

**COUNCIL OF THE DISTRICT OF COLUMBIA
COMMITTEE OF THE WHOLE
COMMITTEE REPORT**

1350 Pennsylvania Avenue, NW, Washington, DC 20004

DRAFT

TO: All Councilmembers

FROM: Chairman Phil Mendelson
Committee of the Whole

DATE: January 18, 2022

SUBJECT: Report on PR 24-154, “Sense of the Council Urging WMATA’s Bus Fleet Electrification Resolution of 2021”

The Committee of the Whole, to which PR 24-154, the “Sense of the Council Urging WMATA’s Bus Fleet Electrification Resolution of 2021” was referred, reports favorably thereon, and recommends approval by the Council.

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I. BACKGROUND AND NEED

On April 5, 2021, PR 24-154, the “Sense of the Council Urging WMATA’s Bus Fleet Electrification Resolution of 2021” was introduced by Chairman Mendelson and Councilmembers McDuffie, Nadeau, Trayon White, Bonds, Lewis George, Allen, Robert White, Cheh, Henderson, Pinto, Silverman, and Gray. The purpose of PR 24-154 is to express the sense of the Council that the Washington Metropolitan Area Transit Authority (WMATA) commit to speeding its electrification program for buses.

WMATA’s current timeline for electrification

On June 10, 2021, WMATA Executive Vice President for Capital Planning and Program Management Tom Webster presented the WMATA Board with a proposed Metrobus Fleet Plan for transitioning to electric buses, which was approved by the WMATA Board’s Executive Committee at that time, and later approved by the entire board on June 24, 2021.

The plan calls for a phased approach to transitioning WMATA's 1,590-bus fleet to 100 percent zero-emissions by 2045.¹ The phasing includes a commitment to purchase only lower-emission and electric buses in WMATA's next bus procurement (which could include additional compressed natural gas (CNG) buses, a transition to 100 percent zero-emission bus purchases by 2030, having two-thirds of all buses employing zero-emissions technology by 2038, and culminating with 100% zero-emission fleet by 2045.²

WMATA asserts that their strategy balances flexibility and adaptability with the potential for faster adoption of electric or other zero-emission buses if 1-for-1 replacement is possible sooner or more funding becomes available and facility capacity and infrastructure improvements are realized more quickly.³

The Need to Transition to Electric Buses

WMATA operates the sixth-largest bus fleet in the United States, providing service to residents in Washington, Maryland, and Virginia, with more than 130 million passenger trips per year. While by the fall of 2019, there were 528 fully electric buses in service in the US — a 29 percent increase from 2018, WMATA currently has one electric bus.⁴ While the Committee acknowledges that speeding the transition to electric buses will require some effort, the Committee is confident that the substantial benefits will outweigh the burdens of the change.

First, there is now an increased federal emphasis on moving toward the electrification of both transit and school buses. According to the Center for Transportation and the Environment (CTE), of the United States' roughly 70,000 largely diesel transit buses, only around 2% are currently zero emission. Under the Biden Administration's \$1.2 trillion Infrastructure Investment & Jobs Act, passed in November 2021, electric bus initiatives would receive approximately \$7.5 billion in funding.⁵

Converting to electric buses also would result in cost savings through reduced fuel and maintenance costs, which would mitigate the premium on the purchase price of electric buses compared with diesel and other types of transit buses. In addition, electric buses would lead to significant annual greenhouse gas (GHG) emissions reductions across the WMATA fleet, and these reductions grow larger over time as more of the fleet shifts to electric buses.⁶ To estimate net

¹ WMATA Sustainability Vision and Principles and Metrobus Fleet Plan (June 2021) - <https://www.wmata.com/about/board/meetings/board-pdfs/upload/3A-Sustainability-Vision-Goals-and-Bus-Fleet.pdf>

² Id. at 32.

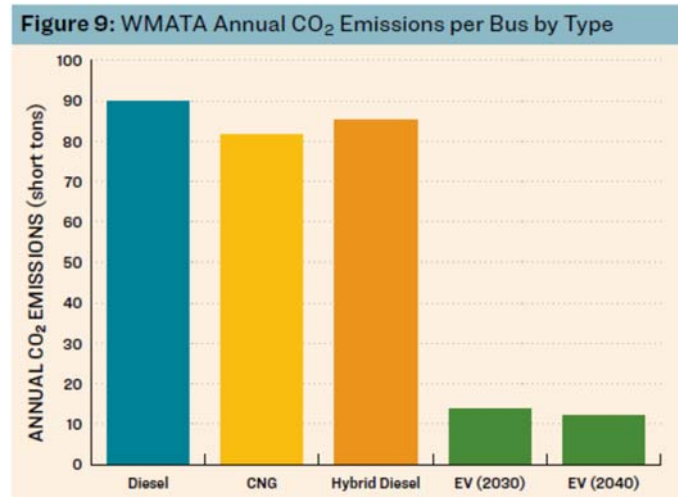
³ Id.

⁴ A VISION FOR CLIMATE LEADERSHIP IN WASHINGTON, DC: Seizing the Economic, Climate, and Public Health Benefits of Electrifying WMATA's Transit Bus Fleet (Sierra Club – October 2020) - https://www.sierraclub.org/sites/www.sierraclub.org/files/press-room/WMATAREport_Web.pdf

⁵ <https://www.forbes.com/sites/jonathanponciano/2021/11/15/everything-in-the-12-trillion-infrastructure-bill-biden-just-signed-new-roads-electric-school-buses-and-more/?sh=5e0576b3161f>

⁶ A VISION FOR CLIMATE LEADERSHIP IN WASHINGTON, DC: Seizing the Economic, Climate, and Public Health Benefits of Electrifying WMATA's Transit Bus Fleet, page 6 (Sierra Club – October 2020) - https://www.sierraclub.org/sites/www.sierraclub.org/files/press-room/WMATAREport_Web.pdf

emissions reductions, the Sierra Club’s analysis of GHG emissions incorporated both on-road emissions from the buses themselves as well as emissions from the electric grid based on the necessary charging of electric buses in the future.



Courtesy: Sierra Club

In addition, converting from diesel and CNG to electric buses would lead to substantial public health benefits for Washington DC area residents in WMATA’s service territory based on reduced air pollution. According to the U.S. Department of Energy’s Argonne National Laboratory, while CNG buses emit less nitrous oxides and particulate matter than conventional diesel buses, they emit nearly the same level of life cycle carbon emissions in many circumstances. Another recent analysis, by the Union of Concerned Scientists, found that the lifecycle carbon emissions of CNG buses are only 12 percent lower than that of conventional diesel buses, while battery electric bus lifecycle carbon emissions are as much as 87 percent lower than diesel and 85 percent lower than CNG bus lifecycle emissions.

WMATA’s plans and progress compared with other jurisdictions

WMATA’s stated goal of moving to all electric buses by 2045 is considerably slower than several transit agencies with larger and similar-sized bus fleets. The Committee believes that the WMATA Board should work to adopt a more ambitious timetable to transition the Metrobus fleet to electric buses to put Metro on par with major city bus authorities across the country and smaller bus agencies in the Washington, D.C., region.

For example, both the Los Angeles County Metropolitan Transportation Authority, which has 2,320 buses, and the Houston Metropolitan Transit Authority, which owns more than 1,230 buses, plan to have an all-electric fleet by 2030. Their timetable coincides with the federal American Jobs Plan goal to electrify 50,000 transit buses by that date, which would include approximately 80 percent of the public transit buses in the United States. Meanwhile, the York City Metropolitan Transportation Authority, which operates 5,800 buses, and the Chicago Transit Authority, which has 1,864 buses, are both scheduled to be all-electric by 2040. WMATA has also lagged behind other transit agencies in the Washington region in terms of moving toward electric

buses. The D.C. Circulator system currently owns 14 battery-electric buses⁷, and Alexandria's DASH and Montgomery County's Ride On also deploy several electric buses. WMATA purchased one electric bus in 2017 but it has seen limited use.

The WMATA plan only commits the agency to begin buying 100-percent zero-emission buses starting in 2030—the same year Los Angeles and Houston are aiming to be 100-percent zero-emission. Instead of quickly pivoting to purchasing electric buses—which is economically and technologically feasible, as evidenced by other transit system plans—WMATA's plan calls for continuing to purchase diesel and compressed natural gas (CNG) buses until 2030, when 80 percent of the fleet will still run on fossil fuels.

Concerns with the WMATA Electrification Plan and Continued Reliance on CNG

The current WMATA plan calls for increasing the percentage of CNG buses in the Metrobus fleet, which WMATA staff noted in the June presentation would lower overall Metrobus carbon emissions. WMATA asserted that CNG buses emit approximately 28 percent less carbon emissions than a conventional diesel bus, but failed to mention that that figure pertains to tailpipe, not life cycle emissions.

Regardless, WMATA still plans to continue to purchase CNG buses in accordance with an the 2017 WMATA policy to purchase 50 percent diesel buses and 50 percent CNG buses. The plan also relies on renewable natural gas (RNG) as a low-emission fuel for its CNG buses, assuming that the agency will achieve 80 percent of its carbon emissions reductions through 2030 by using CNG and RNG. Relying on RNG, however, is problematic. First, supply is limited. According to a 2019 American Gas Foundation (AGF) study, even after ramping up production, RNG could only replace 6 to 13 percent of total natural gas demand. Increased cost also is a factor. The same AGF report noted that RNG would be at least two to five times more expensive than fracked gas.

