APPENDIX A STEERING COMMITTEE MEETING SUMMARIES

Steering Committee #1 – Thursday January 23, 2025

Meeting Summary

Attendees:	Chad Ward, Collier County Pollution Control Manager
Dusty Hansen, Collier MPO	Tonia Selmeski, Collier County Community Planning & Resiliency
Omar Deleon, Collier County PTNE	Wally Blain, Benesch
Yousi Cardesco, Collier County PTNE	Juan Suarez, Benesch

1. Introductions
   - Members made introductions and provided a description of their roles and responsibilities.
   - A broad range of experience and interests are represented on the steering committee that will provide a comprehensive assessment of the analysis and recommendations for the ZEV Transition Plan.
2. Review of Scope and Schedule (See attached Schedule)
   - Benesch briefly provided an overview of the scope with an overview of current activities and activities to be completed.
   - Regarding the coordination with the local electricity providers, Tonia mentioned that she could provided contact information for the Lee County Electric CoOp (LCEC).
3. State of Zero Emission Vehicles
   - Benesch provided an overview of the alternative fuel types that were assessed for the ZEV study, including Battery Electric, Hydrogen Fuel Cell, Diesel Electric Hybrid, and Compressed Natural Gas, noting the current conditions and limitations of each.
   - Information regarding recent trends by transit agencies according to the APTA database were presented that showed roughly 50% of transit fleet vehicles are fueled by alternative fuels.
   - The national trends for alternative fuel adoption were similar to those for Florida transit agencies. While the percentages varied, CNG is the most commonly used alternative fuel. Battery Electric is a small percentage of the alternative fuels used, but a larger percentage in Florida than nationwide.
   - Yousi asked if there was any information available regarding the experience of peer agencies in using hybrid electric vehicles. CAT has hybrid vehicles in 2010, but didn't find the savings to be as great as expected. Additional information was provided later during the Peer Agency item regarding this question.
   - Chad asked if emissions would be a consideration in making a recommendation for the ZEV study As a Zero Emission Transition Plan, this should be a consideration along with the cost for implementing.
   - Juan shared that the AFLEET tool provides general estimates for costs as well as emissions resulting from the fleet characteristics. Benesch will incorporate additional details during the upcoming steering committee meeting to discuss the feasibility analysis.

- Dusty mentioned that the State of ZEV chapter included a high-level summary of emissions for each fuel type in a comparative format.

4. Current Local, State, Regional initiatives
   - Bensch provided an overview of the local, state, and regional initiatives that are currently in place. A review of these initiatives has provided some key takeaways and considerations for the study team to consider.
   - Available funding options were also discussed. Chad asked if the federal grant programs had a local match requirement.
   - Omar indicated that there is usually a 20% local match requirement for federal grants. However, in Florida there is a toll credit program that can be used to offset some or all of the local match requirements. Specific details of grant funding would need to be worked out with FDOT for specific funding requests.
5. Peer Agency Interviews
   - Benesch provided a summary of the selected peer agencies and how they compare with CAT.
   - Yousi asked in JTA (Jacksonville) was considered as a peer agency since they have discussed and considered switching to electric in the near future.
   - Benesch will enquire about adding them for the peer interviews. This would be a good consideration since not all of the selected peer agencies have responded to the initial request.
   - Results from the PSTA interview were shared. Key takeaways included the need to have a diverse mix of fuels for Florida communities given the need to address storm recovery efforts. Flooding and water intrusion were strong considerations for avoiding in-road induction charging.
   - CNG is seen as a more reliable option based on fewer maintenance and operational challenges. However, it is a higher cost alternative.
   - An initiative previously led by the former Fleet Director evaluated conversion to CNG. Estimates at that time were $800,000 for construction of a refueling station. Recent information suggest that Waste Management may have a CNG fueling station in Collier County. Benesch will look into the current status of this and identify if this is an opportunity for consideration during the feasibility analysis.
6. Discussion: What does this study need to include to be successful?
   - Previous discussion during the meeting identified two topics to consider as the study progresses.
     i. Analysis of the cost and financial feasibility. It will be important to have a realistic timeline for implementation.
     ii. As a Zero Emissions Study, consideration of emission reduction should be included and not merely cost-savings for identifying a recommended alternative
7. Upcoming Meetings (dates for discussion)
   - The group agreed that February 13th would work for scheduling the next meeting.
   - There are known conflicts for March 13th. Benesch will send an meeting poll out to identify a tentative time for the third meeting.

Zero Emissions Transition Plan

Steering Committee #2 Agenda – Thursday February 13, 2025

Meeting Summary

Attendees:	Chad Ward, Collier County Pollution Control Manager
Dusty Hansen, Collier MPO	Tonia Selmeski, Collier County Community Planning & Resiliency
Omar Deleon, Collier County PTNE	Wally Blain, Benesch
Yousi Cardesco, Collier County PTNE	Juan Suarez, Benesch
Alex Showalter, Collier County PTNE	

Agenda

8. Peer Agency Interview Updates
9. Outreach to Electricity Providers
10. Feasibility Review
11. Financial Analysis
12. Discussion:
13. Upcoming Meetings

Summary

- Benesch provided a status update on the peer agency interviews. The response from ECAT indicated that receipt of vehicles was delayed and they have not been able to implement any alternative fuels. The interview with LeeTran was completed on February 7th. Much of the feedback received was focused on the mileage limitations observed with first generation propane buses. Experience with hybrid buses did not have the same limitations, but these were best suited for long distance express routes.
- An interview with JTA is scheduled based on direction previously provided by the Steering Committee. An additional interview has also been set up with the City of Hallandale Beach.
- Initial contact was made with both FPL and LCEC for evaluating current electrical service and an assessment of needed upgrades to support a conversion to battery electric buses.
- An overview of the assumptions and considerations that fed into the feasibility analysis was presented. In describing the results of the feasibility analysis, Benesch provided an overview of the fixed route service blocks that would be feasible based on the assumptions. An assessment was completed based on current expectations, especially in regards to battery life, as well as an extrapolated evaluation based on improved battery conditions under assumed future conditions starting 10-years in the future.
- Based on the assumptions and assessment of fuel technologies, four scenarios were developed to identify potential fleet mix options using the various alternative fuels.
- Yousi asked about the impacts to maintenance if multiple fuel types were involved as well as the need to maintain multiple additional spare vehicles for each fuel source. Any change or addition of new fuel sources will require additional training and equipment to support fleet operations. Adding multiple fuel sources complicates the need for additional training and infrastructure and could result in higher costs.
- Omar mentioned that in conversations with Collier County Fleet, that availability of bio-diesel fuels s a primary concern.
- The team reviewed the recommendations for each scenario which include a mix of fueled vehicles for the fixed route fleet, demand response, and support vehicles.

- Based on the mix of fuels from each scenario, anticipated capital costs, annual emissions, and lifecycle emissions were presented.
- Alex asked about the assumptions supporting the feasibility results for the battery electric buses. The analysis used an assumption 420KwH for the total battery energy of a 35' bus. CAT currently has a spec sheet for a GILLIG bus on order that has 686KwH of energy based on a 7-battery pack. Alex asked if changing this assumption would affect the number of potentially feasible service blocks.
- Benesch will evaluate the assumptions used and provide feedback regarding impacts to the feasibility analysis and results from the scenario recommendations.
- The team also reviewed the initial results from the financial analysis which looked at initial capital costs and 10-year operating costs.
- When considering a preference for transitioning the fleet to zero emissions, several topics for consideration were raised which included.
    - Added costs for multiple fuel types
    - Need to carrying additional spare vehicles as backups for each fuel type.
    - Consideration of vehicle availability during storm emergencies or other times when power may be out for an extended period.
- The group did feel that converting some of the support vehicles to battery/electric could be a good test case for easing into a vehicle transition.
- Chad noted that much of the feedback from the peer interviews seemed to focus on the negative impacts to maintenance. Juan agreed that much of the feedback was influenced by maintenance representatives and demonstrated the somewhat experimental transition that some agencies had experienced. Feedback from non-maintenance staff were more favorable. PSTA for example mentioned that their experience suggested the vehicle KwH for battery electric seemed to be conservative and they were finding additional battery charge remaining than expected. This could be indicative of the Florida geography and operating conditions compared to other areas.
- The team agreed to schedule for the next steering committee meeting for March 7th.

Zero Emissions Transition Plan

Steering Committee #3 Agenda – Thursday March 7, 2025

Meeting Summary

Attendees:	Chad Ward, Collier County Pollution Control Manager
Dusty Hansen, Collier MPO	Tonia Selmeski, Collier County Community Planning & Resiliency
Omar Deleon, Collier County PTNE	Wally Blain, Benesch
Yousi Cardesco, Collier County PTNE	Juan Suarez, Benesch
Alex Showalter, Collier County PTNE	

Agenda

1. JTA Peer Experience
2. 10-Year Implementation Plan
3. Questions and Group Discussion
4. Next Steps

Summary

- Benesch provided a status update on the final peer agency interview that was conducted. The interview with JTA was held following the previous Steering Committee Meeting. JTA has had a positive experience using CNG and is moving forward with plans to deploy 14 autonomous electric shuttles later this year. JTA's decision to begin with CNG in 2013 was to support Bus Rapid Transit service.
- Like other agencies, JTA maintains a fleet of diesel buses to maintain operational resiliency.
- JTA has experienced challenges with underperforming EV ranges and facility space for electric charging equipment. Their experience to transition towards zero emissions is an evolving process aligned with their vehicle replacement schedule and funding opportunities.
- Benesch provided an overview of the 10-year implementation plan based on the selected fueling plan. CAT has chosen to use the current electric bus that is in production as a test pilot to evaluate the feasibility and long-term viability of transitioning to alternative fuel sources.
    - Transition of the fixed route fleet is being approached through a phased implementation.
    - Demand response vehicle will continue to be a fuel mix comprised of gasoline and diesel fuels.
    - CAT is planning for the replacement of two support vans to electric SUVs.
- By 2034, the transition plan would move the fixed route fleet to 68% diesel, 19% hybrid battery electric, 7% gasoline, and 6% battery electric. Currently the fleet is 93% diesel.
- Phase 1 of the implementation would extend through 2029. During the phase, the battery electric bus that is on order would be delivered and two overnight chargers would be purchased. After evaluation of this new vehicle, and assessment of the buses operating performance and maintenance needs could be conducted prior to proceeding with a second purchase. Later in the meeting, Omar explained that charging of the battery electric bus and two support SUVs would need to be put on a rotation which would allow all three vehicles to be charged using the two chargers.
- Phase 2 would extend through 2032 when CAT would purchase a second battery electric bus. The next 5-year major update to the Transit Development Plan will be due in 2031. At that time, the ZEV Transition Plan should be re-evaluated based on then, current range and vehicle performance expectations. A consolidated vehicle replacement plan would be updated based on the TDP analysis and needs.

- Phase 3 as currently defined would include replacing six existing buses that reach their end of useful life with hybrid electric buses. As a new technology component is added to the fleet mix, operating performance and maintenance needs would again need to be evaluated.
- As part of the facility assessment, CAT already has preliminary plans for the conversion of two spaces dedicated to electric buses. Based on space limitations, on-site incorporation of CNG or bio-diesel isn't feasible at this time due to the need for fuel storage and on-site refueling.
- As new fuel technologies are introduced, maintenance staff will need to be trained. CAT desires to maintain the existing workforce and provide the necessary training. Immediate implementation of a battery electric vehicle requires dependence on the vehicle manufacturer for warranty work and support.
- In response to the proposed transition plan, Yousi appreciated and supported the slow implementation. She noted that thinking ahead and preparing for future infrastructure needs is necessary for budgeting and preparing grant funding requests. She also noted that developing partnerships, like JTA did, plays a big part in reaching a successful outcome.
- Omar indicated that conversation has continued with FPL in regards to electrification and needs at the Operations/Maintenance Facility. Ultimately a new transformer would be needed with the addition of battery electric buses. The intent is to identify the maximum future need in order to right-size the transformer.
- Chad asked if the transition plan would include emissions level expectations for the recommended approach in addition to the cost information. Benesch is wrapping up the documentation and will incorporate the same level of information for the recommended transition as was used for the comparison of feasibility scenarios.
- The schedule of next steps was discussed. The draft transition plan will be submitted to MPO, CAT, and the Steering Committee for review. A final draft for review by the Public Transit Advisory Committee, Technical Advisory Committee, and Citizens Advisory Committee is due on March 12th.
- Comments by the Steering Committee can be provided by March 21st in order to be included in the information that will be presented to the MPO Board on April 11th. Final action on the transition plan will be made by the Board of County Commissioners at their April 22nd meeting.

APPENDIX B PEER AGENCY INTERVIEW NOTES

Name: Christopher Cochran and Jacob Labutka Organization: PSTA

Interview date and time: 1/14/2025 1:00 PM

1. Please give us an overview of the fuel technologies and fleet mix that you currently employ.

The oldest buses are diesel, mostly will be phased out. Newly ordered trolleys are diesels. Most buses are hybrid electric (Gillig). Incrementally increasing the size of the electric fleet (Gillig and formerly BYG)

2. Why did you choose the mix of technologies that you chose?

Partially motivated by reducing emissions, practical to fund things through grants. Wanted to expand electric fleet with the hope of decreasing maintenance costs. Moving in the direction of a diverse fleet (hybrid and electric), this is important in times of natural disaster. Battery works well in warmer climates.

3. How long have you been operating each technology?

Hybrids- around 2009 and 2010. Electrics- around 2016 and 2017.

4. Are the fuel technologies that you employ tied to a specific type of service? Or conversely, are there any services for which you would not use these alternative fuel vehicles?

Not necessarily tied to a specific service. Electric buses can handle approximately 70% of service blocks. We would not deploy electrics on express routes to Tampa. The hybrids pretty much go anywhere. Some newer buses (electric) cannot clear the obsolete terminals.

5. How did you convince your decision makers to move forward with this technology?

We received $600k from the BP oil spill to build charging infrastructure. We demonstrate to decision makers that we continue to be innovative. We bought the first couple alt fuel buses with our own funds, demonstrating that we can successfully use external funds for these vehicles.

6. Overall, what has been your experience with these technologies?

From a user perspective: We have had minimal issues with hybrids, given the increased fuel efficiencies. With EV's, we are satisfied with the range. 270 miles range for some of them. Our longer routes usually come back with about 15% left. We are looking to deploy on-route chargers. We have had some issues with chargers, not performing to expectations. We are looking at plug in charging instead of inductive charging, it is very complicated and impractical. Add battery capacity instead of inductive charging.

Have you had sufficient vendor support or have there been implementation challenges? (ie: warranty of parts, on-site support, cost over-runs for implementation, etc).

Issues with BYD buses, sent one back due to battery pack going through flooding.

7. Are you getting the expected and/or promised travel range per charge (if applicable)?

Yes. See question 6, given flat conditions and warn weather.

8. If you had to start over, what would you do differently? Has your chosen mix of the technologies been beneficial or would you change the mix of technologies?

There were issues with BYD buses. We developed a statewide template for procuring electric buses. Our current fuel mix is good, it is not practical to expand infrastructure to include additional fuel types.

9. Do you see any advantage to doing a transition by starting with hybrid or is it better to go all in with a ZEB full transition?

Driving habits of the driver really affect the performance of the battery electric, and hybrid to a lesser extent. It matters especially more on limited range battery electrics.

10. What facility improvements were required to implement the technology?

Training maintenance staff (including additional certifications), adding chargers in depot, coordinating with utility provider for electric capacity, especially the latter. We have all 200kwh ChargePoint chargers (5x 45kwh boxes per unit). Several power stations were added onsite by utility provider. In the future, we will convert unused induction charging into plug in charging stations, done with ChargePoint and Duke.

11. What operational constraints has your agency run into?

The main issue is range. We have not overcome this issue completely, but the vast majority of our blocks can accommodate electric. Block schedules can vary greatly (3 to 12 hours).

12. What training was required for operators? Maintenance staff?

Operators were trained on the slight differences on the buses. Maintenance staff were trained on how to work on a completely different vehicle.

13. Have you experienced any cost savings or conducted a return on investment study to assess the financial impacts resulting from planned or implemented fleet changes? (What specifically have you seen as the result and is there information you could share with us).

We have saved some money in terms of maintenance.

14. Are there any additional thoughts or perspectives you have now related to the use of zero emission propulsion that wish you knew sooner?

Would not have gone down the path of the inductive charging. Leadership needs to be on-board with implementing the alt fuel vehicles. Hybrid vehicles are a good place to start.

Name: Julie Parker, Matt Kinninger Organization: LeeTran

Interview date and time: 2/7/2025; 9:00 AM

1. Please give us an overview of the fuel technologies and fleet mix that you currently employ.

Fixed route buses: 8 hybrids, getting up in age, close to being phased out; 2 EV buses on order – will likely receive in 2026; some aging propane vehicles that are reaching their life expectancy.

2. Why did you choose the mix of technologies that you chose?

For hybrids, they were able to get grant funding for them, and they were advertised as more fuel efficient (mpg), but that turned out to not be true. Cost for propane was because fuel was very cheap and they were able to get rebates for propane fuel, extra funding that was able to be used for alternate fuels vehicles.

3. How long have you been operating each technology?

Since 2015, 10 years for propane; 2013 was the hybrid buses; EV will be 2026.

4. Are the fuel technologies that you employ tied to a specific type of service? Or conversely, are there any services for which you would not use these alternative fuel vehicles?

The first generation of propane was limited on miles, but have greatly improved since. It does take time and money to bring these in for fuel and the propane had to be brought in midway through the day. There were occasionally heating issues that would make vehicles stall in hot weather for propane. They did not discriminate hybrid routes, as long as fueling was not an issue. These vehicles are made for long routes with less stop-and-go ability, so they were better for express type services.

5. How did you convince your decision makers to move forward with this technology?

The decision was about overall cost, the savings from government funding led to the purchases of propane and hybrid vehicles. For electric buses, the decision-makers were looking for clean energy to use in the downtown area, so they led the way.

6. Overall, what has been your experience with these technologies?

There has been a need for extra training. The range has for these propane and hybrid vehicles have created a level of uncertainty within the agency. The propane vehicles must be towed if they run out of fuel. If it is left at a dealer, there needs to be fuel brought to and available on site. Propane vehicles get plugged up easier, so there are new fuel pumps being brought in around every 80k miles. Lately, it has been very lengthy to get parts in for vehicles that need maintenance. Waiting two weeks for a fuel pump is frustrating to them. For hybrids, they get 1 extra mpg, so they don't think it is worth the extra costs. Also, only certified technicians are able to work on hybrid bus tops, so they would have to send the vehicle into a dealer if there was damage.

7. Are you getting the expected and/or promised travel range per charge (if applicable)?

Not meeting the expectation for hybrid, propane is not as bad but is a little bit. They think gasoline for vans is best and diesel for buses.

Extra Q) are vendors improving in technology enough to supplement these issues?

They have competition to do the best they can, but LeeTran does not know about the details of that.

8. If you had to start over, what would you do differently? Has your chosen mix of the technologies been beneficial or would you change the mix of technologies?

9. Do you see any advantage to doing a transition by starting with hybrid or is it better to go all in with a ZEB full transition?

10. What facility improvements were required to implement the technology?

For propane, they had to put in a tank on the property to provide daily fueling; they had to install a drive-thru type of system because the propane is temperature sensitive. There is also safety gear required to do it, but the tank itself is the same for gas and diesel.

11. What operational constraints has your agency run into?

12. What training was required for operators? Maintenance staff?

Propane – a crash course for fueling; same for typical gasoline and diesel training for fueling.

13. Have you experienced any cost savings or conducted a return on investment study to assess the financial impacts resulting from planned or implemented fleet changes? (What specifically have you seen as the result and is there information you could share with us).

It costs a lot to implement these buses and keep them maintained. Propane engines are hard to get, so they've had times where buses have had to sit for months while new engines are on backorder.

14. Are there any additional thoughts or perspectives you have now related to the use of zero emission propulsion that wish you knew sooner?

You need to have a really good backup plan; breakdowns are big costs since towing is a cost that quickly adds up.

Name: Alexander Traversa Organization: JTA

Interview date and time: 2:00pm 02/14/25

1. Please give us an overview of the fuel technologies and fleet mix that you currently employ.

197 vehicles in FR, predominately CNG. This started in 2013/2014. This was done for BRT. P3 with clean energy for MPO funded CNG fueling station. This was chosen for stability and fuel costs. At the time CNG buses were not costly compared to diesel. This was highly successful. 70% CNG right now. The remaining 35 to 40 are diesel (hybrid and low sulfur diesel). 2017 LNE grant for two battery electric buses. Not so successful with our service, with long-distance blocks. Our entire fleet is Gillig. 175-mile range for BEB, with the best drivers. Diesel fleet is there for resiliency. CNG station can accommodate 150 buses.

JTA will launch an automated vehicle system in June. 14 retrofitted autonomous electric vans, for shuttle, circulator and MOD service. JTA has considered propane for demand response fleet, as it is successful in other agencies. We have had hydrogen conversations as well.

2. Why did you choose the mix of technologies that you chose?

(Answered in question 1).

3. How long have you been operating each technology?

(Answered in question 1).

4. Are the fuel technologies that you employ tied to a specific type of service? Or conversely, are there any services for which you would not use these alternative fuel vehicles?

(Answered in question 1).

5. How did you convince your decision makers to move forward with this technology?

In regard to EVs and Hydrogen, hands on training with maintenance and ops convinces them to get on board. CNG switch was easy (operates similar to diesel). EVs are logistically more complicated to implement. Overall, building confidence in the technology. CNG has developed to a point where JTA is comfortable, but not quite yet with electric or hydrogen.

6. Overall, what has been your experience with these technologies?

(Answered previously).

