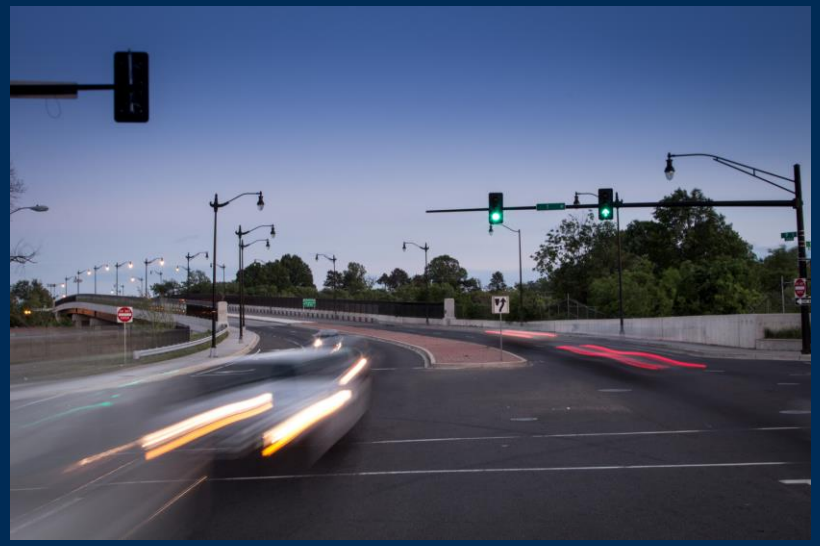
CITYWIDE TRAFFIC SIGNAL CONTROL SYSTEM MODERNIZATION IN OUR NATION'S CAPITAL



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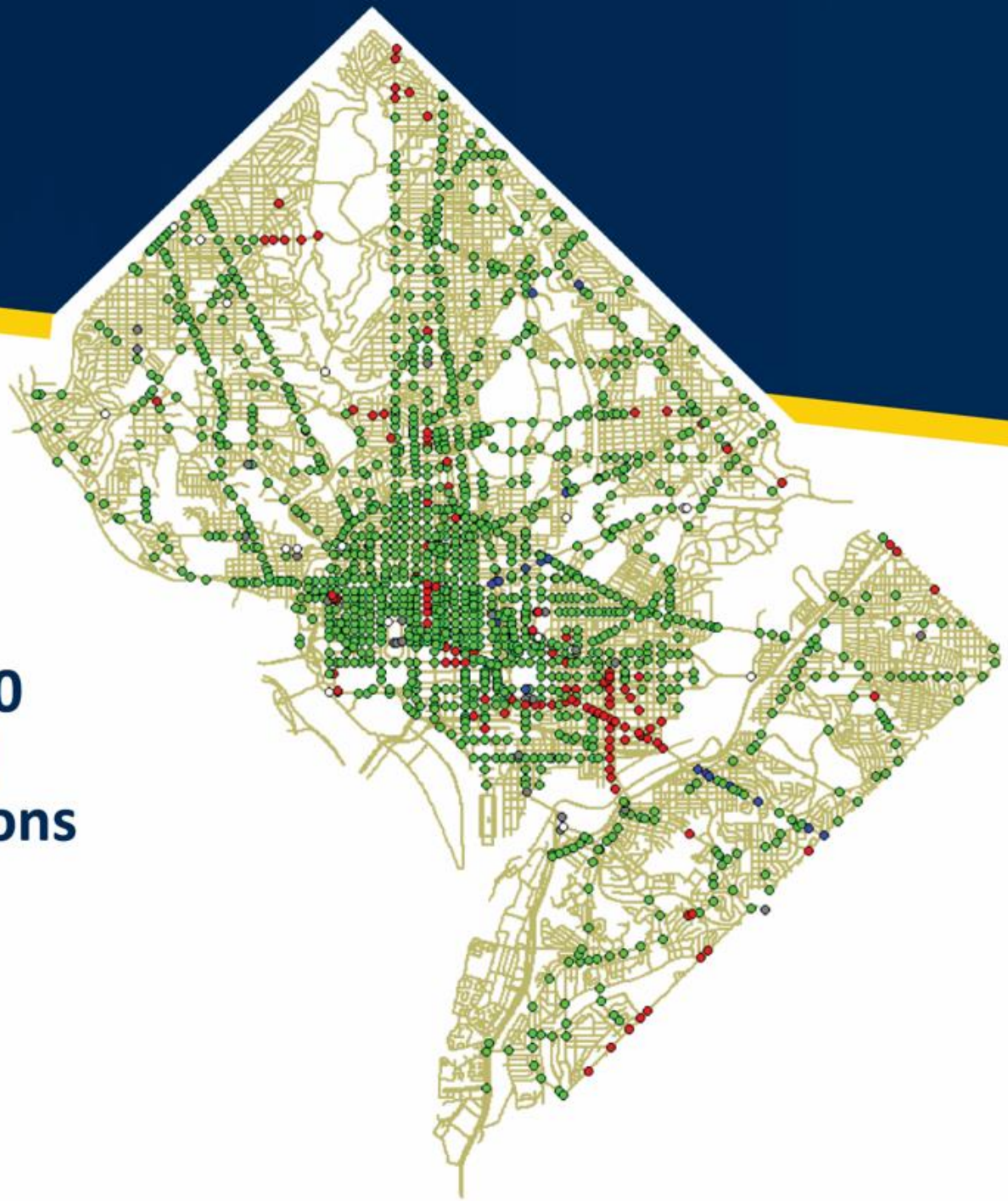
- JMT Consultant Team
  - JMT
  - Mead & Hunt
  - Jacobs
  - PSI

