

worker-wearable worker-attachable industrial robotics

Technical Interchange Meeting. June 28 and 29, 2017. Washington, D.C.

MEETING SYNOPSIS

Announcement

U.S. Department of Energy (DOE), Office of Environmental Management (EM) will host a technical interchange meeting on industrial exoskeletons on Wednesday, June 28 and Thursday, June 29, 2017. This meeting is a collaboration among the National Institute of Standards and Technology (NIST), the National Institute for Occupational Safety and Health (NIOSH), the U.S. Army Natick Soldier Research, Development and Engineering Center (NSRDEC), and several other U.S. federal government executive departments and independent agencies (hereafter, collectively referred to as “federal agencies”). For the purpose of this meeting, “exoskeleton” is a general term that includes robotic devices that are human-wearable or human-attachable.

Purpose

The purpose of this meeting is to engage the robotics community on industrial applications of human-wearable and human-attachable robotic devices to enable and proliferate use among the various occupational groups. Breakout sessions will be held to foster more detailed and open discussions. Actions and status from the exoskeleton technical interchange meeting held in January 2017 will be discussed.

Objectives

- Identify federal agencies and their respective interests, initiatives, projects, and deployments of human-wearable and human-attachable robotic devices for industrial (non-medical, non-military) applications
- Identify opportunities to transfer knowledge and technologies from medical and military applications to industrial applications
- Facilitate the active engagement of the robotics community and its stakeholders
- Identify the key framework elements for a body of knowledge and a community of practice on human-wearable and human-attachable robotic devices
- Discuss terminology and standards among industrial end-users, Government industrial program leaders, insurance representatives, and the testing and standards community
- Identify two or three industrial scenarios for a collaborative test bed demonstration

Emergency Contact Phone Number (202) 586-8677, christi.sullivan@em.doe.gov

Meeting Host: Rodrigo Rimando, DOE-EM Director Technology Development Office, rodrigo.rimando@em.doe.gov, Office: (202) 287-1348

DOE-EM POC: JP Pabon (DOE-EM), jean.pabon@em.doe.gov, Office: (301) 903-9234, Mobile: (301) 820-5644

Technical POC: Jason Wheeler (SNL), jwwheel@sandia.gov, Office: (505) 284-6855, Mobile: (505) 366-4336

Meeting Synopsis (Updated June 2, 2017)

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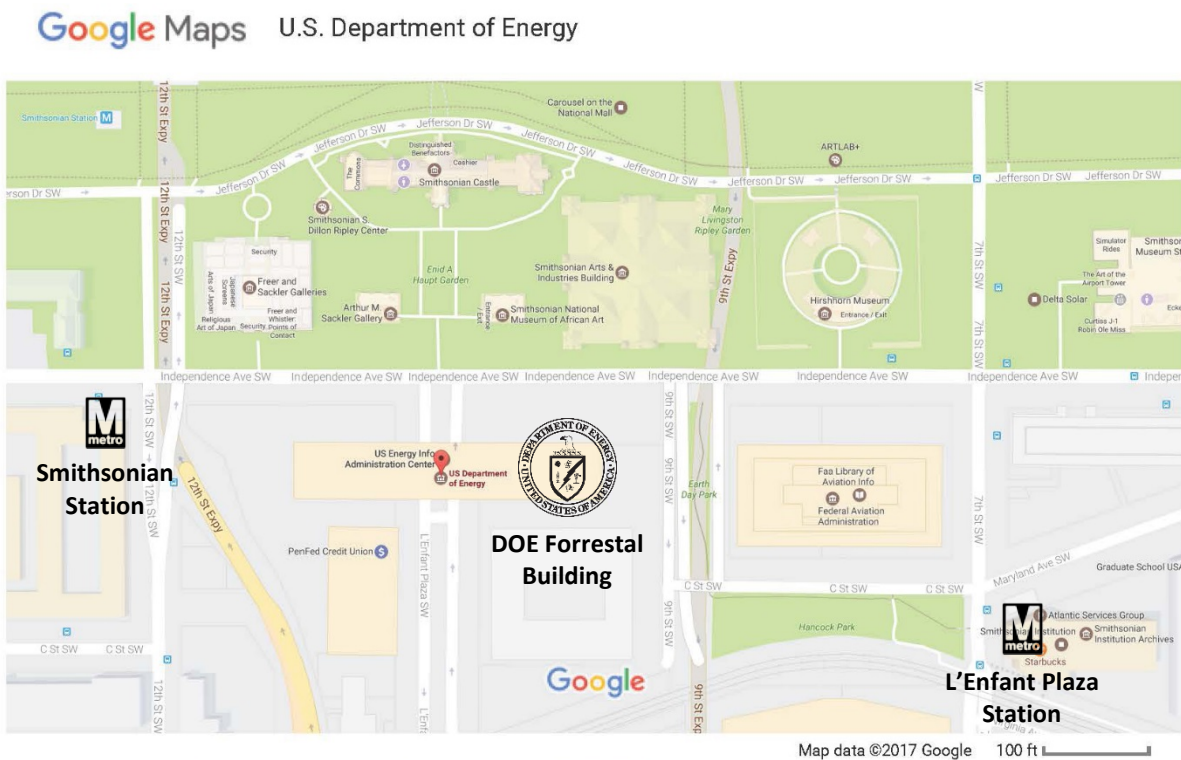
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Participants

