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reach

FORT GILLEM

Lake City



MARTA Reach Cost Assessment

February 23, 2023

**Planning & Capital
Programs Committee**

MARTA Board of Directors

Agenda

1. Service Overview

2. Optimizing Service

- How can we best balance service levels and ridership?

3. Assessing Costs & Staffing Models

- How much does on-demand cost?

4. Putting it all together

- Recommendations for on-demand transit at MARTA
- Hand-off to NextGen Bus Project



MARTA Reach vehicle



Reach Background

Overview of the Reach service

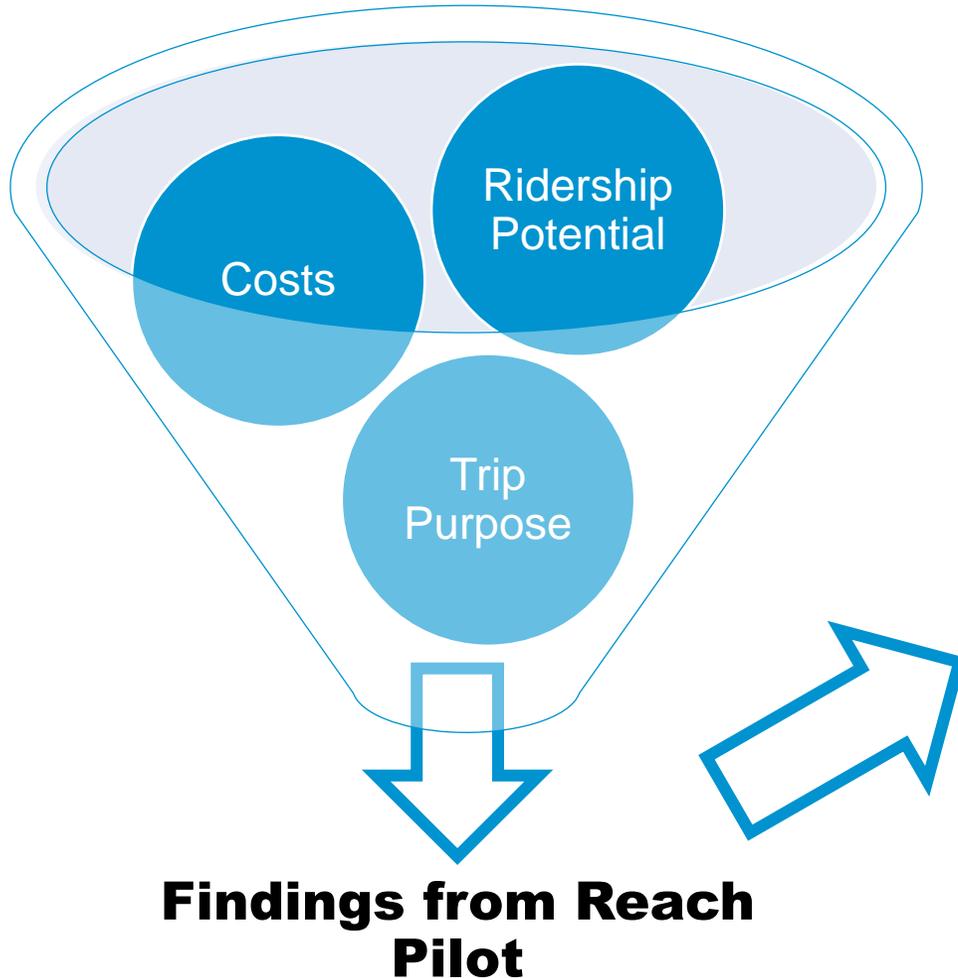
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Pilot Overview

- Shuttles connected “virtual stops” to nearby fixed-route hubs
 - All trips were required to start and end within the zone (unlike Uber/Lyft)
 - If the origin & final destination was within the zone, we would complete the trip directly
 - If the final destination was outside of the zone, we would connect to fixed route service to get to final destination
- Pilot operated **6:00 AM to 7:00 PM, Monday - Friday**
- Standard \$2.50 fare with transfers included, passes accepted
- Pilot service limited to four specific zones. Only trips within these zones were allowed

Contextualizing the Pilot



The findings of the **Reach** pilot are intended to be an input into the **Bus Network Redesign**.