The current WMATA proposal lacks sufficient detail about its plans for RNG. It notes that the agency has no contract for RNG, and it fails to provide an estimate of the quantity that would be required based on WMATA's evolving bus fleet composition. It does not cite a price for the RNG, which will cost more than CNG, nor does it provide a start date for RNG delivery, and the longer the delay, the less time WMATA will have to claim offsets. Finally, it does not mention the source for the RNG.

Those information gaps notwithstanding, and in order to expand the percentage of CNG buses in the fleet, the plan calls for spending more than \$5 million on a new CNG fueling station at Metro's Shepherd Parkway facility in Ward 8, which would require WMATA to rely on fossil fuels well past 2030. The Committee encourages the WMATA Board to revisit plans for the new CNG facility and determine the feasibility of replacing all of the fossil fuel buses in the fleet, including CNG buses, with electric buses as quickly as possible. The Committee also encourages WMATA to strongly reconsider plans to build a new CNG fueling station, which—if WMATA adopts a faster transition schedule—would potentially become a stranded asset. A new CNG

⁷ D.C. Circulator Battery Electric Bus (BEB) Pilot Final Report, District Department of Transportation (August 2021), https://www.dccirculator.com/wp-content/uploads/2021/09/Final-Electric-Bus-Pilot-Report-v3_8.25.21.pdf

fueling station would be inconsistent with the transition to electric, and the resources used to facilitate such a project could certainly be deployed to further the electrification program.

In conclusion, the Committee finds that it is in the vital interest of WMATA to substantially accelerate its efforts to electrify its bus fleet. This action will protect the health, safety and welfare of District residents, other living in the metropolitan region and the environment in and around the District. It also will ensure that the District keep pace with peer jurisdictions in implementing environmental sustainable programs with long-term benefits.

II. LEGISLATIVE CHRONOLOGY

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|--------------------|--|
| April 5, 2021 | PR 24-154, the “Sense of the Council Urging WMATA’s Bus Fleet Electrification Resolution of 2021” is introduced by Chairman Mendelson and Councilmembers McDuffie, Nadeau, Trayon White, Bonds, Lewis George, Allen, Robert White, Cheh, Henderson, Pinto, Silverman, and Gray |
| April 6, 2021 | PR 24-154 is “read” at Regular Legislative Meeting and the retained by the Council with comments by the Committee of the Whole. |
| April 9, 2021 | Notice of Intent to Act on PR 24-154 is published in the <i>District of Columbia Register</i> . |
| September 30, 2021 | The Committee of the Whole holds a Public Roundtable related to PR 24-154. |
| October 5, 2021 | PR 24-154 is re-referred to the Committee of the Whole. |
| January 18, 2022 | The Committee of the Whole marks-up PR 24-154. |

III. POSITION OF THE EXECUTIVE

The Executive did not submit comments with respect to the proposed resolution.

IV. COMMENTS OF ADVISORY NEIGHBORHOOD COMMISSIONS

The Committee received no testimony or comments from any Advisory Neighborhood Commission on PR 24-154.

V. SUMMARY OF TESTIMONY

The Committee of the Whole held a public roundtable on the subject matter of PR 24-154 on Thursday, September 30, 2021. Copies of the testimony regarding PR 24-154 are attached to this report.

Elliott Negin Senior Writer, Union of Concerned Scientists, testified in support of PR 24-154 with modifications made to direct WMATA to substantially expedite its schedule for electrification, noting the various benefits of electrification to public health and the environment.

Karl Wheeler East Coast Regional Sales Manager, BYD Coach and Bus, testified in support of electrification generally and provided information on electric bus purchase, deployment, and repair.

Emmanuelle Touissant Vice President of Legal, Public Affairs, and External Communications, Nova Bus, testified in support of electrification, with an emphasis on finding an equilibrium between education, environment/climate change, and economic growth.

Benoit St. Cyr Product Manager, Nova Bus, testified to the technical aspects of electric buses, including but not limited to mileage, maintenance, and repair.

Jesus Montes, P.E. Senior Executive Officer, Vehicle Acquisition, Vehicle Engineering & Acquisition, LA Metro, testified on the experience of LA Metro in transitioning to electric buses, reconciling the aggressive schedule that LA Metro has adopted while sharing issues related to the transition process.

Mac Dressman Associate, Transform Transportation, U.S. PIRG, testified in support of electrification generally, and provided insight on the experience of other jurisdictions related to transitioning to electric buses, including Chicago, IL and Austin, TX.

James Pittman Vice President, Pepco Region District of Columbia, testified on the Electrification Study that Pepco conducted, which determined that Pepco could handle the anticipated load growth that would result from the transition to electric buses. He also noted that Pepco continues to engage with WMATA on the issue.

VI. IMPACT ON EXISTING LAW

PR 24-154 will have no impact on existing law.

VII. FISCAL IMPACT

PR 24-154 will have no fiscal impact on the District of Columbia budget or financial plan.

VIII. SECTION-BY-SECTION ANALYSIS

Section 1 States the short title of PR 24-154.

Section 2 States the Council's findings regarding the WMATA's plans related to bus electrification, plans in other jurisdictions, and the benefits of bus electrification, including cost savings and reduced air pollution.

- Section 3 Expresses the sense of the Council that WMATA commit to electrifying its fleet on a schedule that meets or exceeds the deadlines in the Clean Energy DC Act; that its current contract should be the final time that WMATA purchases fossil fuel buses; that WMATA apply for all relevant federal funding for bus electrification; and that all WMATA infrastructure improvements, including the renovation and building of new bus garages, be consistent with the transition to electrification.
- Section 4 Requires transmission of this resolution to WMATA and the Mayor
- Section 5 Provides that PR 24-154 shall take effect on first publication in the DC Register

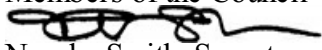
IX. COMMITTEE ACTION

X. ATTACHMENTS

1. PR 24-154 as introduced.
2. Written Testimony.
3. Committee Print for PR 24-154.

COUNCIL OF THE DISTRICT OF COLUMBIA
1350 Pennsylvania Avenue, N.W.
Washington D.C. 20004

Memorandum

To : Members of the Council
From :  Nyasha Smith, Secretary to the Council
Date : Monday, April 5, 2021
Subject : Referral of Proposed Legislation

Notice is given that the attached proposed legislation was introduced in the Office of the Secretary on Monday, April 05, 2021. Copies are available in Room 10, the Legislative Services Division.

TITLE: "Sense of the Council Urging WMATA's Bus Fleet Electrification Resolution of 2021", PR24-0154

INTRODUCED BY: Chairman Mendelson and Councilmembers Silverman, Henderson, Pinto, Lewis George, Gray, McDuffie, Bonds, R. White, Nadeau, Cheh, Allen, and T. White

Retained by the Council with comments from the Committee on Committee of the Whole.

Attachment
cc: General Counsel
Budget Director
Legislative Services

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Councilmember Kenyan McDuffie



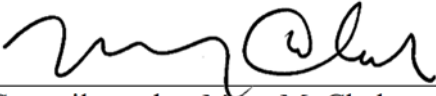
Councilmember Anita Bonds



Councilmember Robert C. White, Jr.



Councilmember Brianne K. Nadeau



Councilmember Mary M. Cheh



Councilmember Charles Allen



Councilmember Trayon White, Sr.



Chairman Phil Mendelson



Councilmember Elissa Silverman



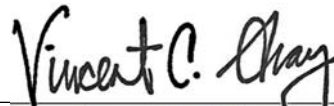
Councilmember Christina Henderson



Councilmember Brooke Pinto



Councilmember Janeese Lewis George



Councilmember Vincent C. Gray

A PROPOSED RESOLUTION

IN THE COUNCIL OF THE DISTRICT OF COLUMBIA

RESOLVED, BY THE COUNCIL OF THE DISTRICT OF COLUMBIA, That this resolution may be cited as the “Sense of the Council Urging WMATA’s Bus Fleet Electrification Resolution of 2021”.

44 Sec. 2. The Council finds that:

45 (1) The Clean Energy DC Omnibus Amendment Act of 2018 (D.C. Law 22-257)
46 mandates that 50 percent of public buses be low or zero-emission by 2030 and 100 percent zero-
47 emission by 2045.

48 (2) The District of Columbia is committed to reducing greenhouse gas emissions
49 50 percent below 2006 levels by 2032 and be carbon neutral by 2050.

50 (3) The District of Columbia aims to be a leader on sustainability, while other
51 major U.S. cities have already committed to electrifying their bus fleets. Los Angeles, for
52 example, has committed to electrifying its fleet by 2030, San Francisco by 2035, and Chicago,
53 New York and Seattle by 2040.

54 (4) Electrification saves money: The Washington Metropolitan Area Transit
55 Authority (WMATA) would save at least \$350 million over the lifetime of its fleet if 50 percent
56 of its fleet is comprised of electric buses, according to a 2020 Sierra Club report; savings would
57 increase if more electric buses were added.

58 (5) Electrification reduces global warming: If 50 percent of the WMATA bus
59 fleet is electrified, greenhouse gas emissions would be reduced by more than 58,000 tons of
60 carbon dioxide per year by 2030, according to the 2020 report.

61 (6) Electrification improves the public health: Even with more stringent tailpipe
62 emission standards for heavy-duty vehicles, like buses, pollution (both particulate and ozone
63 precursors) from diesel buses causes a wide range of health problems, especially in children and
64 vulnerable neighborhoods, including asthma and cancer. Electrifying WMATA's fleet would
65 improve air quality and therefore the public health for Washington, D.C., area residents, saving
66 them more than \$8 million per year (according to the 2020 report) in health care costs once the
67 fleet is fully electric.