Subject matter experts, researchers and principal investigators, technologists, program/project managers, regulators, technology and service providers, stakeholders, and end-users from government, academic, industrial, and international communities are invited to this open meeting.

Location

The meeting will be held in the main auditorium in DOE's James V. Forrestal Building located at 1000 Independence Ave. S.W., Washington, D.C. 20585. The reference cross street is L'Enfant Plaza S.W. Convenient METRO rail stations are the Smithsonian Station (Blue, Orange and Silver Lines) and the L'Enfant Plaza Station (Blue, Orange, Silver, Green, and Yellow Lines). At the Smithsonian Station, use the exit/entrance at Independence Avenue and 12th Street S.W.; the Forrestal Building is one block east. At the L'Enfant Plaza Station, use the exit/entrance at Maryland Avenue and 7th Street; the Forrestal Building is one block west.



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MEETING LOGISTICS

Registration

Register for this meeting at <https://www.nist.gov/news-events/events/2017/06/technical-interchange-meeting-industrial-exoskeletons>.

There is no registration fee or cost for attendance.

There are additional access requirements and security procedures for foreign nationals. Contact Christi Sullivan at christi.sullivan@em.doe.gov no later than June 14, 2017 to process security clearances. (Refer to building access requirements below.)

Access to Forrestal Building

Attendees with Homeland Security Presidential Directive-12 (HSPD-12) Badges:

Attendees with HSPD-12 badges AND their 4-8-digit PIN number can use the kiosk located in the Forrestal lobby to encode their badges. This allows attendees to enter the access-controlled areas via the turnstiles. Those with HSPD-12 badges but do not have their PIN or have trouble using the kiosk, will be able to enter by presenting their badge to protective force personnel and having their belongings scanned; a visitor's badge is not required.

All Other US Citizen Attendees: Attendees not issued HSPD-12 badges will be directed to the visitor's desk to obtain a visitor's badge. Expect long wait times in the morning on June 28; arrive early. Visitors must have one of the following forms of identification:

1. A Real-ID Act compliant driver's license (As of June 6, driver's licenses from Alaska, Kentucky, Oklahoma, Oregon, Pennsylvania, South Carolina, Virginia, Washington, Maine, Minnesota, Missouri, and Montana will not be accepted);
2. U.S. passport or passport card;
3. A military ID; or
4. Other forms such as a Permanent Resident Card, non-U.S. passport, PIV card.

Foreign Nationals: Non-U.S. citizens planning to attend must complete the attached "Unclassified Foreign National Visits & Assignments Questionnaire," and FAX to Christi Sullivan at 202-586-6773 no later than June 14, 2017. To ensure personally identifiable information remains secure, do not send the form via e-mail.

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Laptops

Laptop computers (business and personal) are permitted in the Forrestal Building. An attendee planning to bring a laptop is requested to provide the brand, model, and serial number of his/her laptop to Christi Sullivan (christi.sullivan@em.doe.gov) in advance of arrival to expedite building access clearance.

Attendees will be required to present and return the temporary property pass to protective force personnel upon departure from the Forrestal Building. Attendees are responsible for maintaining possession of the temporary property pass for the duration of their stay.

