# VICINITY



## 2023 NTICC

SEPTEMBER 24 - 28, 2023 I DENA'INA CENTER I ANCHORAGE, AK

Corporate Overview September 2023

# U.S. Assembly Facility

### Washington State Assembly Plant

- U.S. Headquarters in cost-effective location
- Assembles buses for Buy America compliant orders, supplementing contract manufacturer capabilities





#### Production

- Buy America compliant
- Domestic production up to 1,000 units per year



#### Capacity

 Contract manufacturing partners capable of producing additional 2,000 units per year



#### Supply

 Buy America Vicinity buses are built using 70% U.S. sourced parts



#### Control

- All intellectual property controlled by Vicinity Motor, Siemens and AutoCAD
- Product lifecycle management

# **Production Plant**

### Ferndale, Washington 1,000 Units/Year SOP 3<sup>rd</sup> Quarter 2023





# Electric Vehicles – Buses & Shuttles

Addressing the Needs of a More Sustainable Future

|                    | Medium Duty   | Heavy Duty   |  |
|--------------------|---|--|--|
| Model              | Vicinity Lightning 28'  | Vicinity Bolt  |  |
|                    | Electric  | Electric   |  |
| Addressable Market | ~8k+ units  |  |  |
| Applications       | Commercial, airlines, transit   | ETA 2024   |  |
| Key Advantages     | <ul> <li>EV offering with greater convenience vs. mid-sized cutaway alternative</li> <li>Benefit from significant expected EV sector growth</li> <li>Recent winner of competitive RFP 5-year contract with Calgary Transit</li> </ul> | <ul> <li>Vast EV opportunity with EV buses projected to account for<br/>~80% of bus sales by 2035<sup>(1)</sup></li> </ul> |  |

# Electric Vehicles – Class 3-5 Trucks

Addressing the Needs of a More Sustainable Future

|                    | Class 3 – Medium Duty  | Class 5 Medium Duty  |  |
|--------------------|--|--|--|
| Model              |  |  |  |
|                    | VMC 1200   | VMC Class 5  |  |
|                    | Electric   | Electric   |  |
| Addressable Market | ~430k+ units   |  |  |
| Applications       | Municipal, Urban, Commercial Freight, Last Mile  |  |  |
| Key Advantages     | <ul> <li>Popular cab over design, Very Maneuverable</li> <li>Ideal for customers traveling less than 150 miles per day</li> <li>On board electrical power eliminates the need of small generators</li> </ul> | <ul> <li>VMC Powertrain Solution Scale</li> <li>Heavy Class 5 Configuration</li> <li>Excellent Weight Distribution and Cargo Capacity</li> </ul> |  |

# ICE Vehicles

#### Meeting the Realities of the Present

Many contracts were for 5 years. VMC delivering on back log, while customers transitioning to EV orders

|                    | Heavy Duty   |  |
|--------------------|--|--|
| Model              |  |  |
|                    | Vicinity Classic 32' / 35' / 38'<br>Clean Diesel & CNG   |  |
| Addressable Market | ~1.5K units  |  |
| Applications       | Community transit and commercial   |  |
| Addressable Market | 100,000 obsolete inefficient, high energy consumption HD transit buses   |  |
| Key Advantages     | <ul> <li>Lower upfront and operating cost vs. full size bus while maintaining same durability</li> <li>Able to maneuver in narrow downtown streets and residential neighborhoods</li> <li>Reduced Fuel Consumption, Reduced Emissions, Reduced Infrastructure Burden</li> <li>Excellent ROI and Lifecycle costing</li> </ul> |  |

# The Vicinity Lightning EV

#### Purpose-Built, All-Electric Bus to Accelerate Transition to Sustainable Public Transit System

#### **Deliveries Beginning in 2H 2023;**





#### Integrated Battery Packs, Modules & Components

- Customized, premium class, highest standards automotive solutions
- Safe, reliable, certified and cost-competitive

#### Supply Agreements





#### **Proven Automotive Technology**

Purpose Built EV Easy to Use Charges like a Car Fits in any Garage Batteries in Floor Zero Emission Maximum Versatility Industry Standard Charging Danfoss EDITRON Powertrain



- Proven automotive industry standard
- In use globally
- Electrical validation

# Tested for Transit in North America

#### Altoona Test Results for 30' Heavy Duty Vicinity

The US Federal Transit Authority's (FTA) Altoona test is an internationally recognized, rigorous testing regime which entails 12 years and 500,000 miles of heavy-duty testing.