Agencies with Microtransit

Local

- Ride Gwinnett (Future)
- Livable Buckhead (the Buc)
- Valdosta (On-Demand)
- Hall County (We Go)

National

- LA Metro
- King County Metro
- Utah Transit Authority (UTA)
- Metro St. Louis
- Dallas Area Rapid Transit (DART)
- CapMetro
- METRO (Houston, TX)
- **+MANY more**

Optimizing Service

How could we have delivered more efficient service, given the ridership we observed?

Optimization Methodology

1. We partnered with **3 private sector mobility on-demand technology providers** for this service optimization exercise.
2. We also worked with Georgia Tech to create a **baseline for the service optimization**.
3. We provided all 3 providers with ridership data (origins and destinations) from **August 31, 2022** (highest ridership day of the pilot).
4. Based on this data, each provider used their simulation engines to determine **1) vehicle requirements, 2) expected service impacts** (i.e., wait times, travel times, ride-sharing).

What's possible, with on-demand?

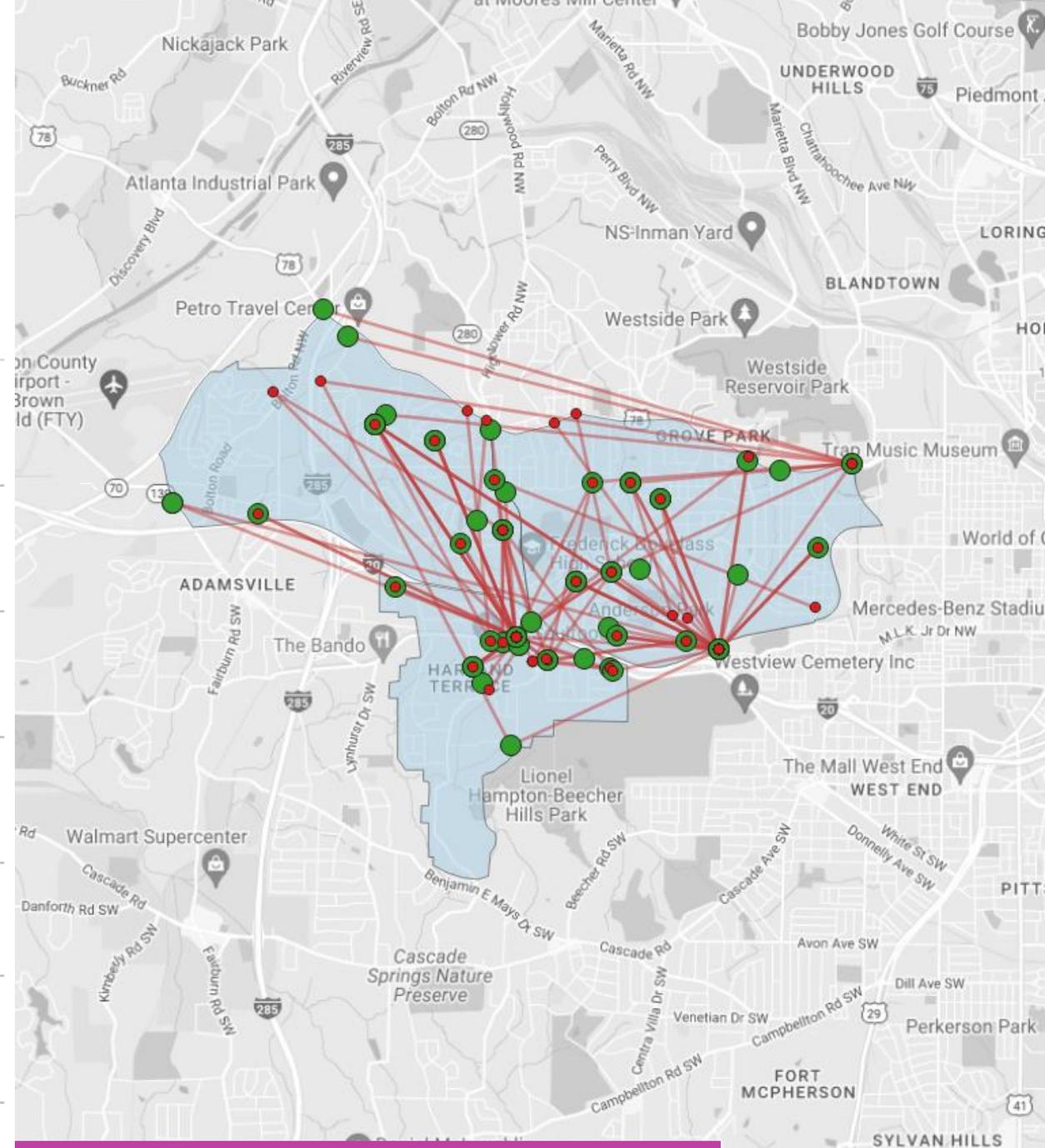
- The goal of this exercise was to explore what **might be possible**, given different models of on-demand transit available in the market.
- **Vendor 1:** Pre-booking, trip-snapping (encourages the sharing of trips by limiting drop-off time periods)
- **Vendor 2:** Flexible operations models
- **Vendor 3:** Has a focus on minimizing the number of dedicated vehicles and brokering trips to TNCs.

