible integration of digital billboards for info, news, games

PROPOSED BPs:

Riding On

PEOPLE-CENTERED

- Focus on comfort for diverse users, including seating options for those who prefer isolation and those who prefer interaction
- Consider Attendant/Concierge serving multiple roles
- Collect data from users about their experience and preferences
- Use shuttle's "eyes on the street" to assist in community policing

as fleet grows there's no reason for one-size fits all. AVs come in all sizes and can be customized for local identity

DATA PLAN FOR FUTURE USER FEEDBACK

DRAFT:

- getting to the shuttle
  - Survey perception of safety, preferred routes, modes and reasons for ”getting to” the shuttle
  - Survey whether they would have driven to their destination without the shuttle
  - Request suggestions to improve user experience of “getting to” the shuttle
  - Benchmark urban changes: walkability, active frontages, growth in destinations, traffic counts
- waiting for the shuttle
  - Survey perception of safety, comfort, information for “waiting for” the shuttle
  - Request suggestions to improve the user experience of “waiting for” the shuttle
  - Test means to make waiting more social, more comfortable, more useful, more fun – and seek user responses
- riding on the shuttle
  - Survey perception of safety, convenience of stops, speed, and comfort of “riding on” the shuttle
  - Request suggestions to improve the user experience of “riding on” the shuttle
  - Test means to improve the user experience of “riding on”: attendant as tour guide, different seating arrangements, signage/text alerts with different social protocols
  - Psycho-analysis of rider posture

Background Research:

Analysis of 18 existing AV shuttle pilots:

- Avg 1.5 miles in length at $721M/mile
- Avg 7,500 riders/year, 9 passengers/vehicle
- 50% are on shared streets, 3 are on public streets, NONE are on non-fixed routes

Interviews of 11 Industry Experts

- Agree there's not enough data to interpret significant differences in approaches yet
- Split on shared or private AVs as dominant alternative
- Industry worried about inconsistent regulations
- Cities worried about equity, accessibility and liability
- **All agree that flexibility, scalability, and adaptability will provide better results than any one technology**

Survey of 6 potential users

- Most likely to use it to run errands and go to shops (not connect to MARTA)
- Most interested in Shelter and Wifi at stations, less in News, Advertising or Games
- Most think $1-2 is a fair price
- Most think 10-12 passengers per van is most comfortable size
- Most would prefer to ride in silence than socialize