#### **Best in Class**

#### **Fuel Economy**

The objective of this test is to provide comparable fuel consumption data on transit buses produced by different manufacturers. The test is comprised of Business District, Arterial and Commuter phases.

#### Best in Class

#### **Structural Durability**

The primary part of the test program is the Structural Durability Test, which also provides the information for the Maintainability and Reliability results. The test bus encountered no Class 1, 2 or 4 failures. All seven reported failures were Class 3, the lowest among buses in its class.

#### **Best in Class**

#### **Maintenance & Repairs**

The objective of this test is to collect maintenance data about the servicing, preventive maintenance, and repair. All significant breakdowns, repairs, man-hours to repair, and hours out of service were recorded.

### **Design Overview**

#### Why Vicinity?

#### Affordable

- Designed to utilize commercially available components and charging systems.
- Creates an affordable and reliable electric bus.
- Lower entry and running costs enable transit operators to adopt EV technologies sooner.

#### **Right Sized**

- Medium duty bus with conventional bus look and durability.
- Short turning radius and compact size allows great maneuverability in any community.
- Cutting-edge monocoque frame technology in an efficient package, fitting into the smallest transit garages.

#### Versatile

- Scaled down for a diverse range of uses including community shuttle, paratransit, universities and other applications.
- Particularly well suited for smaller communities , or medium to low-ridership routes.
- Charge anywhere easy 400 Volt architecture.





### Charging

- "Charge Anywhere" with easy 400
   Volt architecture
- CCS1 AC/DC charge Port

### **SMART FEATURES**

#### Passenger Comfort

- Air ride suspension
- Optional second door for easy loading/unloading



#### Powertrain

- 295 hp motor best in class Gradeability
- Hydraulic brakes and 19.5" wheels provide easy maintenance

#### Batteries



- Mounted in the floor for improved handling and weight distribution
- Expandable up to 252 kWh



- Dedicated driver AC and heating
- Large view windshield

#### ADA Accessible



- 6:1 Ramp and wide entrance way
- True "Low-Floor" design with kneeling

# Capacities and Floorplans - Lightning

|                    | Single Door | Two Door |
|--------------------|-------------|----------|
| Seated Passengers  | 25          | 22       |
| Standees           | 7           | 10       |
| Mobility Aid       | Up to 4     | Up to 3  |
| GVWR (lbs.)        | 24,000      | 24,000   |
| Curb Weight (lbs.) | 16,500      | 16,500   |









### POWERTRAIN

#### **Reliable Components = Reliable Bus**

#### Danfoss Hybrid Synchronous Motor

- 220Kw (295 hp)
- 1491 Nm (1100 ft-lbs) torque
- OEM proven industry leader in motor/invertor design
- 2 speed transmission (Eaton Electric Shift) provides efficiency over a wide speed

range





#### **Dual HV Hydrostatic Pumps**

- Very efficient High Voltage Design
- Millisecond variable response, High Volume/High Pressure

configuration for Maximum performance and reduced energy

consumption

### **Driver and Passenger Comfort**

#### Heat Pump with "Dual Zone Control"



#### Electric AC/Heat Pump & Front-Box

- "Dual zone temperature control" optimizes cabin temperature to increase range.
- All electric roof top unit with heat pump.
- Driver controller front box provides driver-controlled heating <u>and</u> cooling.
- Optional Pro-Heat X30 heater for range extension



Optional Pro-Heat X30 with electronic smokeless combustion control.



"Front-Box" with driver air conditioning.

### **Driver and Passenger Comfort**

#### Ergonomic Dash and "Hygienic" Shield



#### **Ergonomic Driver Workstation**

- Standard driver door with "hygienic" shield
- Driver touch screen combined with easy-toread analog dials (Parker Dash)
- Tilt and telescoping steering wheel
- Separated "Dual Zone" driver-controlled heat and AC.
- Optional farebox cut-out to allow for conventional transit ticket systems

### CHARGING



#### **Charging Options = Easy**

- "Charge Anywhere" with easy 400 Volt architecture
- On Board 22 kW AC charging
- 120 kW DC fast charging
- Industry standard CCS1 combo charger connection



Level 3 direct current fast chargers use ultra high-power 480V circuits at public charging stations.