68 (7) While compressed natural gas is cleaner than diesel fuel, it contributes more to
69 greenhouse gas emissions than desired, so it is imperative to eliminate use of any form of fossil
70 fuel in WMATA’s bus fleet.

71 (8) In June 2020, the Federal Transit Administration awarded WMATA more than
72 \$4 million to purchase new electric buses and charging equipment and to make infrastructure
73 improvements. But at this point Metro has one electric bus and is planning to acquire one dozen
74 more for a two-year pilot to study electrification – even though other cities already have electric
75 buses in operation and the DC Circulator is already partially electrified.

76 (9) WMATA is currently installing electric charging equipment at two D.C. bus
77 garages – Bladensburg and the Northern Bus Barn – so the infrastructure will be in place soon
78 for WMATA bus electrification.

79 Sec. 3. It is the sense of the Council that:

80 (1) WMATA must commit to electrifying its fleet on a schedule that meets –
81 preferably exceeds – the deadlines in the Clean Energy DC Act, by agreeing to electrifying at
82 least 50 percent of its bus fleet by 2030, 75 percent by 2035, 90 percent by 2040, and 100 percent
83 by 2045.

84 (2) WMATA’s current contract for 542 fossil fuel buses with New Flyer to be
85 delivered by 2023 should be the last time Metro purchases fossil fuel buses – or, ideally, it
86 should be converted to electric bus purchases. Going forward, WMATA must buy only electric
87 buses, meaning that Metro's entire fleet would be fully electric by 2038 if the 542 New Flyer
88 buses are delivered on time and are in use for no more than 15 years.

89 (3) Any future upgrades to WMATA bus garages or fueling infrastructure must
90 include electric bus ready designs.

91 (4) WMATA should prioritize introducing electric buses on routes servicing low-
92 and moderate-income neighborhoods and environmental justice communities that have been
93 disproportionately burdened by pollution.

94 (5) WMATA should cease investment in diesel and compressed natural gas
95 fueling infrastructure that risks becoming a stranded asset, including abandoning current plans to
96 install compressed natural gas fueling apparatus at the Shepherd Parkway Bus Division in
97 Southwest D.C.

98 (6) When WMATA finishes refurbishing its Northern Bus Garage on 14th Street
99 NW, it should no longer house diesel buses there, running only electric buses at that site.

100 (7) WMATA must publicly release a bus electrification plan as soon as possible.
101 As part of that plan, WMATA should commit to releasing an annual progress report identifying
102 milestones, challenges, and ongoing actions that facilitate rapid electrification.

103 (8) WMATA should immediately consult with PEPCO, if it has not already done
104 so, to evaluate the local distribution grid around its bus garages to determine what changes and
105 upgrades will be necessary to support charging an electric fleet.

106 (9) WMATA should immediately apply for applicable federal funding for use in
107 2022, building on the more than \$4 million grant award it received in fiscal year 2020.

108 (10) WMATA should substantially shorten its planned two-year pilot project with
109 a dozen electric buses, and begin it as soon as possible.

110 Sec. 4. The Council shall transmit a copy of this resolution to the Washington
111 Metropolitan Area Transit Authority and the Mayor.

112 Sec. 5. This resolution shall take effect upon the first date of publication in the DC
113 Register.

Protect Public Health and the Climate: Get Rid of Fossil Fuel Buses

Testimony of Elliott Negin, Union of Concerned Scientists, September 30, 2021

Council of the District of Columbia Committee of the Whole Public Roundtable on Speeding Electrification of WMATA's Bus Fleet

Good afternoon. Thank you for the opportunity to testify today on the Washington Metropolitan Area Transit Authority's plans to electrify its bus fleet.

My name is Elliott Negin. I work for the Union of Concerned Scientists, one of more than two dozen organizations that make up the Metro Electric Bus Coalition. Our goal is to prod Metro to transition to tailpipe-emissions-free buses as quickly as possible.

Earlier this year, the Metro board signed off on a [plan](#) to electrify Metro's 1,540-bus fleet by 2045, which is considerably slower than transit agencies with similar-sized and larger bus fleets. Los Angeles Metro, for example, plans to electrify its [2,320 buses](#) by 2030. Houston Metro, which owns more than [1,230 buses](#), also plans to have an all-electric fleet [by 2030](#). A number of other transit agencies, including the Chicago Transit Authority ([1,864 buses](#)), King County (Seattle) Metro ([1,600 buses](#)), and New York City's Metropolitan Transportation Authority ([5,800 buses](#)) are planning to be all-electric by 2040.

The Biden administration's [goal](#) is to electrify 50,000 transit buses, about 70 percent of the U.S. fleet, by 2030. According to the [schedule](#) the Metro board approved, only 275 of Metro's buses—less than 20 percent—will be electric by then, the same year fleets in Los Angeles and Houston will be fully electric.

Given Metro's bureaucratic inertia, it is highly unlikely the agency could accelerate its electric bus procurement schedule and install the requisite charging infrastructure to meet the Biden administration's 2030 goal. That said, it could meet the [Clean Energy D.C. Act](#)'s timeline of 50-percent, zero-emission vehicles by then. The benefits of doing so are clear. According to a 2020 Sierra Club [report](#), electrifying half of Metro's bus fleet by 2030 would save the transit agency hundreds of millions of dollars in lifetime bus operating and maintenance costs, slash its fleet's annual carbon pollution by more than 58,000 tons, and dramatically reduce the toll toxic air pollution has on our region's most vulnerable residents.

That is why we are urging Metro to move more quickly: To protect public health and help avoid the worst consequences of climate change.

Fossil Fuel Buses Threaten Public Health

The transportation sector accounts for [more than half](#) of the toxic air pollution in the country, and buses and heavy-duty trucks are major contributors. Although they only

comprise about 4 percent of all U.S. vehicles, they are the [biggest source](#) of nitrogen oxides and particulate pollution on the road.

Vehicle pollution kills. More than 20,000 Americans died prematurely in 2015 as a result of vehicle tailpipe emissions, according to a [2019 study](#), which attributed 43 percent of those deaths to diesels. Another [recent study](#) estimated that exposure to vehicle pollution killed 7,100 Northeastern and Mid-Atlantic state residents in 2016.

Diesel tailpipe pollution also has been linked to [cancer](#) and respiratory and [heart](#) disease. Although they no longer spew plumes of black soot, diesel and diesel electric hybrid buses still [emit](#) a toxic brew of gases—including carbon dioxide, carbon monoxide, nitrogen dioxide and hydrocarbons—and fine particulate matter, including carbon, organic materials and metallic compounds. These minute particles bypass respiratory system defenses and lodge deep into lungs. Once there, they stimulate an immune response that triggers inflammation, airway constriction, mucus production, and asthma symptoms. [Some studies](#) suggest that diesel exhaust not only aggravates asthma, but also may cause it.

Buses that run on compressed natural gas also emit hydrocarbons, which have been linked to [lung disease](#), and a [comparable](#) or [lower](#) amount of nitrogen oxides as diesel buses depending on the emission control technology employed. Nitrogen oxides from fossil fuel buses combine with volatile organic compounds to produce ground-level ozone, or smog, which is so bad in the D.C. metropolitan area that the American Lung Association's most recent [State of the Air report](#) gave our region an ozone grade of F.

Smog [exacerbates](#) allergies and lung conditions, including emphysema, bronchitis and asthma, and asthma is a major health problem in D.C. The Centers for Disease Control and Prevention (CDC) [estimates](#) that 11.4 percent of D.C. residents suffer from the disease, nearly 40 percent more than the national average of 8.2 percent. Only four states—Maine, New Hampshire, Vermont and West Virginia—have a slightly higher percentage.

The CDC data, which is from 2019, includes adults and children. Another [data set](#), which calculated the prevalence of asthma that same year for children only, found that 11.7 percent of children in Washington, D.C., suffer from asthma, a higher percentage than any state in the country.

Metro buses likely exacerbate the problem. D.C. does not provide school buses for all public school children, so they often rely on Metro buses to get to class. Given that children's lungs are not fully developed and they breathe [50 percent more air](#) per pound of body weight than adults, they are more vulnerable to tailpipe pollution.

Washingtonians, I should add, are not affected equally. Asthma rates are significantly higher in low-income neighborhoods. For example, the D.C. Department of Health found that in 2014, 17.6 percent of adults living in Ward 8 had asthma, while only 5.8 percent of the adults in Ward 2 suffered from it.

No one is suggesting that Metro's bus fleet is solely responsible for the high asthma rates in our city, let alone the incidence of lung cancer and heart disease, but toxic emissions from buses that drive up and down our streets every 20 minutes, 14 hours a day, seven days a week, no doubt pose a threat to the health of D.C., Maryland and Virginia residents.

Fossil Fuel Buses Worsen Climate Change

The transportation sector today accounts for nearly [a third](#) of U.S. carbon emissions, edging out the electric power sector as the top source for global warming pollution. Again, heavy-duty trucks and buses are major contributors, responsible for more than [420 million tons](#) of carbon pollution every year—more than the entire output of Australia.

In Washington, D.C., transportation is the second-largest source of carbon emissions, accounting for about [25 percent](#) of the city's output, while in the greater D.C.-Maryland-Virginia region, it accounts for a whopping [40 percent](#).