Have you had sufficient vendor support or have there been implementation challenges? (ie: warranty of parts, on-site support, cost over-runs for implementation, etc).

Gillig has been supportive with the CNG, and their entire Gillig fleet (benefit with one manufacture). Early issues with Gillig Gen 1 EV. Many issues with chargers, though. Most are DC level 3 charge points)

7. Are you getting the expected and/or promised travel range per charge (if applicable)?

They are getting range less than advertised (300 vs 150/175) (due to strenuous operation like A/C). The optimal use of electric (stop and go) is not quite easy to pull of in Jacksonville).

8. If you had to start over, what would you do differently? Has your chosen mix of the technologies been beneficial or would you change the mix of technologies?

Do not really need to change it major. Have heard horror stories about replacing whole fleet with alternate fuels. Policy ramifications as well. But it would be nice for more options (more American manufacturers), because of Buy America restrictions.

9. Do you see any advantage to doing a transition by starting with hybrid or is it better to go all in with a ZEB full transition?

10. What facility improvements were required to implement the technology?

Transformers required for EV charging, needed to find space for chargers as well, as their yard was full.

11. What operational constraints has your agency run into?

CNG was painless in this respect. But we are considering adapting operations for other fuel types. May need to expand/add ops and maintenance facilities to accommodate growth and new fuel types.

12. What training was required for operators? Maintenance staff?

Manufacturers provide support for this. CNG and EV Gilligs needed training for maintenance and needed new equipment for elevated maintenance work.

13. Have you experienced any cost savings or conducted a return on investment study to assess the financial impacts resulting from planned or implemented fleet changes? (What specifically have you seen as the result and is there information you could share with us).

Not formally. Looked at emissions implications, JTA is credited for emission reductions, which was high because of RNG.

14. Are there any additional thoughts or perspectives you have now related to the use of zero emission propulsion that wish you knew sooner?

RNG. Would be nice see if RNG can be integrated with CNG, while waiting for EV and Hydrogen technology to advance. This would be relatively easy to implement. It is important to understand grants, what they are for, and why they exist. Consider community health considerations but strongly consider economic aspects under this new administration. JTA's advantage with their ZEB plan did not call out a specific fuel type, but just a retirement plan. Mixed fuel fleet can have safety and resiliency benefits. Agencies doing it now have funding hurdles to clear.

Given the useful life of buses, focused on dates of vehicle replacement to meet zero emissions by a certain date. It was a light plan for the low no grant only. Funding was less competitive for CNG than EV for that grant. Treat a ZEB plan as a living document. 5339, formula grants, low/no is TBD for 2025. Look into P3 route for fueling infrastructure, public private partnerships. p

APPENDIX C FEASIBILITY ANALYSIS RESULTS

This appendix to Task 6 for ZEV feasibility details the results generated by each of the models used for the analysis

C.1 Model Results

The following section presents the detailed results of the block feasibility model. The first set of tables presents the results from the battery electric bus model for fixed route vehicle blocks split by vehicle length. This is then followed by results for other fuel alternative vehicle types. The results are then presented in the same order for demand response vehicles, and equipment vehicles.

C.1.1 Fixed Route Block Results

The following presents results from the model for all fixed route block analysis.

C.1.1.1 Current Electric Bus Feasibility

Tables C-1 through C-9 show the model results and demonstrate their feasibility by day of week. Results can be interpreted as follows:

- **Feasible**: bus can feasibly operate the entire length of a block in strenuous conditions without tapping into reserve energy even after the potential amount of battery degradation in that given model year.
- **Maybe**: The bus may be able to operate but could potentially run into occasional issues where the reserve energy may need to be used. This indicator can also suggest the feasibility of a block if in-route or off-route charging were implemented.
- **Unfeasible**: The bus will likely fail to operate the entire length of a block unless major operational changes are made such as splitting a block, adjusting scheduled operations, reducing number of trips, or making the alignment shorter.

TABLE C-1: 30-FOOT WEEKDAY SERVICE MODEL FOR BATTERY ELECTRIC BUSES (2025)

Block	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
2/20	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
3	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
6	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
7	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
8	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
9	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
10	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
11	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
12	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
15/21	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
16	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
17	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
19	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
22	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible

Table C-2: 30-Foot Saturday Service Model for Battery Electric Buses (2025)

Block	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
2	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
3	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
6	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
7	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
8	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
9	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
10	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
11	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
12	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
15	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
16	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
17	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible

Table C-3: 30-Foot Sunday Service Model for Battery Electric Buses (2025)

Block	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
2	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible
3	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
6	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
7	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
8	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
9	Maybe	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
10	Maybe	Maybe	Maybe	Maybe	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
11	Feasible	Maybe	Maybe	Maybe	Maybe	Maybe	Maybe	Maybe	Unfeasible	Unfeasible	Unfeasible
12	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible

Table C-4: 35-Foot Weekday Service Model for Battery Electric Buses (2025)

Block	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
5	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
4	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
13	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible
18	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible

Table C-5: 35-Foot Saturday Service Model for Battery Electric Buses (2025)

Block	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
5	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
4	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
13	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
18	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible

Table C-6: 35-Foot Sunday Service Model for Battery Electric Buses (2025)

Block	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
5	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible
4	Feasible	Maybe	Maybe	Maybe	Maybe	Maybe	Maybe	Maybe	Unfeasible	Unfeasible	Unfeasible
13	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible

Table C-7: 40-Foot Weekday Service Model for Battery Electric Buses (2025)

Block	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
1	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible

Table C-8: 40-Foot Saturday Service Model for Battery Electric Buses (2025)

Block	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
1	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible

Table C-9: 40-Foot Sunday Service Model for Battery Electric Buses (2025)

Block	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
1	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible

C.1.1.2 Future Electric Bus Feasibility

Figures C-1 through C-9 demonstrate how many blocks will be feasible up to the tenth year from purchase for bus purchase years 2025 and 2035.

Figure C-1: 30-Foot Weekday Blocks 10-Year Feasibility (2035)

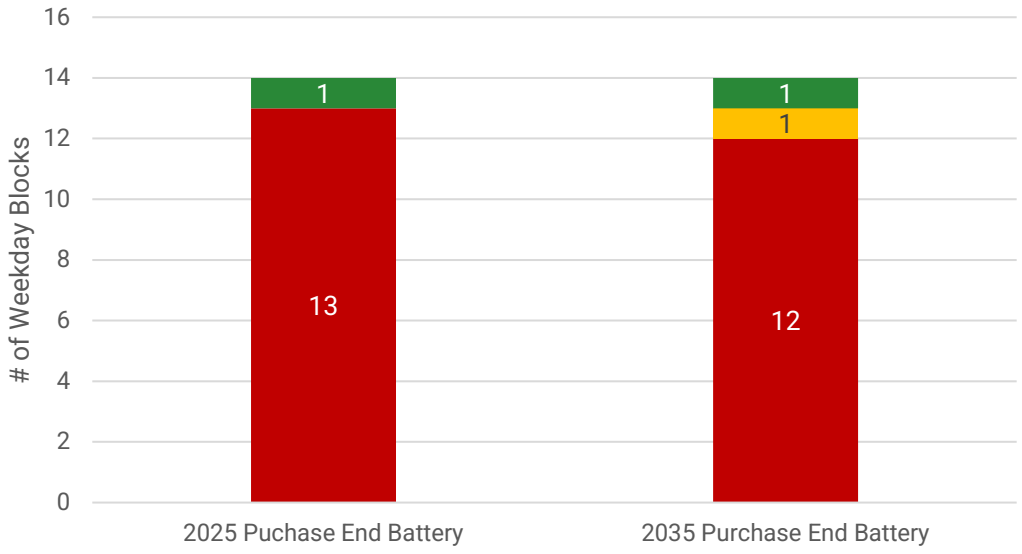


FIGURE C-2: 30-FOOT SATURDAY BLOCKS 10-YEAR FEASIBILITY (2035)

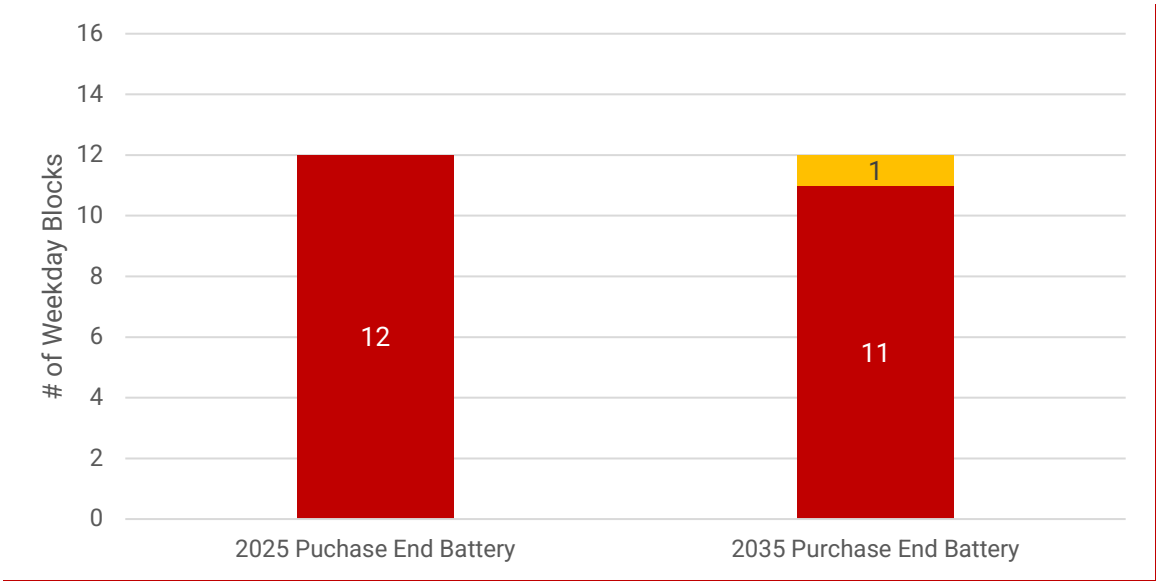


FIGURE C-3: 30-FOOT SUNDAY BLOCKS 10-YEAR FEASIBILITY (2035)

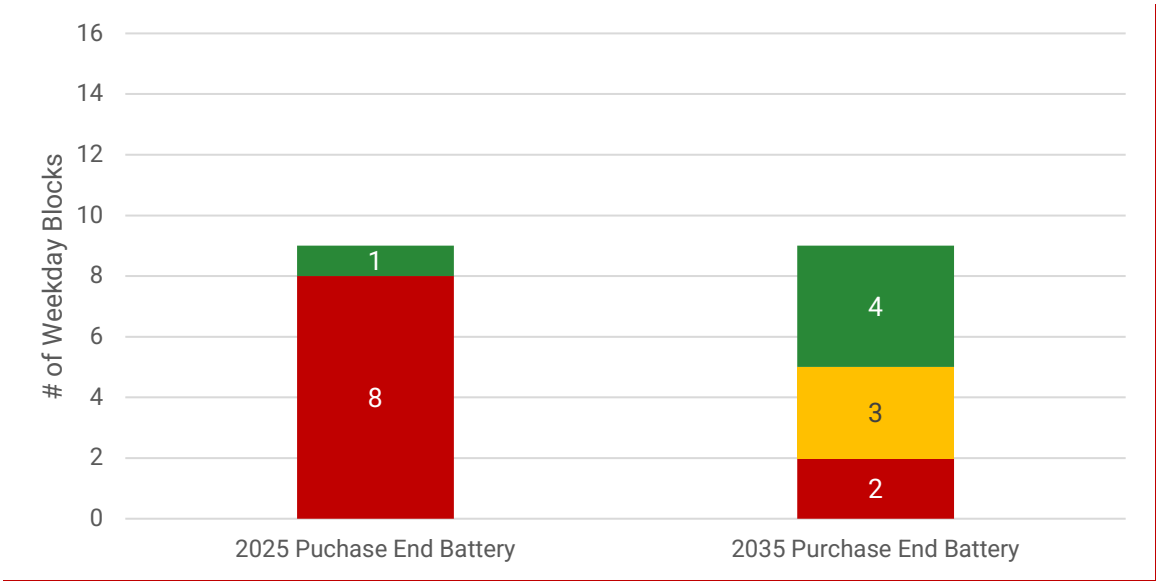


FIGURE C-4: 35-FOOT WEEKDAY BLOCKS 10-YEAR FEASIBILITY (2035)

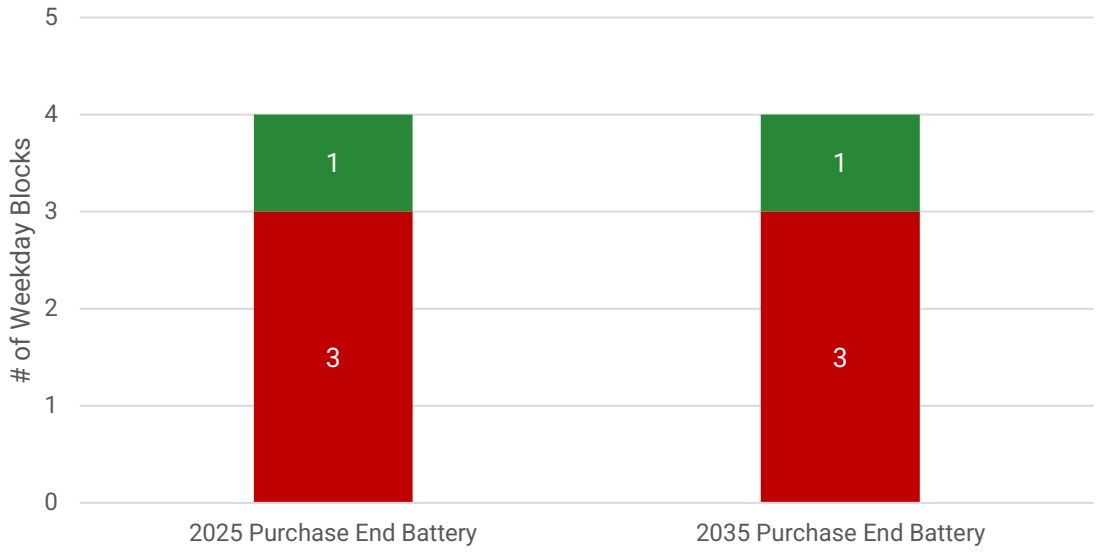


FIGURE C-5: 35-FOOT SATURDAY BLOCKS 10-YEAR FEASIBILITY (2035)

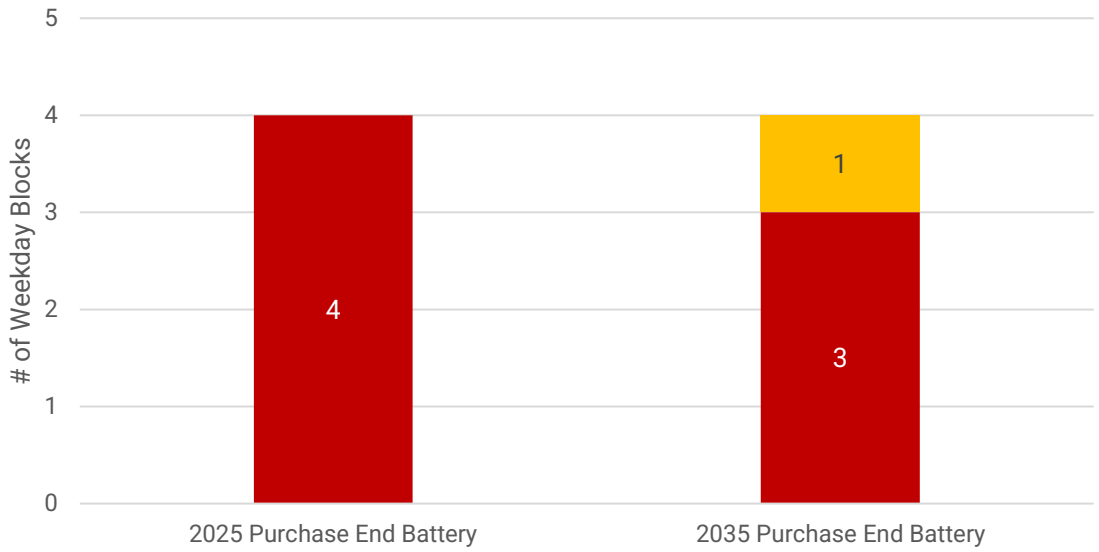


FIGURE C-6: 35-FOOT SUNDAY BLOCKS 10-YEAR FEASIBILITY (2035)

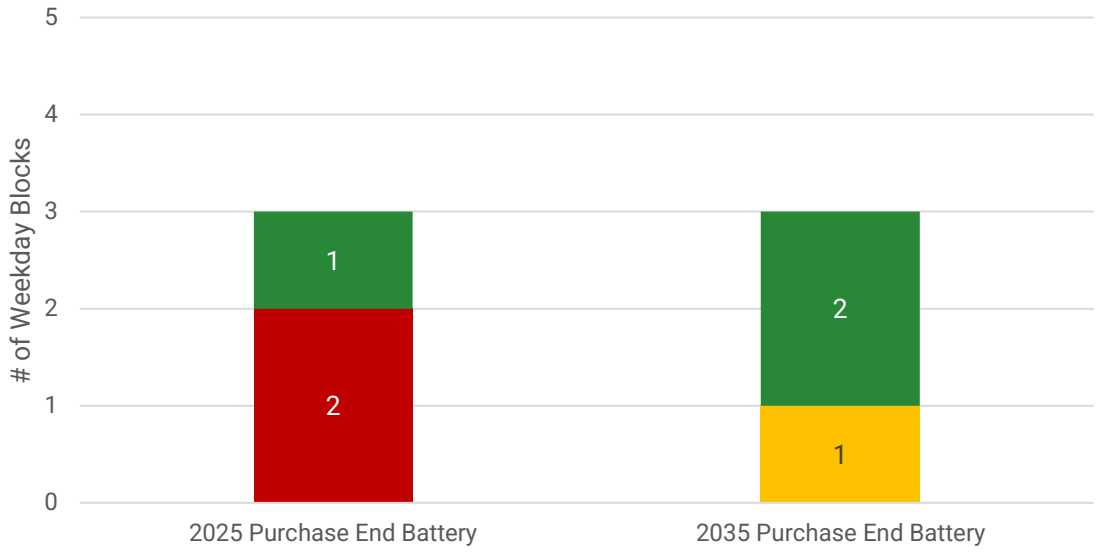


FIGURE C-7: 40-FOOT WEEKDAY BLOCKS 10-YEAR FEASIBILITY (2035)

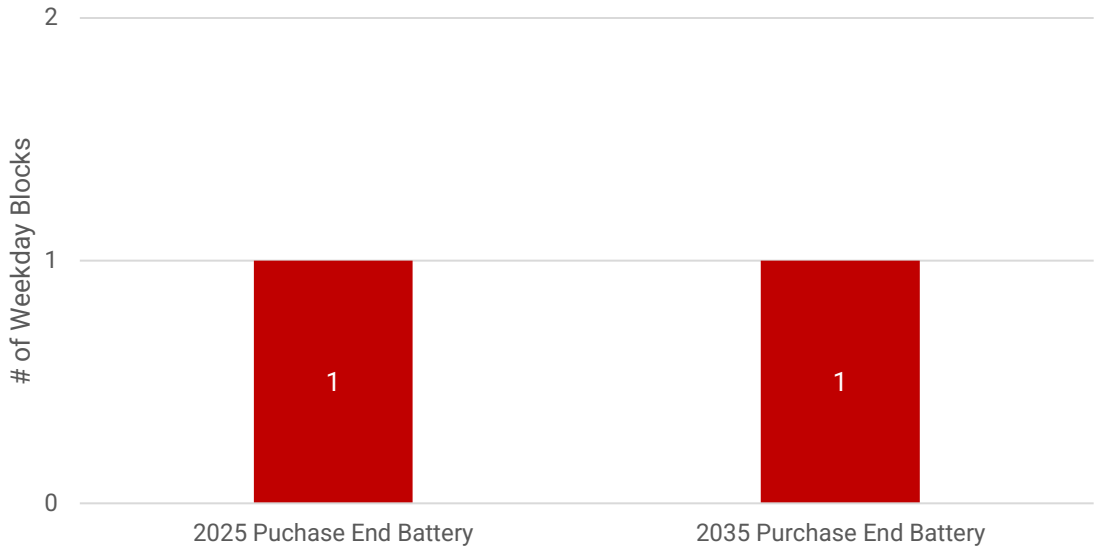


FIGURE C-8: 40-FOOT SATURDAY BLOCKS 10-YEAR FEASIBILITY (2035)

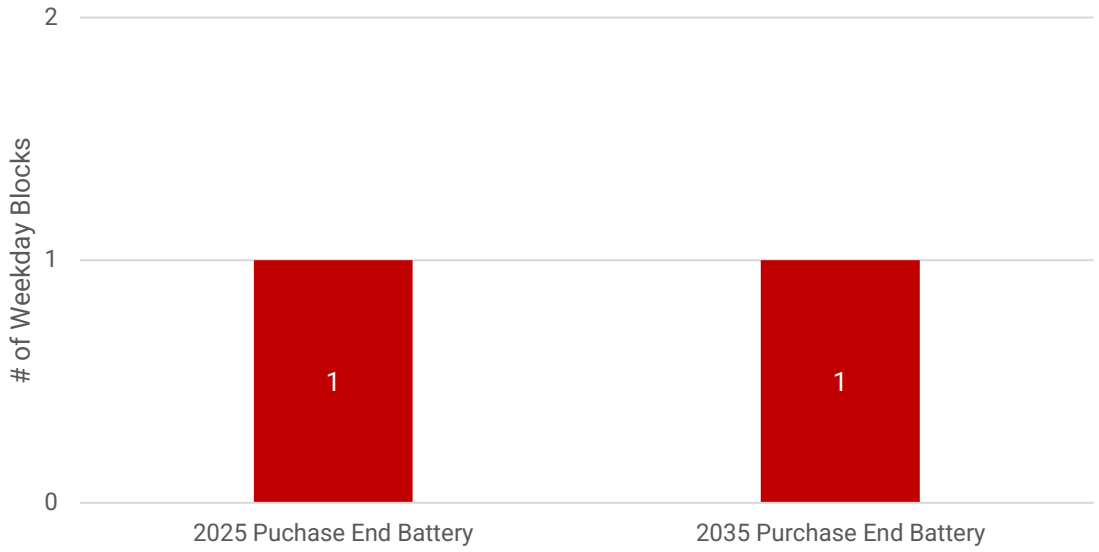
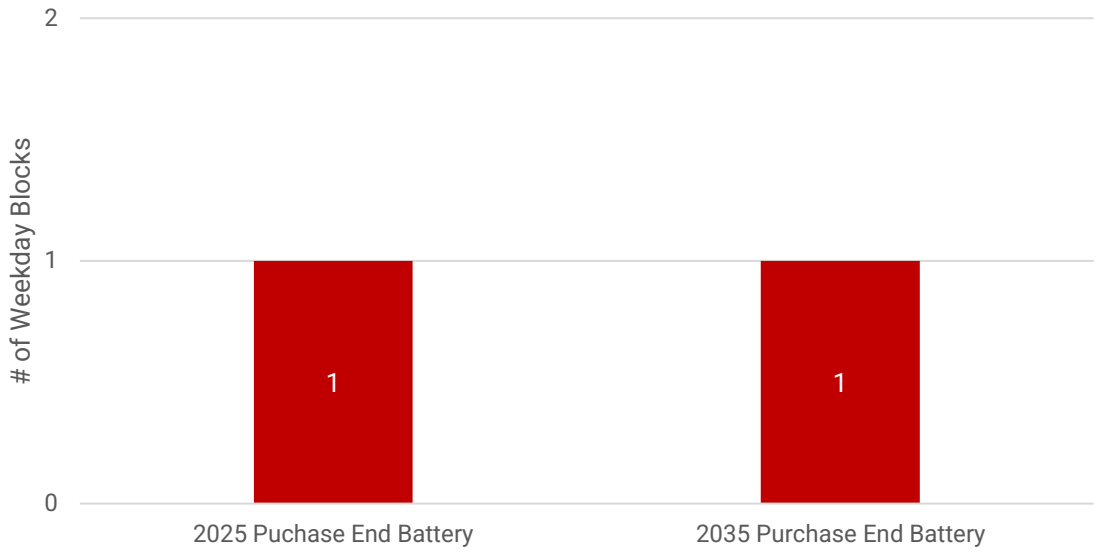


FIGURE C-9: 40-FOOT SUNDAY BLOCKS 10-YEAR FEASIBILITY (2035)



C.1.1.3 Electric Re-Charging Scenario

Results from this analysis are documented were extracted from excel for each block configuration analyzed.

