

# Northern Bus Garage Reconstruction Project



**Summer Community Update  
Meeting**

June 15, 2021



## Meeting Etiquette

**Metro wants to hear from you. Here are a few guidelines to keep this meeting productive and to maintain respect for all participants:**

- You will have an opportunity to ask questions following each section of the presentation.
- To ensure we hear from as many community members as possible, please adhere to the Q&A protocol:
  -  Request to speak by typing your name in the chat
  -  Type questions directly into the chat
- When speaking:
  - Maintain a civil tone
  - Be mindful of time so that your fellow community members can share their feedback

**Anyone in violation of the meeting etiquette guidelines will be muted for the duration of the meeting.**

## Agenda

- Introductions
- Project Overview and Updates
- Environmental Management: Overview and Status
- Construction Survey and Claims Processes
- Art in Transit: Perimeter Fencing
- Update on Metro's Zero-Emission Bus Strategy
- What to Expect in 2021

# Introductions

Northern Bus Garage Reconstruction Project

## Project Team

- ❑ Diana Levy, Director Capital Delivery WMATA
- ❑ Jim Ashe, Environmental Coordinator WMATA
- ❑ Kit Conway, Manager, Strategic Initiatives WMATA
- ❑ Laurent Odde, Art in Transit Manager WMATA
- ❑ Philip Sheridan, Clark Construction
- ❑ Sean Beachy, Wendel

# Project Overview and Updates

Northern Bus Garage Reconstruction Project

# 2021 Summary of Q2 Project Events

- March 2021
  - Mayor's Agent Hearing
- May 2021
  - Meeting with DC Water
  - Post-hearing submissions filed with Mayor's Agent
- June 2021
  - Meeting with DOEE
  - Meeting with ANC Leaders
  - DDOT Public Space Committee Hearing



# Agency Collaboration Since Last Meeting

Agency	Brief Purpose
DC Office of Zoning	Transitional setback, penthouses
SHPO (State Historic Preservation Office)	Follow-up from December HPRB, review of updated renderings
DDOT	Design update per Public Space Committee, loading zone, Urban Forest Division
Pepco	Location of proposed services to building
Washington Gas	Gas main extension, Service meter location
DOEE	Review of stormwater management

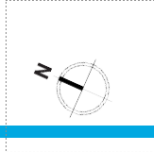


## Mayor's Agent Hearing

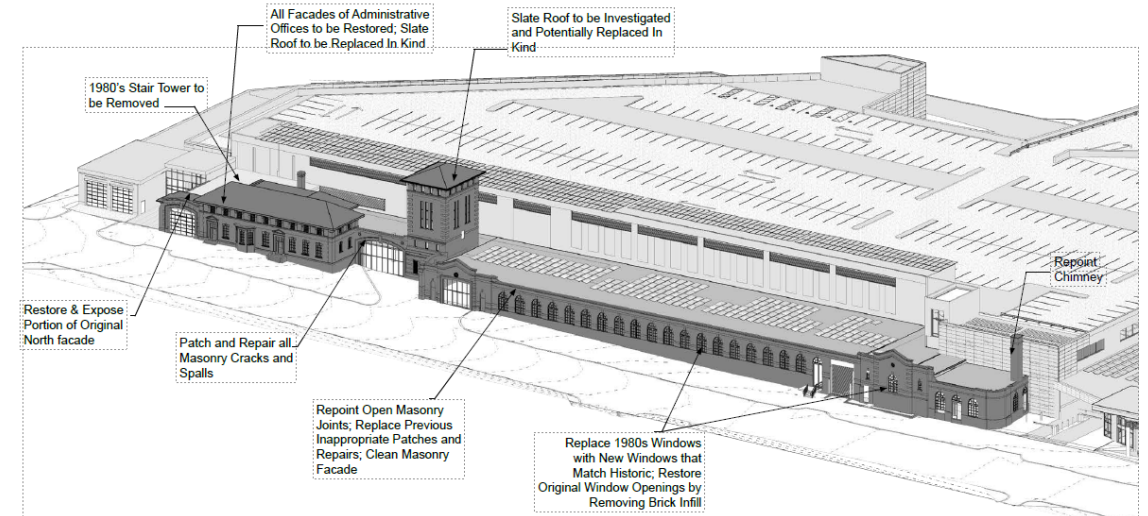
Hearing held on March 26, 2021

- WMATA witnesses provided uncontroverted testimony supporting WMATA's pending Raze Permit as necessary to allow construction of a project of special merit
- Raze permit covers limited removal of historic fabric
- Testimony and exhibits established that the project will provide significant transit and community benefits, further local land use planning goals, and preserve key historic features.
- Testimony was also offered by representatives of Northern Bus Barn Neighbors, 14<sup>th</sup> St. Uptown Business Association, 16<sup>th</sup> Street Neighbors Association, and the D.C. Historic Preservation Office

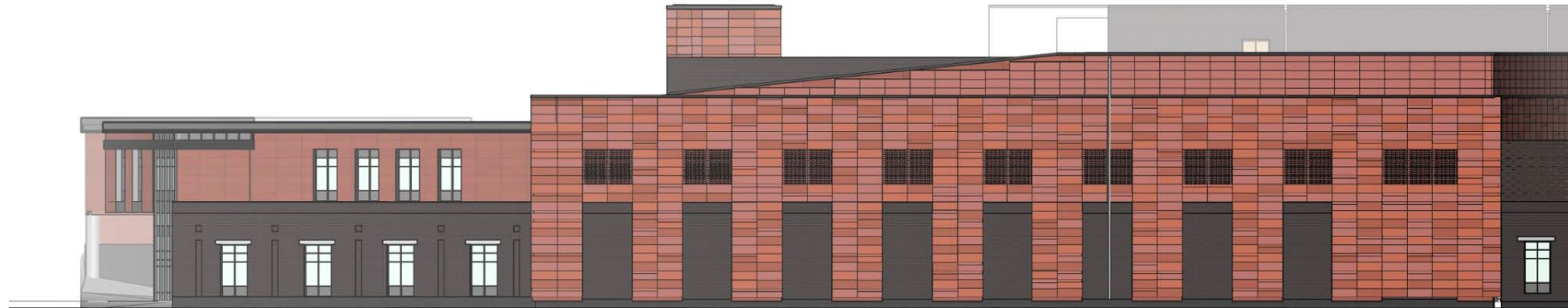
### Northern Bus Garage Preservation Treatment Approach



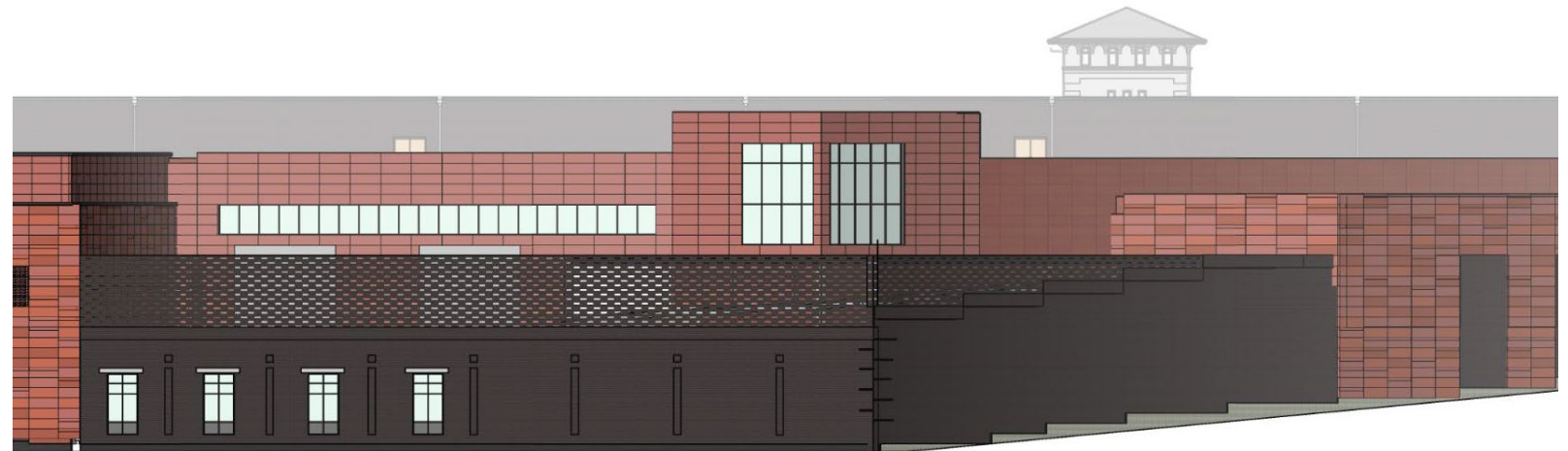
#### Programmatic Massing of New Construction to Historic Building