Metro plans to continue to buy fossil fuel buses for the rest of the decade, but maintaining the status quo is simply unacceptable. Consider the catastrophic events that occurred in just the last few months that were more than likely [turbocharged by climate change](#): the [worst flooding](#) in decades in Central Europe, deadly monsoon-triggered [mudslides](#) in India, [unprecedented drought](#) in the U.S. Southwest, and [record-breaking wildfires](#) in Greece, Italy, Turkey, Russia and the Western United States. Then there was Hurricane Ida, which killed [more than 100 people](#) and may have caused at least [\\$95 billion in damages](#). And it was just one of a number of hurricanes that ravaged the Gulf Coast and states up and down the Eastern seaboard.

Let's take the issue of warming temperatures as a prime example of why we can't fiddle while the world burns. This summer Washingtonians suffered through [42 days](#) at or above 90 degrees Fahrenheit between January 1 and August 25, just a few days more than the historical average. If we don't move quickly to establish a clean energy economy, it is going to get a lot worse.

My organization, the Union of Concerned Scientists, issued a [report](#) in 2019, *Killer Heat in the United States: The Future of Dangerously Hot Days*, which calculated just how bad it will get for cities and counties across the country if we do not act, and act soon.

Here's what we found for D.C.:

Historically, D.C. has experienced an average of 39 days per year with a heat index above 90 degrees, including seven days above 100 degrees and two days above 105 degrees.

If we fail to cut carbon emissions, by midcentury, D.C. would experience an average of 83 days per year with a heat index above 90 degrees, including 41 days above 100 degrees, 23 days above 105 degrees, and two days at or above 127 degrees! And by

late century, D.C. would experience an average of 111 days per year with a heat index above 90 degrees, including 68 days above 100 degrees, 48 days above 105 degrees, and seven days at or above 127 degrees.

On the other hand, if we quickly slash carbon emissions and, under the 2015 Paris climate agreement, limit future global average warming to 3.6 degrees (2 degrees Centigrade) above pre-industrial temperatures, we could limit the increase in extreme heat in D.C. to an average of 77 days per year with a heat index above 90 degrees, including 30 days above 100 degrees and 14 days above 105 degrees. Still no picnic, but nowhere near as horrible if we do not act—and act decisively.

Given the potential for this bleak future, fossil fuel buses—indeed fossil fuel vehicles of all kinds—must be replaced as soon as possible. Neither diesel, diesel electric hybrids, nor natural gas buses could be considered low-emission alternatives compared to battery electric buses.

Even so, Metro is not only planning to continue to buy diesel electric hybrids and natural gas buses until 2030, it also plans to increase the percentage of natural gas buses in its fleet to roughly half and spend more than \$5 million on a new natural gas fueling facility, presumably because the agency believes natural gas is significantly cleaner than diesel and diesel electric hybrids. In fact, carbon pollution from natural gas buses is only 12 percent lower than that of conventional diesel buses, according to a Union of Concerned Scientists [analysis](#), and that calculation may be too generous. The Argonne National Laboratory [found](#) that in many circumstances, natural gas buses emit *nearly the same level* of carbon emissions as conventional diesel buses. By inference, natural gas buses are no better—and in many cases likely worse—for the climate than diesel electric hybrids.

When comparing lifecycle carbon emissions, electric buses are superior to fossil fuel buses across the country, no matter where they get their electricity. It is important to set the record straight on this issue, because a Metro board member falsely asserted that electric buses are not necessarily any cleaner than fossil fuel buses if they get their power from coal or natural gas power plants. In fact, battery electric buses in the Washington metropolitan area would have 70 percent lower lifecycle carbon emissions than diesel buses, 65 percent lower than natural gas buses, and 60 percent lower than diesel electric hybrids based on 2016 Environmental Protection Agency power plant emission data, according to a Union of Concerned Scientists [analysis](#). And the good news is the electric grid in our region has gotten cleaner over the last five years, so electric bus emissions now would likely be around 5 percent better.

In sum, Metro's current plan to continue to purchase fossil fuel buses until 2030 and slow-walk adding electric buses to its fleet will condemn D.C. area residents to decades of bus toxic and carbon pollution. Other major transit agencies across the country and smaller ones in our region are facing the same challenges as Metro to replace their fossil fuel fleets with zero-tailpipe-emission buses. But unlike Metro, they are addressing these challenges head on and have ambitious plans to transition as quickly as possible. There is no reason why Metro cannot do the same.

###

The Metro Electric Bus Coalition includes: Audubon Naturalist Society, Breathe D.C., Center for Clean Air Policy, Chesapeake Climate Action Network, Chispa Maryland, Citizens' Climate Lobby, D.C. Climate Coalition, D.C. Environmental Network, Earthjustice, Electric Vehicle Association of Metropolitan Washington, D.C., Environment America, Environmental Working Group, Faith Alliance for Climate Solutions, Friends of the Earth, Generation180, Green Latinos, Greenpeace USA, Interfaith Power & Light, Labor Network for Sustainability, Moms Clean Air Force, Northern Bus Barn Neighbors, Northern Bus Garage Community Environment Committee, Public Citizen, Sierra Club, 350 Loudoun and Union of Concerned Scientists.

**Presentation of Karl Wheeler, East Coast Regional Sales Manager
BYD Bus and Coach
September 30, 2021**

2021 BYD Bus Models




MODELS RANGING FROM 23' TO 60'. ANY BUS IN YOUR FLEET CAN BE ELECTRIFIED

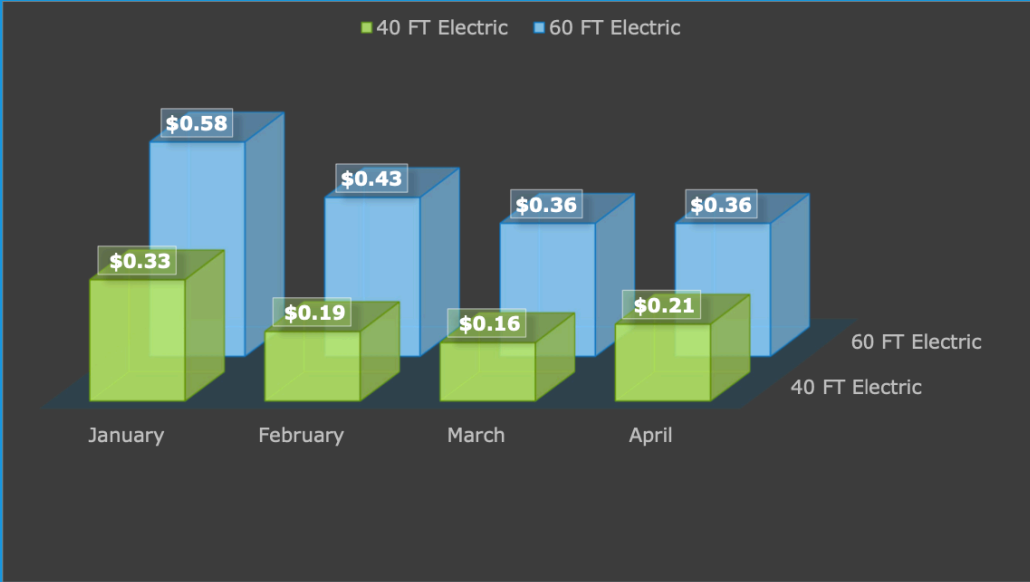
Transit Bus Model	Range
30ft	Up to 200 miles
35ft	Up to 200 miles
40ft	Up to 200 miles
60ft	Up to 200 miles
Note	
<ol style="list-style-type: none"> Multiple battery capacity versions (Range) can be selected. New Battery Technology will be deployed to buses with higher energy density, capacity (Range) BYD will do route analysis to provide most suitable solution for transits. 	

FY 2021 Monthly Maintenance Key Performance Indicators

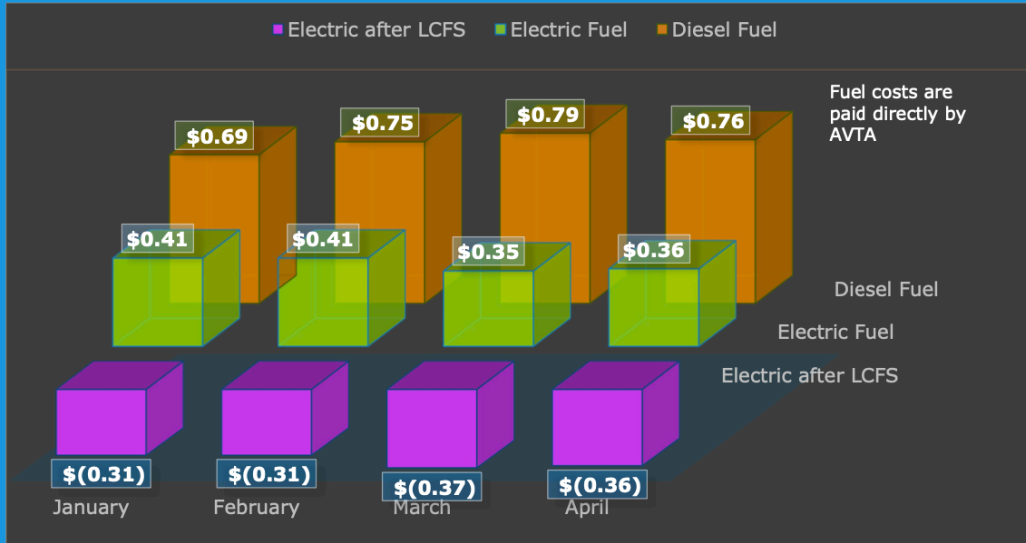
Presentation to the Board of Directors
June 22, 2021