Battery Electric Bus Recharge Calulator

Block Profile	7	*ID*
Vehicle Size	30	*30, 35, 40 feet*
Starting Charge 2035 (Strenous Mileage Yr. 10)	98	
Starting Charge 2040 (Strenous Mileage Yr. 10)	117	
Starting Charge 2045 (Strenous Mileage Yr. 10)	141	
Charger Type	Fast	
Recharge Assumption (Miles per Minute of Recharge)	1	
Recharge Location	Governmenrt Center	

Round Trip	**Trip Length before Layover**	**Layover Time in minutes at End of Trip**	**Miles**	**Miles Left**	**Yr 1 Assessment**	**Miles**	**Miles Left**	**Yr 5 Assessment**	**Miles**	**Miles Left**	**Yr 10 Assessment**
Initial Deadhead	0	0	98	98	Can Make This Trip	117	117	Can Make This Trip	141	141	Can Make This Trip
First Round Trip	6.3	7	98	98	Can Make This Trip	117	117	Can Make This Trip	141	141	Can Make This Trip
Second Round Trip	28.3	7	98	76.7	Can Make This Trip	117	95.7	Can Make This Trip	141	119.7	Can Make This Trip
Third Round Trip	28.3	7	76.7	55.4	Can Make This Trip	95.7	74.4	Can Make This Trip	119.7	98.4	Can Make This Trip
Fourth Round Trip	28.3	12	55.4	39.1	Can Make This Trip	74.4	58.1	Can Make This Trip	98.4	82.1	Can Make This Trip
Fifth Round Trip	28.3	12	39.1	22.8	Can Make This Trip	58.1	41.8	Can Make This Trip	82.1	65.8	Can Make This Trip
Sixth Round Trip	28.3	12	22.8	6.5	Can Make This Trip	41.8	25.5	Can Make This Trip	65.8	49.5	Can Make This Trip
Seventh Round Trip	28.3	12	6.5	-9.8	Running on Reserve Energy	25.5	9.2	Can Make This Trip	49.5	33.2	Can Make This Trip
Eighth Round Trip	28.3	12	-9.8	-26.1	Cannot Complete Trip	9.2	-7.1	Running on Reserve Energy	33.2	16.9	Can Make This Trip
Ninth Round Trip	28.3	12	-26.1	-42.4	Cannot Complete Trip	-7.1	-23.4	Cannot Complete Trip	16.9	0.6	Can Make This Trip
Tenth Round Trip	28.3	12	-42.4	-58.7	Cannot Complete Trip	-23.4	-39.7	Cannot Complete Trip	0.6	-15.7	Cannot Complete Trip
Eleventh Round Trip	22	0	-58.7	-80.7	Cannot Complete Trip	-39.7	-61.7	Cannot Complete Trip	-15.7	-37.7	Cannot Complete Trip
End Deadhead	0	0	-80.7	-80.7	Cannot Complete Trip	-61.7	-61.7	Cannot Complete Trip	-37.7	-37.7	Cannot Complete Trip
Twelfth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Thirteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Fourteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Fifteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Sixteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Seventeenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Nineteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Twentieth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
					Trip Not Needed			Trip Not Needed			Trip Not Needed
					Trip Not Needed			Trip Not Needed			Trip Not Needed
					Trip Not Needed			Trip Not Needed			Trip Not Needed

Battery Electric Bus Recharge Calulator

Block Profile	7	*ID*
Vehicle Size	30	*30, 35, 40 feet*
Starting Charge (Strenous Mileage Yr. 1)	121	
Starting Charge (Strenous Mileage Yr. 5)	109	
Starting Charge (Strenous Mileage Yr. 10)	98	
Charger Type	Fast	
Recharge Assumption (Miles per Minute of Recharge)	1	
Recharge Location	Governmenrt Center	

Round Trip	**Trip Length before Layover**	**Layover Time in minutes at End of Trip**	**Miles**	**Miles Left**	**Yr 1 Assessment**	**Miles**	**Miles Left**	**Yr 5 Assessment**	**Miles**	**Miles Left**	**Yr 10 Assessment**
Initial Deadhead	0	0	121	121	Can Make This Trip	109	109	Can Make This Trip	98	98	Can Make This Trip
First Round Trip	6.3	7	121	121	Can Make This Trip	109	109	Can Make This Trip	98	98	Can Make This Trip
Second Round Trip	28.3	7	121	99.7	Can Make This Trip	109	87.7	Can Make This Trip	98	76.7	Can Make This Trip
Third Round Trip	28.3	7	99.7	78.4	Can Make This Trip	87.7	66.4	Can Make This Trip	76.7	55.4	Can Make This Trip
Fourth Round Trip	28.3	12	78.4	62.1	Can Make This Trip	66.4	50.1	Can Make This Trip	55.4	39.1	Can Make This Trip
Fifth Round Trip	28.3	12	62.1	45.8	Can Make This Trip	50.1	33.8	Can Make This Trip	39.1	22.8	Can Make This Trip
Sixth Round Trip	28.3	12	45.8	29.5	Can Make This Trip	33.8	17.5	Can Make This Trip	22.8	6.5	Can Make This Trip
Seventh Round Trip	28.3	12	29.5	13.2	Can Make This Trip	17.5	1.2	Can Make This Trip	6.5	-9.8	Running on Reserve Energy
Eighth Round Trip	28.3	12	13.2	-3.1	Running on Reserve Energy	1.2	-15.1	Cannot Complete Trip	-9.8	-26.1	Cannot Complete Trip
Ninth Round Trip	28.3	12	-3.1	-19.4	Cannot Complete Trip	-15.1	-31.4	Cannot Complete Trip	-26.1	-42.4	Cannot Complete Trip
Tenth Round Trip	28.3	12	-19.4	-35.7	Cannot Complete Trip	-31.4	-47.7	Cannot Complete Trip	-42.4	-58.7	Cannot Complete Trip
Eleventh Round Trip	22	0	-35.7	-57.7	Cannot Complete Trip	-47.7	-69.7	Cannot Complete Trip	-58.7	-80.7	Cannot Complete Trip
End Deadhead	0	0	-57.7	-57.7	Cannot Complete Trip	-69.7	-69.7	Cannot Complete Trip	-80.7	-80.7	Cannot Complete Trip
Twelfth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Thirteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Fourteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Fifteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Sixteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Seventeenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Nineteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Twentieth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
					Trip Not Needed			Trip Not Needed			Trip Not Needed
					Trip Not Needed			Trip Not Needed			Trip Not Needed
					Trip Not Needed			Trip Not Needed			Trip Not Needed

Battery Electric Bus Recharge Calulator

Block Profile	18	*ID*
Vehicle Size	35	*30, 35, 40 feet*
Starting Charge 2035 (Strenous Mileage Yr. 10)	119	
Starting Charge 2040 (Strenous Mileage Yr. 10)	143	
Starting Charge 2045 (Strenous Mileage Yr. 10)	171	
Charger Type	Fast	
Recharge Assumption (Miles per Minute of Recharge)	1	
Recharge Location	Immokalee	

Round Trip	**Trip Length before Layover**	**Layover Time in minutes at End of Trip**	**Miles**	**Miles Left**	**Yr 1 Assessment**	**Miles**	**Miles Left**	**Yr 5 Assessment**	**Miles**	**Miles Left**	**Yr 10 Assessment**
Initial Deadhead	35.6	0	119	83.4	Can Make This Trip	143	107.4	Can Make This Trip	171	135.4	Can Make This Trip
First Round Trip	22.2	12	83.4	73.2	Can Make This Trip	107.4	97.2	Can Make This Trip	135.4	125.2	Can Make This Trip
Second Round Trip	22.2	12	73.2	63	Can Make This Trip	97.2	87	Can Make This Trip	125.2	115	Can Make This Trip
Third Round Trip	22.2	12	63	52.8	Can Make This Trip	87	76.8	Can Make This Trip	115	104.8	Can Make This Trip
Fourth Round Trip	22.2	12	52.8	42.6	Can Make This Trip	76.8	66.6	Can Make This Trip	104.8	94.6	Can Make This Trip
Fifth Round Trip	22.2	12	42.6	32.4	Can Make This Trip	66.6	56.4	Can Make This Trip	94.6	84.4	Can Make This Trip
Sixth Round Trip	22.2	12	32.4	22.2	Can Make This Trip	56.4	46.2	Can Make This Trip	84.4	74.2	Can Make This Trip
Seventh Round Trip	22.2	12	22.2	12	Can Make This Trip	46.2	36	Can Make This Trip	74.2	64	Can Make This Trip
Eighth Round Trip	22.2	0	12	-10.2	Cannot Complete Trip	36	13.8	Can Make This Trip	64	41.8	Can Make This Trip
End Deadhead	35.6	0	-10.2	-45.8	Cannot Complete Trip	13.8	-21.8	Cannot Complete Trip	41.8	6.2	Can Make This Trip
Tenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Eleventh Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Twelfth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Thirteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Fourteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Fifteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Sixteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Seventeenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Nineteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Twentieth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
					Trip Not Needed			Trip Not Needed			Trip Not Needed
					Trip Not Needed			Trip Not Needed			Trip Not Needed
					Trip Not Needed			Trip Not Needed			Trip Not Needed
					Trip Not Needed			Trip Not Needed			Trip Not Needed

Battery Electric Bus Recharge Calulator

Block Profile	18	*ID*
Vehicle Size	35	*30, 35, 40 feet*
Starting Charge (Strenous Mileage Yr. 1)	148	
Starting Charge (Strenous Mileage Yr. 5)	133	
Starting Charge (Strenous Mileage Yr. 10)	119	
Charger Type	Fast	
Recharge Assumption (Miles per Minute of Recharge)	1	
Recharge Location	Immokalee	

Round Trip	**Trip Length before Layover**	**Layover Time in minutes at End of Trip**	**Miles**	**Miles Left**	**Yr 1 Assessment**	**Miles**	**Miles Left**	**Yr 5 Assessment**	**Miles**	**Miles Left**	**Yr 10 Assessment**
Initial Deadhead	35.6	0	148	112.4	Can Make This Trip	133	97.4	Can Make This Trip	119	83.4	Can Make This Trip
First Round Trip	22.2	12	112.4	102.2	Can Make This Trip	97.4	87.2	Can Make This Trip	83.4	73.2	Can Make This Trip
Second Round Trip	22.2	12	102.2	92	Can Make This Trip	87.2	77	Can Make This Trip	73.2	63	Can Make This Trip
Third Round Trip	22.2	12	92	81.8	Can Make This Trip	77	66.8	Can Make This Trip	63	52.8	Can Make This Trip
Fourth Round Trip	22.2	12	81.8	71.6	Can Make This Trip	66.8	56.6	Can Make This Trip	52.8	42.6	Can Make This Trip
Fifth Round Trip	22.2	12	71.6	61.4	Can Make This Trip	56.6	46.4	Can Make This Trip	42.6	32.4	Can Make This Trip
Sixth Round Trip	22.2	12	61.4	51.2	Can Make This Trip	46.4	36.2	Can Make This Trip	32.4	22.2	Can Make This Trip
Seventh Round Trip	22.2	12	51.2	41	Can Make This Trip	36.2	26	Can Make This Trip	22.2	12	Can Make This Trip
Eighth Round Trip	22.2	0	41	18.8	Can Make This Trip	26	3.8	Can Make This Trip	12	-10.2	Cannot Complete Trip
End Deadhead	35.6	0	18.8	-16.8	Cannot Complete Trip	3.8	-31.8	Cannot Complete Trip	-10.2	-45.8	Cannot Complete Trip
Tenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Eleventh Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Twelfth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Thirteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Fourteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Fifteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Sixteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Seventeenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Nineteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Twentieth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
					Trip Not Needed			Trip Not Needed			Trip Not Needed
					Trip Not Needed			Trip Not Needed			Trip Not Needed
					Trip Not Needed			Trip Not Needed			Trip Not Needed
					Trip Not Needed			Trip Not Needed			Trip Not Needed

Battery Electric Bus Recharge Calulator

Block Profile	16	*ID*
Vehicle Size	30	*30, 35, 40 feet*
Starting Charge 2035 (Strenous Mileage Yr. 10)	98	
Starting Charge 2040 (Strenous Mileage Yr. 10)	117	
Starting Charge 2045 (Strenous Mileage Yr. 10)	141	
Charger Type	Fast	
Recharge Assumption (Miles per Minute of Recharge)	1	
Recharge Location	Immokalee	

Round Trip	**Trip Length before Layover**	**Layover Time in minutes at End of Trip**	**Miles**	**Miles Left**	**Yr 1 Assessment**	**Miles**	**Miles Left**	**Yr 5 Assessment**	**Miles**	**Miles Left**	**Yr 10 Assessment**
Initial Deadhead	37.2	0	98	60.8	Can Make This Trip	117	79.8	Can Make This Trip	141	103.8	Can Make This Trip
First Round Trip	3	80	60.8	98	Can Make This Trip	79.8	117	Can Make This Trip	103.8	141	Can Make This Trip
Second Round Trip	22.2	12	98	87.8	Can Make This Trip	117	106.8	Can Make This Trip	141	130.8	Can Make This Trip
Third Round Trip	22.2	12	87.8	77.6	Can Make This Trip	106.8	96.6	Can Make This Trip	130.8	120.6	Can Make This Trip
Fourth Round Trip	22.2	12	77.6	67.4	Can Make This Trip	96.6	86.4	Can Make This Trip	120.6	110.4	Can Make This Trip
Fifth Round Trip	22.2	12	67.4	57.2	Can Make This Trip	86.4	76.2	Can Make This Trip	110.4	100.2	Can Make This Trip
Sixth Round Trip	22.2	12	57.2	47	Can Make This Trip	76.2	66	Can Make This Trip	100.2	90	Can Make This Trip
Seventh Round Trip	22.2	12	47	36.8	Can Make This Trip	66	55.8	Can Make This Trip	90	79.8	Can Make This Trip
Eighth Round Trip	22.2	12	36.8	26.6	Can Make This Trip	55.8	45.6	Can Make This Trip	79.8	69.6	Can Make This Trip
Ninth Round Trip	22.2	0	26.6	4.4	Can Make This Trip	45.6	23.4	Can Make This Trip	69.6	47.4	Can Make This Trip
End Deadhead	37.2	0	4.4	-32.8	Cannot Complete Trip	23.4	-13.8	Cannot Complete Trip	47.4	10.2	Can Make This Trip
Tenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Eleventh Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Twelfth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Thirteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Fourteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Fifteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Sixteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Seventeenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Nineteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Twentieth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
					Trip Not Needed			Trip Not Needed			Trip Not Needed
					Trip Not Needed			Trip Not Needed			Trip Not Needed
					Trip Not Needed			Trip Not Needed			Trip Not Needed

Battery Electric Bus Recharge Calulator

Block Profile	16	*ID*
Vehicle Size	30	*30, 35, 40 feet*
Starting Charge (Strenous Mileage Yr. 1)	121	
Starting Charge (Strenous Mileage Yr. 5)	109	
Starting Charge (Strenous Mileage Yr. 10)	98	
Charger Type	Fast	
Recharge Assumption (Miles per Minute of Recharge)	1	
Recharge Location	Immokalee	

Round Trip	**Trip Length before Layover**	**Layover Time in minutes at End of Trip**	**Miles**	**Miles Left**	**Yr 1 Assessment**	**Miles**	**Miles Left**	**Yr 5 Assessment**	**Miles**	**Miles Left**	**Yr 10 Assessment**
Initial Deadhead	37.2	0	121	83.8	Can Make This Trip	109	71.8	Can Make This Trip	98	60.8	Can Make This Trip
First Round Trip	3	80	83.8	121	Can Make This Trip	71.8	109	Can Make This Trip	60.8	98	Can Make This Trip
Second Round Trip	22.2	12	121	110.8	Can Make This Trip	109	98.8	Can Make This Trip	98	87.8	Can Make This Trip
Third Round Trip	22.2	12	110.8	100.6	Can Make This Trip	98.8	88.6	Can Make This Trip	87.8	77.6	Can Make This Trip
Fourth Round Trip	22.2	12	100.6	90.4	Can Make This Trip	88.6	78.4	Can Make This Trip	77.6	67.4	Can Make This Trip
Fifth Round Trip	22.2	12	90.4	80.2	Can Make This Trip	78.4	68.2	Can Make This Trip	67.4	57.2	Can Make This Trip
Sixth Round Trip	22.2	12	80.2	70	Can Make This Trip	68.2	58	Can Make This Trip	57.2	47	Can Make This Trip
Seventh Round Trip	22.2	12	70	59.8	Can Make This Trip	58	47.8	Can Make This Trip	47	36.8	Can Make This Trip
Eighth Round Trip	22.2	12	59.8	49.6	Can Make This Trip	47.8	37.6	Can Make This Trip	36.8	26.6	Can Make This Trip
Ninth Round Trip	22.2	0	49.6	27.4	Can Make This Trip	37.6	15.4	Can Make This Trip	26.6	4.4	Can Make This Trip
End Deadhead	37.2	0	27.4	-9.8	Running on Reserve Energy	15.4	-21.8	Cannot Complete Trip	4.4	-32.8	Cannot Complete Trip
Tenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Eleventh Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Twelfth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Thirteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Fourteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Fifteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Sixteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Seventeenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Nineteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Twentieth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
					Trip Not Needed			Trip Not Needed			Trip Not Needed
					Trip Not Needed			Trip Not Needed			Trip Not Needed
					Trip Not Needed			Trip Not Needed			Trip Not Needed

Battery Electric Bus Recharge Calulator

Block Profile	5	*ID*
Vehicle Size	35	*30, 35, 40 feet*
Starting Charge 2035 (Strenous Mileage Yr. 10)	119	
Starting Charge 2040 (Strenous Mileage Yr. 10)	143	
Starting Charge 2045 (Strenous Mileage Yr. 10)	171	
Charger Type	Fast	
Recharge Assumption (Miles per Minute of Recharge)	1	
Recharge Location	Government Center	