WiFi Service

The main auditorium is equipped with WiFi service. The name of the network is DOEGUEST. The password is energy.wireless. WiFi service will not be available in the breakout rooms.

Attire

The attire is Business Professional for the meeting.

Meals and Snacks

The Department offers several food services in the immediate Forrestal Building.

Forrestal Cafeteria. The Forrestal cafeteria offers breakfast and lunch at specialty stations and self-serve hot/cold buffets. Foods are priced by weight.

Breakfast: 6:45 AM to 10:00 AM

Morning Break: 10:00 AM to 11:00 AM. The dining hall is open and only self-service foods and beverages are for sale.

Lunch: 11:00 AM to 2:00 PM

Afternoon Happy Hour - 30% off all buffet and self-service items: 2:00 PM to 3:00 PM.

Subway: Ground Floor, GE-234: 7:00 AM-2:30 PM

Dunkin' Donuts: Ground Floor, GE-234: 7:00 AM-2:30 PM

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TRAVEL CONSIDERATIONS

Airports

There are three major airports in the Greater Washington Metropolitan Area: Ronald Reagan Washington National Airport (DCA); Dulles International Airport (IAD); and Baltimore/Washington International Thurgood Marshall Airport (BWI). Visit www.flyreagan.com, www.flydulles.com, and www.bwiairport.com, respectively.

Hotels

There are approximately 130 hotels with over 31,300 rooms located in Washington, D.C. The Greater Washington Metropolitan Area is home to over 690 hotels with over 111,200 rooms. Those that are most convenient to both Ronald Reagan Washington National Airport and the Forrestal Building are located in the urban, unincorporated neighborhoods of Pentagon City and Crystal City in the southeastern corner of Arlington County, Virginia, south of downtown Washington, D.C. The corresponding METRO rail stations are the Pentagon Station, Pentagon City Station, and Crystal City Station all of which service the Yellow Line (the shortest and most direct to the Forrestal Building via L'Enfant Plaza Station).

Public Transportation

Public transportation is provided by the Washington Metropolitan Area Transit Authority (WMATA), commonly referred as Metro, in the Washington D.C. metropolitan area. WMATA provides rapid transit service under the Metrorail name, fixed-route bus service under the Metrobus and Metroway brand, and paratransit service under the MetroAccess brand. The authority is also part of a public-private partnership that operates the DC Circulator bus system. Visit <https://www.wmata.com> for more information and a “trip planner” tool. For your convenience, a map of Metrorail and Metroway (bus service that operates Pentagon City and Braddock Road Metrorail stations).

Public Parking

Public parking is available at commercial lots near 12th Street and Independence Avenue. The cost is approximately \$40 for all-day parking.

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MEETING AGENDA (PRELIMINARY)

Wednesday, June 28, 2017	
8:00 to 9:00 AM	Arrival, Badging, Sign-in
9:00 to 9:45 AM	Welcome, Introduction, & Objectives. Rod Rimando, Director of Office of Technology Development, DOE/EM
9:45 to 10:30 AM	Industry (Automotive) Perspective. Speaker: TBD, General Motors OR Joshua Mehling, NASA Johnson Space Center
10:30 to 11:15 AM	Industry (Ergonomics) Perspective. Speaker: Matthew Marino. Briotix, Inc.
11:15 AM to 12:00 PM	Industry (Sensors) Perspective. Speaker: Bruce Floersheim, GoX Studio
12:00 to 1:00 PM	Lunch and Networking. Forrestal Building cafeteria.
1:00 to 1:45 PM	U.S. Bureau of Labor Statistics' Occupational Requirements Survey. Speaker: TBD
1:45 to 2:00 PM	Overview and Objectives of Topical Breakout Sessions. Jason Wheeler, DOE Sandia National Laboratories
2:00 to 2:30 PM	Break. Move to breakout rooms.
2:30 to 4:30 PM	Test Methods and Metrics Breakout. Room # TBD. Facilitator: TBD.
	Ergonomics Breakout. Room # TBD. Facilitator: TBD.
	Sizing and Fitting Breakout Session. Room # TBD. Facilitator: TBD.
	Risks/Regulation Breakout Session. Room # TBD. Facilitator: TBD.
	Manufacturing Breakout Session. Room # TBD. Facilitator: TBD.
4:30 to 5:00 PM	Day #1 Recap and Follow-Up Discussions. Day #2 Agenda Review. Rod Rimando, DOE/EM
5:00 PM	Day #1 Meeting Adjourn