Vendor 1 Findings

Vendor 1 estimates being able to cover ridership seen in Reach pilot (in all zones) with 5 vehicles (compared to 16 in pilot service). Below are simulation results for West Atlanta zone.

Rides Served	100%	Consider additional vehicles above 100 riders/day
Sharing Rate	60%	Effective ride pooling
Passengers per vehicle hour	5	Efficient ride grouping
On-Demand Wait Time	10 – 15 mins	Quick and timely rides
Average On-Board Duration	8 mins	Comparable to direct
On-Time Performance	95%	Consistently Reliable. Expect higher OTP with prebooking enabled.

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Sample Demand Profile Used in West Atlanta Simulation

Vendor 2 Findings

Vendor 2 estimates being able to cover ridership seen in Reach pilot (in all zones) with 6-8 vehicles (compared to 16 in pilot service). Below are simulation results for W. Atlanta zone.

Rides Served	100%	Consider additional vehicles above 100 riders/day
Sharing Rate	15-20%	Moderate ride pooling
Passengers per vehicle hour	3	Moderate group riding
On-Demand Wait Time	7-9 mins	Quick and timely rides
Average On-Board Duration	6-8 mins	Comparable to direct
On-Time Performance	95%	Consistently Reliable.

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Sample Demand Profile Used in West Atlanta Simulation

Vendor 3 Findings

Vendor 3 estimates being able to cover ridership seen in Reach pilot (in all zones) with 2-3 vehicles (compared to 16 in pilot service). Below are simulation results for all Reach ridership.

Rides Served	79%	<i>Consider additional vehicles to increase served trips</i>
Sharing Rate	66%	<i>Effective ride pooling</i>
Passenger per vehicle hour	4.8	<i>Efficient ride grouping</i>
On-Demand Wait Time	19 – 22 mins	<i>Additional vehicles may decrease wait time to within advertised waiting period</i>
Average On-Board Duration	10 mins	<i>Comparable to direct</i>
On-Time Performance	85%	<i>OTP could be improve with an additional vehicle allocated</i>