Round Trip	**Trip Length before Layover**	**Layover Time in minutes at End of Trip**	**Miles**	**Miles Left**	**Yr 1 Assessment**	**Miles**	**Miles Left**	**Yr 5 Assessment**	**Miles**	**Miles Left**	**Yr 10 Assessment**
Initial Deadhead	0	0	119	119	Can Make This Trip	143	143	Can Make This Trip	171	171	Can Make This Trip
First Trip	6.3	3	119	115.7	Can Make This Trip	143	139.7	Can Make This Trip	171	167.7	Can Make This Trip
Second Round Trip	42.2	9	115.7	82.5	Can Make This Trip	139.7	106.5	Can Make This Trip	167.7	134.5	Can Make This Trip
Third Round Trip	42.2	7	82.5	47.3	Can Make This Trip	106.5	71.3	Can Make This Trip	134.5	99.3	Can Make This Trip
Fourth Round Trip	42.2	10	47.3	15.1	Can Make This Trip	71.3	39.1	Can Make This Trip	99.3	67.1	Can Make This Trip
Fifth Round Trip	42.2	11	15.1	-16.1	Cannot Complete Trip	39.1	7.9	Can Make This Trip	67.1	35.9	Can Make This Trip
Sixth Round Trip	42.2	10	-16.1	-48.3	Cannot Complete Trip	7.9	-24.3	Cannot Complete Trip	35.9	3.7	Can Make This Trip
Seventh Round Trip	42.2	9	-48.3	-81.5	Cannot Complete Trip	-24.3	-57.5	Cannot Complete Trip	3.7	-29.5	Cannot Complete Trip
Eighth Round Trip	42.2	9	-81.5	-114.7	Cannot Complete Trip	-57.5	-90.7	Cannot Complete Trip	-29.5	-62.7	Cannot Complete Trip
Ninth Round Trip	42.2	8	-114.7	-148.9	Cannot Complete Trip	-90.7	-124.9	Cannot Complete Trip	-62.7	-96.9	Cannot Complete Trip
Last Trip	35.9	0	-148.9	-184.8	Cannot Complete Trip	-124.9	-160.8	Cannot Complete Trip	-96.9	-132.8	Cannot Complete Trip
End Deadhead	0	0	-184.8	-184.8	Cannot Complete Trip	-160.8	-160.8	Cannot Complete Trip	-132.8	-132.8	Cannot Complete Trip
Tenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Eleventh Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Twelfth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Thirteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Fourteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Fifteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Sixteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Seventeenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Nineteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Twentieth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
					Trip Not Needed			Trip Not Needed			Trip Not Needed
					Trip Not Needed			Trip Not Needed			Trip Not Needed

Battery Electric Bus Recharge Calulator

Block Profile	5	*ID*
Vehicle Size	35	*30, 35, 40 feet*
Starting Charge (Strenous Mileage Yr. 1)	148	
Starting Charge (Strenous Mileage Yr. 5)	133	
Starting Charge (Strenous Mileage Yr. 10)	119	
Charger Type	Fast	
Recharge Assumption (Miles per Minute of Recharge)	1	
Recharge Location	Government Center	

Round Trip	**Trip Length before Layover**	**Layover Time in minutes at End of Trip**	**Miles**	**Miles Left**	**Yr 1 Assessment**	**Miles**	**Miles Left**	**Yr 5 Assessment**	**Miles**	**Miles Left**	**Yr 10 Assessment**
Initial Deadhead	0	0	148	148	Can Make This Trip	133	133	Can Make This Trip	119	119	Can Make This Trip
First Trip	6.3	3	148	144.7	Can Make This Trip	133	129.7	Can Make This Trip	119	115.7	Can Make This Trip
Second Round Trip	42.2	9	144.7	111.5	Can Make This Trip	129.7	96.5	Can Make This Trip	115.7	82.5	Can Make This Trip
Third Round Trip	42.2	7	111.5	76.3	Can Make This Trip	96.5	61.3	Can Make This Trip	82.5	47.3	Can Make This Trip
Fourth Round Trip	42.2	10	76.3	44.1	Can Make This Trip	61.3	29.1	Can Make This Trip	47.3	15.1	Can Make This Trip
Fifth Round Trip	42.2	11	44.1	12.9	Can Make This Trip	29.1	-2.1	Running on Reserve Energy	15.1	-16.1	Cannot Complete Trip
Sixth Round Trip	42.2	10	12.9	-19.3	Cannot Complete Trip	-2.1	-34.3	Cannot Complete Trip	-16.1	-48.3	Cannot Complete Trip
Seventh Round Trip	42.2	9	-19.3	-52.5	Cannot Complete Trip	-34.3	-67.5	Cannot Complete Trip	-48.3	-81.5	Cannot Complete Trip
Eighth Round Trip	42.2	9	-52.5	-85.7	Cannot Complete Trip	-67.5	-100.7	Cannot Complete Trip	-81.5	-114.7	Cannot Complete Trip
Ninth Round Trip	42.2	8	-85.7	-119.9	Cannot Complete Trip	-100.7	-134.9	Cannot Complete Trip	-114.7	-148.9	Cannot Complete Trip
Last Trip	35.9	0	-119.9	-155.8	Cannot Complete Trip	-134.9	-170.8	Cannot Complete Trip	-148.9	-184.8	Cannot Complete Trip
End Deadhead	0	0	-155.8	-155.8	Cannot Complete Trip	-170.8	-170.8	Cannot Complete Trip	-184.8	-184.8	Cannot Complete Trip
Tenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Eleventh Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Twelfth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Thirteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Fourteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Fifteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Sixteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Seventeenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Nineteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Twentieth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
					Trip Not Needed			Trip Not Needed			Trip Not Needed
					Trip Not Needed			Trip Not Needed			Trip Not Needed

Battery Electric Bus Recharge Calulator

Block Profile	11	*ID*
Vehicle Size	30	*30, 35, 40 feet*
Starting Charge 2035 (Strenous Mileage Yr. 10)	98	
Starting Charge 2040 (Strenous Mileage Yr. 10)	117	
Starting Charge 2045 (Strenous Mileage Yr. 10)	141	
Charger Type	Fast	
Recharge Assumption (Miles per Minute of Recharge)	1	
Recharge Location	Government Center	

Round Trip	**Trip Length before Layover**	**Layover Time in minutes at End of Trip**	**Miles**	**Miles Left**	**Yr 1 Assessment**	**Miles**	**Miles Left**	**Yr 5 Assessment**	**Miles**	**Miles Left**	**Yr 10 Assessment**
Initial Deadhead	6.3	0	98	91.7	Can Make This Trip	117	110.7	Can Make This Trip	141	134.7	Can Make This Trip
First Round Trip	17.4	16	91.7	90.3	Can Make This Trip	110.7	109.3	Can Make This Trip	134.7	133.3	Can Make This Trip
Second Round Trip	17.4	6	90.3	78.9	Can Make This Trip	109.3	97.9	Can Make This Trip	133.3	121.9	Can Make This Trip
Third Round Trip	17.4	6	78.9	67.5	Can Make This Trip	97.9	86.5	Can Make This Trip	121.9	110.5	Can Make This Trip
Fourth Round Trip	17.4	6	67.5	56.1	Can Make This Trip	86.5	75.1	Can Make This Trip	110.5	99.1	Can Make This Trip
Fifth Round Trip	17.4	6	56.1	44.7	Can Make This Trip	75.1	63.7	Can Make This Trip	99.1	87.7	Can Make This Trip
Sixth Round Trip	17.4	14	44.7	41.3	Can Make This Trip	63.7	60.3	Can Make This Trip	87.7	84.3	Can Make This Trip
Seventh Round Trip	17.4	9	41.3	32.9	Can Make This Trip	60.3	51.9	Can Make This Trip	84.3	75.9	Can Make This Trip
Eighth Round Trip	17.4	9	32.9	24.5	Can Make This Trip	51.9	43.5	Can Make This Trip	75.9	67.5	Can Make This Trip
Ninth Round Trip	17.4	9	24.5	16.1	Can Make This Trip	43.5	35.1	Can Make This Trip	67.5	59.1	Can Make This Trip
Tenth Round Trip	17.4	9	16.1	7.7	Can Make This Trip	35.1	26.7	Can Make This Trip	59.1	50.7	Can Make This Trip
Eleventh Round Trip	17.4	9	7.7	-0.7	Running on Reserve Energy	26.7	18.3	Can Make This Trip	50.7	42.3	Can Make This Trip
Twelfth Round Trip	17.4	0	-0.7	-18.1	Cannot Complete Trip	18.3	0.9	Can Make This Trip	42.3	24.9	Can Make This Trip
End Deadhead	6.3	0	-18.1	-24.4	Cannot Complete Trip	0.9	-5.4	Running on Reserve Energy	24.9	18.6	Can Make This Trip
Thirteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Fourteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Fifteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Sixteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Seventeenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Nineteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Twentieth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
					Trip Not Needed			Trip Not Needed			Trip Not Needed
					Trip Not Needed			Trip Not Needed			Trip Not Needed
					Trip Not Needed			Trip Not Needed			Trip Not Needed

Battery Electric Bus Recharge Calulator

Block Profile	11	*ID*
Vehicle Size	30	*30, 35, 40 feet*
Starting Charge (Strenous Mileage Yr. 1)	121	
Starting Charge (Strenous Mileage Yr. 5)	109	
Starting Charge (Strenous Mileage Yr. 10)	98	
Charger Type	Fast	
Recharge Assumption (Miles per Minute of Recharge)	1	
Recharge Location	Government Center	

Round Trip	**Trip Length before Layover**	**Layover Time in minutes at End of Trip**	**Miles**	**Miles Left**	**Yr 1 Assessment**	**Miles**	**Miles Left**	**Yr 5 Assessment**	**Miles**	**Miles Left**	**Yr 10 Assessment**
Initial Deadhead	6.3	0	121	114.7	Can Make This Trip	109	102.7	Can Make This Trip	98	91.7	Can Make This Trip
First Round Trip	17.4	16	114.7	113.3	Can Make This Trip	102.7	101.3	Can Make This Trip	91.7	90.3	Can Make This Trip
Second Round Trip	17.4	6	113.3	101.9	Can Make This Trip	101.3	89.9	Can Make This Trip	90.3	78.9	Can Make This Trip
Third Round Trip	17.4	6	101.9	90.5	Can Make This Trip	89.9	78.5	Can Make This Trip	78.9	67.5	Can Make This Trip
Fourth Round Trip	17.4	6	90.5	79.1	Can Make This Trip	78.5	67.1	Can Make This Trip	67.5	56.1	Can Make This Trip
Fifth Round Trip	17.4	6	79.1	67.7	Can Make This Trip	67.1	55.7	Can Make This Trip	56.1	44.7	Can Make This Trip
Sixth Round Trip	17.4	14	67.7	64.3	Can Make This Trip	55.7	52.3	Can Make This Trip	44.7	41.3	Can Make This Trip
Seventh Round Trip	17.4	9	64.3	55.9	Can Make This Trip	52.3	43.9	Can Make This Trip	41.3	32.9	Can Make This Trip
Eighth Round Trip	17.4	9	55.9	47.5	Can Make This Trip	43.9	35.5	Can Make This Trip	32.9	24.5	Can Make This Trip
Ninth Round Trip	17.4	9	47.5	39.1	Can Make This Trip	35.5	27.1	Can Make This Trip	24.5	16.1	Can Make This Trip
Tenth Round Trip	17.4	9	39.1	30.7	Can Make This Trip	27.1	18.7	Can Make This Trip	16.1	7.7	Can Make This Trip
Eleventh Round Trip	17.4	9	30.7	22.3	Can Make This Trip	18.7	10.3	Can Make This Trip	7.7	-0.7	Running on Reserve Energy
Twelfth Round Trip	17.4	0	22.3	4.9	Can Make This Trip	10.3	-7.1	Running on Reserve Energy	-0.7	-18.1	Cannot Complete Trip
End Deadhead	6.3	0	4.9	-1.4	Running on Reserve Energy	-7.1	-13.4	Cannot Complete Trip	-18.1	-24.4	Cannot Complete Trip
Thirteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Fourteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Fifteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Sixteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Seventeenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Nineteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Twentieth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
					Trip Not Needed			Trip Not Needed			Trip Not Needed
					Trip Not Needed			Trip Not Needed			Trip Not Needed
					Trip Not Needed			Trip Not Needed			Trip Not Needed

Battery Electric Bus Recharge Calulator

Block Profile	17	*ID*
Vehicle Size	30	*30, 35, 40 feet*
Starting Charge (Strenous Mileage Yr. 1)	121	
Starting Charge (Strenous Mileage Yr. 5)	109	
Starting Charge (Strenous Mileage Yr. 10)	98	
Charger Type	Fast	
Recharge Assumption (Miles per Minute of Recharge)	1	
Recharge Location	Government Center	

Round Trip	**Trip Length before Layover**	**Layover Time in minutes at End of Trip**	**Miles**	**Miles Left**	**Yr 1 Assessment**	**Miles**	**Miles Left**	**Yr 5 Assessment**	**Miles**	**Miles Left**	**Yr 10 Assessment**
Initial Deadhead	6.3	0	121	114.7	Can Make This Trip	109	102.7	Can Make This Trip	98	91.7	Can Make This Trip
First Round Trip	15.7	8	114.7	107	Can Make This Trip	102.7	95	Can Make This Trip	91.7	84	Can Make This Trip
Second Round Trip	15.7	8	107	99.3	Can Make This Trip	95	87.3	Can Make This Trip	84	76.3	Can Make This Trip
Third Round Trip	15.7	8	99.3	91.6	Can Make This Trip	87.3	79.6	Can Make This Trip	76.3	68.6	Can Make This Trip
Fourth Round Trip	15.7	8	91.6	83.9	Can Make This Trip	79.6	71.9	Can Make This Trip	68.6	60.9	Can Make This Trip
Fifth Round Trip	15.7	10	83.9	78.2	Can Make This Trip	71.9	66.2	Can Make This Trip	60.9	55.2	Can Make This Trip
Sixth Round Trip	15.7	10	78.2	72.5	Can Make This Trip	66.2	60.5	Can Make This Trip	55.2	49.5	Can Make This Trip
Seventh Round Trip	15.7	10	72.5	66.8	Can Make This Trip	60.5	54.8	Can Make This Trip	49.5	43.8	Can Make This Trip
Eighth Round Trip	15.7	10	66.8	61.1	Can Make This Trip	54.8	49.1	Can Make This Trip	43.8	38.1	Can Make This Trip
Ninth Round Trip	15.7	10	61.1	55.4	Can Make This Trip	49.1	43.4	Can Make This Trip	38.1	32.4	Can Make This Trip
Tenth Round Trip	15.7	0	55.4	39.7	Can Make This Trip	43.4	27.7	Can Make This Trip	32.4	16.7	Can Make This Trip
End Deadhead	6.3	0	39.7	33.4	Can Make This Trip	27.7	21.4	Can Make This Trip	16.7	10.4	Can Make This Trip
Eleventh Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Twelfth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Thirteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Fourteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Fifteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Sixteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Seventeenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Nineteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Twentieth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
					Trip Not Needed			Trip Not Needed			Trip Not Needed
					Trip Not Needed			Trip Not Needed			Trip Not Needed
					Trip Not Needed			Trip Not Needed			Trip Not Needed

Battery Electric Bus Recharge Calulator

Block Profile	15/21	*ID*
Vehicle Size	30	*30, 35, 40 feet*
Starting Charge (Strenous Mileage Yr. 1)	121	
Starting Charge (Strenous Mileage Yr. 5)	109	
Starting Charge (Strenous Mileage Yr. 10)	98	
Charger Type	Fast	
Recharge Assumption (Miles per Minute of Recharge)	1	
Recharge Location	CAT Ops	

Round Trip	**Trip Length before Layover**	**Layover Time in minutes at End of Trip**	**Miles**	**Miles Left**	**Yr 1 Assessment**	**Miles**	**Miles Left**	**Yr 5 Assessment**	**Miles**	**Miles Left**	**Yr 10 Assessment**
Initial Deadhead	0	0	121	121	Can Make This Trip	109	109	Can Make This Trip	98	98	Can Make This Trip
First Round Trip	29.2	8	121	99.8	Can Make This Trip	109	87.8	Can Make This Trip	98	76.8	Can Make This Trip
Second Round Trip	29.2	8	99.8	78.6	Can Make This Trip	87.8	66.6	Can Make This Trip	76.8	55.6	Can Make This Trip
Third Round Trip	29.2	3	78.6	52.4	Can Make This Trip	66.6	40.4	Can Make This Trip	55.6	29.4	Can Make This Trip
Fourth Round Trip	29.2	0	52.4	23.2	Can Make This Trip	40.4	11.2	Can Make This Trip	29.4	0.2	Can Make This Trip
Layover at CAT Ops Center	0	50	23.2	73.2	Can Make This Trip	11.2	61.2	Can Make This Trip	0.2	50.2	Can Make This Trip
Fifth Round Trip	29.2	13	73.2	57	Can Make This Trip	61.2	45	Can Make This Trip	50.2	34	Can Make This Trip
Sixth Round Trip	29.2	17	57	44.8	Can Make This Trip	45	32.8	Can Make This Trip	34	21.8	Can Make This Trip
Seventh Round Trip	29.2	0	44.8	15.6	Can Make This Trip	32.8	3.6	Can Make This Trip	21.8	-7.4	Running on Reserve Energy
End Deadhead	0	0	15.6	15.6	Can Make This Trip	3.6	3.6	Can Make This Trip	-7.4	-7.4	Running on Reserve Energy
Eighth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Tenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Eleventh Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Twelfth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Thirteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Fourteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Fifteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Sixteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Seventeenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Nineteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Twentieth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
					Trip Not Needed			Trip Not Needed			Trip Not Needed
					Trip Not Needed			Trip Not Needed			Trip Not Needed
					Trip Not Needed			Trip Not Needed			Trip Not Needed

Layover at CAT Ops Center
End Deadhead

Battery Electric Bus Recharge Calulator

Block Profile	2/20	*ID*
Vehicle Size	30	*30, 35, 40 feet*
Starting Charge 2035 (Strenous Mileage Yr. 10)	98	
Starting Charge 2040 (Strenous Mileage Yr. 10)	117	
Starting Charge 2045 (Strenous Mileage Yr. 10)	141	
Charger Type	Fast	
Recharge Assumption (Miles per Minute of Recharge)	1	
Recharge Location	CAT Ops	

Round Trip	**Trip Length before Layover**	**Layover Time in minutes at End of Trip**	**Miles**	**Miles Left**	**Yr 1 Assessment**	**Miles**	**Miles Left**	**Yr 5 Assessment**	**Miles**	**Miles Left**	**Yr 10 Assessment**
Initial Deadhead	1	0	98	97	Can Make This Trip	117	116	Can Make This Trip	141	140	Can Make This Trip
First Round Trip	30.2	0	97	66.8	Can Make This Trip	116	85.8	Can Make This Trip	140	109.8	Can Make This Trip
Second Round Trip	30.2	0	66.8	36.6	Can Make This Trip	85.8	55.6	Can Make This Trip	109.8	79.6	Can Make This Trip
Third Round Trip	30.2	0	36.6	6.4	Can Make This Trip	55.6	25.4	Can Make This Trip	79.6	49.4	Can Make This Trip
Fourth Round Trip	30.2	0	6.4	-23.8	Cannot Complete Trip	25.4	-4.8	Running on Reserve Energy	49.4	19.2	Can Make This Trip
Fifth Round Trip	30.2	0	-23.8	-54	Cannot Complete Trip	-4.8	-35	Cannot Complete Trip	19.2	-11	Cannot Complete Trip
Deadhead	1	0	-54	-55	Cannot Complete Trip	-35	-36	Cannot Complete Trip	-11	-12	Cannot Complete Trip
Layover at CAT Ops Center	0	80	-55	25	Can Make This Trip	-36	44	Can Make This Trip	-12	68	Can Make This Trip
Deadhead	1	0	25	24	Can Make This Trip	44	43	Can Make This Trip	68	67	Can Make This Trip
Sixth Round Trip	30.2	0	24	-6.2	Running on Reserve Energy	43	12.8	Can Make This Trip	67	36.8	Can Make This Trip
Seventh Round Trip	30.2	0	-6.2	-36.4	Cannot Complete Trip	12.8	-17.4	Cannot Complete Trip	36.8	6.6	Can Make This Trip
Deadhead	1	0	-36.4	-37.4	Cannot Complete Trip	-17.4	-18.4	Cannot Complete Trip	6.6	5.6	Can Make This Trip
Eighth Round Trip	43.9	0	-37.4	-81.3	Cannot Complete Trip	-18.4	-62.3	Cannot Complete Trip	5.6	-38.3	Cannot Complete Trip
End Deadhead	43.9	0	-81.3	-125.2	Cannot Complete Trip	-62.3	-106.2	Cannot Complete Trip	-38.3	-82.2	Cannot Complete Trip
Tenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Eleventh Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Twelfth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Thirteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Fourteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Fifteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Sixteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Seventeenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Nineteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Twentieth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed

Battery Electric Bus Recharge Calulator

Block Profile	2/20	*ID*
Vehicle Size	30	*30, 35, 40 feet*
Starting Charge (Strenous Mileage Yr. 1)	121	
Starting Charge (Strenous Mileage Yr. 5)	109	
Starting Charge (Strenous Mileage Yr. 10)	98	
Charger Type	Fast	
Recharge Assumption (Miles per Minute of Recharge)	1	
Recharge Location	CAT Ops	

Round Trip	Trip Length before Layover	Layover Time in minutes at End of Trip	Miles	Miles Left	Yr 1 Assessment	Miles	Miles Left	Yr 5 Assessment	Miles	Miles Left	Yr 10 Assessment
Initial Deadhead	1	0	121	120	Can Make This Trip	109	108	Can Make This Trip	98	97	Can Make This Trip
First Round Trip	30.2	0	120	89.8	Can Make This Trip	108	77.8	Can Make This Trip	97	66.8	Can Make This Trip
Second Round Trip	30.2	0	89.8	59.6	Can Make This Trip	77.8	47.6	Can Make This Trip	66.8	36.6	Can Make This Trip
Third Round Trip	30.2	0	59.6	29.4	Can Make This Trip	47.6	17.4	Can Make This Trip	36.6	6.4	Can Make This Trip
Fourth Round Trip	30.2	0	29.4	-0.8	Running on Reserve Energy	17.4	-12.8	Cannot Complete Trip	6.4	-23.8	Cannot Complete Trip
Fifth Round Trip	30.2	0	-0.8	-31	Cannot Complete Trip	-12.8	-43	Cannot Complete Trip	-23.8	-54	Cannot Complete Trip
Deadhead	1	0	-31	-32	Cannot Complete Trip	-43	-44	Cannot Complete Trip	-54	-55	Cannot Complete Trip
Layover at CAT Ops Center	0	80	-32	48	Can Make This Trip	-44	36	Can Make This Trip	-55	25	Can Make This Trip
Deadhead	1	0	48	47	Can Make This Trip	36	35	Can Make This Trip	25	24	Can Make This Trip
Sixth Round Trip	30.2	0	47	16.8	Can Make This Trip	35	4.8	Can Make This Trip	24	-6.2	Running on Reserve Energy
Seventh Round Trip	30.2	0	16.8	-13.4	Cannot Complete Trip	4.8	-25.4	Cannot Complete Trip	-6.2	-36.4	Cannot Complete Trip
Deadhead	1	0	-13.4	-14.4	Cannot Complete Trip	-25.4	-26.4	Cannot Complete Trip	-36.4	-37.4	Cannot Complete Trip
Express Trip to Immokalee	40.4	0	-14.4	-54.8	Cannot Complete Trip	-26.4	-66.8	Cannot Complete Trip	-37.4	-77.8	Cannot Complete Trip
End Deadhead	40.4	0	-54.8	-95.2	Cannot Complete Trip	-66.8	-107.2	Cannot Complete Trip	-77.8	-118.2	Cannot Complete Trip
Tenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Eleventh Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Twelfth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Thirteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Fourteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Fifteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Sixteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Seventeenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Nineteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Twentieth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed

C.1.1.4 Current Alternative Fuel Vehicle Feasibility

The alternative fuel vehicle feasibility model results are presented in tables A-10 through A-12. Feasibility can be interpreted for these results as follows:

- **Feasible**: The bus can operate the entire length of a block under most conditions without relying on fuel reserves.
- **Maybe**: The bus may complete the block but could occasionally require fuel reserves. This classification also applies to blocks that may be feasible if refueling is possible during layovers.
- **Unfeasible**: The bus is unlikely to complete the block without depleting fuel reserves unless major operational adjustments are made. These could include splitting the block, modifying schedules, reducing trips, or shortening the route.