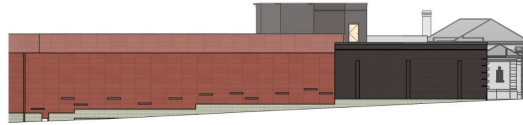
# DC Historic Preservation Review Board



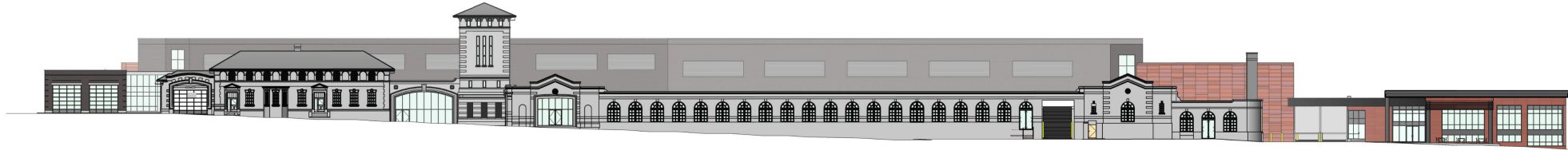
While awaiting the Mayor's Agent's determination, Metro continues to meet with representatives from the D.C. Historic Preservation Office to refine the design.



## Overall Building Elevations



1 ELEVATION - OVERALL - NORTH  
3/64" = 1'-0"



2 ELEVATION - OVERALL - WEST  
3/64" = 1'-0"



3 ELEVATION - OVERALL - SOUTH  
3/64" = 1'-0"



4 ELEVATION - OVERALL - EAST  
3/64" = 1'-0"

# Northern Bus Garage Reconstruction Project



VIEW 1



# Northern Bus Garage Reconstruction Project



VIEW 2



# Northern Bus Garage Reconstruction Project



VIEW 3



# Northern Bus Garage Reconstruction Project



VIEW 4



# Northern Bus Garage Reconstruction Project



VIEW 5





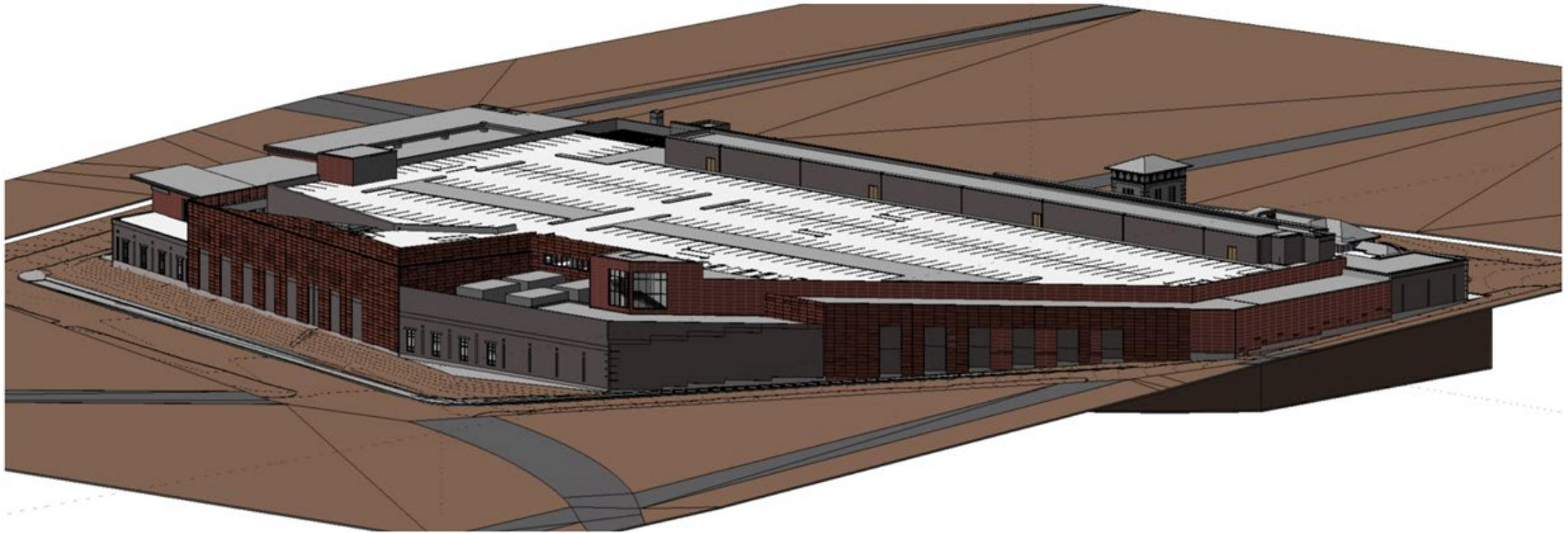
# Northern Bus Garage Reconstruction Project



VIEW 6



## Isometric view of the Arkansas and Iowa Avenues Façade



## View from Corner of Buchanan

NOTE: THE IMAGE PROVIDES AN ADDITIONAL VIEW OF THE TOP SETBACK AND IS NOT A PHOTOREALISTIC VIEW.