MAINTENANCE COST PER MILE BY FLEET

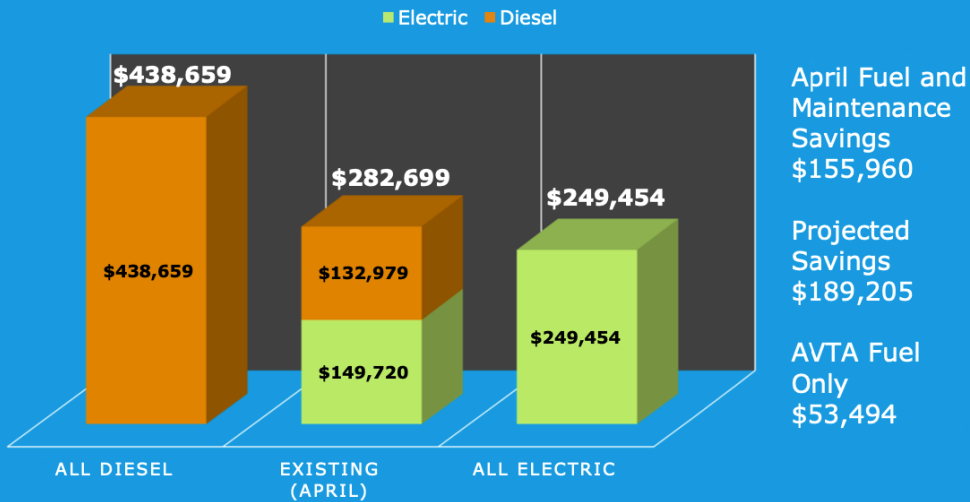


PROPULSION FUEL COST PER MILE w/LOW CARBON FUEL STANDARD (LCFS) OFFSET



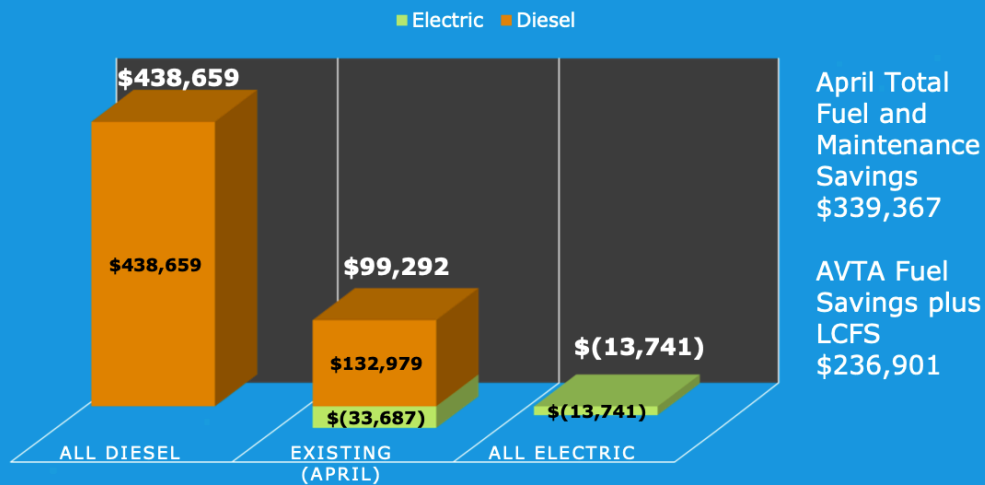
5

TOTAL FUEL & MAINTENANCE COST ASSUMPTIONS



7

TOTAL FUEL & MAINTENANCE COST ASSUMPTIONS W/LCFS



“Even today the lifetime cost of an electric bus is significantly lower than that of a new diesel or alternative fuel bus, though the upfront cost is higher. The all-in cost of buses--that is, the upfront cost of the bus purchase, fuel costs and maintenance costs--for electric buses is around \$1,000,000, and around \$1,400,000 for diesel and CNG buses. Moreover, as EV bus manufacturing scales up, and as battery costs--the most expensive part of an EV--plummet over time, EV bus prices will fall rapidly as well. “

https://www.sierraclub.org/sites/www.sierraclub.org/files/sce/new-jersey-chapter/Handouts/VW_Zero_Emission_Bus_Factsheet.pdf (2017-2018)

Nova Bus Testimony

Council of the District of Columbia Committee of the Whole Public Roundtable September 30, 2021 Speeding Electrification of WMATA's Bus Fleet Virtual Participation

Good morning Chairman Mendelson and Members of the D.C. Council,

I am Emmanuelle Toussaint, Vice President for Legal, Public Affairs and External Communications for Nova Bus. Nova Bus is one of the main transit bus manufacturers in America and have a facility in Plattsburgh, NY, since 2009. We manufacture different types of transit buses – electric, hybrid, diesel and CNG.

Also attending is Benoit St-Cyr, Product Planning Manager, who is responsible for the description of scope of our electric offering, the LFSe+, in response to the market need and evolution. Benoit is here to address any technical questions you may have.

Thank you for allowing me to testify before you today to discuss the electrification of WMATA's transit bus fleet.

We are at a turning point in our society and hence our industry, the transportation industry.

There is a need to find an equilibrium between education, climate change, our economic growth. The protection of our environment has been at the forefront of our thoughts and our priorities which has precipitated decisions to promote a greener, more responsible, and innovative society.

The multiple challenges of our economy in the past two years, such as with the supply chain, has forced us all to think through our interdependence.

As an essential service and one of the backbones of our communities, the Public Transit industry has certainly been in the eye of the storm and has seen firsthand over the last two years how its service offering has been transformed. In an era where there are still many uncertainties, change and the agility for transit agencies, and for society as a whole, is becoming a key element of success.

At Nova Bus, we are at the forefront of these changes, leading the transformation specifically related to a clean transportation industry via the electrification of fleets.

The Electromobility ecosystem from the transit agency's perspective is evolving. Nova Bus wants to help the transit agencies define the building blocks of this ecosystem via knowledge sharing and best practices, so that together we reach our goal of a cleaner

transportation industry serving the masses and help move the technology rapidly, safely and more economically-

Multiple levels of government are aligning with the need for a cleaner transportation industry by offering numerous funding programs, aggressive targets and mobilizing communities to succeed in this important transition. In fact, currently Congress is in the midst of reauthorizing the surface transportation bill, the Infrastructure Investment and Jobs Act (IIJA) which prioritizes low and no zero emission buses for funding at the federal level.

Historically, funding has focused on the bus, which in the case of electrifying a fleet for transit agencies, is insufficient to achieve zero emission transit systems that are functional, reliable, and cost efficient over the fleet's life cycle.

Approaching Electromobility as an ecosystem can allow for a better identification of key milestones and help establish the actual speed of deployment of electric fleets.

We believe that a minimum of 7 elements need to be considered by Transit authorities:

- Electric Bus
- Charging Infrastructure
- Bus Depot
- Route Planning
- Service Support
- Workforce Training
- Telematics & Diagnostics; *evolution to autonomous driving with connected services via Smart cities.*

Of course, to be included as a core element of this ecosystem is also the "Grid Infrastructure and Battery Technology". Transit Agencies need to have a strong partnership with their energy providers and access the latest battery technology roadmap. Electrification of the fleet will imply a change at the very least: new technologies, new training, new charging strategies

There are also some Pressures/Barriers to entry, which we have identified to be:

- **Financial.** The funding is one of the main barriers to electrification. It is no longer just a bus procurement, like with diesel or hybrid buses. There are significant upfront costs associated with the procurement of electric buses and infrastructures
- **Technologies Roadmap,** including the battery and the range of electric buses.
- **Availability of Workforce.** Drivers, mechanics, and others need to be well trained

Reduce the complexity of the electric bus and its EV systems

Electrical Vehicle (EV) systems that have less complex configurations for better control on cost, maintenance with easier access to modules for cleaning and repair and easier ramp up in terms of training and ease of operations of these systems.

Nova Bus' Sustainability Plan is our perspective on how to address the need for electromobility as far as the vehicle goes.

This is an approach to tackle the first building block, the electric bus.

Nova Bus has answered the need for electrification by building on its base, by leveraging its strength with the proven LFS platform. This is a gradual approach to bus electrification while reducing the risk for transit agencies.

By electrifying the LFS platform, the uncertainty is greatly reduced for our customers while providing them a 100% electrified bus to meet their zero emission goals.

Such a structured stepped approach allows for better risk management.

Workforce training and safety

A few points to consider in terms of unique technical skills required to make sure the training workforce can meet the demand of electrified fleets.

- Safety
 - Technicians will be expected to be able to follow OEM lock-out, tag-out procedure, and be able to make a vehicle safe for the purpose of conducting repairs.
 - An understanding of what is and isn't high-voltage.
 - PPE – an understanding of what Personal Protective Equipment is required for different jobs. This can include high-voltage gloves and tools, or for more advanced jobs involving exposure to high-voltage battery modules, it can require face shields, fire-resistant balaclavas, etc.
- Diagnostics – continued development of 'laptop-first' diagnostic skills will be necessary. Many EV faults begin with a stored fault code that needs to be read, interpreted and repaired.
- Schematics – able to read and understand OEM schematics. Can include low-voltage, high-voltage and databus circuits.
- Networking – EV and specifically heavy-duty vehicles (i.e. trucks, and buses) operate multiple data networks running at different speeds. An understanding of how they work and have an ability to record data logs for review by OEM technicians or engineers.

- Insulation testing – being able to conduct and interpret insulation testing on high-voltage cables.