TABLE C-10: CURRENT ALTERNATIVE FUEL VEHICLE FEASIBILITY BY WEEKDAY BLOCK

Block	Hydrogen FCE	CNG	Biodiesel	Hybrid Diesel Electric
1	Unfeasible	Feasible	Feasible	Feasible
2/20	Unfeasible	Feasible	Feasible	Feasible
3	Unfeasible	Feasible	Feasible	Feasible
4	Unfeasible	Unfeasible	Unfeasible	Maybe
5	Maybe	Feasible	Feasible	Feasible
6	Unfeasible	Feasible	Feasible	Feasible
7	Maybe	Feasible	Feasible	Feasible
8	Feasible	Feasible	Feasible	Feasible
9	Maybe	Feasible	Feasible	Feasible
10	Unfeasible	Maybe	Feasible	Feasible
11	Feasible	Feasible	Feasible	Feasible
12	Maybe	Feasible	Feasible	Feasible
13	Feasible	Feasible	Feasible	Feasible
15/21	Maybe	Feasible	Feasible	Feasible
16	Maybe	Feasible	Feasible	Feasible
17	Feasible	Feasible	Feasible	Feasible
18	Maybe	Feasible	Feasible	Feasible
19	Maybe	Feasible	Feasible	Feasible
22	Feasible	Feasible	Feasible	Feasible

TABLE C-11: CURRENT ALTERNATIVE FUEL VEHICLE FEASIBILITY BY SATURDAY BLOCK

Block	Hydrogen FCE	CNG	Biodiesel	Hybrid Diesel Electric
1	Unfeasible	Feasible	Feasible	Feasible
2	Maybe	Feasible	Feasible	Feasible
3	Unfeasible	Feasible	Feasible	Feasible
4	Unfeasible	Unfeasible	Unfeasible	Maybe
5	Maybe	Feasible	Feasible	Feasible
6	Unfeasible	Feasible	Feasible	Feasible
7	Maybe	Feasible	Feasible	Feasible
8	Feasible	Feasible	Feasible	Feasible
9	Maybe	Feasible	Feasible	Feasible
10	Feasible	Feasible	Feasible	Feasible
11	Maybe	Feasible	Feasible	Feasible
12	Maybe	Feasible	Feasible	Feasible
13	Feasible	Feasible	Feasible	Feasible
15	Maybe	Feasible	Feasible	Feasible
16	Feasible	Feasible	Feasible	Feasible
17	Maybe	Feasible	Feasible	Feasible
18	Unfeasible	Feasible	Feasible	Feasible

TABLE C-12: CURRENT ALTERNATIVE FUEL VEHICLE FEASIBILITY BY SUNDAY BLOCK

Block	Hydrogen FCE	CNG	Biodiesel	Hybrid Diesel Electric
1	Unfeasible	Feasible	Feasible	Feasible
2	Feasible	Feasible	Feasible	Feasible
3	Maybe	Feasible	Feasible	Feasible
4	Feasible	Feasible	Feasible	Feasible
5	Feasible	Feasible	Feasible	Feasible
6	Maybe	Feasible	Feasible	Feasible
7	Feasible	Feasible	Feasible	Feasible
8	Feasible	Feasible	Feasible	Feasible
9	Feasible	Feasible	Feasible	Feasible
10	Feasible	Feasible	Feasible	Feasible
11	Feasible	Feasible	Feasible	Feasible
12	Feasible	Feasible	Feasible	Feasible
13	Feasible	Feasible	Feasible	Feasible

C.1.2 Demand Response

The following section presents feasibility results for demand response trips.

C.1.2.1 Current Electric Cutaway Feasibility

Table A-13 presents the results of this analysis by each percentile of trips. Result interpretations are the same as those for electric buses previously presented.

TABLE C-13: PERCENTAGE OF DR TRIPS SERVED FEASIBLY BY A CURRENT ELECTRIC CUTAWAY

Trips	Miles	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
First Percentile	70	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Maybe	Maybe	Maybe	Maybe	Maybe
Fifth Percentile	110	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
Tenth Percentile	135	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
First Quartile	166	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
Median	193	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
Average	196	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
Third Quartile	228	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
85th Percentile	245	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
All Trips	400	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible

C.1.2.2 Electric Results Future Scenario

Table A-14 presents the results of this analysis, indicating what percentage of trips can be served feasibly up to the tenth year from purchase for bus purchase years 2025 and 2035.

TABLE C-14: PERCENTAGE OF DR TRIPS THAT MAY BE SERVED FEASIBLY BY FUTURE ELECTRIC CUTAWAYS

Trips	Miles	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
First Percentile	70	Maybe	Maybe	Maybe	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible
Fifth Percentile	110	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
Tenth Percentile	135	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
First Quartile	166	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
Median	193	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
Average	196	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
Third Quartile	228	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
85th Percentile	245	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
All Trips	400	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible

C.1.2.3 Alternative Fuel Results

Table A-15 presents the results of the alternative fuel assessment for CNG and biodiesel fueled cutaways.

TABLE C-15: PERCENTAGE OF DR TRIPS SERVED FEASIBLY BY ALTERNATIVE FUEL CUTAWAYS

Observed Trips	Miles	CNG Cutaways	Biodiesel (Using Diesel Cutaways)
First Percentile	70	Feasible	Feasible
Fifth Percentile	110	Feasible	Feasible
Tenth Percentile	135	Feasible	Feasible
25th Percentile	165	Feasible	Feasible
Median	193	Feasible	Feasible
Average	195	Feasible	Feasible
50th Percentile	195	Feasible	Feasible
75th Percentile	230	Maybe	Feasible
85th Percentile	245	Maybe	Feasible
All Trips	400	Unfeasible	Unfeasible

C.1.3 Equipment/Support Vehicle

Equipment/Support Vehicle data was presented sufficiently in the document and will not be presented here.

C.2 Additional Data

Table A-16 presents the assumptions used for the electric vehicle analysis. These assumptions are provided by vehicle length and type to help provide reference to Collier Area Transit regarding the mileage limit recommendations for nominal and strenuous conditions. In this way, if CAT wishes to analyze blocks in the future, CAT can use these figures as reference to the suggested maximum operational mileage that they should operate their electric vehicles on for vehicles purchased in or near 2025.

Service Range (in miles) for Vehicles Purchased in 2025												
Vehicle	**Condition**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**
30' Bus	**Nominal**	141	137	135	131	129	126	123	121	118	116	113
	Strenuous	121	119	116	114	111	109	107	104	102	100	98
35' Bus	**Nominal**	171	168	164	161	157	154	150	147	144	141	138
	Strenuous	148	145	142	139	136	133	130	127	124	122	119
40' Bus	**Nominal**	205	201	197	192	189	185	181	177	173	170	166
	Strenuous	178	174	170	166	163	160	156	153	150	147	143
Cutaways	**Nominal**	90	89	87	86	83	81	80	78	77	74	72
	Strenuous	78	77	75	74	72	70	69	67	66	64	62
Minivan	**All**	111										
SUV	**All**	223										
Pickup Truck	**All**	168										

APPENDIX D FEASIBILITY ANALYSIS RESULTS (686 KWH BATTERY)

This appendix to Task 6 for ZEV feasibility details the results generated for the 35-foot Gillig Battery Electric bus model, with a manufacturer battery capacity of 686 kWh.

CAT has procured an electric Gillig bus which at the time of this writing is being built. Notably, the bus has a significantly higher capacity than the average electric bus models available in the current market. This is due to the fact that the technology employed in the development of this battery includes new materials that greatly improve upon much of the lithium batteries available in the market. These lithium-ion nickel, manganese, and cobalt (NMC) batteries are new in the market and have not been broadly adopted but are expected to be the new standard in the very near-future, replacing the lithium iron phosphate (LFP) composition in many batteries currently in production for electric vehicles. NMC batteries have an increased energy density compared to LFP batteries, meaning that they have a higher energy capacity. While NMC batteries improve on the existing battery capacity that is available among LFP batteries, they do not improve the battery's cycle life. This essentially means that NMC batteries will degrade more rapidly for every recharging cycle, leading to a larger variation in a vehicle's service range over the years.

NMC batteries are impacted by two major factors, heat, and state of charge (SoC). NMC batteries are more sensitive to heat than LFP batteries. This is because the internal materials used breakdown faster when exposed to high temperatures, reducing the battery's lifecycle. The range at which significant degradation occurs over NMC batteries is above 86 degrees Fahrenheit, which is important to consider in Collier County where the mean daily maximum temperatures reach 86 degrees Fahrenheit or higher between May and October. Fast charging through direct current (DC) chargers can also have an impact over battery degradation as DC charging generates more heat than slow charging methods.

NMC batteries are also more sensitive to SoC management. Keeping a battery fully recharged for prolonged periods can degrade the battery over time. Research suggests that maintaining batteries charged at 80 to 90% optimizes the battery's lifespan.

In order to examine the feasibility of the 35-foot Gillig bus, a few assumptions will be adjusted, mostly those that model battery degradation. The starting battery capacity will be 686 kWh, and the battery will be modeled for a 10-year period. In order to model battery degradation better for this battery, a 4% annual degradation factor will be implemented. No SoC assumptions will be made, with the model reflecting maximum battery recharge.

TABLE D-1: BATTERY LIFE AND DEGRADATION ASSUMPTIONS (35 FOOT GILLIG)

Variable	Description	Assumption
% of Original Capacity	Percentage of the original battery's capacity that is useable at the end of battery life	**60%**
Useful Life of Battery	The number of years of a battery's useful lifecycle	10 years
Annual Degradation	The annual Rate of Battery Degradation	**-4%**
Reserve Energy (kWh)	Estimated energy required to travel approximately 10 miles to the depot from an on-route location; a "safety net" to	20 kWh

Variable	Description	Assumption
	ensure the bus can return to the depot if a bus experiences an issue on-route, causing it to use more energy than expected.	
New Battery Scenario (2025)		
Total Battery Energy (kWh)	The total energy contained in the battery upon purchase	**686 kWh**
Useable Energy (kWh)	The total energy that can be withdrawn from a new battery before needing to stop	**549 kWh**
Service Energy (kWh)	Maximum energy that should be used in revenue service for buses with new batteries ("Useable Energy" minus "Reserve Energy")	**529 kWh**
End of Life Battery Scenario (2035)		
Total Battery Energy (kWh)	The total energy contained in the battery at the end of battery life	**487 kWh**
Useable Energy (kWh)	The total energy that can be withdrawn from the battery before needing to stop	**366 kWh**
Service Energy (kWh)	Maximum energy that should be used in revenue service (Useable Energy minus Reserve Energy)	**346 kWh**

** All assumptions in bold have changed from the 35' model used for the feasibility analysis*

D.1 Model Results

The following section presents the detailed results of the block feasibility model for the 35-foot electric Gillig Bus with a 686-kWh battery capacity. The tables present the results from the battery electric bus model for fixed route vehicle blocks split by day of operation.

D.1.1 Fixed Route Block Results

The following presents results from the model for all fixed route block analysis.

D.1.1.1 Current Electric Bus Feasibility

Table D-2 through Table D-4 show the model results and demonstrate their feasibility by day of week. Results can be interpreted as follows:

- **Feasible**: bus can feasibly operate the entire length of a block in strenuous conditions without tapping into reserve energy even after the potential amount of battery degradation in that given model year.
- **Maybe**: The bus may be able to operate but could potentially run into occasional issues where the reserve energy may need to be used. This indicator can also suggest the feasibility of a block if in-route or off-route charging were implemented.
- **Unfeasible**: The bus will likely fail to operate the entire length of a block unless major operational changes are made such as splitting a block, adjusting scheduled operations, reducing number of trips, or making the alignment shorter.

Table D-5 summarizes the results.

Table D-2: Weekday Service Model for 35-Foot 686 kWh Battery Electric Buses (2025)

Block	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
1	Maybe	Maybe	Maybe	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
2/20	Maybe	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
3	Maybe	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
4	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
5	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
6	Maybe	Maybe	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
7	Feasible	Maybe	Maybe	Maybe	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
8	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Maybe	Maybe	Maybe	Maybe
9	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Maybe	Maybe	Maybe	Unfeasible
10	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
11	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Maybe	Maybe	Maybe	Maybe
12	Feasible	Maybe	Maybe	Maybe	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
13	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible
15/21	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Maybe	Maybe	Maybe	Unfeasible
16	Feasible	Feasible	Maybe	Maybe	Maybe	Maybe	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
17	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible
18	Feasible	Feasible	Maybe	Maybe	Maybe	Maybe	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
19	Feasible	Feasible	Feasible	Feasible	Maybe	Maybe	Maybe	Maybe	Unfeasible	Unfeasible	Unfeasible
22	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible

Table D-3: Saturday Service Model for 35-Foot 686 kWh Battery Electric Buses (2025)

Block	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
1	Maybe	Maybe	Maybe	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
2	Feasible	Feasible	Feasible	Feasible	Feasible	Maybe	Maybe	Maybe	Maybe	Unfeasible	Unfeasible
3	Maybe	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
4	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
5	Feasible	Feasible	Feasible	Maybe	Maybe	Maybe	Maybe	Unfeasible	Unfeasible	Unfeasible	Unfeasible
6	Maybe	Maybe	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
7	Feasible	Maybe	Maybe	Maybe	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
8	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Maybe	Maybe	Maybe	Maybe
9	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Maybe	Maybe	Maybe	Unfeasible
10	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Maybe	Maybe
11	Feasible	Feasible	Feasible	Maybe	Maybe	Maybe	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
12	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Maybe	Maybe	Maybe	Maybe	Unfeasible
13	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Maybe	Maybe	Maybe	Maybe
15	Feasible	Feasible	Maybe	Maybe	Maybe	Maybe	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
16	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible
17	Feasible	Feasible	Maybe	Maybe	Maybe	Maybe	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
18	Maybe	Maybe	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible

Table D-4: Sunday Service Model for 35-Foot 686 kWh Battery Electric Buses (2025)

Block	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
1	Maybe	Maybe	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
2	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible
3	Feasible	Feasible	Maybe	Maybe	Maybe	Maybe	Unfeasible	Unfeasible	Unfeasible	Unfeasible	Unfeasible
4	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible
5	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible
6	Feasible	Feasible	Feasible	Feasible	Maybe	Maybe	Maybe	Maybe	Unfeasible	Unfeasible	Unfeasible
7	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible
8	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible
9	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible
10	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible
11	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible
12	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible
13	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Feasible	Maybe	Maybe	Maybe

Table D-5: Currently Feasible Blocks by Operation Day

Block	Vehicle Length	Block Feasibility by Operation Day		
		Weekday	Saturday	Sunday
1	35’			
2/20	35’			✓
3	35’			
4	**35’**			✓
5	**35’**			✓
6	35’			
7	35’			✓
8	35’	!	!	✓
9	35’			✓
10	35’		!	✓
11	35’	!		✓
12	35’			✓
13	**35’**	✓	!	!
15/21	35’			
16	35’		✓	
17	35’	✓		
18	**35’**			
19	35’			
22	35’	✓		

✓ *= Feasible* ! *= Maybe Feasible*

Based on the results of the service modeling, only three weekday blocks are feasible through 2035: Blocks 13, 17, and 22, and four blocks may possibly be feasible (8, 9, 11, and 15/21) up to 2035. On Saturdays, Block 16 is feasible, and five blocks may possibly be feasible. On Sundays, only blocks 1, 3, and 6 are not feasible.

D.1.1.2 Future Electric Bus Feasibility

Figures D-1 through D-3 demonstrate how many blocks will be feasible up to the tenth year from purchase for bus purchase years 2025 and 2035 due to continued improvements on the 686 kWh battery. Table D-6 summarizes the results.

FIGURE D-1: 35-FOOT WEEKDAY BLOCKS 10-YEAR FEASIBILITY (2035)

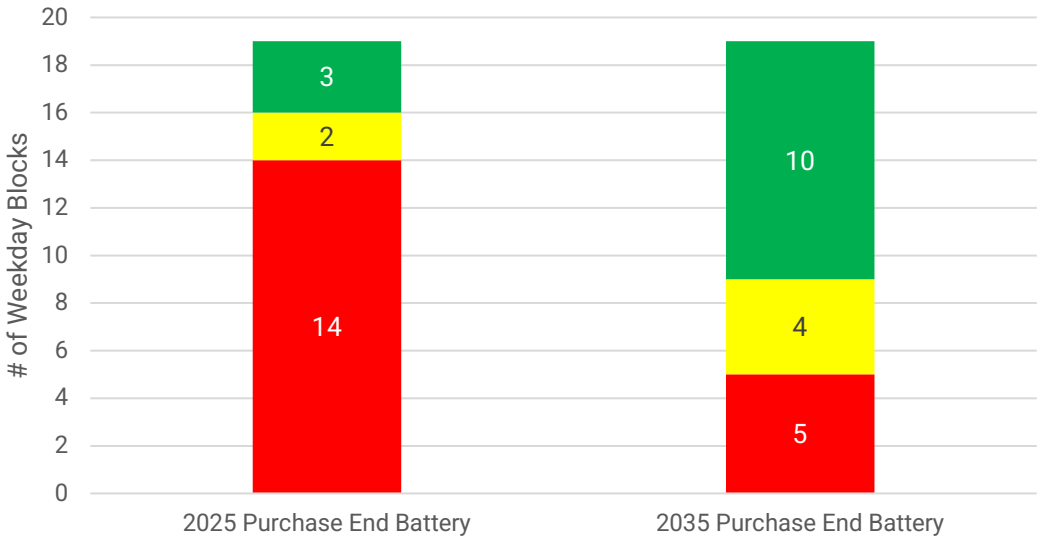


FIGURE D-2: 35-FOOT SATURDAY BLOCKS 10-YEAR FEASIBILITY (2035)

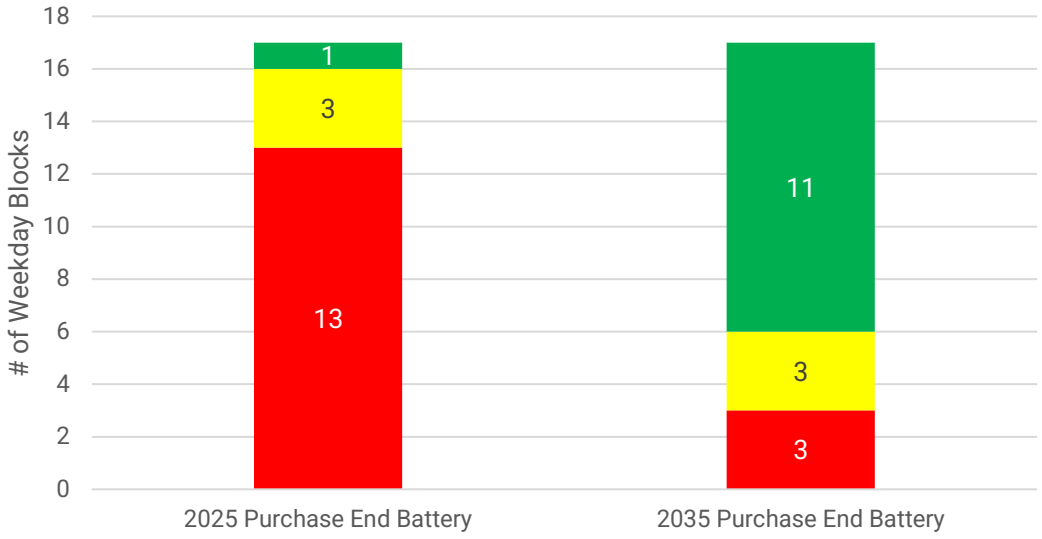


FIGURE D-3: 35-FOOT SUNDAY BLOCKS 10-YEAR FEASIBILITY (2035)