## Design Progress Update

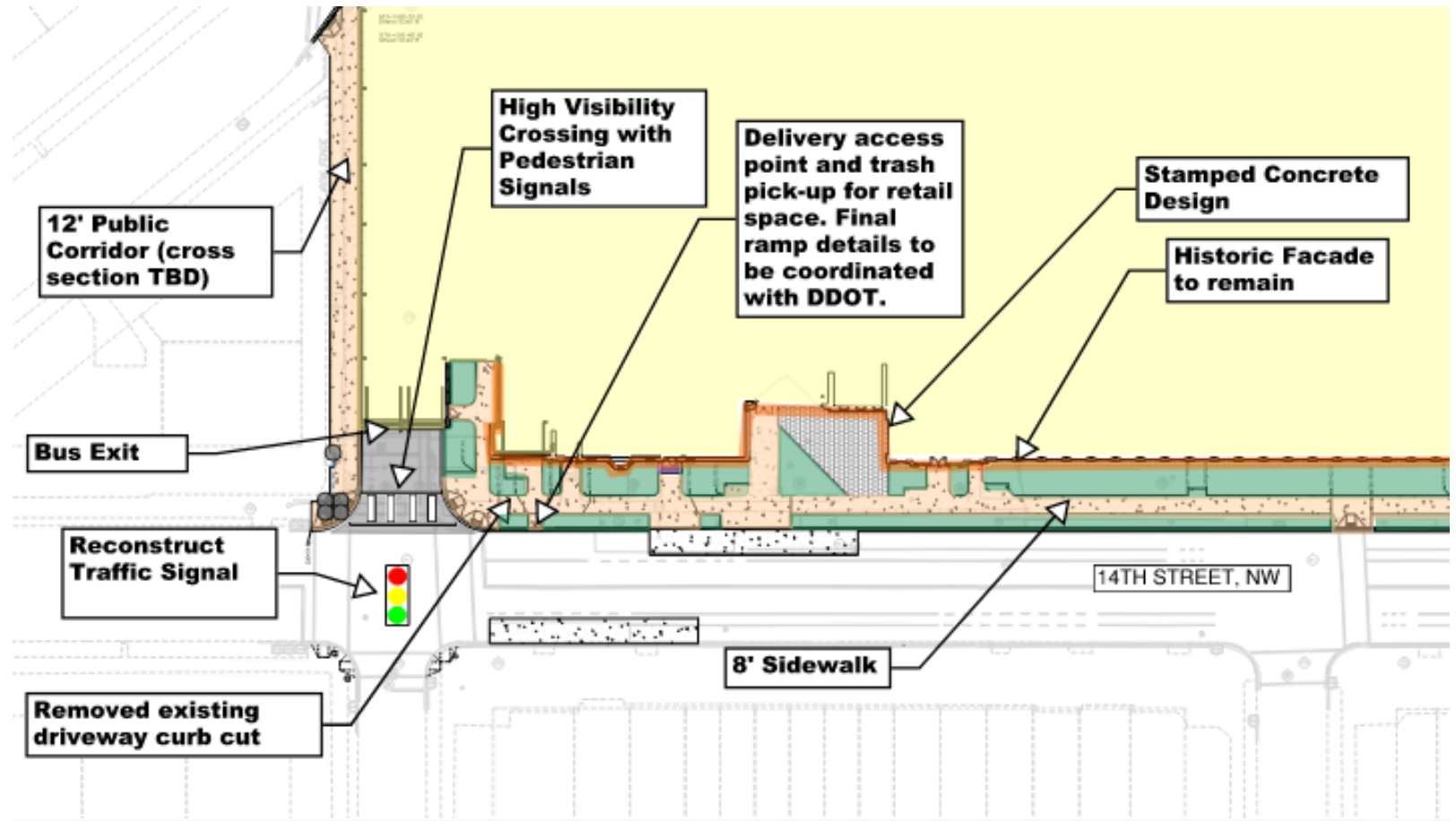
- Design Package 1 (DP1)
  - DP1 consists of civil, underground utilities and services, landscape, grading, foundation and structure
  - 75% design submitted to WMATA on April 16, 2021
  - DP1 90% submittal to WMATA is due on August 4, 2021
- Design Package 2 (DP2)
  - DP2 consists of mechanical, plumbing, electrical, building envelop, interior finishes and design
  - 75% design submittal expected on June 7, 2021
  - DP2 90% submittal expected on October 19, 2021

**Target Completion of Issue For Construction (IFC) Plans:  
November 2021 and February 2022, respectively**

## Proposed Site Plan

Improvements since last meeting:

- Articulating the historic trolley entry through hardscape design
- Refining retail delivery approach with DDOT
- Nominal adjustments to all curb cuts based on feedback received at the February Public Space Committee (PSC) hearing
- Return to June PSC hearing for final plan approval



# Field Progress Update

- Historic Foundation Test Pitting Program
  - Purpose is to collect data on size and depth of the wall footings, top of rock elevation at the existing wall footings, the depth of the underground storage tank anchor slabs, and the depth and exact location of the sewer along 14th Street, which will provide us with the necessary information to finalize the bus garage design
- Caisson Load Test Program
  - Purpose is to validate the new building's foundation design by measuring the capacity of the soil and rock underneath the existing bus garage
- Work on both programs started on June 7 and is expected to be completed this month

## Field Progress Update



- Shown (left) is the progress of the first test pit searching for a wall footing
- The test pitting requires us to remove a small section of the concrete slab to access the soil underneath
- The soil is then mostly hand-dug, once accessible
- All soils will be backfilled into the pits once the foundation elements are surveyed

## Any Questions?

There are two ways to submit your questions



Request to speak by typing your name in the chat



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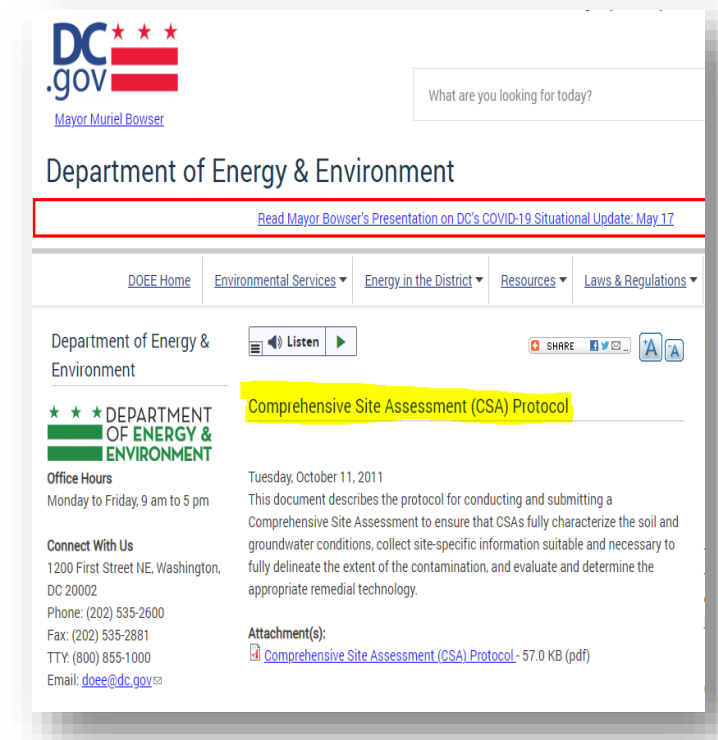


# Environmental Management: Overview and Status

Northern Bus Garage Reconstruction Project

## DOEE Collaboration

- Comprehensive Site Assessment (CSA) Work Plan
  - Original submission February 2021
  - DOEE comments received & incorporated
  - Revised CSA report submitted in May 2021
- Revised CSA Work Plan includes workplan covering:
  - Four wells near Arkansas and Iowa Avenues
  - 18 well points (2 water samples per hole and 1-2 soil sample per hole)
  - Confirmatory sampling in excavated areas
  - Approval received June 4
- Next steps:
  - Secure permits
  - Complete investigations and provide findings to DOEE



The screenshot shows the DC Department of Energy & Environment website. At the top left is the DC.gov logo with three stars and the text 'Mayor Muriel Bowser'. A search bar on the right asks 'What are you looking for today?'. Below the logo is the text 'Department of Energy & Environment' and a link to 'Read Mayor Bowser's Presentation on DC's COVID-19 Situational Update: May 17'. A navigation menu includes 'DOEE Home', 'Environmental Services', 'Energy in the District', 'Resources', and 'Laws & Regulations'. The main content area features the department's logo, a 'Listen' button, and social media icons. The title of the page is 'Comprehensive Site Assessment (CSA) Protocol'. The date is 'Tuesday, October 11, 2011'. The text describes the protocol for conducting and submitting a Comprehensive Site Assessment. An attachment link is provided: 'Comprehensive Site Assessment (CSA) Protocol - 57.0 KB (pdf)'. The 'Connect With Us' section lists the address (1200 First Street NE, Washington, DC 20002), phone number (202) 535-2600, fax (202) 535-2881, TTY (800) 855-1000, and email doee@dc.gov.