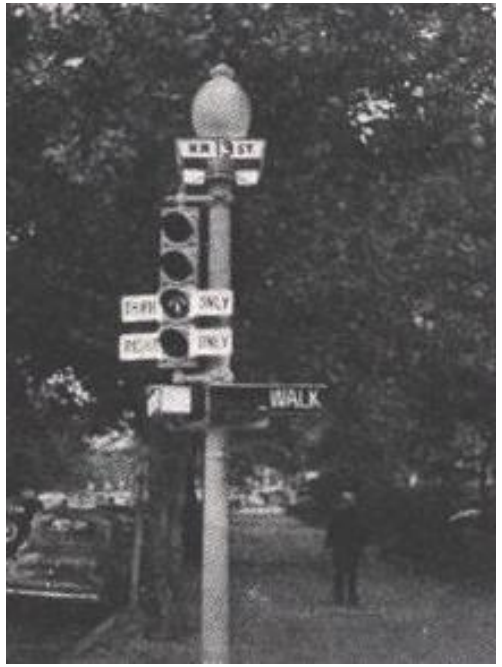
d.

Over 1,600 Signalized Intersections



HISTORY OF SIGNAL CONTROL (DC)

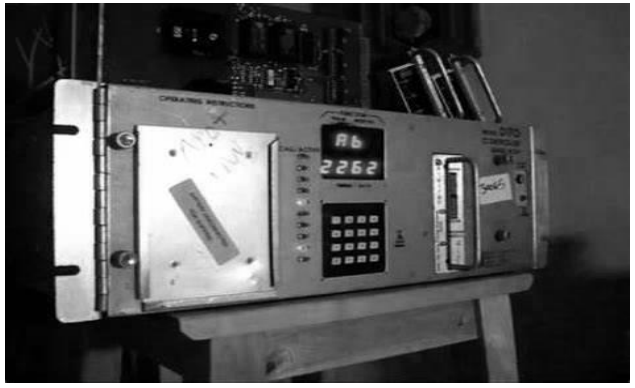
- First Traffic Signals in DC: Early 1920s
- First Coordinated Signals in US
  - 16th Street NW (1926)
- First Pedestrian Display (W/DW) in DC
  - 13th St and Pennsylvania Av NW (1939)
- First Centralized Signal Control: 1970s
  (UTCS @ 600 intersections, by early 90s,1300 intersections)
- Implementation of Model 170E Controllers, custom firmware, interconnect: 1970s-80s
- Modernized Signal System (COTS): 1990s-2010s
- Adaptive Control Testing (55 Model 2070 Controllers): 2018