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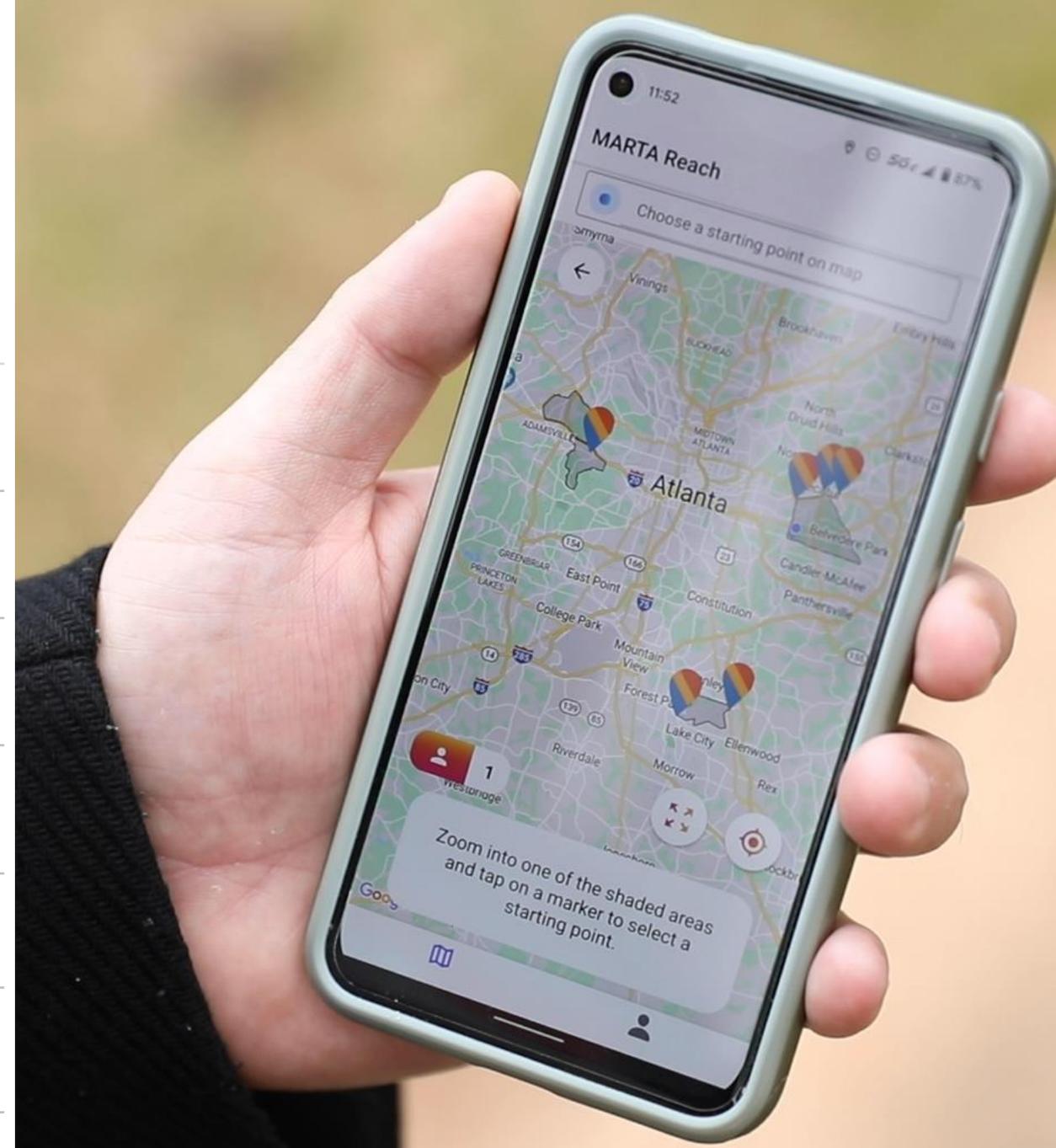
Sample Demand Profile Used in West Atlanta Simulation

Georgia Tech Baseline

MARTA worked with Georgia Tech to establish a baseline for how to optimize the Reach service. The Georgia Tech team estimates that the Reach service can be served with 4-5 vehicles in total.

Rides Served	100%	<i>Consider additional vehicles to increase served trips</i>
Sharing Rate	45%	<i>Effective ride pooling</i>
Passenger per vehicle hour	3-4	<i>Efficient ride grouping</i>
On-Demand Wait Time	15 mins	<i>Additional vehicles may decrease wait time to within advertised waiting period</i>
Average On-Board Duration	5 mins	<i>Comparable to direct</i>
On-Time Performance	85%	<i>OTP could be improve with an additional vehicle allocated</i>

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Sample Demand Profile Used in West Atlanta Simulation

Optimization Take-a-ways

1. The pilot service over allocated resources given observed ridership levels.
2. The advertised wait-times (15-20 minutes) are achievable with **far fewer resources** (and therefore lower costs).
3. Potential to **expand service** offering (e.g., days & hours of service) while maintaining **similar costs** to pilot service.
- 4. Service is scalable** – increases in ridership and number of zones can be met with increases in vehicles.
5. Impact of changes to fixed route bus service were not tested during the Reach pilot.
6. There is opportunity to further optimize the service by allowing pre-booking and commingling ADA and non-ADA trips.



Costs & Staffing Models

Exploring the cost impacts of on-demand transit

Reminder: Staffing Assessment

- To understand the potential future of on-demand service at MARTA, we evaluated two potential future scenarios.