## Air Pollution Treatment Update

- WMATA & Clark performed review of MERV 14 filters versus MERV 16 filters to be used in the 14 units of Dry Scrubber Technology
- Use of MERV 16 filters, instead of MERV 14 filters as previously proposed, is achievable with several accommodations and changes to the current design
- ASHRAE estimated 95% efficiency in filtering particulate matters of all sizes with MERV 16 filters
- MERV Filters Maintenance:
  - Will be checked by monitoring pressure differences across the filters
  - Will be monitored monthly for the first six months to determine frequency of replacement, then quarterly after that

ASHRAE Standard 52.2-2017 -- Minimum Efficiency Reporting Value (MERV)

Standard 52.2 Minimum Efficiency Reporting Value (MERV)	Composite Average Particle Size Efficiency, % in Size Range, $\mu\text{m}$			
	Range 1 0.30 to 1.0	Range 2 1.0 to 3.0	Range 3 3.0 to 10.0	Average Arrestance, %
1	N/A	N/A	$E_3 < 20$	$A_{avg} < 65$
2	N/A	N/A	$E_3 < 20$	$65 \leq A_{avg}$
3	N/A	N/A	$E_3 < 20$	$70 \leq A_{avg}$
4	N/A	N/A	$E_3 < 20$	$75 \leq A_{avg}$
5	N/A	N/A	$20 \leq E_3$	N/A
6	N/A	N/A	$35 \leq E_3$	N/A
7	N/A	N/A	$50 \leq E_3$	N/A
8	N/A	$20 \leq E_2$	$70 \leq E_3$	N/A
9	N/A	$35 \leq E_2$	$75 \leq E_3$	N/A
10	N/A	$50 \leq E_2$	$80 \leq E_3$	N/A
11	$20 \leq E_1$	$65 \leq E_2$	$85 \leq E_3$	N/A
12	$35 \leq E_1$	$80 \leq E_2$	$90 \leq E_3$	N/A
13	$50 \leq E_1$	$85 \leq E_2$	$90 \leq E_3$	N/A
14	$75 \leq E_1$	$90 \leq E_2$	$95 \leq E_3$	N/A
15	$85 \leq E_1$	$90 \leq E_2$	$95 \leq E_3$	N/A
16	$95 \leq E_1$	$95 \leq E_2$	$95 \leq E_3$	N/A

Average Minimum PSE Designator	Corresponding Size Range Group, $\mu\text{m}$
$E_1$	0.30 to 1.0
$E_2$	1.0 to 3.0
$E_3$	3.0 to 10

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# Construction Survey and Claims Processes

Northern Bus Garage Reconstruction Project

## Construction Monitoring

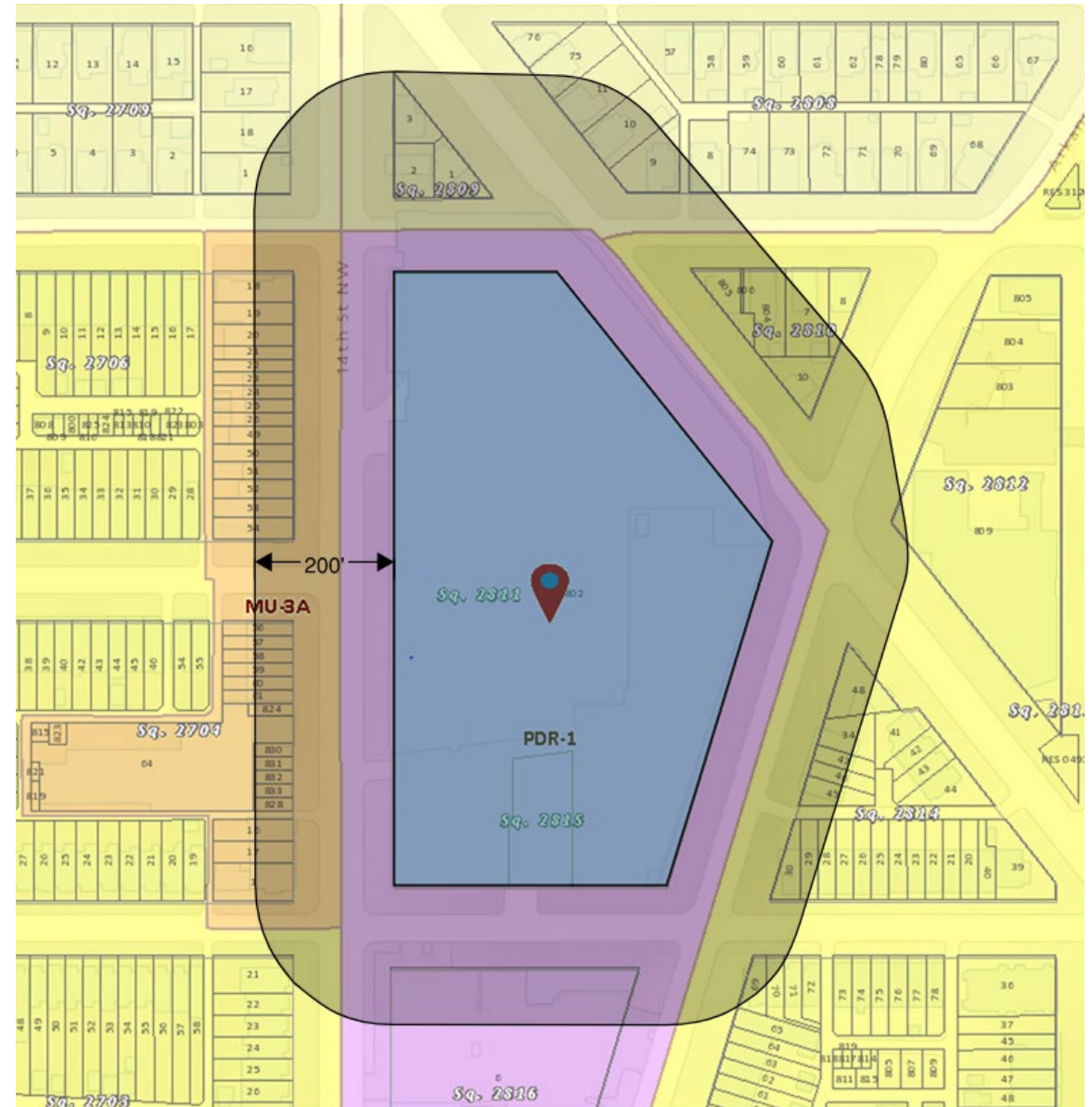
- Various instruments installed to monitor for movements as coordinated and permitted with District of Columbia agencies
  - In ground to measure movement and groundwater
  - On Adjacent Structures (with owner permission)
  - On Ground surface
  - On Utilities
- Vibration monitoring will occur at project perimeter
- Baseline readings of current background noise and vibration will be established for at least 30 days prior to the start of demolition

# Pre- and Post-Construction Survey Overview

- Clark team will engage an engineering firm to conduct pre-existing condition surveys of homes and buildings in the neighborhood around the Northern Bus Garage
- These inspections will document the current interior and exterior condition of the surveyed properties and help expedite processing any future claims

## Pre- and Post-Construction Surveys

- Map shows an overlay with the properties that fall within 200 ft of the proposed new bus garage





# Recap: Pre- and Post-Construction Survey Process

- Surveys offered for all adjacent buildings within 200 ft of the WMATA property lines
  - Purpose is to document existing conditions of structures prior to the start of major construction
  - Baseline report prepared prior to start of demolition
    - Invite to opt into inspection program provided to property owner about 90 days prior to planned start of work
  - Property is eligible for a post-construction survey even if owner did not elect to get a pre-construction survey, though survey findings may be more limited, and damage claims maybe be more difficult absent a pre-construction survey
- Surveys performed by independent third-party engineering firm
  - A hard copy and digital copy (CD or thumb drive) is provided to the property owner via certified mail
  - Point of contact provided for property owner to discuss any questions on the survey findings

# Damage Claims Process

Northern Bus Garage Reconstruction Project

# Damage Claim Process

- Claim form will be available by request through the project website
  - [wmata.com/NorthernBusGarage](http://wmata.com/NorthernBusGarage)
- Clark project staff will review the claim form with property owners to make sure all required information is submitted
- Claim forms will be submitted to Clark's risk department by our safety manager
- Claims will be assigned to an adjuster by Clark's insurance company
- The insurance adjuster will contact the property owner to schedule an inspection of the reported damage

## Damage Claim Process

- After inspection, the adjuster will provide a written estimate for the cost of repairs to the property owner
- The property owner may choose to get an independent opinion of cost for repairs
- Once a settlement agreement is reached between property owner and insurer, payment will be made to the property owner by the insurance company
- If the damage claim is found to not have merit, a findings letter will be prepared by the adjuster and mailed to the property owner
- There is an appeals process if the property owner disagrees with the adjuster's determination