FHWA

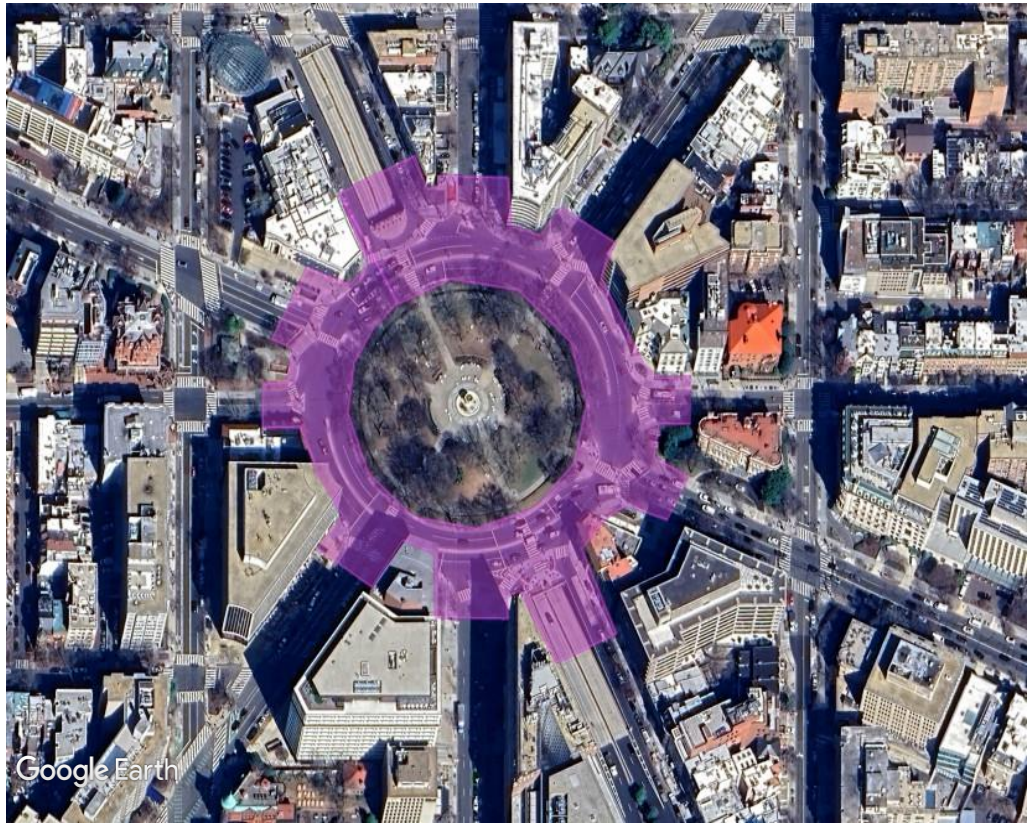
THE NEED FOR MODERNIZATION (2022 Study)

- Equipment at End of Life Cycle
  - Majority of controllers (170E) date from 1980s
  - Replacement parts no longer readily available
  - Central TSCS has worked well but developer no longer supports system, currently running on Windows 7
  - Current systems not NTCIP-compliant
  - Custom mods to support signal priority, V2X, exclusive bike lanes



THE NEED FOR MODERNIZATION (2022 Study)

- Non-standard operations
  - Ten complex intersections (including traffic circles and multi-leg intersections) utilize *interval-based operation* rather than NEMA phasing and overlaps
  - Firmware at these locations also no longer supported by vendor, was specifically developed for DC application
  - Challenge to coordinate with adjoining intersections



Dupont Circle

VISION

- TSCS Modernization Integral to moveDC LRTP (2021)
- Vision: Provide solution using current industry communications and hardware standards, supporting improved green light progression and bus priority as well as improved pedestrian and bicycle lane performance
- Goals and Objectives
  - Enhance safety & multimodal features
  - Make DC network more reliable for public transit users, pedestrians, bicyclists, other non-motorized users
  - Reduce user and operator costs
  - Enable DDOT to manage traffic congestion more efficiently and quickly

move dc
2021 UPDATE

HOW TO GET THERE?