Scenario A
***Fully Contractor
Supported Model***

Vendor provides vehicles
and is responsible all
operations and
maintenance.

Scenario B
***Fully MARTA
Supported Model***

MARTA provides vehicles
and is responsible for all
operations and
maintenance.

Costs Analysis Assumptions

- Given that decisions regarding the future of on-demand service are dependent on the outcomes of the NextGen Bus Project, several assumptions were incorporated into this cost analysis:
 - Ridership levels were assumed to be the same as the final day of the pilot (August 31, 2022)
 - Service hours were assumed to be the same as the pilot service (Monday – Friday, 6:00am – 7:00pm)
 - One estimate was collected assuming broader service hours (Monday – Sunday, 4:00am – 1:00am)
- The costs on the next page are for the service ran during the pilot. Any future on-demand service at MARTA would have different costs depending on the number of zones and vehicles.

Costs (Year 1)

Vendor	Scenario A ¹ <i>Contractor Supported Model</i>		Scenario B ¹ <i>MARTA Supported Model</i>	
	Software	Turnkey	Software	MARTA O&M
Vendor 1	Included	\$1.41M	\$94,000	\$1M (Operations) \$1M (vehicles/maintenance)
	Total: \$1.4M		Total: \$2.1M	
Vendor 2	Included	\$1.1M – \$1.9M	\$78,000	\$1M (Operations) \$1M (vehicles/maintenance)
	Total: ~1.5M		Total: \$2.1M	
Vendor 3	--	--	\$77,000	\$1M (Operations) \$1M (vehicles/maintenance)
	Total: N/A		Total: \$2.1M	

The costs are for the service ran during the pilot. Any future on-demand service at MARTA would have different costs depending on the number of zones and vehicles.

Sample Costs (Year 2 & 3)

Vendor	Scenario A ¹ <i>Contractor Supported Model</i>		Scenario B ¹ <i>MARTA Supported Model</i>	
	Software	Turnkey	Software	MARTA O&M
Vendor 1	<i>Included</i>	\$1.45M (Y2)	\$64k (Y2)	\$1M <i>(Operations)</i>
		\$1.50M (Y3)	\$67k (Y3)	\$300k <i>(Maintenance)</i>
		<i>Total: \$1.45M (Y2), \$1.50M (Y3)</i>	<i>Total: \$1.36M (Y2), \$1.37M (Y3)</i>	
Vendor 2				
Vendor 3	--	--	\$67k (Y2)	\$1M <i>(Operations)</i>
				\$300k <i>(maintenance)</i>
		<i>Total: N/A</i>	<i>Total: \$1.36M (Y2)</i>	

Putting it all together

Developing a vision for the
future of on-demand
transit at MARTA



On-demand can work at MARTA

First/Last
Mile

Community
Circulation

- However, **on-demand is not a one-size fits all.**
- To work as a first/last mile solution on-demand must be a part of the broader public transportation network:
 - The service must connect to other transit services that are **highly frequent and reliable.**
- On-demand can also work for local trips given the community demographics and needs:
 - For this the service should connect to **key community points of interest** (e.g., schools, hospitals, grocery stores, major employers, or other key POIs)
 - The service should also connect to “trip drivers” or key centers of trip generations, like **housing centers** (esp. those with high % of car-free households) or **areas with high job density**

Recommendations for the NextGen Bus Project

- 1. Evaluate the potential use-cases for on-demand:**
 - Deliver service in the places where there is limited service available today
 - Address underperforming fixed bus route routes with on-demand transit
 - Provide a solution to the first-mile/last-mile problem
 - Create community circulators to connect potential riders to POIs
- 2. In each location determine which use-case we're addressing**
 - Do the zone demographics, land-use, overlapping fixed route transit, and other factors support the use-case?
- 3. Ensure that on-demand is a good fit operationally**
 - Do the expected passengers per vehicle hour work with on-demand (i.e., 4-8 p/vh)?