Some changes and challenges to expect regarding the layout and capabilities of the facilities that service heavy duty EVs;

- In terms of infrastructure for public-transit vehicles, many systems (battery, battery thermal management, charging, HVAC) have moved to the vehicle roof. Ideally maintenance shops would have cat-walks at roof height, and over-head cranes for being to safely work and lift heavy equipment (batteries, inverters) off and onto the buses.
- Investments in High Voltage (HV) tooling and PPE will be required at a shop level.
- Facilities will require charging stations so that charging functionality can be validated after a repair.

Developing diagnostic troubleshooting trees, and diagnostic tools for technicians who have a baseline familiarization of high-voltage systems. Electrical vehicles can be complex and present unique challenges to technicians in diagnosing on-road faults.

One development actively being pursued is always-on telemetry systems which will assist OEM support staff in supporting customer technicians in diagnosing and repairing vehicle faults.

Training requirements

Current training can include:

- HV familiarization
- Lock-out/tag-out
- EV Powertrain Diagnostic Software
- EV Vehicle Specific Service
- Advanced Battery Maintenance

Future courses will likely match development of vehicle powertrains and customer requirements.

Charging Infrastructure

Energy management protocols are needed to ensure an uninterrupted, steady and predictable electric supply.

A robust grid system, robust partnership with electric utility provider is necessary.

A Smart charging software system to optimize the management of the grid, to allow economies of scale and to optimize route planning

Technologies that save energy, like regenerative braking for example. It allows for wasted energy resulting from braking or speed reduction to be used to recharge the battery by transforming kinetic energy to electric energy.

The LFS+ features dual charging options supporting overhead charging infrastructure such as pantographs as well as plug-ins on each sides of the vehicle, offering you the flexibility wanted when it comes to fleet management in depot, an essential feature to address the complexity of the infrastructure.

The range of the Electric bus will be dependent on battery capacity and could range 564kWh to 361 kWh of nominal capacity, which could be translated into an autonomy between 211 to 292 miles. Range recommendations from the OEM of the BEB should be aligned with the route planning objectives of the transit agencies.

Optimization of the charging infrastructure is essential as well as what happens overnight or during the day at the depot as far as ensuring uninterrupted service for transit agencies. These depots require a massive footprint, flexible charging solutions, abilities to host multiple types of bus propulsions safely and the ability to optimize the grid system as well.

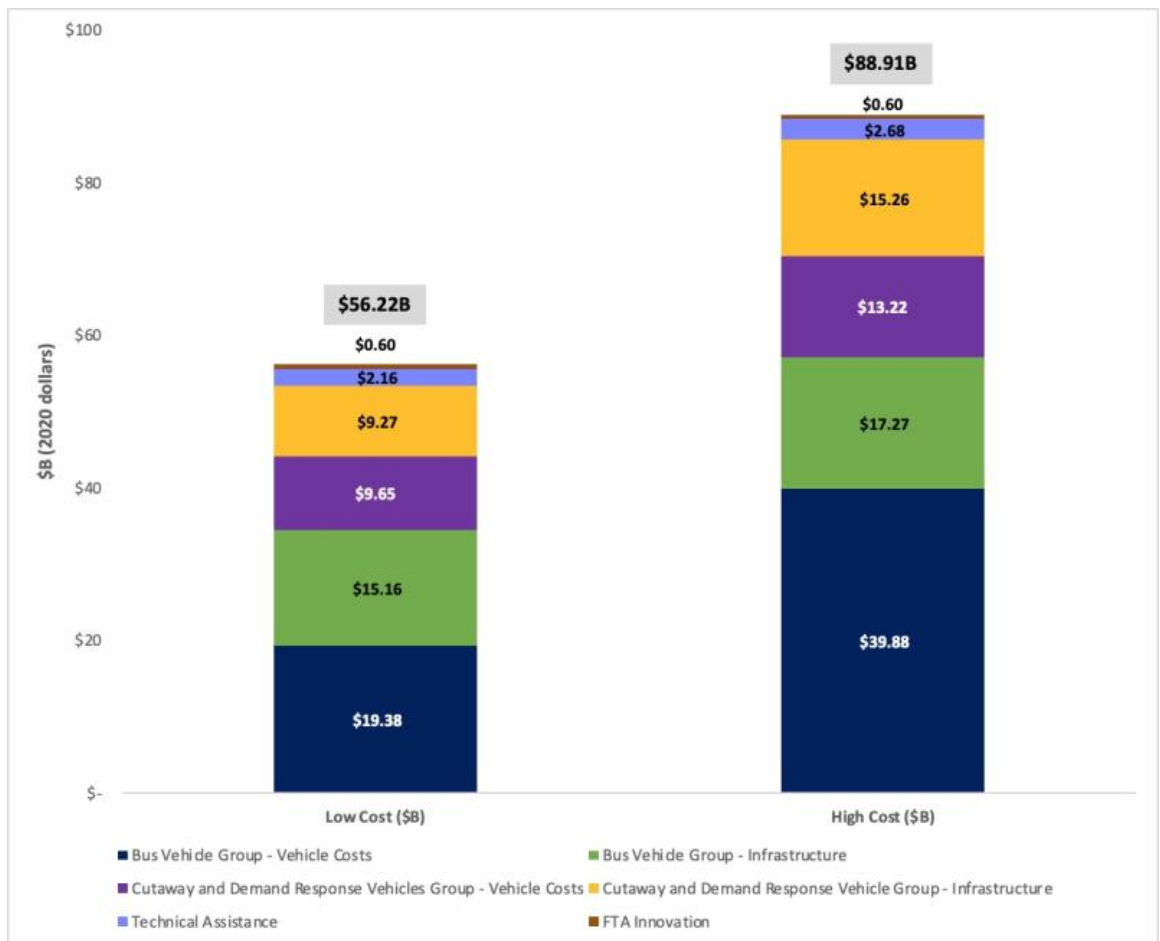
Before electric buses go into daily public transport service, energy-consuming activities like heating the bus interior should be done at the bus depot while the bus is still connected to the grid. Using energy that would otherwise be at the expense of the batteries and therefore the range. Hence, pre-conditioning of the e-buses is important for daily public transport service.

Capital costs

Capital costs of both the BEB themselves and their associated charging infrastructure constitute critical planning parameters that transit agencies must consider when deciding to procure electric buses. Some sources below:

- APTA estimates that to convert the entire US bus fleet to zero-emission vehicles, the total cost is \$68 billion - \$74 billion, including approximately \$58 billion for buses and \$10 billion - \$16 billion for charging infrastructure.
- Infrastructure charging cost will vary between 90 000\$/bus to over 250 000\$/bus
- Sources below form the Center for Transportation and the Environment (CTE), May 2021:

- The entire US transit fleet could transition to ZEVs by 2035 for \$56B - \$89B
- In a scenario assuming a reduction in bus capital cost in 2028, the total cost drops to \$42.39 billion on the low end and \$60.02 billion on the high end.
- Currently, more than 1,300 zero-emission buses (ZEBs) have been delivered or awarded to US transit agencies, representing roughly 2% of the US transit bus fleet.
- This estimate accounts for vehicles, infrastructure, technical assistance, and federal research and development support. The report assumes the national fleet will require a mix of both battery-electric and fuel-cell-electric vehicles to meet zero-emission transition targets (Mixed Fleet Scenario).



Source : Center for Transportation and the Environment (CTE)

Generally, however, the premise of an BEB will have lower operational, maintenance cost lower than the hybrid, and diesel counterparts as well as providing a greener mode of transport for all.

Service Aftermarket Support

Electrification of the fleet will imply a change: new technologies, new training, new charging strategies

To support the electrification of a fleet and the changes that entails, a strong service support and aftermarket support is needed. Early in the transition to electrical vehicles specifically in the transit or heavy-duty vehicle market, it is likely that OEMs Support staff and customer technician will work closely to diagnose and repair vehicles, using a variety of diagnostic software tools. As the battery-electric fleet grows larger, customer technicians will be working more independently. This will happen in conjunction with the further development of complete and robust diagnostic software that encompasses all aspects of battery-electrical vehicle systems.

In conclusion, please look to Nova Bus as a technical resource as WMATA moves towards transitioning to an all zero-emissions transit bus fleet.

Presentation of Jesus Montes, P.E.
LA Metro
Sr. Executive Officer, Vehicle Acquisition
Vehicle Engineering & Acquisition
September 30, 2021

The following is a brief summary of Metro's experience with our conversion of CNG Bus Operations to Zero Emissions (ZE).

Background:

- 2400 CNG buses
- 10 Maintenance Yards (Divisions)
- Approximately 3000 vehicle blocks with ranges from under 25 miles to above 300 miles; approximately 70% of the blocks have ranges within 150 miles.
- Buses on blocks with ranges above 150 miles will need to be supported with en-route charging.

Challenges:

- Costs:
 - Estimates consistently indicate that the cost for the complete transition will be approximately \$3.5B; \$1.5B for the procurement and installation of the en-route and division chargers, and \$2B for the Battery Electric Buses (BEB)
 - Utility costs are still being developed
 - Costs for charge management software is currently being developed (see additional discussion below)
 - Costs for cellular service is still being developed (see additional discussion below)
- Power:
 - Most Metro divisions have about 3-5 MW of power available. However, to support Metro's ZE services power will have to be increased to about 12-18 MW if there is no charge management.
 - Even with good coordination with the utilities, it may take 2-4 years to add the necessary power.
- Space:
 - Divisions: With managed charging, the power demand may be reduced to 7-10 MW. Regardless, most divisions will require that a substation be added. Assuming that an agency decides to manage charging, space will be needed to accommodate the following. The space demands are not trivial. Agencies in both Europe and Asia have decided to add divisions to accommodate the space demands:
 - Substation
 - Electrical cabinets for chargers
 - Combination of slow/fast chargers
 - On-site energy generation (solar)
 - On-site energy storage (batteries)
 - En-route Chargers:
 - Suitable sites will have to be identified for layover locations where buses needing to be topped off mid-service can be charged.
 - Ideally sites should not be in a public area to ensure that the space is secured for only bus charging and to preclude vandalism.