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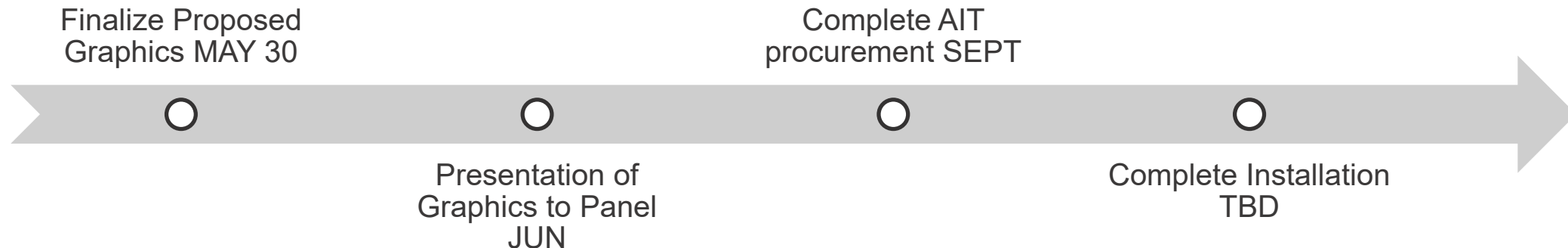
# Art in Transit: Perimeter Fencing

Northern Bus Garage Reconstruction Project

## Art in Transit (AIT): Perimeter Fencing

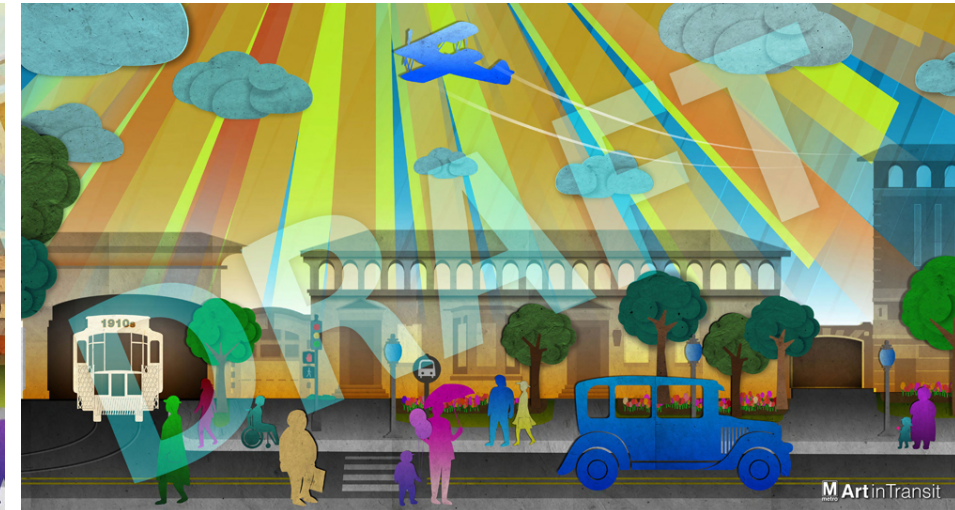
- Graphics are in the process of being completed by WMATA AIT graphic designer
- WMATA AIT & Government Relations teams will coordinate with panel of community representatives to present proposed graphics
- WMATA will launch procurement process to produce and install graphics on the perimeter fence

### Interim AIT Planned Timeline CY21 (subject to change)



## AIT: Perimeter Fencing Proposed Graphics

- Idea behind graphic:
  - Evolution of public transportation
  - Celebrating the neighborhood
  - Connecting the neighborhood
- Social media moment



**Graphics are drafts and for preview purposes only**



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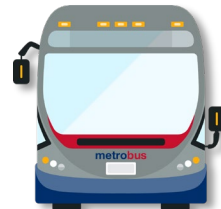
# Update on Metro's Zero-Emission Bus Strategy

Northern Bus Garage Reconstruction Project

# Metrobus Fleet Strategy Key Questions



1. **What level of service** does Metro expect to supply in the future?
2. **How many buses** should Metro operate to meet demand and service requirements?
3. **What types of buses** should Metro operate?
4. **How will Metro's maintenance facilities and operations** meet evolving fleet needs?



# Why Consider Electric Buses?

Benefits for regional air quality, customer experience



Cleaner air, reduced greenhouse gas and tailpipe emissions



Quieter vehicles, less vibration, increased passenger comfort



Decreased use of fossil fuels, reduced fuel costs

## Local Air Quality Context

**Metrobus fleet can help drive regional air quality improvements**

The Metropolitan Washington Council of Governments (MWCOG) identifies ground level **ozone** and **particulate matter** as the two most important pollutants harmful to health in the region

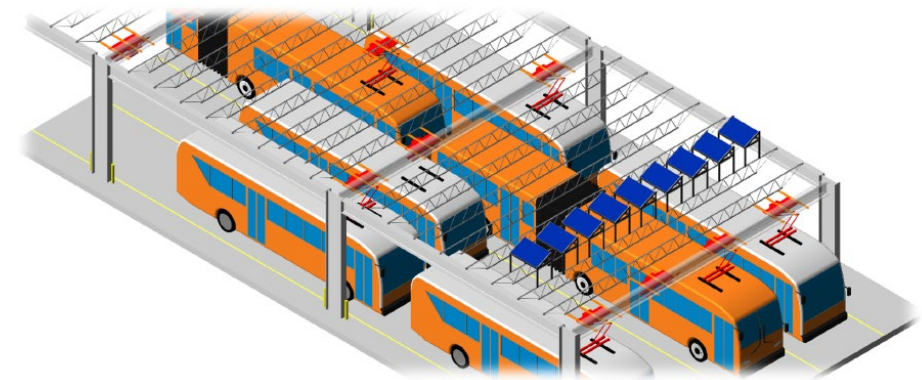
Ozone is formed by interaction between nitrogen oxides (NOx) and volatile organic compounds (VOC)

Region not meeting standards for ozone, is meeting standards for particulate matter with occasional exceedance days

Other pollutants tracked include carbon monoxide, for which region meets all standards

# Electric Buses: Industry-wide momentum, varied approaches to adoption

- Of ~55,000 U.S. transit buses: approximately 29,000 diesel, 12,500 CNG, 9,000 diesel-electric hybrid, 3,600 biodiesel, 600 electric trolleybuses, **500 battery-electric buses** with an additional **500 additional battery-electric bus orders pending**
- Regional targets and regulations encouraging or requiring fleet conversion
- Peer approaches include
  - Full commitment to 100% zero-emission fleet, infrastructure support
  - Test deployments to evaluate technology in operation
  - Wait-and-see approach as technologies mature



LA Metro Bus Division Overhead Charging Concept

# Current and Upcoming Electric Bus Activities

- **Electric Bus Test & Evaluation**
  - Pilot program operating out of Shepherd Parkway to include deployment, testing and evaluation of ~10 standard-length electric buses and ~2 articulated electric buses.
  - Project work is ongoing, with bus deliveries expected in early FY2023 and project closeout completed by mid-FY2024.
- **Continued Coordination with Electric Utilities**
  - Staff working with local electric utilities to define future fleet electrification requirements and outline requirements for successful integration with grid infrastructure.
- **Evaluation of Additional Funding Sources**
  - Staff reviewing potential opportunities for funding support of electric bus technology adoption, including federal programs and grants.