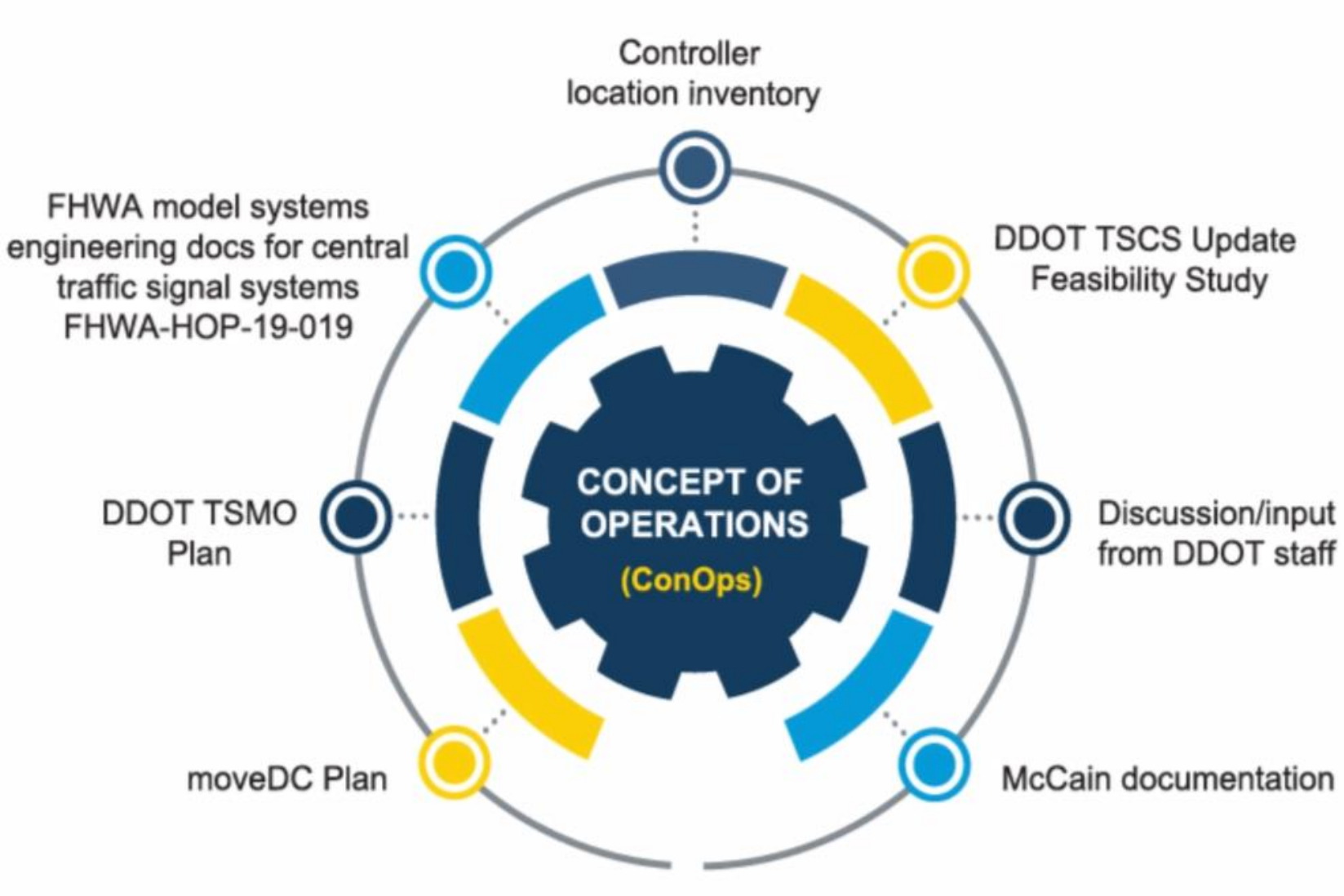
BASIC NEED

- Transitioning from old to new central system and transitioning of 1584 intersections to modern controllers
- Transitioning of 20 controllers located at 10 complex locations
- Maintain coordination and operational integrity during transition