- Technology & Obsolescence. Technology with both buses and chargers continues to develop at a high rate. Which leads to numerous challenges.
 - The technology between the vehicles and chargers are developing at different rates which means that there are sometimes compatibility issues between them.
 - The technology is advancing so quickly that a bus or charger is obsolete after a couple of years and the vendor is reluctant to continue providing service. They would rather sell you a new model.
 - This has also created situations where Metro is ready to start a procurement; however, if it waits 8-12 months, a newer model will be available that addresses some performance issues.
- Software and SOP's:
 - Charge management software is needed to make effective use of the vehicles and charging equipment purchased and ensure that power demands are kept as low as possible. This software must be easy to use by the agency's dispatchers and must address the agency's needs in both normal and abnormal conditions. Under normal conditions the software produces assignments for buses and charging strategies to meet the published schedule. However, when something happens and a bus needs to be replaced, a bus bridge added, or detours are required, the software needs to be able to adapt so that it ensures that sufficiently charged buses are available to support service.
 - This will require a large learning curve and adjustment to SOPs.
- Cellular:
 - To be able to respond to real disruptions in real time, real time tracking and data collection is required for all components of the system: division chargers, en-route chargers, and vehicle's location, state of charge, and performance.
 - The amount of data that needs to be transmitted constantly in real time may result in large cellular charges.
- Choreography:
 - A very large challenge is perform the transition without disrupting service from a division. This will require tremendous planning and coordination among different agency entities.

Hello, thank you so much for having me. My name is Mac Dressman, and I'm an associate with grassroots public interest advocacy group PIRG. I'd like to speak today about the importance of making a rapid transition to clean electric buses and provide some broader context about the current status of electric buses in the United States.

As D.C. already knows, continuing to rely on fossil-fuel powered vehicles threatens our health and the climate. Traffic-related air pollution kills an estimated 58,000 Americans every year, and transportation is the single largest contributor to climate change in the United States.

That's why transitioning to clean electric vehicles in the District is so important. Electric buses aren't just good for the environment and public health; they're also just a smart investment for transit agencies over the long-term, due to reduced maintenance and fuel costs.

For example, Chicago rolled out two electric buses in 2014. According to the Chicago Transit Authority, the vehicles have performed well, have had no difficulty with extreme temperatures, and have saved the CTA more than \$24,000 each year in fuel costs and \$30,000 each year in maintenance costs.¹

Additionally, according to the California Air Resources Board, while electric transit buses cost around \$200,000 more than diesel buses, lifetime fuel and maintenance savings of electric buses are around \$400,000.²

As these successes pile up, more and more municipalities are adopting electric transit buses. Just this week, Austin, Texas approved the purchase of 197 new electric buses over the next five years.

I want to share a few ideas from other cities that Washington, D.C. could keep in mind to help ensure a successful transition to electric buses. First, collaboration with utilities can help make the transition more affordable. Some municipalities have adopted financing programs like "pay as you save" in which utilities front the initial investment for electric buses and allow cities and school districts to pay back on utility bills as they save on fuel and maintenance costs. These "pay as you save" financing programs can help agencies overcome the higher upfront costs of electric buses and deliver monetary savings immediately.

¹ Chicago Transit Authority, CTA Expands Electric Bus Fleet, archived at <https://web.archive.org/web/20190920232250/https://www.transitchicago.com/cta-expands-electric-bus-fleet/>, 15 July 2019

² 8 California Air Resources Board (2017). *5th Innovative Clean Transit Workgroup Meeting*.

Public officials could also consider restructuring electric rates so as to provide discounted off-peak charging, limit excessive demand charges, and experiment with policies and practices that allow the buses to be used for energy storage and employ vehicle-to-grid technology to ensure that electric buses can work as efficiently as possible with the electrical grid. More information about these programs can be found in our report “Paying For Electric Buses,” which I’m happy to share with the committee.

With all that in mind, I applaud WMATA for their commitment to all-electric buses by 2045. I also urge Washington, D.C. to move quicker on making the transition and move up the goal for an all-electric bus fleet to 2030, to protect the climate and the lungs of D.C. residents. As a former Georgetown student who relied on the District’s public bus system to get to work and move around the city, I would love to see D.C. take the lead on clean transportation. Thank you for your time.

Links to reports:

Lessons from cities who have adopted electric buses:

<https://uspig.org/feature/usp/electric-buses-america>

Information about savings and finding funding for paying for electric buses:

<https://uspig.org/reports/usp/paying-electric-buses>

Testimony of Potomac Electric Power Company

Council of the District of Columbia Committee of The Whole

Public Roundtable

September 30, 2021

Good Afternoon Chairman Mendelson, attending Councilmembers, staff and the listening and participating audience. Thank you for the invitation to testify during today's important Public Roundtable on the electrification of the transportation sector in the District of Columbia, with an emphasis on Washington Metropolitan Area Transit Authority's ("WMATA") bus fleet. I am James Pittman, Vice President, Pepco Region, District of Columbia. Please know that Pepco is committed to working with the District of Columbia and WMATA to enable its transition to an electric fleet, in alignment with the District's Clean Energy Plan and the DC Clean Energy Omnibus Amendment Act of 2018. Current District law requires that buses be 100% zero emissions by 2045 and 50% zero emissions by 2030. Pepco stands ready to work collaboratively with the District of Columbia and WMATA to meet the established goals.

2021 marks our 125th anniversary serving the District of Columbia and its residents, and we do not take this privilege lightly. Pepco has always viewed itself as a member of the communities we serve - *serving over 350,000 customers across all eight Wards*. Our years of service have provided the company with the opportunity to be directly involved in the positive evolution and progress of the District, including the policies and plans to advance a cleaner, brighter and smarter energy future for the District and its residents, equitably and inclusively.

We recognize that, as the electric company serving the District, we are central to achieving the District's transportation electrification roadmap and assisting in the District meeting its landmark goal of carbon neutrality by 2050. Pepco has made several recent filings with the

Public Service Commission of the District of Columbia (“Commission”), which are responsive to the Commission’s oversight in this important area and reflective of Pepco’s commitment to addressing climate change and building resilience. Most recently, we have filed an Electrification Study, which was executed by the Brattle Group, and a high-level Climate Solutions Plan that builds upon Pepco’s 2020 Climate Commitment, in which the company committed to reducing its own greenhouse gas footprint 70% by the end of 2025, achieve net zero emissions by 2050 and help our customers and communities do the same.

These plans are aligned with and designed to assist in the District meeting its goals through actionable programs and initiatives, including those that will help all of our valued customers reduce their carbon footprint and save money through reducing their energy usage. The Company continues to advance new technologies to effectively manage and operate the electric distribution system, including the integration and operation of distributed energy resources, while enabling customer-focused solutions, such as solar and battery energy storage. We recognize that we must ready the grid to enable these new technologies and increased electrification, including the transportation sector, while we prepare for increased and more frequent severe weather events, as a result of climate change. The implementation of new technologies and system upgrades, along with appropriate and coordinated planning to enable increased electrification, will ensure a more resilient, more reliable, smarter and cleaner grid that is prepared to respond to increased weather events and enable broad-scale decarbonization and electrification.

As a step in our planning process, the Electrification Study the Company submitted to the Commission in August focused on several important questions: 1) at what rate do we expect load to grow based on the policies and plans being advanced in the District to combat climate change;

2) is it within historical norms; and 3) can the system “handle it?” The key findings of the study are as follows:

- Pepco’s electric system can handle the load growth on its system anticipated under the Districts landmark policy goals.
- The District has seen periods of tremendous growth over the past decades, including mid-last century with the introduction of air conditioning, and as recently as this past decade, with significant growth in terms of office and apartment buildings in the District.
- The rates of load growth expected, or the maximum demand on the system, over the next thirty years are consistent with, or even less than, growth rates experienced in the past, particularly when aided by energy efficiency and load flexibility options.
- There will be a shift in terms of Pepco’s system moving from a summer peaking to a winter peaking system, due to the electrification of heating in homes and buildings.
- There will be necessary investments, just as there have been in the past, to accommodate this growth, while both maintaining the reliability and resilience of the system and integrating the new and emerging technologies to drive decarbonization, including transportation electrification.
- And, while Pepco has already experienced and managed much higher rates of load growth than what we will see in the coming 30 years, there are many technologies and programs available today to significantly reduce that growth rate in the long term.

In response to the question regarding the cost of electrification, while that question was not answered in this study, I would note that there will be incremental investments required. As we advance our Climate Solutions Plan and move toward decarbonization, there will be a cost to achieve this end, which will occur over a multi-decade horizon, with a focus on affordability and support for our most vulnerable customers.

The large-scale electrification of buildings and transportation in the District is expected to result in load growth that is within the range of growth rates that Pepco has experienced and managed in the past. The impacts of this load growth; however, will be mitigated by energy efficiency and programs and technologies to enable load flexibility, the current availability of

some excess capacity, overall, for managing near-term growth in heating-related load, and as a result of a long-range planning horizon over which to meet the District's goals.