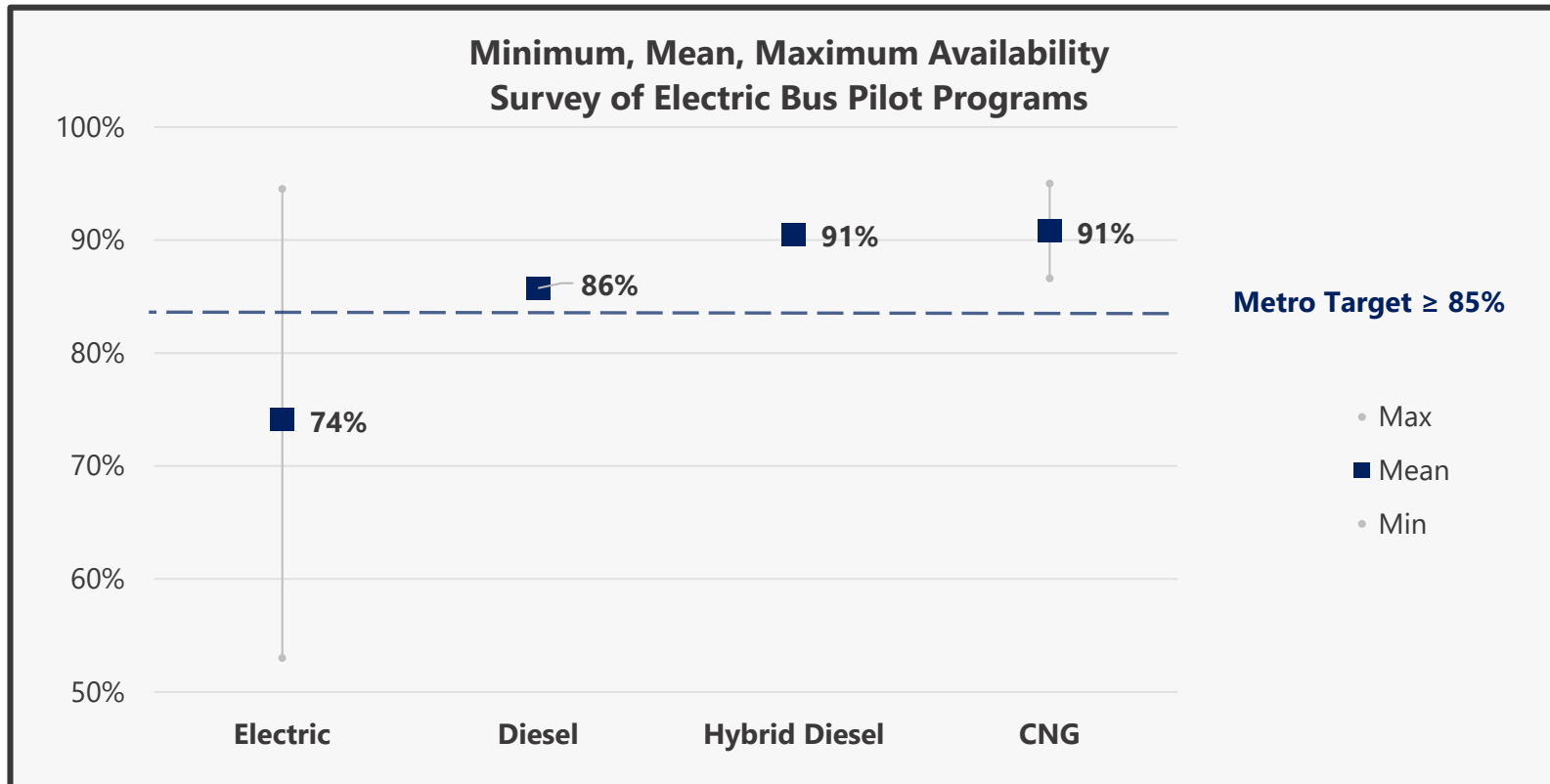


# Current and Upcoming Electric Bus Activities

- **Upcoming Five-Year Bus Procurement**
  - Development of Metro's next five-year bus procurement contract, including vehicle specifications.
  - Initial procurement development is ongoing, with issuance of request for proposals expected in FY2022. Contract bus deliveries expected to begin in FY2024.
- **Hiring of Program Management Team**
  - Expansion of staff support required to manage program associated with fleet electrification. Hiring activities underway.
- **Planning and Capital Project Development for Garage Electrification**
  - Development and evaluation of capital projects to expand Metro capacity to support, maintain, charge and store electric buses. Identification of sequencing and timing of garage conversion to support future fleet needs.
  - **Exploration of Potential Hydrogen Fuel Cell Bus Test and Evaluation**
  - Staff to review potential program structure, implementation options and funding sources for test and evaluation of hydrogen fuel cell bus technologies.

# Battery Electric Bus Availability, Survey of Pilots

Electric buses have not yet demonstrated consistent reliability on par with conventional vehicles



Improvements expected as technologies scale, market commitments shift to electric buses and manufacturers respond






Survey of publicly available industry test and evaluation data  
5 manufacturers (4 electric), 96 buses (49 electric), 6 peer agencies



# Metro Advancing Electric Bus Plans, Monitoring Technology

Expectation is electric buses will eventually be capable of 1-for-1 replacement of conventional buses

Every year, Metro's bus fleet covers 50 million miles and delivers 3.7 million hours of service

Performance Factor		Present	Target
	Miles/hours of service	Limited demonstration data suggests <b>~15,000-20,000 miles/year</b>	On par with conventional vehicles <b>~30,000 miles/year</b>
	Availability	Demonstrated availability averages <b>~75%</b>	On par with conventional vehicles <b>~Available 85% of days</b>
	Reliability	Limited demonstration data suggests <b>~2,500-5,000 miles between failures</b>	On par with conventional vehicles, Metro target <b>~7,000 miles between failures</b>
	Travel range	In ideal operating conditions <b>~150 miles</b>	On par with conventional vehicles <b>~250+ miles</b>
	Useful life	Useful life assumption of <b>12 years</b>	On par with conventional vehicles <b>15 years</b>

Upcoming Electric Bus Test and Evaluation will provide data and experience with electric bus performance in Metro operating conditions

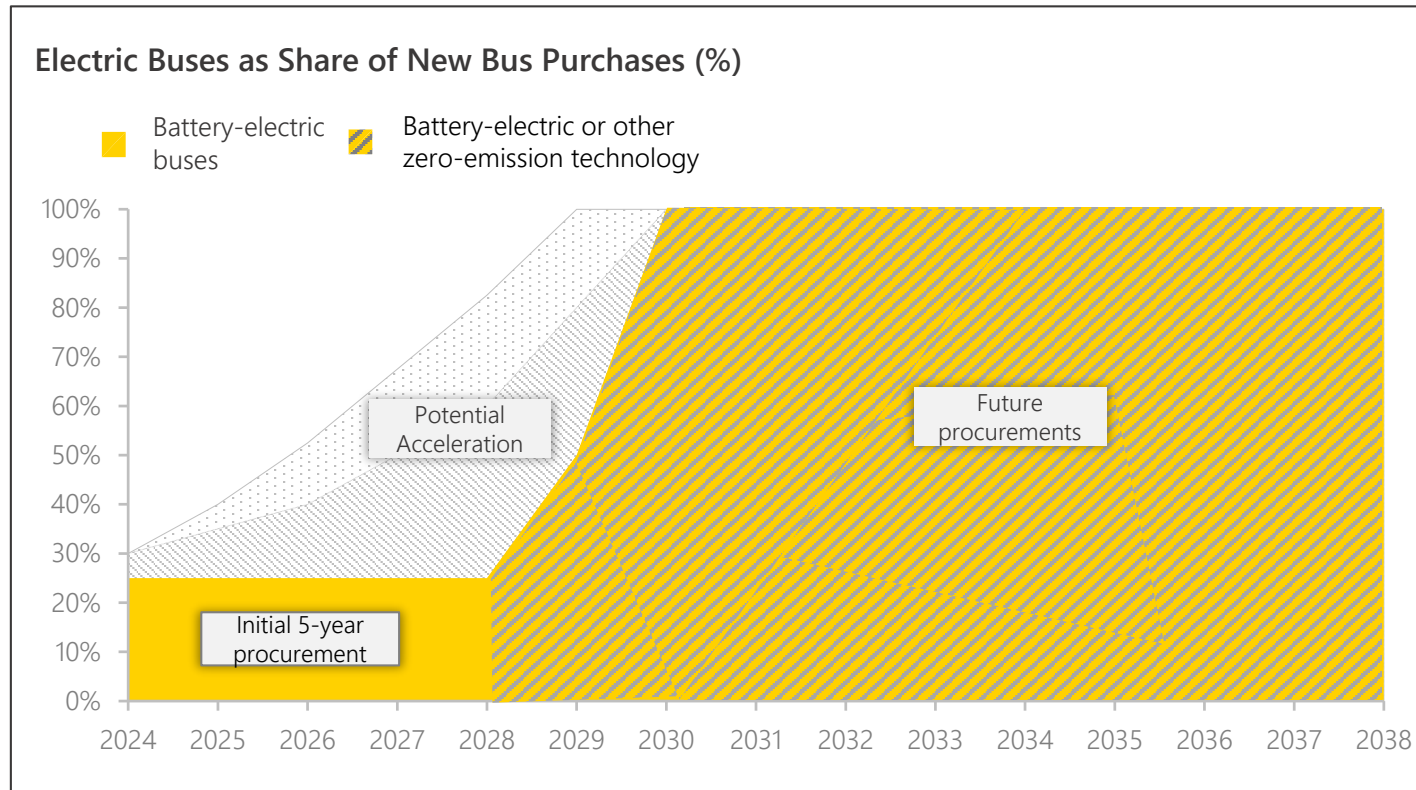
# Draft Strategy: Metrobus Fleet Summary