APPROACH

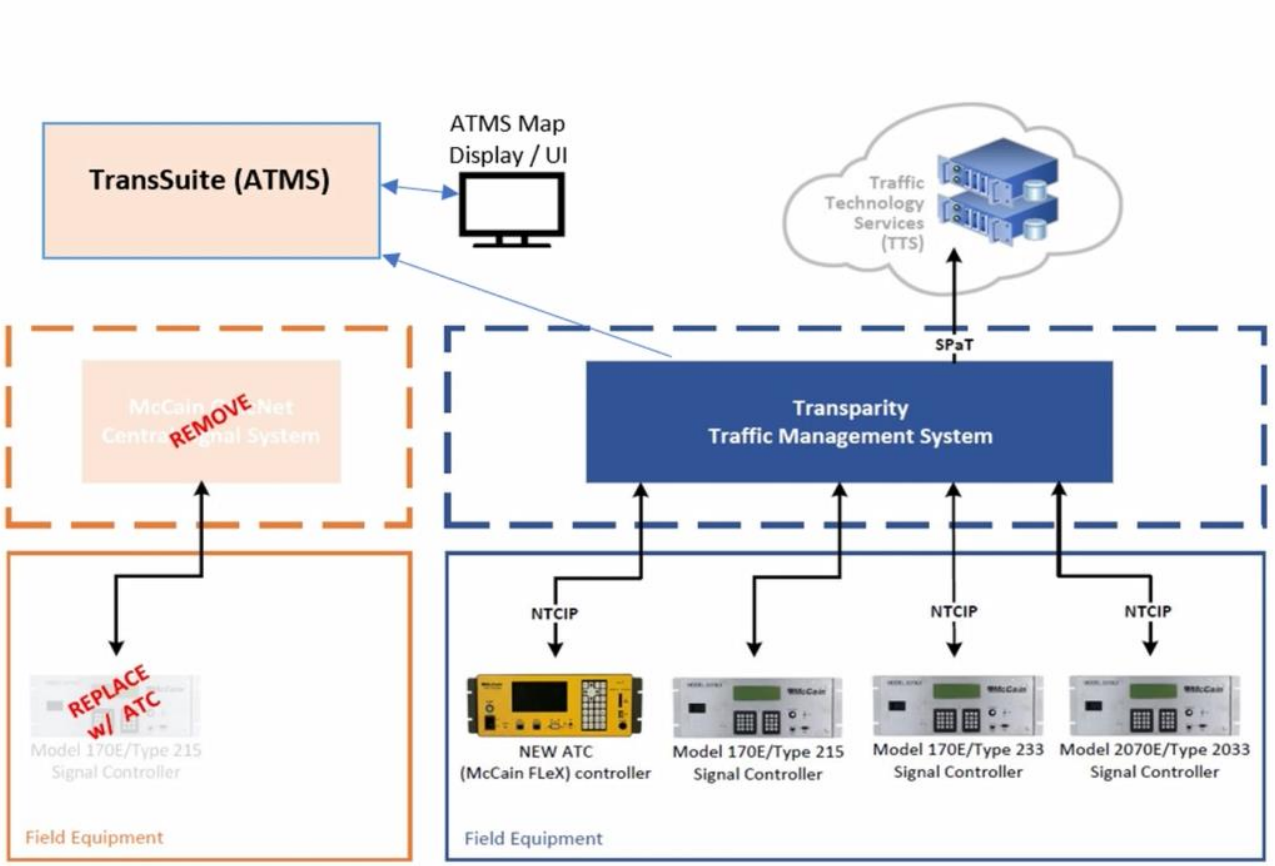
- Utilized **ITS-type systems engineering process** to define transition needs (who does what and when), which in turn helped drive the selection of appropriate systems and controllers

CONCEPT OF OPERATIONS



PREFERRED OPTION

- Recommended Advanced Transportation Controllers (ATC 5201) using NTCIP 1202 interfaces
- Transition must support both new and existing controllers
- Determined single system controlling all controller types was preferable to parallel old and new systems



IMPLEMENTATION PLAN

- Central TSCS: First step…….will provide compatibility with existing controllers and their ATC replacements.
  - Sole-Source procurement: Requires use of current vendor
  - Long term: Consider new central TSCS to work with the eventual full NTCIP controller population

Phase 1 Controller Replacements

- Staged install of 1584 ATCs for majority of intersections over 4 year period.
- Using existing controller cabinets & communications (reduce cost, time to install, and complexity).

Phase 2 Complex Intersections

- Replace controllers & cabinets, reconfigure operations for NEMA phasing
- Dupont Circle now broken out as separate project, coordinated with Connecticut Avenue improvement. Will involve full signal infrastructure replacement.