I would like to focus on this last point because I think it is important. We work daily to assess, evaluate, plan for and address the needs of the electric grid, with a focus on long-term planning, while meeting immediate needs. This is achieved by working collaboratively with District agencies and economic development and community-based organizations, as well as specific customers, such as WMATA, to understand future needs, both at the macro- and micro-level, as capacity needs must be addressed at both a system-wide and localized level. Based on this information and engagement, we can make informed decisions to design, propose and implement electric delivery solutions to meet those needs, some of which require new investment, timely.

Pepco is engaged with WMATA on advancing programs and electrifying specific sites to enable the transition of its fleet to electric. Our discussions are focused on two primary areas—advancing the infrastructure that is required to enable this new transportation future and a rate structure that will be responsive. We have to think strategically how we can improve the economics for bus electrification, including seeking resources from the federal government to support this priority. Pepco sees its role as a connector in this process. We must advance make-ready infrastructure to allow the installation of charging stations and provide interconnection to the system. And, foremost, we must advance this infrastructure in close coordination and collaboration with WMATA and other fleet operators, such as the District government, as we work to transition to an electrified transportation system. The process is iterative and requires an understanding of customer timelines, charging needs, and use cases. Pepco then takes this information to assess what needs can be met today, and what system upgrades and investments

may be needed to meet the specific needs of the customer at specific sites and locations in order to both serve that customer, while maintaining the overall reliability and safe operations of the electric distribution system for all customers connected to the system.

Toward that end, the Commission approved a suite of transportation electrification programs for Pepco previously, and our impending Climate Solutions Plan 5-year program plan filing has four portfolios, with one being Transportation Electrification. Within this portfolio, Pepco will advance a plan that will focus on programs to expand infrastructure and address rate design changes contemplative of enabling the electrification of public buses efficiently and affordably, for both the fleet operator and customer. We continue to engage WMATA regularly to understand program constructs that would be most beneficial and supportive as well as the independent actions that are in progress by WMATA. Overall, our approach to such a significant conversion to an electric fleet is to work with transit agencies to understand their plans and objectives, particularly regarding charging electric buses, and to identify targeted solutions to reduce barriers to bus electrification. WMATA has shared its commitment to meeting important District goal of zero emissions. WMATA is also actively seeking grant/federal support to offset cost and is actively engaged with Pepco to develop programs that will assist in accelerating this important transition.

We recognize the importance of moving expeditiously and in alignment with the District's roadmap to decarbonize the District with a focus on transportation and the built environment. We know that the two largest contributors to carbon emissions in the District are the built environment and transportation. Therefore, we continue to work collaboratively and in coordination with the DC Sustainable Energy Utility to implement programs to assist both residential and commercial customers in reducing their energy usage, and with WMATA, the

District Department of Energy and Environment and the District Department of Transportation and others on planning for a more electrified future regarding transportation. And, as I noted previously, we believe that with the combination of this focus on energy efficiency, while working to electrify transportation and other aspects of the economy, the distribution grid is capable of handling this transition. However, it will require thoughtful and timely planning, incremental investments, and ongoing collaboration to ensure we are making the necessary system upgrades in a way that aligns with both District and customer goals and needs, and does so in a manner that maintains overall system reliability, resiliency, affordability and accessibility for all customers.

Thank you for the opportunity to testify and we are committed to assisting the District of Columbia meet its climate commitment goals, with affordability, equity and inclusion being foundational guiding principles. We look forward to working with you to support and enable a cleaner transportation future for the District and its residents.

1 **DRAFT COMMITTEE PRINT**
2 Committee of the Whole
3 January 18, 2022
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6 A PROPOSED RESOLUTION
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11 IN THE COUNCIL OF THE DISTRICT OF COLUMBIA
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16 RESOLVED, BY THE COUNCIL OF THE DISTRICT OF COLUMBIA, That this
17 resolution may be cited as the “Sense of the Council Urging WMATA’s Bus Fleet Electrification
18 Resolution of 2022”.

19 Sec. 2. The Council finds that:

20 (1) The Clean Energy DC Omnibus Amendment Act of 2018 (D.C. Law 22-257)
21 mandates that 50 percent of public buses be low or zero-emission by 2030 and 100 percent zero-
22 emission by 2045.

23 (2) The District of Columbia is committed to reducing greenhouse gas emissions
24 50 percent below 2006 levels by 2032 and be carbon neutral by 2050.

25 (3) The District of Columbia aims to be a leader on sustainability, but many other
26 major U.S. cities are moving more quickly to electrify their bus fleets. Los Angeles and Houston,
27 for example, have committed to electrifying their fleets by 2030, while Chicago, New York and
28 Seattle (King County) are planning to do so by 2040.

29 (4) Electrification saves money: The Washington Metropolitan Area Transit
30 Authority (WMATA) would save at least \$350 million over the lifetime of its fleet if 50 percent

31 of its fleet is comprised of electric buses, according to a 2020 Sierra Club report; savings would
32 increase if more electric buses were added.

33 (5) Electrification reduces global warming: If 50 percent of the WMATA bus
34 fleet is electrified, greenhouse gas emissions would be reduced by more than 58,000 tons of
35 carbon dioxide per year by 2030, according to the 2020 report.

36 (6) Electrification improves public health: Even with more stringent tailpipe
37 emission standards for heavy-duty vehicles, such as buses, pollution (both particulate and ozone
38 precursors) from diesel buses causes a wide range of health problems, especially for children and
39 vulnerable residents, including asthma and cancer. Electrifying WMATA's fleet would improve
40 air quality and therefore the health of Washington, D.C., area residents, saving them more than
41 \$8 million per year (according to the 2020 report) in health care costs once the fleet is fully
42 electric.

43 (7) While compressed natural gas buses emit less toxic pollution than diesel
44 buses, they are only marginally cleaner than diesel buses in terms of greenhouse gas emissions, if
45 that. The Argonne National Laboratory found that in many circumstances, natural gas buses emit
46 nearly the same level of greenhouse gas emissions as conventional diesel buses. So it is
47 imperative to eliminate use of any form of fossil fuel in WMATA's bus fleet.

48 (8) In June 2020, the Federal Transit Administration awarded WMATA more than
49 \$4 million to purchase new electric buses and charging equipment and to make infrastructure
50 improvements. But at this point Metro has one electric bus and is planning to acquire one dozen
51 more for a two-year pilot to study electrification – even though other cities already have electric
52 buses in operation and the DC Circulator is already partially electrified.

53 (9) WMATA is currently installing electric charging equipment at two D.C. bus
54 garages – Bladensburg and the Northern Bus Barn – and plans to run its electric bus pilot project

55 out of its Shepherd Park Garage, so the infrastructure should be in place soon for WMATA bus
56 electrification.

57 Sec. 3. It is the sense of the Council that:

58 (1) WMATA must commit to electrifying its fleet on a schedule that meets –
59 preferably exceeds – the deadlines in the Clean Energy DC Act, by agreeing to electrifying at
60 least 50 percent of its bus fleet by 2030, 75 percent by 2035, 90 percent by 2040, and 100 percent
61 by 2045.

62 (2) WMATA’s current contract for 542 fossil fuel buses with New Flyer to be
63 delivered by 2023 should be the last time Metro purchases fossil fuel buses. Going forward,
64 WMATA must buy only electric buses. By doing so, 45 percent of Metro’s fleet would be zero
65 emission by 2030 and 100 percent would be zero-emission by 2039.

66 (3) Any future upgrades to WMATA bus garages or fueling infrastructure must
67 include electric bus ready designs.

68 (4) WMATA should prioritize introducing electric buses on routes servicing low-
69 and moderate-income neighborhoods and environmental justice communities that have been
70 disproportionately burdened by pollution.

71 (5) WMATA should cease investment in new diesel and compressed natural gas
72 fueling infrastructure that risks becoming a stranded asset, including abandoning current plans to
73 spend more than \$5 million on new compressed natural gas fueling apparatus at the Shepherd
74 Parkway Bus Division in Southwest D.C., and \$5 million to \$8 million on new diesel bus-related
75 infrastructure at the Northern Bus Garage in Northwest, D.C., which is currently under
76 renovation.

77 (6) Likewise, WMATA should not increase the percentage of compressed natural
78 gas buses in its fleet. It should immediately abandon the board’s current plan to purchase 50

79 percent compressed natural gas and 50 percent diesel-electric hybrid buses going forward, as
80 stated in the 2017 Metrobus Fleet Management Plan and reiterated in the 2021 Sustainability
81 Vision and Principles and Metrobus Fleet Plan.

82 (7) When WMATA finishes refurbishing its Northern Bus Garage on 14th Street
83 NW, it should no longer house diesel buses there, running only electric buses at that site.

84 (8) WMATA must publicly release a revised, accelerated bus electrification plan
85 as soon as possible. As part of that plan, WMATA should commit to releasing an annual
86 progress report identifying milestones, challenges, and ongoing actions that facilitate rapid
87 electrification. WMATA must complete and publicly release this revised bus electrification plan
88 before it signs a new contract for new buses.

89 (9) WMATA should immediately consult with PEPCO, if it has not already done
90 so, to evaluate the local distribution grid around its bus garages to determine what changes and
91 upgrades will be necessary to support charging an electric fleet.

92 (10) WMATA should immediately apply for applicable federal funding for use in
93 2022, building on the more than \$4 million grant award it received in fiscal year 2020.

94 (11) WMATA should substantially shorten its planned two-year pilot project with
95 a dozen electric buses, and begin it as soon as possible.

96 Sec. 4. The Council shall transmit a copy of this resolution to the Washington
97 Metropolitan Area Transit Authority and the Mayor.

98 Sec. 5. This resolution shall take effect upon the first date of publication in the DC
99 Register.