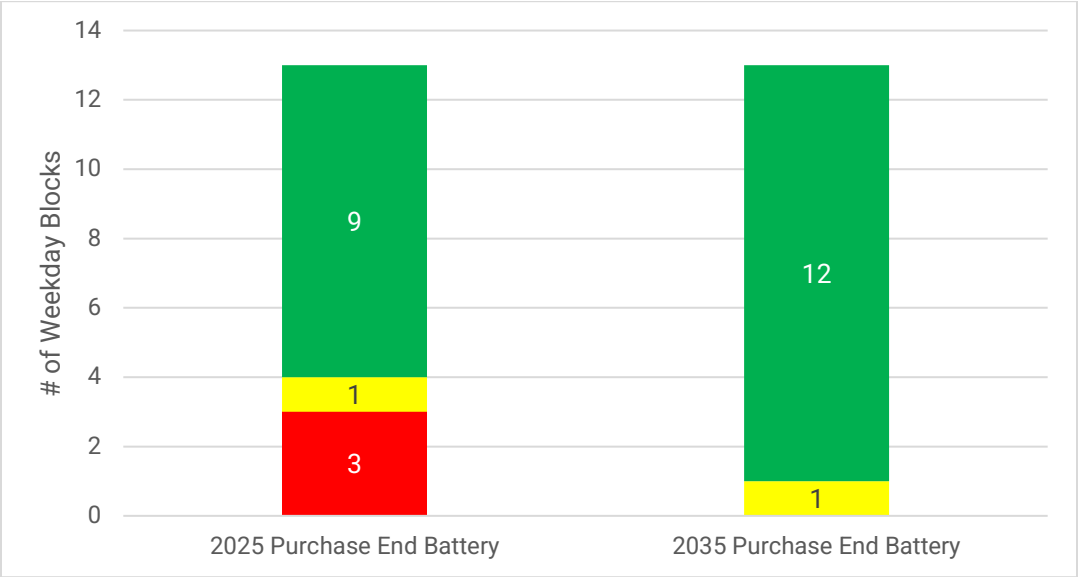


TABLE D-6: FUTURE FEASIBLE BLOCKS BY OPERATION DAY FOR PURCHASE YEARS 2025 AND 2035

Block	Vehicle Length	Block Feasibility by Operation Day					
		Weekday		Saturday		Sunday	
		2025	2035	2025	2035	2025	2035
1	35'		!		!		!
2/20	35'				✓	✓	✓
3	35'						✓
4	**35'**					✓	✓
5	**35'**				✓	✓	✓
6	35'		!		!		✓
7	35'		!		!	✓	✓
8	35'	!	✓	!	✓	✓	✓
9	35'		✓		✓	✓	✓
10	35'			!	✓	✓	✓
11	35'	!	✓		✓	✓	✓
12	35'		!		✓	✓	✓
13	**35'**	✓	✓	!	✓	!	✓
15/21	35'		✓		✓		
16	35'		✓	✓	✓		
17	35'	✓	✓		✓		
18	**35'**		✓				
19	35'		✓				
22	35'	✓	✓				

✓ = *Feasible* ! = *Maybe Feasible*

Based on the results of the service modeling, 10 total weekday blocks would become feasible by 2035 and four may be feasible. These latter blocks can benefit from additional in route charging support, making them fully feasible with the increased battery capacity

D.1.1.3 Electric Re-Charging Scenario

An electric on-route recharging scenario was also assessed over this current configuration. Several weekday blocks were selected for further analysis to understand the impact of mid-route recharging.

Results from this analysis are documented were extracted from excel for each block configuration analyzed. The following briefly describes the selected routes and the assessment.

- **Block 1** Neither in the current scenario nor in the future scenario does Block 1 confidently complete a trip in the most strenuous circumstance. This would lead to failure in a worst-case scenario.
- **Block 2/20** in the current scenario would not benefit from recharging at the CAT Operations Center after the fifth year of purchase, when battery degradation will have impacted recharging capacity significantly. However, Block 2/20 is expected to benefit from recharging starting in a future scenario.
- **Block 3** in the current scenario would not benefit from recharging at the CAT Operations Center after the fifth year of purchase, when battery degradation will have impacted recharging capacity significantly. However, Block 3 is expected to benefit from recharging starting in a future scenario.
- **Block 4** Neither in the current scenario nor in the future scenario does Block 4 confidently complete a trip in the most strenuous circumstance. This would lead to failure in a worst-case scenario.
- **Block 5** Neither in the current scenario nor in the future scenario does Block 5 confidently complete a trip in the most strenuous circumstance. This would lead to failure in a worst-case scenario.
- **Block 7** would comfortably benefit from on-route charging at the Government Center through the 10th year in the current scenario. Considerations include the addition of chargers at the transfer station.
- **Block 12** Neither in the current scenario nor in the future scenario does Block 12 confidently complete a trip in the most strenuous circumstance. This would lead to failure in a worst-case scenario.
- **Block 16** would comfortably benefit from on-route charging at the Immokalee Transfer Stations through the 10th year in the current scenario. Considerations include the addition of chargers at the transfer station.
- **Block 18** would comfortably benefit from on-route charging at the Immokalee Transfer Stations through the 9th year in the current scenario. It's recommended to add 5 minutes in layover before the final deadhead, especially in the later years of the purchase. Considerations include the addition of chargers at the transfer station.

It is expected that the on-route charging approach will allow 3 blocks (7, 16 and 18) to operate comfortably with Battery Electric Buses. Two additional blocks (2/20 and 3) will become feasible through on-route charging in a future scenario. Detailed results can be found in the following pages.

Battery Electric Bus Recharge Calulator

Block Profile	2/20	*ID*
Vehicle Size	35' Gillig (686 kWh)	*30, 35, 40 feet*
Starting Charge (Strenous Mileage Yr. 1)	247	
Starting Charge (Strenous Mileage Yr. 5)	200	
Starting Charge (Strenous Mileage Yr. 10)	162	
Charger Type	Fast	
Recharge Assumption (Miles per Minute of Recharge)	1	
Recharge Location	CAT Ops	

Round Trip	**Trip Length before Layover**	**Layover Time in minutes at End of Trip**	**Miles**	**Miles Left**	**Yr 1 Assessment**	**Miles**	**Miles Left**	**Yr 5 Assessment**	**Miles**	**Miles Left**	**Yr 10 Assessment**
Initial Deadhead	1	0	247	246	Can Make This Trip	200	199	Can Make This Trip	162	161	Can Make This Trip
First Round Trip	30.2	0	246	215.8	Can Make This Trip	199	168.8	Can Make This Trip	161	130.8	Can Make This Trip
Second Round Trip	30.2	0	215.8	185.6	Can Make This Trip	168.8	138.6	Can Make This Trip	130.8	100.6	Can Make This Trip
Third Round Trip	30.2	0	185.6	155.4	Can Make This Trip	138.6	108.4	Can Make This Trip	100.6	70.4	Can Make This Trip
Fourth Round Trip	30.2	0	155.4	125.2	Can Make This Trip	108.4	78.2	Can Make This Trip	70.4	40.2	Can Make This Trip
Fifth Round Trip	30.2	0	125.2	95	Can Make This Trip	78.2	48	Can Make This Trip	40.2	10	Can Make This Trip
Deadhead	1	0	95	94	Can Make This Trip	48	47	Can Make This Trip	10	9	Can Make This Trip
Layover at CAT Ops Center	0	80	94	174	Can Make This Trip	47	127	Can Make This Trip	9	89	Can Make This Trip
Deadhead	1	0	174	173	Can Make This Trip	127	126	Can Make This Trip	89	88	Can Make This Trip
Sixth Round Trip	30.2	0	173	142.8	Can Make This Trip	126	95.8	Can Make This Trip	88	57.8	Can Make This Trip
Seventh Round Trip	30.2	0	142.8	112.6	Can Make This Trip	95.8	65.6	Can Make This Trip	57.8	27.6	Can Make This Trip
Deadhead	1	0	112.6	111.6	Can Make This Trip	65.6	64.6	Can Make This Trip	27.6	26.6	Can Make This Trip
Eighth Round Trip	43.9	0	111.6	67.7	Can Make This Trip	64.6	20.7	Can Make This Trip	26.6	-17.3	Cannot Complete Trip
End Deadhead	43.9	0	67.7	23.8	Can Make This Trip	20.7	-23.2	Cannot Complete Trip	-17.3	-61.2	Cannot Complete Trip
Tenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Eleventh Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Twelfth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Thirteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Fourteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Fifteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Sixteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Seventeenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Nineteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Twentieth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed

Battery Electric Bus Recharge Calulator

Block Profile	2/20	*ID*
Vehicle Size	35' Gillig (686 kWh)	*30, 35, 40 feet*
Starting Charge 2035 (Strenous Mileage Yr. 10)	162	
Starting Charge 2040 (Strenous Mileage Yr. 10)	193	
Starting Charge 2045 (Strenous Mileage Yr. 10)	232	
Charger Type	Fast	
Recharge Assumption (Miles per Minute of Recharge)	1	
Recharge Location	CAT Ops	

Round Trip	**Trip Length before Layover**	**Layover Time in minutes at End of Trip**	**Miles**	**Miles Left**	**Yr 1 Assessment**	**Miles**	**Miles Left**	**Yr 5 Assessment**	**Miles**	**Miles Left**	**Yr 10 Assessment**
Initial Deadhead	1	0	162	161	Can Make This Trip	193	192	Can Make This Trip	232	231	Can Make This Trip
First Round Trip	30.2	0	161	130.8	Can Make This Trip	192	161.8	Can Make This Trip	231	200.8	Can Make This Trip
Second Round Trip	30.2	0	130.8	100.6	Can Make This Trip	161.8	131.6	Can Make This Trip	200.8	170.6	Can Make This Trip
Third Round Trip	30.2	0	100.6	70.4	Can Make This Trip	131.6	101.4	Can Make This Trip	170.6	140.4	Can Make This Trip
Fourth Round Trip	30.2	0	70.4	40.2	Can Make This Trip	101.4	71.2	Can Make This Trip	140.4	110.2	Can Make This Trip
Fifth Round Trip	30.2	0	40.2	10	Can Make This Trip	71.2	41	Can Make This Trip	110.2	80	Can Make This Trip
Deadhead	1	0	10	9	Can Make This Trip	41	40	Can Make This Trip	80	79	Can Make This Trip
Layover at CAT Ops Center	0	80	9	89	Can Make This Trip	40	120	Can Make This Trip	79	159	Can Make This Trip
Deadhead	1	0	89	88	Can Make This Trip	120	119	Can Make This Trip	159	158	Can Make This Trip
Sixth Round Trip	30.2	0	88	57.8	Can Make This Trip	119	88.8	Can Make This Trip	158	127.8	Can Make This Trip
Seventh Round Trip	30.2	0	57.8	27.6	Can Make This Trip	88.8	58.6	Can Make This Trip	127.8	97.6	Can Make This Trip
Deadhead	1	0	27.6	26.6	Can Make This Trip	58.6	57.6	Can Make This Trip	97.6	96.6	Can Make This Trip
Eighth Round Trip	43.9	0	26.6	-17.3	Cannot Complete Trip	57.6	13.7	Can Make This Trip	96.6	52.7	Can Make This Trip
End Deadhead	43.9	0	-17.3	-61.2	Cannot Complete Trip	13.7	-30.2	Cannot Complete Trip	52.7	8.8	Can Make This Trip
Tenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Eleventh Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Twelfth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Thirteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Fourteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Fifteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Sixteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Seventeenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Nineteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Twentieth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed

Battery Electric Bus Recharge Calulator

Block Profile	5	*ID*
Vehicle Size	35' Gillig (686 kWh)	*30, 35, 40 feet*
Starting Charge (Strenous Mileage Yr. 1)	247	
Starting Charge (Strenous Mileage Yr. 5)	200	
Starting Charge (Strenous Mileage Yr. 10)	162	
Charger Type	Fast	
Recharge Assumption (Miles per Minute of Recharge)	1	
Recharge Location	Government Center	

Round Trip	Trip Length before Layover	Layover Time in minutes at End of Trip	Miles	Miles Left	Yr 1 Assessment	Miles	Miles Left	Yr 5 Assessment	Miles	Miles Left	Yr 10 Assessment
Initial Deadhead	0	0	247	247	Can Make This Trip	200	200	Can Make This Trip	162	162	Can Make This Trip
First Trip	6.3	3	247	243.7	Can Make This Trip	200	196.7	Can Make This Trip	162	158.7	Can Make This Trip
Second Round Trip	42.2	9	243.7	210.5	Can Make This Trip	196.7	163.5	Can Make This Trip	158.7	125.5	Can Make This Trip
Third Round Trip	42.2	7	210.5	175.3	Can Make This Trip	163.5	128.3	Can Make This Trip	125.5	90.3	Can Make This Trip
Fourth Round Trip	42.2	10	175.3	143.1	Can Make This Trip	128.3	96.1	Can Make This Trip	90.3	58.1	Can Make This Trip
Fifth Round Trip	42.2	11	143.1	111.9	Can Make This Trip	96.1	64.9	Can Make This Trip	58.1	26.9	Can Make This Trip
Sixth Round Trip	42.2	10	111.9	79.7	Can Make This Trip	64.9	32.7	Can Make This Trip	26.9	-5.3	Running on Reserve Energy
Seventh Round Trip	42.2	9	79.7	46.5	Can Make This Trip	32.7	-0.5	Running on Reserve Energy	-5.3	-38.5	Cannot Complete Trip
Eighth Round Trip	42.2	9	46.5	13.3	Can Make This Trip	-0.5	-33.7	Cannot Complete Trip	-38.5	-71.7	Cannot Complete Trip
Ninth Round Trip	42.2	8	13.3	-20.9	Cannot Complete Trip	-33.7	-67.9	Cannot Complete Trip	-71.7	-105.9	Cannot Complete Trip
Last Trip	35.9	0	-20.9	-56.8	Cannot Complete Trip	-67.9	-103.8	Cannot Complete Trip	-105.9	-141.8	Cannot Complete Trip
End Deadhead	0	0	-56.8	-56.8	Cannot Complete Trip	-103.8	-103.8	Cannot Complete Trip	-141.8	-141.8	Cannot Complete Trip
Tenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Eleventh Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Twelfth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Thirteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Fourteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Fifteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Sixteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Seventeenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Nineteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Twentieth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
					Trip Not Needed			Trip Not Needed			Trip Not Needed
					Trip Not Needed			Trip Not Needed			Trip Not Needed

Battery Electric Bus Recharge Calulator

Block Profile	5	*ID*
Vehicle Size	35' Gillig (686 kWh)	*30, 35, 40 feet*
Starting Charge 2035 (Strenous Mileage Yr. 10)	162	
Starting Charge 2040 (Strenous Mileage Yr. 10)	193	
Starting Charge 2045 (Strenous Mileage Yr. 10)	232	
Charger Type	Fast	
Recharge Assumption (Miles per Minute of Recharge)	1	
Recharge Location	Government Center	

Round Trip	**Trip Length before Layover**	**Layover Time in minutes at End of Trip**	**Miles**	**Miles Left**	**Yr 1 Assessment**	**Miles**	**Miles Left**	**Yr 5 Assessment**	**Miles**	**Miles Left**	**Yr 10 Assessment**
Initial Deadhead	0	0	162	162	Can Make This Trip	193	193	Can Make This Trip	232	232	Can Make This Trip
First Trip	6.3	3	162	158.7	Can Make This Trip	193	189.7	Can Make This Trip	232	228.7	Can Make This Trip
Second Round Trip	42.2	9	158.7	125.5	Can Make This Trip	189.7	156.5	Can Make This Trip	228.7	195.5	Can Make This Trip
Third Round Trip	42.2	7	125.5	90.3	Can Make This Trip	156.5	121.3	Can Make This Trip	195.5	160.3	Can Make This Trip
Fourth Round Trip	42.2	10	90.3	58.1	Can Make This Trip	121.3	89.1	Can Make This Trip	160.3	128.1	Can Make This Trip
Fifth Round Trip	42.2	11	58.1	26.9	Can Make This Trip	89.1	57.9	Can Make This Trip	128.1	96.9	Can Make This Trip
Sixth Round Trip	42.2	10	26.9	-5.3	Running on Reserve Energy	57.9	25.7	Can Make This Trip	96.9	64.7	Can Make This Trip
Seventh Round Trip	42.2	9	-5.3	-38.5	Cannot Complete Trip	25.7	-7.5	Running on Reserve Energy	64.7	31.5	Can Make This Trip
Eighth Round Trip	42.2	9	-38.5	-71.7	Cannot Complete Trip	-7.5	-40.7	Cannot Complete Trip	31.5	-1.7	Running on Reserve Energy
Ninth Round Trip	42.2	8	-71.7	-105.9	Cannot Complete Trip	-40.7	-74.9	Cannot Complete Trip	-1.7	-35.9	Cannot Complete Trip
Last Trip	35.9	0	-105.9	-141.8	Cannot Complete Trip	-74.9	-110.8	Cannot Complete Trip	-35.9	-71.8	Cannot Complete Trip
End Deadhead	0	0	-141.8	-141.8	Cannot Complete Trip	-110.8	-110.8	Cannot Complete Trip	-71.8	-71.8	Cannot Complete Trip
Tenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Eleventh Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Twelfth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Thirteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Fourteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Fifteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Sixteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Seventeenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Nineteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Twentieth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
					Trip Not Needed			Trip Not Needed			Trip Not Needed
					Trip Not Needed			Trip Not Needed			Trip Not Needed

Battery Electric Bus Recharge Calulator

Block Profile	16	*ID*
Vehicle Size	35' Gillig (686 kWh)	*30, 35, 40 feet*
Starting Charge (Strenous Mileage Yr. 1)	247	
Starting Charge (Strenous Mileage Yr. 5)	200	
Starting Charge (Strenous Mileage Yr. 10)	162	
Charger Type	Fast	
Recharge Assumption (Miles per Minute of Recharge)	1	
Recharge Location	Immokalee	

Round Trip	**Trip Length before Layover**	**Layover Time in minutes at End of Trip**	**Miles**	**Miles Left**	**Yr 1 Assessment**	**Miles**	**Miles Left**	**Yr 5 Assessment**	**Miles**	**Miles Left**	**Yr 10 Assessment**
Initial Deadhead	37.2	0	247	209.8	Can Make This Trip	200	162.8	Can Make This Trip	162	124.8	Can Make This Trip
First Round Trip	3	80	209.8	247	Can Make This Trip	162.8	200	Can Make This Trip	124.8	162	Can Make This Trip
Second Round Trip	22.2	12	247	236.8	Can Make This Trip	200	189.8	Can Make This Trip	162	151.8	Can Make This Trip
Third Round Trip	22.2	12	236.8	226.6	Can Make This Trip	189.8	179.6	Can Make This Trip	151.8	141.6	Can Make This Trip
Fourth Round Trip	22.2	12	226.6	216.4	Can Make This Trip	179.6	169.4	Can Make This Trip	141.6	131.4	Can Make This Trip
Fifth Round Trip	22.2	12	216.4	206.2	Can Make This Trip	169.4	159.2	Can Make This Trip	131.4	121.2	Can Make This Trip
Sixth Round Trip	22.2	12	206.2	196	Can Make This Trip	159.2	149	Can Make This Trip	121.2	111	Can Make This Trip
Seventh Round Trip	22.2	12	196	185.8	Can Make This Trip	149	138.8	Can Make This Trip	111	100.8	Can Make This Trip
Eighth Round Trip	22.2	12	185.8	175.6	Can Make This Trip	138.8	128.6	Can Make This Trip	100.8	90.6	Can Make This Trip
Ninth Round Trip	22.2	0	175.6	153.4	Can Make This Trip	128.6	106.4	Can Make This Trip	90.6	68.4	Can Make This Trip
End Deadhead	37.2	0	153.4	116.2	Can Make This Trip	106.4	69.2	Can Make This Trip	68.4	31.2	Can Make This Trip
Tenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Eleventh Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Twelfth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Thirteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Fourteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Fifteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Sixteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Seventeenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Nineteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Twentieth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
					Trip Not Needed			Trip Not Needed			Trip Not Needed
					Trip Not Needed			Trip Not Needed			Trip Not Needed
					Trip Not Needed			Trip Not Needed			Trip Not Needed

Battery Electric Bus Recharge Calulator

Block Profile	18	*ID*
Vehicle Size	35' Gillig (686 kWh)	*30, 35, 40 feet*
Starting Charge (Strenous Mileage Yr. 1)	247	
Starting Charge (Strenous Mileage Yr. 5)	200	
Starting Charge (Strenous Mileage Yr. 10)	162	
Charger Type	Fast	
Recharge Assumption (Miles per Minute of Recharge)	1	
Recharge Location	Immokalee	