- **Begin adoption of electric buses**, starting with next bus procurement, and transition new bus procurement to 100% electric or other zero-emission technologies by 2030, fleet fully zero-emission by 2045.
- Maintain **steady state** fleet size of approximately 1,593 buses, procuring 100 new vehicles per year.
- **Articulated 60-foot buses**: Grow share of overall bus fleet from current **4% to 12%**, or 180 buses, to address crowding and improve capacity on high ridership corridors.
- **Spare ratio of 19.5%**, changed from current 18.5%, to support bus technology transition, increase in articulated buses, reduced garage and fleet flexibility, and increased capital program support needs (e.g., Platform Improvement Project).

A fleet's **spare ratio** is defined as the number of **spare vehicles** (extra buses in the fleet for maintenance and training purposes) **divided by the number of vehicles required for annual maximum service** (running service at the busiest time on the busiest day).

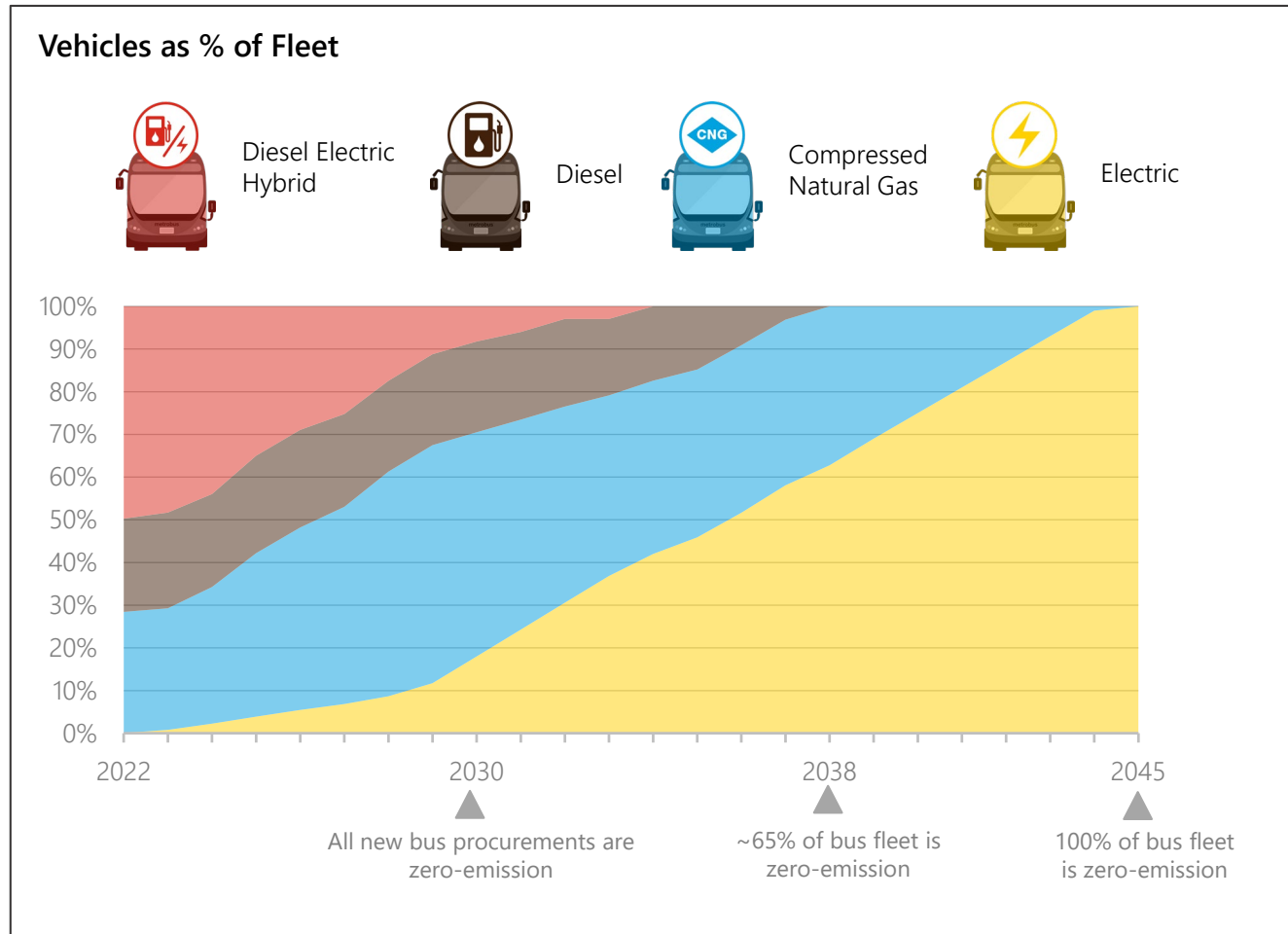
Spare ratios are expressed as a percentage. If a fleet had **100 vehicles** required for service and **20 spares**, the total fleet is 120 buses and has a **spare ratio of 20%**.

## Draft Strategy: Bus Procurement



- Draft Bus Fleet Strategy contemplates **phased approach** to electric bus adoption
  - Purchase only **lower-emission and electric buses** in next bus procurement
  - Transition to **100% zero-emission bus purchases by 2030**
  - Fleet **100% zero-emission by 2045**
- Draft Strategy weighs flexibility and adaptability with the potential for faster adoption of electric or other zero-emission buses if:
  - 1-for-1 replacement is possible sooner
  - More funding is available
  - Facility capacity and infrastructure improvements are realized more quickly

# Draft Strategy: Fuel Mix Implications



- **Flexibility and adaptability** considered in draft strategy, especially as technologies emerge and develop
- Draft target of 100% of new bus procurements to be **zero-emission by 2030**, **~65% zero-emission fleet by 2038**, **100% zero-emission fleet by 2045**
- Hydrogen fuel cell and other zero-emission bus types considered and evaluated in future