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Thursday, June 29, 2017	
7:30 to 8:30 AM	Arrival, Badging, Sign-in
8:30 to 8:45 AM	Day #2 Agenda Review.
8:45 to 10:00 AM	10-Minute Power Breakout Debriefs. Discussion.
10:00 to 10:30 AM	Break
10:30 to 11:15 AM	Industry (Automotive) Perspective. Speaker: Frank Pochiro, BMW Manufacturing Co., LLC
11:15 AM to 12:30 PM	Lunch and Networking. Forrestal Building cafeteria.
12:30 to 1:30 PM	Standards, Terminology Working Group, ASTM Standards Development. Speaker: Bill Billotte, NIST
1:30 to 2:15 PM	User Group Perspective. Speaker: Thomas Sugar, Wearable Robotics Association (WearRA)
2:15 to 2:45 PM	Break
2:45 to 3:15 PM	Update on Military Applications. Speaker: David Audet, NSRDC.
3:15 to 3:45 PM	Update on Medical Applications. Speaker: TBD
3:45 to 4:45 PM	Open Discussion: Discuss next steps
4:45 to 5:00 PM	Closing Remarks: Rod Rimando, DOE/EM
5:00 PM	Technical Interchange Meeting Adjourn

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Unclassified Foreign National Visits & Assignments Questionnaire

Welcome to Department of Energy, Headquarters! We are looking forward to your visit or assignment with us. In order to comply with our security requirements and ensure that your time with the Department of Energy goes smoothly we need to obtain some information from you prior to your arrival.

Please take a few minutes to provide the information requested below for each member of your party that is not a U.S. citizen and then return the form(s) to your host.

Please be sure to comply with the deadlines your host has communicated to you for returning this form.

Part 1: Completed by Visitor

Please complete all questions below, as applicable. See listing of requested documents at end.

1	Given Name/First Name (exactly as it appears on passport)	
2	Middle Name (exactly as it appears on passport)	
3	Surname/Last Name (exactly as it appears on passport)	
4	Gender	<input checked="" type="checkbox"/> Male <input type="checkbox"/> Female
5	Are you currently in the United States?	<input type="checkbox"/> Yes <input type="checkbox"/> No
6	Are you Currently a Legal Permanent Resident (LPR) Immigrant Alien of the U.S.?	<input type="checkbox"/> Yes (go to question 7) <input type="checkbox"/> No (skip question 7)
7	Immigration & Naturalization (INS A#) Number and Expiration Date	INS A#: Expiration Date:
8	Primary Citizenship (Citizenship admitted to United States)	
9	Dual Citizenship (if any)	<input type="checkbox"/> Yes <input type="checkbox"/> No If yes, what Country?
10	Birth Date	
11	Country of Birth	
12	City of Birth	
13	Institution or Company Name	
14	Institution or Company Address and Country	
15	Employer Telephone Number	
16	Employer Facsimile Number	
17	Employer E-mail Address	
18	Title/Description of Duties with Employer/Company	

19	What is the U.S. Visa Type you will have/require upon arrival in U.S. for this visit, assignment or employment?	<input type="checkbox"/> A2 <input type="checkbox"/> H1 <input type="checkbox"/> TN <input type="checkbox"/> F1 <input type="checkbox"/> J1 <input type="checkbox"/> B1 <input type="checkbox"/> O-1 <input type="checkbox"/> E2 <input type="checkbox"/> Visa Waiver Business (VWB) <input type="checkbox"/> Other: A1 <input type="checkbox"/> Employment Authorization Document (EAD) Number and Expiration date:
20	Visa Number and Expiration Date (This is the Form I-94 number; if J-1 or F-1 visa, see IAP-66/DS-2019 or I-20, respectively, for expiration dates)	A1 Number: Valid Until Date:
21	Passport Number and Expiration Date (mm/dd/yyyy)	Passport Number: Expiration Date:
22	What Country Is Identified On Your Passport As Issuer?	
23	Other ID (specify type and number, if applicable)	Diplomatic Identification Card, PID# Expiration Date:

PLEASE PROVIDE THE FOLLOWING DOCUMENTS:

You will need to bring and present proper documentation of your current immigration status. If you are a Legal Permanent Resident (LPR), the LPR card must be presented before obtaining a badge. If you are NOT a Legal Permanent Resident, you must present sufficient passport, visa and U.S. Citizenship and Immigration Services (USCIS) information to verify identity, authority to work (where applicable to request involved), and current eligibility (in lawful immigration status) to be in the U.S. If you are from Canada or not required to have a passport or visa, you must present government issued photo identification proving citizenship. A driver's license is **NOT** acceptable identification.** Please **note that this information may also be requested in advance from your host.**

The following additional documents will need to be provided, as applicable:

If you have this type of documentation or if this is your status:	You will need to present:
Legal Permanent Residents (LPR) (Also known as Permanent Resident Aliens, PRA's, and/or "green card" holders) or Conditional Permanent Residents (CPR)	Permanent Resident Card (or I-551 stamp in your passport, if you have not received your Permanent Resident card)
Pending Permanent Resident (PPR) [or Employment Authorization Document (EAD)]	Employment Authorization Card and the receipt notice from INS indicating your petition for Permanent Residence is pending
H-1B – Temporary Employee Visa O-1 - Extraordinary Ability O-1 - Extraordinary Ability (Outside U.S.)	I-94 Card* I-94 Card* Passport
J-1 – Exchange Visitor	I-94 Card* and Signed Form DS-2019 (formerly IAP-66)
F-1 – Student Visa	I-94 Card* and Form I-20 signed within last 12 months. And *EAD – (Employment Authorization Document *) only if using Optional Practical Training (OPT) after I-20 expires.
B-1 (Currently inside the U.S.) B-1 (Currently outside the U.S.)	I-94 Card* Passport
Visa Waiver-Business (VWB) (Currently in U.S.) Visa Waiver-Business (VWB) (Currently outside U.S.)	I-94W Card (small green card stapled in passport, copy front and back). Passport Note: All VWB's limited to maximum of 90 days from Authorized arrival date, but not greater than what actual I-94W displays.
E-2 Treaty Trader/Investor Visa (In U.S.) E-2 (Outside U.S.) TN – Canada/Mexico Professionals (In U.S.) TN – (Outside U.S.)	I-94 Card* Passport, I-94 Card* Passport

* White departure record card stapled in your passport. Provide copy of front and back.

**NOTE: A driver's license is not acceptable for proof of being in-status with U.S. Government immigration policies.

M System Map

wmata.com
 Customer Information Service: 202-637-7000
 TTY Phone: 202-962-2033
 Metro Transit Police: 202-962-2121

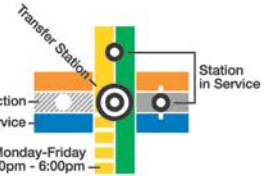
Legend

- **RD** Red Line • Glenmont / Shady Grove
- **OR** Orange Line • New Carrollton / Vienna
- **BL** Blue Line • Franconia-Springfield / Largo Town Center
- **GR** Green Line • Branch Ave / Greenbelt
- **YL** Yellow Line • Huntington / Fort Totten
- **SV** Silver Line • Wiehle-Reston East / Largo Town Center

Station Features

- Bus to Airport
- Parking
- Hospital
- Airport

Connecting Rail Systems



MetroRail Operating Times
Mon-Fri
 5am-midnight
Sat-Sun
 7am-midnight
 Times are approximate



WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY © 2015

REV. 12/01/16



No Smoking



No Eating or Drinking



No Animals (except service animals)