Round Trip	**Trip Length before Layover**	**Layover Time in minutes at End of Trip**	**Miles**	**Miles Left**	**Yr 1 Assessment**	**Miles**	**Miles Left**	**Yr 5 Assessment**	**Miles**	**Miles Left**	**Yr 10 Assessment**
Initial Deadhead	35.6	0	247	211.4	Can Make This Trip	200	164.4	Can Make This Trip	162	126.4	Can Make This Trip
First Round Trip	22.2	12	211.4	201.2	Can Make This Trip	164.4	154.2	Can Make This Trip	126.4	116.2	Can Make This Trip
Second Round Trip	22.2	12	201.2	191	Can Make This Trip	154.2	144	Can Make This Trip	116.2	106	Can Make This Trip
Third Round Trip	22.2	12	191	180.8	Can Make This Trip	144	133.8	Can Make This Trip	106	95.8	Can Make This Trip
Fourth Round Trip	22.2	12	180.8	170.6	Can Make This Trip	133.8	123.6	Can Make This Trip	95.8	85.6	Can Make This Trip
Fifth Round Trip	22.2	12	170.6	160.4	Can Make This Trip	123.6	113.4	Can Make This Trip	85.6	75.4	Can Make This Trip
Sixth Round Trip	22.2	12	160.4	150.2	Can Make This Trip	113.4	103.2	Can Make This Trip	75.4	65.2	Can Make This Trip
Seventh Round Trip	22.2	12	150.2	140	Can Make This Trip	103.2	93	Can Make This Trip	65.2	55	Can Make This Trip
Eighth Round Trip	22.2	0	140	117.8	Can Make This Trip	93	70.8	Can Make This Trip	55	32.8	Can Make This Trip
End Deadhead	35.6	0	117.8	82.2	Can Make This Trip	70.8	35.2	Can Make This Trip	32.8	-2.8	Running on Reserve Energy
Tenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Eleventh Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Twelfth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Thirteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Fourteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Fifteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Sixteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Seventeenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Nineteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Twentieth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
					Trip Not Needed			Trip Not Needed			Trip Not Needed
					Trip Not Needed			Trip Not Needed			Trip Not Needed
					Trip Not Needed			Trip Not Needed			Trip Not Needed
					Trip Not Needed			Trip Not Needed			Trip Not Needed

Battery Electric Bus Recharge Calulator

Block Profile	7	*ID*
Vehicle Size	35' Gillig (686 kWh)	*30, 35, 40 feet*
Starting Charge (Strenous Mileage Yr. 1)	247	
Starting Charge (Strenous Mileage Yr. 5)	200	
Starting Charge (Strenous Mileage Yr. 10)	162	
Charger Type	Fast	
Recharge Assumption (Miles per Minute of Recharge)	1	
Recharge Location	Governmenrt Center	

Round Trip	**Trip Length before Layover**	**Layover Time in minutes at End of Trip**	**Miles**	**Miles Left**	**Yr 1 Assessment**	**Miles**	**Miles Left**	**Yr 5 Assessment**	**Miles**	**Miles Left**	**Yr 10 Assessment**
Initial Deadhead	0	0	247	247	Can Make This Trip	200	200	Can Make This Trip	162	162	Can Make This Trip
First Round Trip	6.3	7	247	247	Can Make This Trip	200	200	Can Make This Trip	162	162	Can Make This Trip
Second Round Trip	28.3	7	247	225.7	Can Make This Trip	200	178.7	Can Make This Trip	162	140.7	Can Make This Trip
Third Round Trip	28.3	7	225.7	204.4	Can Make This Trip	178.7	157.4	Can Make This Trip	140.7	119.4	Can Make This Trip
Fourth Round Trip	28.3	12	204.4	188.1	Can Make This Trip	157.4	141.1	Can Make This Trip	119.4	103.1	Can Make This Trip
Fifth Round Trip	28.3	12	188.1	171.8	Can Make This Trip	141.1	124.8	Can Make This Trip	103.1	86.8	Can Make This Trip
Sixth Round Trip	28.3	12	171.8	155.5	Can Make This Trip	124.8	108.5	Can Make This Trip	86.8	70.5	Can Make This Trip
Seventh Round Trip	28.3	12	155.5	139.2	Can Make This Trip	108.5	92.2	Can Make This Trip	70.5	54.2	Can Make This Trip
Eighth Round Trip	28.3	12	139.2	122.9	Can Make This Trip	92.2	75.9	Can Make This Trip	54.2	37.9	Can Make This Trip
Ninth Round Trip	28.3	12	122.9	106.6	Can Make This Trip	75.9	59.6	Can Make This Trip	37.9	21.6	Can Make This Trip
Tenth Round Trip	28.3	12	106.6	90.3	Can Make This Trip	59.6	43.3	Can Make This Trip	21.6	5.3	Can Make This Trip
Eleventh Round Trip	22	0	90.3	68.3	Can Make This Trip	43.3	21.3	Can Make This Trip	5.3	-16.7	Cannot Complete Trip
End Deadhead	0	0	68.3	68.3	Can Make This Trip	21.3	21.3	Can Make This Trip	-16.7	-16.7	Cannot Complete Trip
Twelfth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Thirteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Fourteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Fifteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Sixteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Seventeenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Nineteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Twentieth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
					Trip Not Needed			Trip Not Needed			Trip Not Needed
					Trip Not Needed			Trip Not Needed			Trip Not Needed
					Trip Not Needed			Trip Not Needed			Trip Not Needed

Battery Electric Bus Recharge Calulator

Block Profile	4	*ID*
Vehicle Size	35' Gillig (686 kWh)	*30, 35, 40 feet*
Starting Charge (Strenous Mileage Yr. 1)	247	
Starting Charge (Strenous Mileage Yr. 5)	200	
Starting Charge (Strenous Mileage Yr. 10)	162	
Charger Type	Fast	
Recharge Assumption (Miles per Minute of Recharge)	1	
Recharge Location	Government Center	

Round Trip	**Trip Length before Layover**	**Layover Time in minutes at End of Trip**	**Miles**	**Miles Left**	**Yr 1 Assessment**	**Miles**	**Miles Left**	**Yr 5 Assessment**	**Miles**	**Miles Left**	**Yr 10 Assessment**
Initial Deadhead	0	0	247	247	Can Make This Trip	200	200	Can Make This Trip	162	162	Can Make This Trip
First Round Trip	70.8	12	247	188.2	Can Make This Trip	200	141.2	Can Make This Trip	162	103.2	Can Make This Trip
Second Round Trip	80.8	11	188.2	118.4	Can Make This Trip	141.2	71.4	Can Make This Trip	103.2	33.4	Can Make This Trip
Third Round Trip	80.8	14	118.4	51.6	Can Make This Trip	71.4	4.6	Can Make This Trip	33.4	-33.4	Cannot Complete Trip
Fourth Round Trip	80.8	9	51.6	-20.2	Cannot Complete Trip	4.6	-67.2	Cannot Complete Trip	-33.4	-105.2	Cannot Complete Trip
Fifth Round Trip	80.8	13	-20.2	-88	Cannot Complete Trip	-67.2	-135	Cannot Complete Trip	-105.2	-173	Cannot Complete Trip
Sixth Round Trip	80.8	0	-88	-168.8	Cannot Complete Trip	-135	-215.8	Cannot Complete Trip	-173	-253.8	Cannot Complete Trip
Deadhead	10	0	-168.8	-178.8	Cannot Complete Trip	-215.8	-225.8	Cannot Complete Trip	-253.8	-263.8	Cannot Complete Trip
Deadhead					Trip Not Needed			Trip Not Needed			Trip Not Needed
Sixth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Seventh Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Deadhead					Trip Not Needed			Trip Not Needed			Trip Not Needed
Eighth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
End Deadhead					Trip Not Needed			Trip Not Needed			Trip Not Needed
Tenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Eleventh Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Twelfth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Thirteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Fourteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Fifteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Sixteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Seventeenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Nineteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Twentieth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed

Battery Electric Bus Recharge Calulator

Block Profile	4	*ID*
Vehicle Size	35' Gillig (686 kWh)	*30, 35, 40 feet*
Starting Charge 2035 (Strenous Mileage Yr. 10)	162	
Starting Charge 2040 (Strenous Mileage Yr. 10)	193	
Starting Charge 2045 (Strenous Mileage Yr. 10)	232	
Charger Type	Fast	
Recharge Assumption (Miles per Minute of Recharge)	1	
Recharge Location	Government Center	

Round Trip	**Trip Length before Layover**	**Layover Time in minutes at End of Trip**	**Miles**	**Miles Left**	**Yr 1 Assessment**	**Miles**	**Miles Left**	**Yr 5 Assessment**	**Miles**	**Miles Left**	**Yr 10 Assessment**
Initial Deadhead	0	0	162	162	Can Make This Trip	193	193	Can Make This Trip	232	232	Can Make This Trip
First Round Trip	70.8	12	162	103.2	Can Make This Trip	193	134.2	Can Make This Trip	232	173.2	Can Make This Trip
Second Round Trip	80.8	11	103.2	33.4	Can Make This Trip	134.2	64.4	Can Make This Trip	173.2	103.4	Can Make This Trip
Third Round Trip	80.8	14	33.4	-33.4	Cannot Complete Trip	64.4	-2.4	Running on Reserve Energy	103.4	36.6	Can Make This Trip
Fourth Round Trip	80.8	9	-33.4	-105.2	Cannot Complete Trip	-2.4	-74.2	Cannot Complete Trip	36.6	-35.2	Cannot Complete Trip
Fifth Round Trip	80.8	13	-105.2	-173	Cannot Complete Trip	-74.2	-142	Cannot Complete Trip	-35.2	-103	Cannot Complete Trip
Sixth Round Trip	80.8	0	-173	-253.8	Cannot Complete Trip	-142	-222.8	Cannot Complete Trip	-103	-183.8	Cannot Complete Trip
Deadhead	10	0	-253.8	-263.8	Cannot Complete Trip	-222.8	-232.8	Cannot Complete Trip	-183.8	-193.8	Cannot Complete Trip
Deadhead					Trip Not Needed			Trip Not Needed			Trip Not Needed
Sixth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Seventh Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Deadhead					Trip Not Needed			Trip Not Needed			Trip Not Needed
Eighth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
End Deadhead					Trip Not Needed			Trip Not Needed			Trip Not Needed
Tenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Eleventh Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Twelfth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Thirteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Fourteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Fifteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Sixteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Seventeenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Nineteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Twentieth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed

Battery Electric Bus Recharge Calulator

Block Profile	1	*ID*
Vehicle Size	35' Gillig (686 kWh)	*30, 35, 40 feet*
Starting Charge (Strenous Mileage Yr. 1)	247	
Starting Charge (Strenous Mileage Yr. 5)	200	
Starting Charge (Strenous Mileage Yr. 10)	162	
Charger Type	Fast	
Recharge Assumption (Miles per Minute of Recharge)	1	
Recharge Location	Government Center	

Round Trip	Trip Length before Layover	Layover Time in minutes at End of Trip	Miles	Miles Left	Yr 1 Assessment	Miles	Miles Left	Yr 5 Assessment	Miles	Miles Left	Yr 10 Assessment
Initial Deadhead	1	0	247	246	Can Make This Trip	200	199	Can Make This Trip	162	161	Can Make This Trip
First Round Trip	76.2	7	246	176.8	Can Make This Trip	199	129.8	Can Make This Trip	161	91.8	Can Make This Trip
Second Round Trip	62.8	8	176.8	122	Can Make This Trip	129.8	75	Can Make This Trip	91.8	37	Can Make This Trip
Third Round Trip	62.8	12	122	71.2	Can Make This Trip	75	24.2	Can Make This Trip	37	-13.8	Cannot Complete Trip
Fourth Round Trip	62.8	9	71.2	17.4	Can Make This Trip	24.2	-29.6	Cannot Complete Trip	-13.8	-67.6	Cannot Complete Trip
Fifth Round Trip	62.8	12	17.4	-33.4	Cannot Complete Trip	-29.6	-80.4	Cannot Complete Trip	-67.6	-118.4	Cannot Complete Trip
Deadhead	62.8	10	-33.4	-86.2	Cannot Complete Trip	-80.4	-133.2	Cannot Complete Trip	-118.4	-171.2	Cannot Complete Trip
Layover at CAT Ops Center	62.8	9	-86.2	-140	Cannot Complete Trip	-133.2	-187	Cannot Complete Trip	-171.2	-225	Cannot Complete Trip
Deadhead	5.3	0	-140	-145.3	Cannot Complete Trip	-187	-192.3	Cannot Complete Trip	-225	-230.3	Cannot Complete Trip
Sixth Round Trip			-145.3	-145.3	Cannot Complete Trip	-192.3	-192.3	Cannot Complete Trip	-230.3	-230.3	Cannot Complete Trip
Seventh Round Trip			-145.3	-145.3	Cannot Complete Trip	-192.3	-192.3	Cannot Complete Trip	-230.3	-230.3	Cannot Complete Trip
Deadhead			-145.3	-145.3	Cannot Complete Trip	-192.3	-192.3	Cannot Complete Trip	-230.3	-230.3	Cannot Complete Trip
Eighth Round Trip			-145.3	-145.3	Cannot Complete Trip	-192.3	-192.3	Cannot Complete Trip	-230.3	-230.3	Cannot Complete Trip
End Deadhead			-145.3	-145.3	Cannot Complete Trip	-192.3	-192.3	Cannot Complete Trip	-230.3	-230.3	Cannot Complete Trip
Tenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Eleventh Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Twelfth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Thirteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Fourteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Fifteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Sixteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Seventeenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Nineteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Twentieth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed

Battery Electric Bus Recharge Calulator

Block Profile	1	*ID*
Vehicle Size	35' Gillig (686 kWh)	*30, 35, 40 feet*
Starting Charge 2035 (Strenous Mileage Yr. 10)	162	
Starting Charge 2040 (Strenous Mileage Yr. 10)	193	
Starting Charge 2045 (Strenous Mileage Yr. 10)	232	
Charger Type	Fast	
Recharge Assumption (Miles per Minute of Recharge)	1	
Recharge Location	Government Center	

Round Trip	**Trip Length before Layover**	**Layover Time in minutes at End of Trip**	**Miles**	**Miles Left**	**Yr 1 Assessment**	**Miles**	**Miles Left**	**Yr 5 Assessment**	**Miles**	**Miles Left**	**Yr 10 Assessment**
Initial Deadhead	1	0	162	161	Can Make This Trip	193	192	Can Make This Trip	232	231	Can Make This Trip
First Round Trip	76.2	7	161	91.8	Can Make This Trip	192	122.8	Can Make This Trip	231	161.8	Can Make This Trip
Second Round Trip	62.8	8	91.8	37	Can Make This Trip	122.8	68	Can Make This Trip	161.8	107	Can Make This Trip
Third Round Trip	62.8	12	37	-13.8	Cannot Complete Trip	68	17.2	Can Make This Trip	107	56.2	Can Make This Trip
Fourth Round Trip	62.8	9	-13.8	-67.6	Cannot Complete Trip	17.2	-36.6	Cannot Complete Trip	56.2	2.4	Can Make This Trip
Fifth Round Trip	62.8	12	-67.6	-118.4	Cannot Complete Trip	-36.6	-87.4	Cannot Complete Trip	2.4	-48.4	Cannot Complete Trip
Deadhead	62.8	10	-118.4	-171.2	Cannot Complete Trip	-87.4	-140.2	Cannot Complete Trip	-48.4	-101.2	Cannot Complete Trip
Layover at CAT Ops Center	62.8	9	-171.2	-225	Cannot Complete Trip	-140.2	-194	Cannot Complete Trip	-101.2	-155	Cannot Complete Trip
Deadhead	5.3	0	-225	-230.3	Cannot Complete Trip	-194	-199.3	Cannot Complete Trip	-155	-160.3	Cannot Complete Trip
Sixth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Seventh Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Deadhead					Trip Not Needed			Trip Not Needed			Trip Not Needed
Eighth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
End Deadhead					Trip Not Needed			Trip Not Needed			Trip Not Needed
Tenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Eleventh Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Twelfth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Thirteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Fourteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Fifteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Sixteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Seventeenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Nineteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Twentieth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed

Battery Electric Bus Recharge Calulator

Block Profile	3	*ID*
Vehicle Size	35' Gillig (686 kWh)	*30, 35, 40 feet*
Starting Charge (Strenous Mileage Yr. 1)	247	
Starting Charge (Strenous Mileage Yr. 5)	200	
Starting Charge (Strenous Mileage Yr. 10)	162	
Charger Type	Fast	
Recharge Assumption (Miles per Minute of Recharge)	1	
Recharge Location	Government Center	

Round Trip	**Trip Length before Layover**	**Layover Time in minutes at End of Trip**	**Miles**	**Miles Left**	**Yr 1 Assessment**	**Miles**	**Miles Left**	**Yr 5 Assessment**	**Miles**	**Miles Left**	**Yr 10 Assessment**
Initial Deadhead (To Immokalee)	45.6	0	247	201.4	Can Make This Trip	200	154.4	Can Make This Trip	162	116.4	Can Make This Trip
Rt. 19 Express Trip	50.6	19	201.4	169.8	Can Make This Trip	154.4	122.8	Can Make This Trip	116.4	84.8	Can Make This Trip
Second Round Trip	31.4	8	169.8	146.4	Can Make This Trip	122.8	99.4	Can Make This Trip	84.8	61.4	Can Make This Trip
Third Round Trip	31.4	12	146.4	127	Can Make This Trip	99.4	80	Can Make This Trip	61.4	42	Can Make This Trip
Fourth Round Trip	31.4	9	127	104.6	Can Make This Trip	80	57.6	Can Make This Trip	42	19.6	Can Make This Trip
Fifth Round Trip	31.4	12	104.6	85.2	Can Make This Trip	57.6	38.2	Can Make This Trip	19.6	0.2	Can Make This Trip
Sixth Round Trip	31.4	10	85.2	63.8	Can Make This Trip	38.2	16.8	Can Make This Trip	0.2	-21.2	Cannot Complete Trip
Seventh Round Trip	31.4	9	63.8	41.4	Can Make This Trip	16.8	-5.6	Running on Reserve Energy	-21.2	-43.6	Cannot Complete Trip
Deadhead	5.3	0	41.4	36.1	Can Make This Trip	-5.6	-10.9	Cannot Complete Trip	-43.6	-48.9	Cannot Complete Trip
Sixth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Seventh Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Deadhead					Trip Not Needed			Trip Not Needed			Trip Not Needed
Eighth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
End Deadhead					Trip Not Needed			Trip Not Needed			Trip Not Needed
Tenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Eleventh Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Twelfth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Thirteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Fourteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Fifteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Sixteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Seventeenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Nineteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Twentieth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed

Battery Electric Bus Recharge Calulator

Block Profile	12	*ID*
Vehicle Size	35' Gillig (686 kWh)	*30, 35, 40 feet*
Starting Charge (Strenous Mileage Yr. 1)	247	
Starting Charge (Strenous Mileage Yr. 5)	200	
Starting Charge (Strenous Mileage Yr. 10)	162	
Charger Type	Fast	
Recharge Assumption (Miles per Minute of Recharge)	1	
Recharge Location	CAT Ops	

Round Trip	**Trip Length before Layover**	**Layover Time in minutes at End of Trip**	**Miles**	**Miles Left**	**Yr 1 Assessment**	**Miles**	**Miles Left**	**Yr 5 Assessment**	**Miles**	**Miles Left**	**Yr 10 Assessment**
Initial Deadhead (To Comm. Center)	4	0	247	243	Can Make This Trip	200	196	Can Make This Trip	162	158	Can Make This Trip
First Round Trip	32.1	0	243	210.9	Can Make This Trip	196	163.9	Can Make This Trip	158	125.9	Can Make This Trip
Second Round Trip	32.1	0	210.9	178.8	Can Make This Trip	163.9	131.8	Can Make This Trip	125.9	93.8	Can Make This Trip
Third Round Trip	32.1	0	178.8	146.7	Can Make This Trip	131.8	99.7	Can Make This Trip	93.8	61.7	Can Make This Trip
Fourth Round Trip	32.1	0	146.7	114.6	Can Make This Trip	99.7	67.6	Can Make This Trip	61.7	29.6	Can Make This Trip
Fifth Round Trip	32.1	0	114.6	82.5	Can Make This Trip	67.6	35.5	Can Make This Trip	29.6	-2.5	Running on Reserve Energy
Sixth Round Trip	32.1	0	82.5	50.4	Can Make This Trip	35.5	3.4	Can Make This Trip	-2.5	-34.6	Cannot Complete Trip
Seventh Round Trip	32.1	0	50.4	18.3	Can Make This Trip	3.4	-28.7	Cannot Complete Trip	-34.6	-66.7	Cannot Complete Trip
Eighth Round Trip	32.1	0	18.3	-13.8	Cannot Complete Trip	-28.7	-60.8	Cannot Complete Trip	-66.7	-98.8	Cannot Complete Trip
Deadhead	4	0	-13.8	-17.8	Cannot Complete Trip	-60.8	-64.8	Cannot Complete Trip	-98.8	-102.8	Cannot Complete Trip
Seventh Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Deadhead					Trip Not Needed			Trip Not Needed			Trip Not Needed
Eighth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
End Deadhead					Trip Not Needed			Trip Not Needed			Trip Not Needed
Tenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Eleventh Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Twelfth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Thirteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Fourteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Fifteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Sixteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Seventeenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Nineteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Twentieth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed

Battery Electric Bus Recharge Calulator

Block Profile	12	*ID*
Vehicle Size	35' Gillig (686 kWh)	*30, 35, 40 feet*
Starting Charge 2035 (Strenous Mileage Yr. 10)	162	
Starting Charge 2040 (Strenous Mileage Yr. 10)	193	
Starting Charge 2045 (Strenous Mileage Yr. 10)	232	
Charger Type	Fast	
Recharge Assumption (Miles per Minute of Recharge)	1	
Recharge Location	CAT Ops	

Round Trip	**Trip Length before Layover**	**Layover Time in minutes at End of Trip**	**Miles**	**Miles Left**	**Yr 1 Assessment**	**Miles**	**Miles Left**	**Yr 5 Assessment**	**Miles**	**Miles Left**	**Yr 10 Assessment**
Initial Deadhead	4	0	162	158	Can Make This Trip	193	189	Can Make This Trip	232	228	Can Make This Trip
First Round Trip	32.1	0	158	125.9	Can Make This Trip	189	156.9	Can Make This Trip	228	195.9	Can Make This Trip
Second Round Trip	32.1	0	125.9	93.8	Can Make This Trip	156.9	124.8	Can Make This Trip	195.9	163.8	Can Make This Trip
Third Round Trip	32.1	0	93.8	61.7	Can Make This Trip	124.8	92.7	Can Make This Trip	163.8	131.7	Can Make This Trip
Fourth Round Trip	32.1	0	61.7	29.6	Can Make This Trip	92.7	60.6	Can Make This Trip	131.7	99.6	Can Make This Trip
Fifth Round Trip	32.1	0	29.6	-2.5	Running on Reserve Energy	60.6	28.5	Can Make This Trip	99.6	67.5	Can Make This Trip
Deadhead	32.1	0	-2.5	-34.6	Cannot Complete Trip	28.5	-3.6	Running on Reserve Energy	67.5	35.4	Can Make This Trip
Layover at CAT Ops Center	32.1	0	-34.6	-66.7	Cannot Complete Trip	-3.6	-35.7	Cannot Complete Trip	35.4	3.3	Can Make This Trip
Deadhead	32.1	0	-66.7	-98.8	Cannot Complete Trip	-35.7	-67.8	Cannot Complete Trip	3.3	-28.8	Cannot Complete Trip
Sixth Round Trip	4	0			Trip Not Needed			Trip Not Needed			Trip Not Needed
Seventh Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Deadhead					Trip Not Needed			Trip Not Needed			Trip Not Needed
Eighth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
End Deadhead					Trip Not Needed			Trip Not Needed			Trip Not Needed
Tenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Eleventh Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Twelfth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Thirteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Fourteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Fifteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Sixteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Seventeenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Nineteenth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed
Twentieth Round Trip					Trip Not Needed			Trip Not Needed			Trip Not Needed

D.2 Comparison with Chapter 6 Models

In Chapter 6, Table 6-10 identifies four blocks—Blocks 4, 5, 13, and 18—that were assigned to 35-foot buses. The Chapter 6 model assumes these 35-foot buses have an original battery capacity of 420 kWh, whereas the 686-kWh bus offers nearly 270 kWh more energy capacity. Despite this increase, no improvements were observed in the ability of either model to serve these four blocks on weekdays, suggesting that the 686-kWh bus does not provide a significant advantage over the 420-kWh model in this scenario. However, improvements due to the increased battery capacity are observed on Sundays for Block 4 in the current scenario, as well as on both Saturdays and Sundays for Block 13 in both the current and future scenarios. Additionally, the 686-kWh bus improves the feasibility of Block 18 when on-route charging is available.