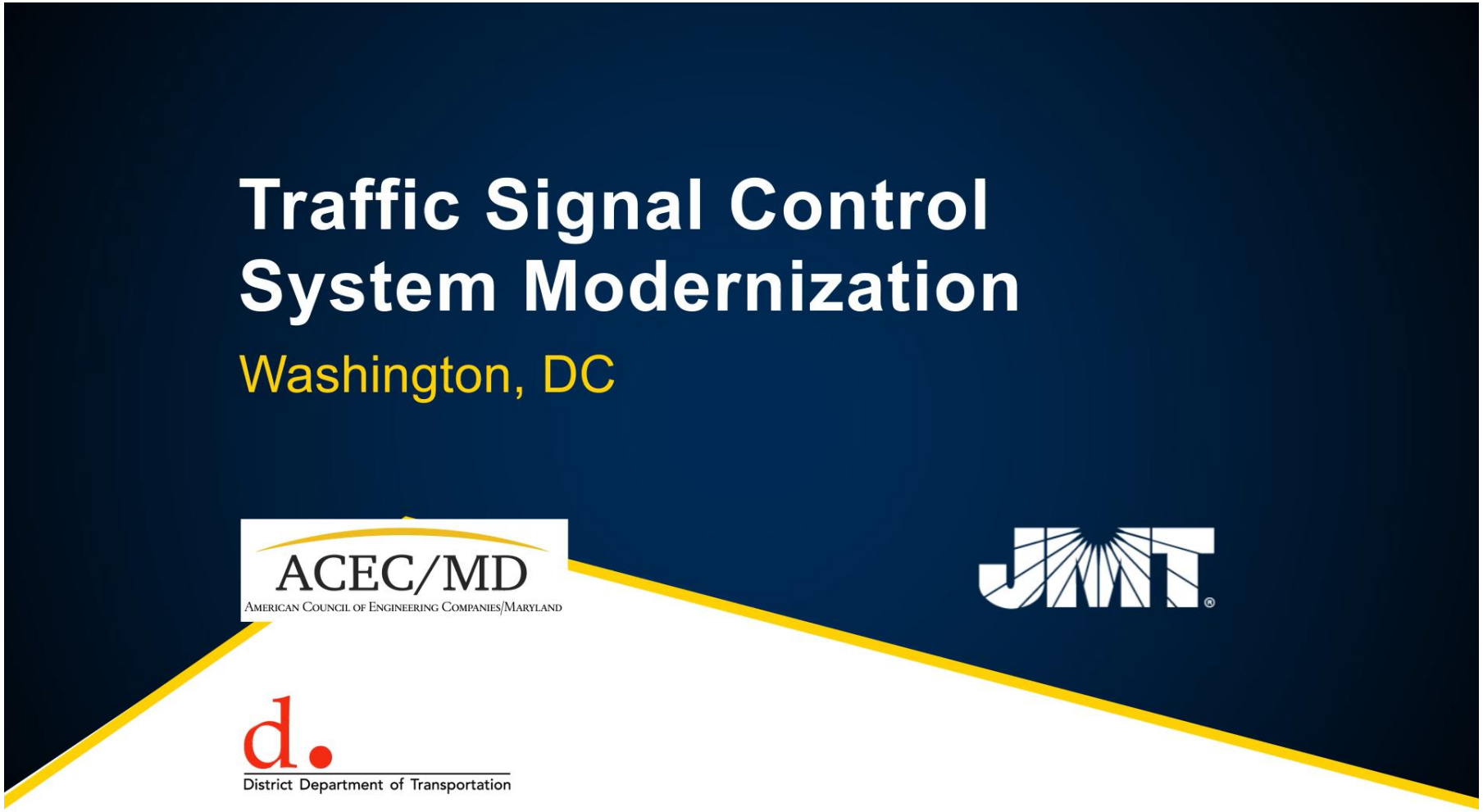
PROCUREMENT APPROACH

- Central system: Sole-Source procure, install, O & M
- Phase 1 and 2: Electrical contractors procure and install ATCs. For Phase 2, possibly some minor signal design (conduit, wiring, signal heads if needed)
- Dupont Circle: Incorporate into current construction project, complete controller, redesign and replacement of current signal infrastructure
- In parallel with these activities, *system management activities* will include:
  - Configuration of controllers (includes transferring or converting signal timing and phasing)
  - Supervise integration of ATCs with new central system while maintaining signal coordination through the District
  - Supervise testing and ensure continuous verification and validation activities

CURRENT STATUS

- Initial training of DDOT and consultant staff done
- Transition to new central TSCS (McCain Transparity, now known as MyCity) nearing completion
- Phase 1 (1584 intersections)
  - Procurement package (standard installation plans, specs) currently under review
  - Scheduled for advertising by late summer
- Dupont Circle
  - New cabinets, wiring, and other aged and obsolete equipment to be replaced as part of current corridor project along Connecticut Avenue. Survey and design underway.
- Phase 2 (upgrading of complex intersections)
  - Design continuing through 2025

VIDEO (for ACEC-MW Honor Award)



QUESTIONS