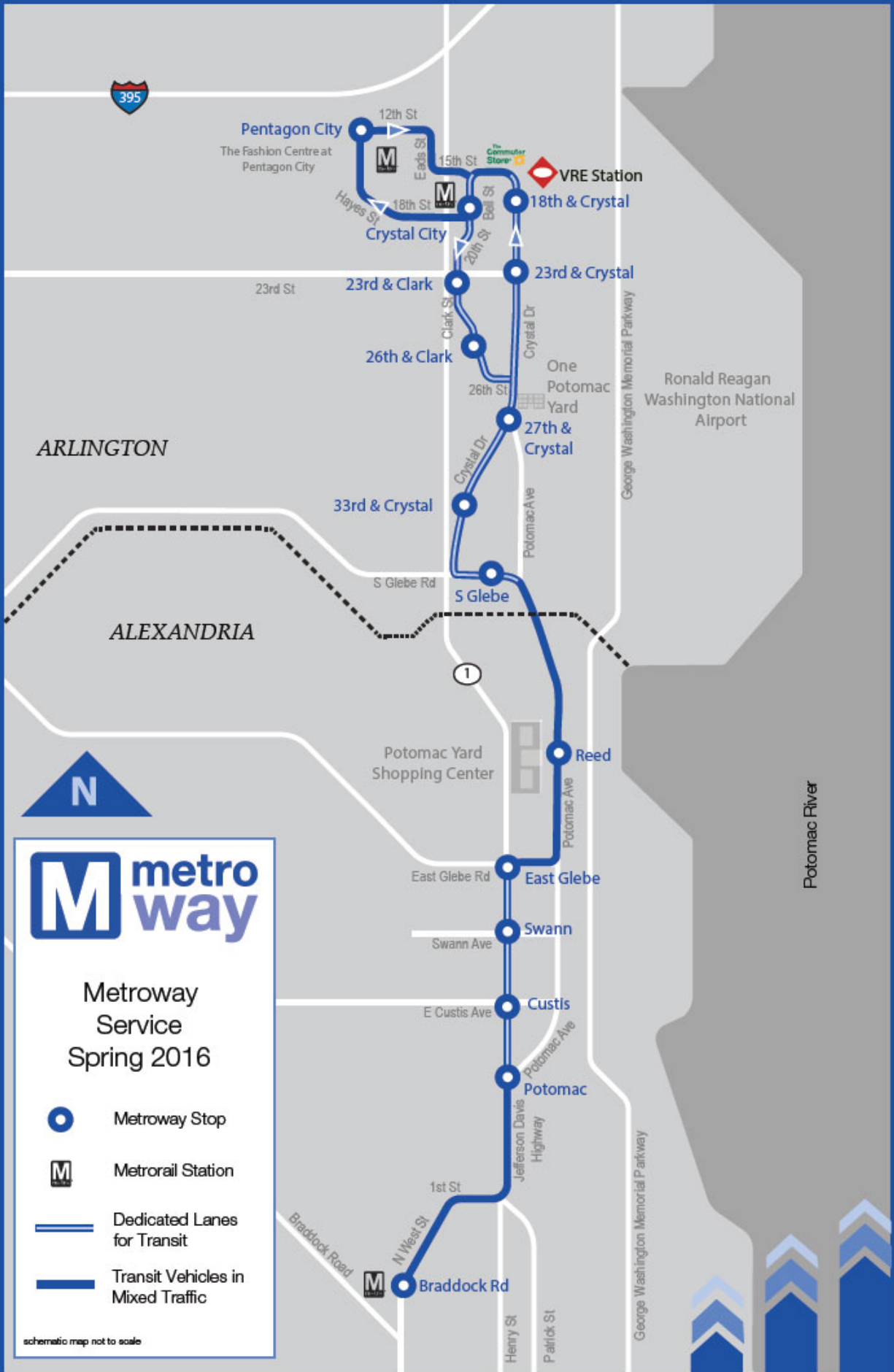
No Audio (without earphones)







No Littering or Spitting



No Dangerous or Flammable Items



**Metroway
Service
Spring 2016**

-  Metroway Stop
-  Metrorail Station
-  Dedicated Lanes for Transit
-  Transit Vehicles in Mixed Traffic

schematic map not to scale



(<http://metrowayva.com>)

Route

The Route

Metroway operates between Pentagon City and Braddock Road Metrorail stations, with a new stop at 33rd and Crystal Drive. Operating stations include:

Northbound

Braddock Rd Metro
Potomac Avenue
Custis Avenue
Swann Avenue
East Glebe Road
Reed Avenue
South Glebe Road
33rd Street & Crystal Drive
27th Street & Crystal Drive
23rd Street & Crystal Drive
18th Street & Crystal Drive
Crystal City Metro
Pentagon City Metro

Southbound

Pentagon City Metro
Crystal City Metro
23rd Street & Clark Street
26th Street & Clark Street
27th Street & Crystal Drive
33rd Street & Crystal Drive
South Glebe Road
Reed Avenue
East Glebe Road
Swann Avenue
Custis Avenue
Potomac Avenue
Braddock Rd Metro