When compared to the smaller 30-foot buses with 350-kWh batteries, the 686-kWh model demonstrates substantial improvements in the current weekday scenarios. Most notably, it enables Block 17 to become feasible and likely improves feasibility for Blocks 8, 9, 11, and 15/21. The addition of on-route charging further enhances service feasibility for Blocks 7 and 16 when compared to the 350-kWh 30-foot buses.

Finally, when comparing the 686-kWh bus to the larger 40-foot buses with 500-kWh batteries, no improvements were observed in serving Block 1 in the current scenario. This suggests that the increased battery capacity of the 686-kWh model does not offer an operational advantage over the 500-kWh 40-foot bus in this case.

D.3 Additional Data

Table D-7 presents the assumptions used for the electric vehicle analysis. These assumptions are provided by for the 686 kWh 35-foot Gillig bus that CAT has procured to help provide reference to regarding the mileage limit recommendations for nominal and strenuous conditions. In this way, if CAT wishes to analyze vehicle blocks in the future, CAT can consider these figures as reference to the suggested maximum operational mileage that they should operate their electric vehicles for the 35-foot bus that is in the procurement process.

TABLE D-7: SERVICE RANGE OVER THE YEARS

Service Range (in miles) for Vehicles Purchased in 2025											
Vehicle	**Condition**	**Yr. 1**	**Yr. 2**	**Yr. 3**	**Yr. 4**	**Yr. 5**	**Yr. 6**	**Yr. 7**	**Yr. 8**	**Yr. 9**	**Yr. 10**
35' Gillig Bus (686 kWh)	**Nominal**	286	274	263	252	242	232	222	213	204	195
	Strenuous	247	237	227	218	209	200	192	184	176	169

APPENDIX E POTENTIAL ADDITIONAL FUNDING PROGRAMS

E.1.1 Low- or No-Emission Vehicle Program, Section 5339(c)

The Low- or No-Emission Vehicle Program provides funding to state and local governments for the purchase or lease of low- or no-emission transit buses as well as acquisition, construction, and leasing of required supporting facilities. The program aims to assist in the deployment of low- or no-emission vehicles. According to FTA, the projects should aim to comply or maintain compliance with the Clean Air Act (CAA) and the Americans with Disabilities Act (ADA) to achieve maximum federal share for the cost of acquiring, installing, or constructing, vehicle-related equipment or facilities.

Grants are awarded based on several criteria such as a demonstration of needs and benefits, consistency with long-range plans, and local financial commitment, among others. If a project is related to zero-emission vehicles (e.g., buses or depot), 5 percent of the requested grant award must be used for workforce development to retrain the existing workforce and develop the workforce of the future, including registered apprenticeships and other joint labor management training programs.

- Apportioning Entity: FTA
- Period of Availability: 4 years
- Funding Available: $1.1 billion (FY 24). From this amount, FTA has set aside $357 million (21.5%) for low-emission technologies annually. In FY 23, this amount was rolled over since a few agencies applied for low-emission projects in FY 22, essentially making $714 million available for such purchases in FY 23.
- Program Match:
    - Total Vehicle Cost (Lease): 85% Federal, 15% Local
    - Net Equipment and Facilities Cost: 90% Federal, 10% Local
- Eligible Activities:
    - Purchasing or leasing of low- or zero-emission buses
    - Acquiring low- or zero-emission buses with a leased power source

E.1.2 National Electric Vehicle Infrastructure (NEVI) Formula Program

The NEVI Formula Program is designed to provide dedicated funding to states to strategically deploy electric vehicle charging infrastructure and help create a national electric vehicle network. In the current funding stage, NEVI funds are being directed towards the one-mile buffer surrounding designated Alternative Fuel Corridors (AFC). In Collier County, there are three such corridors: I-75, U.S. 41, and SR 29. Funds may be used to purchase and install publicly available electric vehicle charging infrastructure, operating expenses, purchase, and installation of traffic control devices located in the right-of-way, on-premises signage, development activities, and mapping and analysis activities. The 2021 Florida Department of Transportation (FDOT) Electric Vehicle Infrastructure Master Plan has information on the state strategy for the implementation of an electric vehicle network throughout Florida.

- Apportioning Entity: FDOT
- Period of Availability: Until funds are expended
- Funding Available: $198 million (FY 24)
- Program Match: 80% Federal, 20% Local

- Eligible Activities:
    - Publicly Available electric vehicle Chargers
    - Projects within the buffer area that would support the availability of public electric vehicle chargers.

E.1.3 Bus and Bus Facilities Discretionary Program, 5339(a)

The Bus and Bus Facilities Discretionary Program makes federal resources available to states and direct recipients to replace, rehabilitate, purchase, or lease buses, vans or related equipment and construct bus-related facilities. The program aims to support the replacement or enhancement of existing buses and bus facilities based on age and asset condition. Recipients can use up to 0.5 percent of the requested grant award for workforce development including on-the-job training, labor management partnership training, and registered apprenticeships.

- Apportioning Entity: FTA
- Period of Availability: 4 years
- Funding Available: $1.66 billion (FY 22)
- Program Match:
    - Total Vehicle Cost (Lease): 85% Federal, 15% Local
    - Net Equipment and Facilities Cost: 90% Federal, 10% Local
- Eligible Activities:
    - Constructing or leasing facilities and related equipment
    - Constructing new public transportation facilities to accommodate buses.
    - Rehabilitating or improving existing public transportation facilities.

E.1.4 Rebuilding American Infrastructure with Sustainability and Equity (RAISE) Grants

RAISE grants are intended to help state, municipal and tribal entities fund projects that are not easily or readily funded through other transportation grant programs. The statutory criteria require evaluation based on safety, environmental sustainability, quality of life, mobility and community connectivity, economic competitiveness and opportunities including tourism, state of good repair, partnership and collaboration, and innovation.

Successful projects have included electric vehicles and charging facilities including a $20 million grant for the Clearwater Multimodal Transit Center submitted by the Pinellas Suncoast Transit Authority for FY22.

- Apportioning Entity: USDOT
- Funding Available: $1.5 billion (FY 23)
- Program Match: 80% Federal, 20% Local (Areas of Persistent Poverty or Historically Disadvantaged Communities have reduced Federal match requirements)
- Eligible Activities:
    - Capital projects including but not limited to:
        - Highway, bridge, or other road projects eligible under title 23, United States Code
        - Public transportation projects eligible under chapter 53 of title 49, United States Code
        - Passenger and freight rail transportation projects

        - Port infrastructure investments
        - Intermodal projects
        - Any other surface transportation infrastructure project that the Secretary considers to be necessary to advance the goals of the program.
    - Planning projects which include planning, preparation, or design (for example: environmental analysis, feasibility studies, benefit cost analysis (BCA), and other pre-construction activities) of eligible surface transportation capital projects.

E.1.5 Advanced Transportation Technologies and Innovative Mobility Deployment (ATTIMD)

The ATTIMD provides competitive grants for the development and deployment of advanced or emerging technologies and support systems that are geared towards improving safety, efficiency, system performance and infrastructure return on investments. This opportunity also includes efforts to increase connectivity to employment, education, services, and other opportunities.

- Apportioning Entity: FHWA
- Period of Availability: One to four years
- Funding Available: $60 million (FY 23)
- Program Match: 80% Federal, 20% Local
- Eligible Activities:
    - Advanced Traveler Information Systems
    - Advanced Public Transportation Systems
    - Transportation system performance data collection, analysis, and dissemination systems
    - Advanced mobility and access technologies, such as dynamic ride sharing and information systems to support human services for elderly and disabled individuals.

E.1.6 Diesel Emissions Reduction Act (DERA)

The DERA program funds grants and rebates that are geared toward replacing diesel engines with cleaner fuel alternatives. This program awards reimbursements which are granted over a two-year cycle and may be fully or incrementally funded as deemed appropriate. For eligible vehicles, DERA will reimburse up to 45 percent of the cost for electric vehicles that replace certain diesel vehicles. The purchase and installation of electric vehicle charging infrastructure can be included in an electric vehicle replacement project. State, local, or tribal agencies with jurisdiction over transportation or air quality may apply.

- Apportioning Entity: EPA
- Period of Availability: Two years
- Funding Available: $46.0 M (FY21)
- Program Match: Federal Match: Up to 45% of the total electric bus replacement cost including charging infrastructure.
- Eligible Activities:
    - Replacement of diesel engines on:
        - Buses
        - Class 5 – Class 8 heavy-duty highway vehicles
        - Locomotive engines

- Marine engines
- Non-road engines, equipment or vehicles used in construction, cargo handling, etc.

E.1.7 Alternative Fuel Infrastructure Tax Credit

The Internal Revenue Service (IRS) provides a tax credit for fueling equipment for most alternative fuel infrastructure. The credit may be used for one or various locations where infrastructure is implemented, and the credit may be carried backwards one year or forwards for 20 years. The equipment must be installed in locations that meet at least one of these requirements at the census tract level: the area is not urban, the poverty rate is at least 20 percent, or the median family income is less than 80 percent of the state medium family income level.

- Apportioning Entity: IRS
- Period of Availability: Up to 20 years
- Tax Credit provisions:
  - Before 2023: 30% of the cost of equipment not to exceed $30,000.
  - After 2023: 30% of the cost of equipment or 6% of property that is subject to depreciation, not to exceed $100,000.

E.1.8 Title XVII Renewable Energy and Efficient Energy (REEE) Projects Solicitation

The Department of Energy (DOE) Loan Programs Office (LPO) has issued a supplement to its Title XVII REEE solicitation in the form of a loan guarantee. REEE solicitations are provided to projects that support innovative, renewable energy and energy efficiency. The continued deployment of electric vehicles has been impeded in recent years due to a lack of charging infrastructure and battery prices. As a result, the LPO supplement is aimed at providing assistance in the deployment of electric vehicle projects.

- Apportioning Entity: DOE Loan Programs Office
- Funding Available: $4.5 B
- Program Match: Federal Match: Up to 45% of the total electric bus replacement cost including charging infrastructure.
- Eligible Activities:
  - Charging infrastructure
  - Batteries
  - Associated hardware or software

E.1.9 Advanced Transportation and Congestion Management Technologies Deployment Program

Through Fixing America's Surface Transportation Act (FAST Act), FHWA established the Advanced Transportation and Congestion Management Technologies Deployment Program to make grants available for the development of model deployment sites for large scale installation and operation of advanced transportation technologies to improve safety, efficiency, system performance, and infrastructure return on investment. Up to 5 percent of funds are allowed to be used each fiscal year to carry out planning and reporting requirements under the program.

- Apportioning Entity: FHWA
- Funding Available: $60 M

- Program Match: 50% Federal, 50% Local
- Eligible Activities:
    - Advanced traveler information systems
    - Advanced transportation management technologies
    - Infrastructure maintenance, monitoring, and condition assessment
    - Advanced public transportation systems
    - Transportation system performance data collection, analysis, and dissemination systems
    - Advanced safety systems, including vehicle-to-vehicle and vehicle-to-infrastructure communications
    - Technologies associated with autonomous vehicles, and other collision avoidance technologies, including systems using cellular technology
    - Integration of intelligent transportation systems with the smart grid and other energy distribution and charging systems
    - Electronic pricing and payment systems
    - Advanced mobility and access technologies, such as dynamic ridesharing and information systems to support human services for elderly and disabled individuals.

E.1.10 Accelerating Innovative Mobility (AIM)

FTA's AIM initiative promotes forward-thinking approaches to improve transit financing, planning, system design, and service. The program also supports innovative approaches to advance strategies that promote accessibility, including equitable and equivalent accessibility for all travelers.

- Apportioning Entity: FTA
- Funding Available: $14 M (FY20)
- Program Match: Federal Match: 80% Federal, 20% Local
- Eligible Activities:
    - Planning and developing business models
    - Obtaining equipment and service
    - Acquiring or developing software and hardware interfaces to implement the project.
    - Operating or implementing the new service model
    - Evaluating project results

E.1.11 Charging and Fueling Infrastructure (CFI) Discretionary Grant Program

The CFI Discretionary Grant Program aims to strategically deploy publicly accessible electric vehicle charging and alternative fueling infrastructure in the places people live and work as well as along designated AFCs. The awards are structured as cost reimbursement grants. There are two funding categories: Community Charging and Fueling Grants and Alternative Fuel Corridor Grants. For the Community Grants, infrastructure must be located on a public road or a publicly accessible location. For the AFC grants, battery electric charging infrastructure must be located within a mile of an AFC, while infrastructure for other alternative fuels must be located within five miles of an AFC. Compressed Natural Gas AFC status is pending for Interstate 75 and Electric Vehicle AFC status is pending for Interstate 75, U.S. 41, and State Road 29.

- Apportioning Entity: FHWA

- Funding Available: $700 M (FYs 22 and 23)
- Eligible Activities:
    - Electric vehicle charging infrastructure
    - Hydrogen fueling infrastructure
    - Propane fueling infrastructure
    - Natural gas fueling infrastructure

E.1.12 Recent Federal Actions

On January 20, 2025, President Trump issued an Executive Order rescinding all diversity, equity, inclusion, and accessibility initiatives within the Federal government, within federal funding initiatives, and encouraging the private sector to do the same. The next day, January 21, 2025, President Trump issued an order rescinding Executive Order 12898 of February 11, 1994 (Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations). Both of these actions suggest that the use of the words “diversity”, “equity”, “inclusion”, or “accessibility” should be discouraged in federally funded documents and reports.

Similarly, another Executive Order issued on January 20, 2025, titled “Unleashing American Energy” attempted to halt funding under the IIJA and Inflation Reduction Act specifically for electric vehicles, and also rescinded multiple prior executive orders related to climate change. This executive order did not discourage the development of electric vehicles but rather promoted freedom of choice by consumers.

As rulemaking and guidance are released in response to these Executive Orders, CAT should continue to monitor funding opportunities and grant eligibility criteria for successfully securing additional funding.

APPENDIX F VEHICLE REPLACEMENT PLAN

This appendix to the Implementation Plan details the suggested Vehicle Replacement Plan (VRP) for years 2025 through 2034, for each vehicle in the current fleet by vehicle ID

Vehicle ID	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
CC2-868	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline
CC2-1115	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel
CC2-1117	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel
CC2-1376	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline
CC2-1377	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline
CC2-1412	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel
CC2-1411	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel
CC2-1843	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline
CC2-1842	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline
CC2-1844	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline
CC2-1845	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline
CC2-2194	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel
CC2-2195	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel
CC2-2196	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel
CC2-2197	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel	Demand Response Diesel
CC2-2342	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline
CC2-2345	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline
CC2-2344	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline

Vehicle ID	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
CC2-2343	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline
CC2-2393	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline
CC2-2480	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline
CC2-2481	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline
CC2-2478	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline
CC2-2482	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline
CC2-2477	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline
CC2-2479	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline
CC2-2700	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline
CC2-2701	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline
CC2-2702	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline
CC2-2703	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline
CC2-2704	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline
CC2-2705	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline
7008	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline
7013	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline
7006	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline
7005	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline	Demand Response Gasoline
CC2-800	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel
CC2-799	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel
CC2-1122	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel

Vehicle ID	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
CC2-1008	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel
CC2-1621	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel
CC2-1620	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel
CC2-1623	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel
CC2-1622	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel
CC2-1409	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel
CC2-1408	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel
CC2-1719	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel
CC2-1917	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Battery Electric	Fixed Route Battery Electric	Fixed Route Battery Electric	Fixed Route Battery Electric	Fixed Route Battery Electric	Fixed Route Battery Electric
CC2-2569	Fixed Route Gasoline	Fixed Route Gasoline	Fixed Route Gasoline	Fixed Route Gasoline	Fixed Route Gasoline	Fixed Route Gasoline	Fixed Route Gasoline	Fixed Route Gasoline	Fixed Route Gasoline	Fixed Route Gasoline
CC2-2568	Fixed Route Gasoline	Fixed Route Gasoline	Fixed Route Gasoline	Fixed Route Gasoline	Fixed Route Gasoline	Fixed Route Gasoline	Fixed Route Gasoline	Fixed Route Gasoline	Fixed Route Gasoline	Fixed Route Gasoline
CC2-2725	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel
CC2-2726	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel
CC2-2727	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel
CC2-2729	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Hybrid Electric	Fixed Route Hybrid Electric	Fixed Route Hybrid Electric
CC2-2728	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Hybrid Electric	Fixed Route Hybrid Electric	Fixed Route Hybrid Electric
CC2-2864	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Hybrid Electric	Fixed Route Hybrid Electric
CC2-2865	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Hybrid Electric	Fixed Route Hybrid Electric
CC2-2866	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Hybrid Electric	Fixed Route Hybrid Electric

Vehicle ID	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
CC2-2867	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Hybrid Electric	Fixed Route Hybrid Electric
CC2-2601	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel
TBD 30' Bus 2	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel
TBD 30' Bus 1	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel
CC2-3017	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel
TBD 35' Bus 2	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel
TBD 35' Bus 1	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel	Fixed Route Diesel
TBD 35' - Electric	Fixed Route Battery Electric	Fixed Route Battery Electric	Fixed Route Battery Electric	Fixed Route Battery Electric	Fixed Route Battery Electric	Fixed Route Battery Electric	Fixed Route Battery Electric	Fixed Route Battery Electric	Fixed Route Battery Electric	Fixed Route Battery Electric
CC2-1553 (sedan)	Support Car Gasoline	Support Car Gasoline	Support Car Gasoline	Support Car Gasoline	Support Car Gasoline	Support Car Gasoline	Support Car Gasoline	Support Car Gasoline	Support Car Gasoline	Support Car Gasoline
CC2-2019 (SUV)	Support Car Gasoline	Support Car Gasoline	Support Car Gasoline	Support Car Gasoline	Support Car Gasoline	Support Car Gasoline	Support Car Gasoline	Support Car Gasoline	Support Car Gasoline	Support Car Gasoline
CC2-1402 (Pickup)	Support Pickup Gasoline	Support Pickup Gasoline	Support Pickup Gasoline	Support Pickup Gasoline	Support Pickup Gasoline	Support Pickup Gasoline	Support Pickup Gasoline	Support Pickup Gasoline	Support Pickup Gasoline	Support Pickup Gasoline
CC2-1662 (Pickup)	Support Pickup Gasoline	Support Pickup Gasoline	Support Pickup Gasoline	Support Pickup Gasoline	Support Pickup Gasoline	Support Pickup Gasoline	Support Pickup Gasoline	Support Pickup Gasoline	Support Pickup Gasoline	Support Pickup Gasoline
CC2-2106 (van)	Support Van Gasoline	Support Van Gasoline	Support Van Gasoline	Support Van Gasoline	Support Van Gasoline	Support Car Battery Electric	Support Car Battery Electric	Support Car Battery Electric	Support Car Battery Electric	Support Car Battery Electric
CC2-2107 (Van)	Support Van Gasoline	Support Van Gasoline	Support Van Gasoline	Support Van Gasoline	Support Van Gasoline	Support Car Battery Electric	Support Car Battery Electric	Support Car Battery Electric	Support Car Battery Electric	Support Car Battery Electric