#### How fast can I charge?





### Vicinity Lightning Advantages – Flexible Charging Options

#### AC Charging (Standard)

- 13.2 kW On Board Charger (OBC)
- J1772 Type 1 Charge Inlet
- AC Level 1 Charging (120V)
- AC Level 2 Charging (240V)
- Full charge <8 hours</p>

#### **EVSE**

- Partner for Level 2
- Charges 2 buses simultaneously
- Wall mount or free standing



#### **DC Fast Charging (Optional)**

- No On-Board Charger
- CCS Type 1 Charge Inlet
- DC Level 2 (Up to 870V)
- 60 kW
- Full charge <2 hours</p>

#### EVSE

- J1772 DC-FC
- Compatible with EVSE
- Up to 4 dispensers
- Wall or pedestal mount
- Bi-directional V2G capability



# What? Why? and How? of Telematic Systems

#### What is a telematics system?

 Telematics is the vehicle onboard communication services and applications that communicate with one another via GPS receivers and other telematics devices.

#### Why is a telematics system needed?

- Telematics captures important information about operations, bus driver behavior, safety, and vehicle health.
- improve efficiency, safety, and customer satisfaction

#### How can telematics impact bus fleets?

- Telematics systems are a great way for bus companies to create, better more efficient routes
- Elevate safety with uninterrupted, constant and immediate communication
- Save fuel and improve their bottom line.

### The "Black Box" for Buses





# Telematics Partner for OEMs





#### **Driving Session Overview**



ECIUM

OT

- Supports ANY vehicle
- $\,\circ\,$  Real-time SECURE data collection
- Supports custom non-OEM sensors
- Compression + Encryption
- $\circ$  Event based triggers
- High-speed full waveform acquisition on sub-systems (Big Data ready)

• Powerful customizable analytics

ECIUM

cloud

- Insights on sub-system operation
- o Trusted long-term custodian of data for all vehicles
- Advanced EV analytics custom KPIs and reports
- Powerful 'root cause' analysis of EV systems
- Advanced user management and cybersecurity
- Platform is tuned based on dataset from diverse EV fleets
- Unique insights on battery degradation
- Simulation and **digital-twin** support
- Verification of warranty issues

### User-Driven Solution Designed for Our Cloud-based telematics for buses, transit, and heavy-duty vehicles with advanced energy management

Cloud-based telematics for buses, transit, and heavy-duty vehicles with advanced energy management **Industry** intelligence – that is fully customizable for **all** propulsion types

### () 4G ECIUM VER NETWORK STATUS ETHERNET TECIUM UTV-100 Powerful, Inside and Out The rugged enclosure houses a dual-core, 800 MHz processor. Compatible with 12V and 24V systems with on-board automotive-grade power management

145.2 x 121.2 x 52.3 mm



We can white-label devices with another organization's name, customize features, UI/UX interfaces and device colour for branding purposes

**Connectivity** Wi-Fi and 4G Cellular connections transfer vehicle and GPS location data to cloud. RF wireless capability allows for seamless communication with external sensors



J1939 and OBD-II Compatible Monitor and store vehicle diagnostics through the industry standard CAN protocol

> Intuitive User Interface Easy to use interface shows a live and historical view of the vehicle stats both individually and as a fleet



# A Solution for **Our** Industry

Vehicle Manufacturers

Dealers may offer IoT device on vehicles as a value-add to owners



#### Utilities

Charging as a service / fuelling as a service introduces range/demand risk to utility business models. IoT device offers real time data



#### Vehicle Owners

Vehicle owners/operators require real-time data to make TCO, operational and asset management decisions



# Component Manufacturers (on-board vs. off-board)

Major component manufacturers / suppliers include IoT device in specifications



#### **Battery Suppliers**

Battery twinning and secondary market based on IoT data reduces warranty risk for battery suppliers



#### Lenders

Financing for hydrogen and electric heavy-duty vehicles tied to value of propulsion systems. IoT device offers monitoring of asset and borrower behaviour

#### Advisors

Using advanced IoT and API to enhance simulation accuracy and robustness of ZEB databases



#### **Granting Agencies**

Evaluation of pilot success and subsequent payments can be tied to data generated from IoT device

# Contact

#### **Sales and Marketing**

Marshall Lucier Vicinity Motor Corp. Director of Sales, NA (518) 225-1100 marshall.lucier@vicinitymotor.com



#### Vicinity Motor Corp 3168 262nd Street Aldergrove, BC V4W 2Z6 Canada

### www.vicinitymotor.com