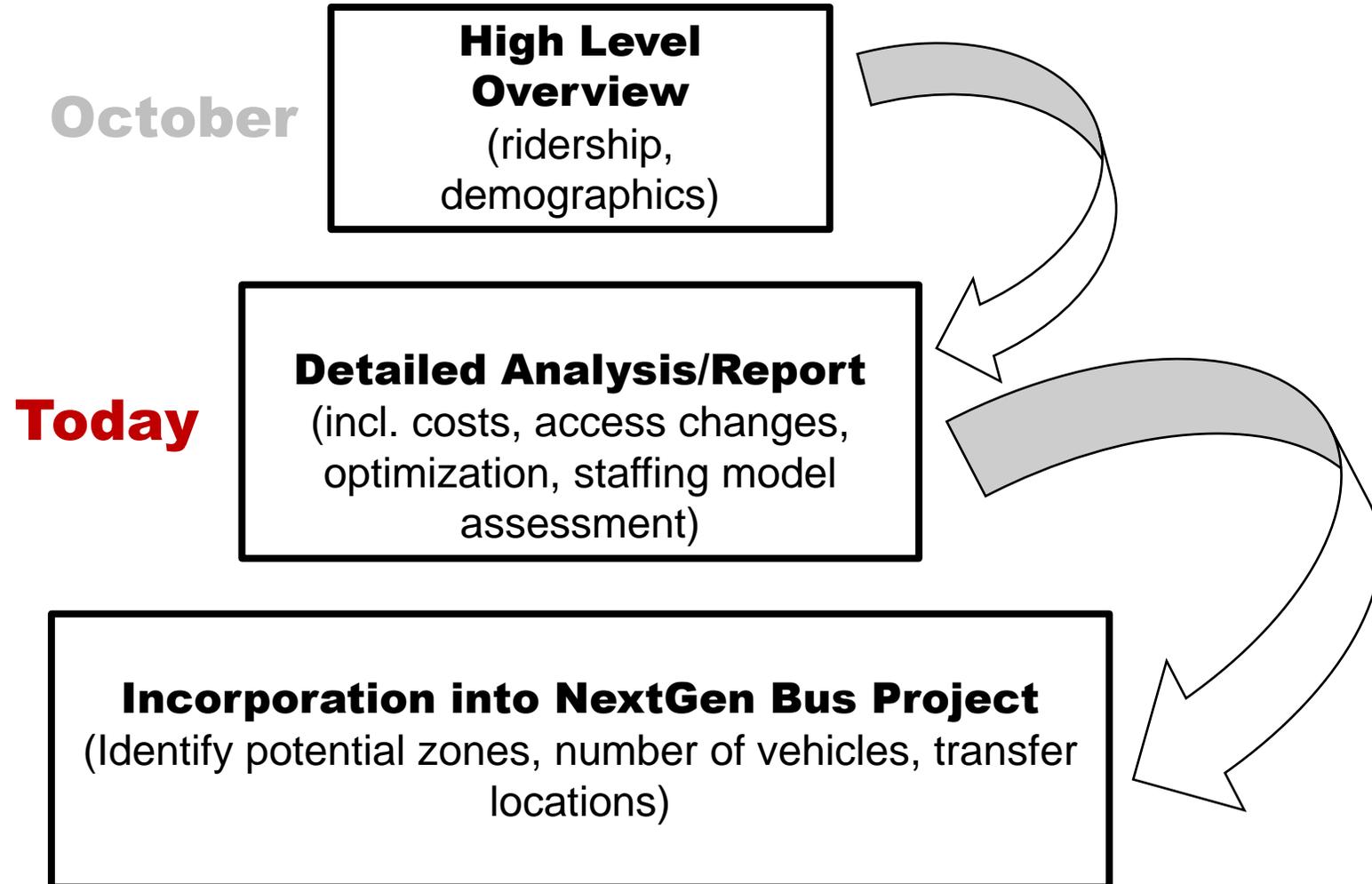
Recommendations for the NextGen Bus Project (cont.)

- 4. Plan cost assumptions based on a MARTA-operated model**
 - Incorporate cost assumptions of MARTA operated model into NextGen Bus Project
 - Develop an RFP for on-demand software services
 - Begin developing an operational plan for new mode of MARTA Bus Operations

Recommendations for MARTA Operations

- **Start commingling ADA and non-ADA trips on on-demand service**
 - There is potential to improve paratransit operations by commingling ADA and non-ADA trips (allowing paratransit patrons to access same day booking)

Reach Next Steps





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Thank you!

More information at
www.itsmarta.com/reach.aspx

Email us at
reach@itsmarta.com

Anthony Thomas
Program Manager, Customer
Experience Innovation
athomas5@itsmarta.com