## Draft Strategy: Electric Bus Support, Facility Requirements

Conversion of Metro facilities to support electric buses requires investment

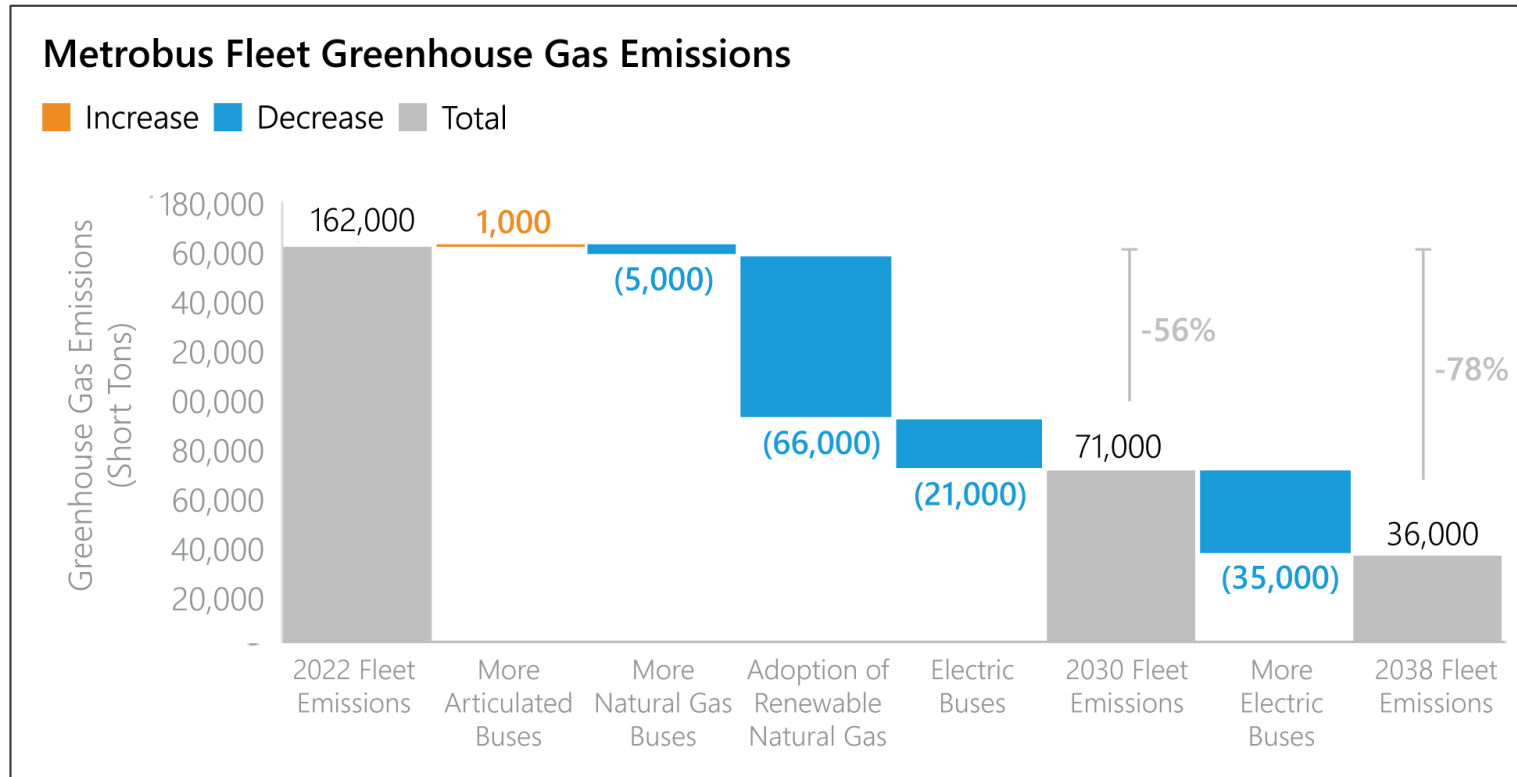
- **Charging equipment:** Chargers (plug-in, pantograph, etc.), conduits, transformers and other equipment must be installed in each garage offering electric bus support.
  - Potential exploration of in-route charging infrastructure, depending on deployment factors and fleet needs
- **Garage configuration:** Ceiling height, parking, and maintenance area dimensions and layouts likely to impact support for new bus technology.
- **Workforce opportunities and collaboration with labor:** New vehicle technologies will require new maintenance skillsets and training protocols, offer new skills and job training opportunities for workforce in the region.
- **Parts and materials storage:** New bus technology requires new parts inventories and other supporting materials and equipment.
- **Operational and safety considerations:** Time required for charging, operator role in bus charging likely to impact operations and require planning and review. Further modifications expected to ensure facility safety.

**Facilities are the critical path to transition**  
Some factors within Metro's control, others to require regional coordination and support



Conceptual design of Division Charging Infrastructure  
Source: LA Metro, ZEBGO December 2019

# Draft Strategy: Emissions Implications, Greenhouse Gases



Source: EPA bus emissions data and 2020 Department of Energy Argonne National Laboratory model.

- Every trip taken with Metro instead of a car reduces the region's greenhouse gas emissions; **lower-emission vehicles provide additional benefit**
- Addition of **electric buses**, expansion of **CNG fleet**, adoption of **renewable natural gas** drive greenhouse gas emission reductions
- Estimated **~56% reduction** in annual emissions by 2030, **~78% reduction** by 2038

# Metrobus Fleet Strategy Next Steps

- Metro staff presented draft Metrobus fleet strategy to Board of Directors on June 10, 2021 and recommended Board adoption of zero-emission vehicle goals:
  - Purchase only **lower-emission and electric buses** in next bus vehicle procurement
  - Transition to **100% zero-emission bus purchases by 2030**
  - **100% zero-emission bus fleet by 2045**
- Board currently considering proposed zero-emission vehicle goals



Art in Transit  
New Leaf, 2006  
Lisa Scheer

## Any Questions?

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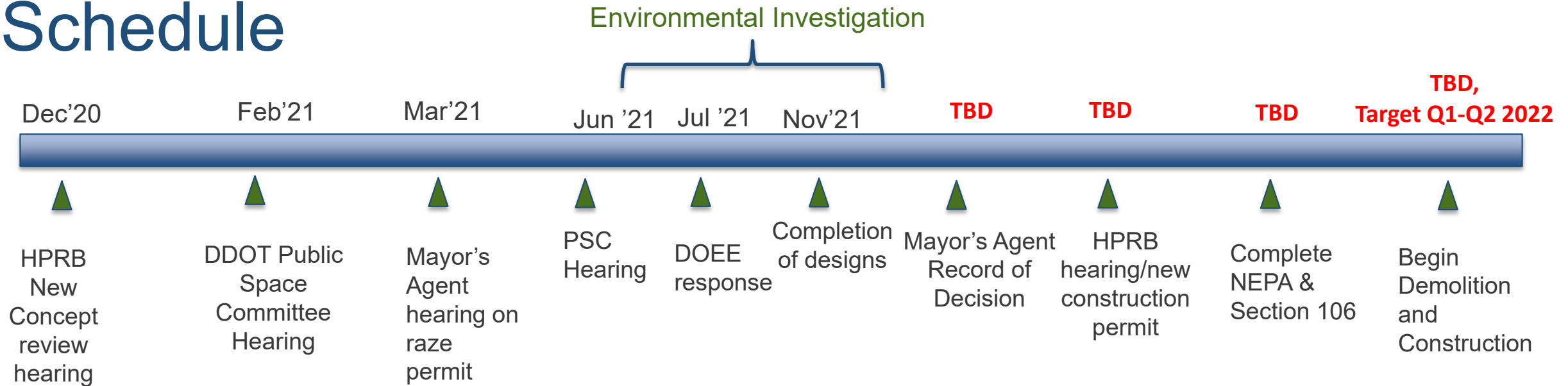
Type questions directly into the chat



# What to Expect in 2021

Northern Bus Garage Reconstruction Project

## Schedule



Mayor's Agent clearance of Raze Permit, NEPA review, and Section 106 process must be received/completed before project can begin demolition/construction

# Upcoming Community Engagement Meetings



**Fall**  
\*Sept. 21, 2021



**Winter**  
\*Dec. 14, 2021

- Updates posted to [wmata.com/NorthernBusGarage](https://wmata.com/NorthernBusGarage) and shared via email
- Email [MCAP\\_NBG\\_Reconstruction\\_Project@wmata.com](mailto:MCAP_NBG_Reconstruction_Project@wmata.com) to join the project's community contact list or request additional information

***\*Dates may be subject to change***

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