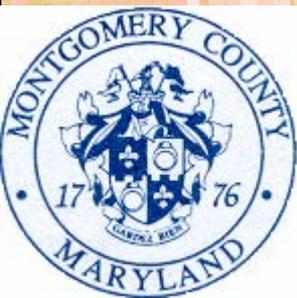




**COUNTY ENGINEERS ASSOCIATION OF MARYLAND  
SPRING 2016 CONFERENCE**

**Conference Center at the Maritime Institute  
Anne Arundel County, Maryland**



**Thursday, April 28, 2016**



# Two bridges in Two Months - Accelerated Bridge Construction (ABC)

## Montgomery County DOT's approach to solving critical challenges on the Whites Ferry Road Bridges Project

Girum Awoke, Ph.D, P.E. – Chief, Construction  
Division of Transportation Engineering

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# Outline of Presentation

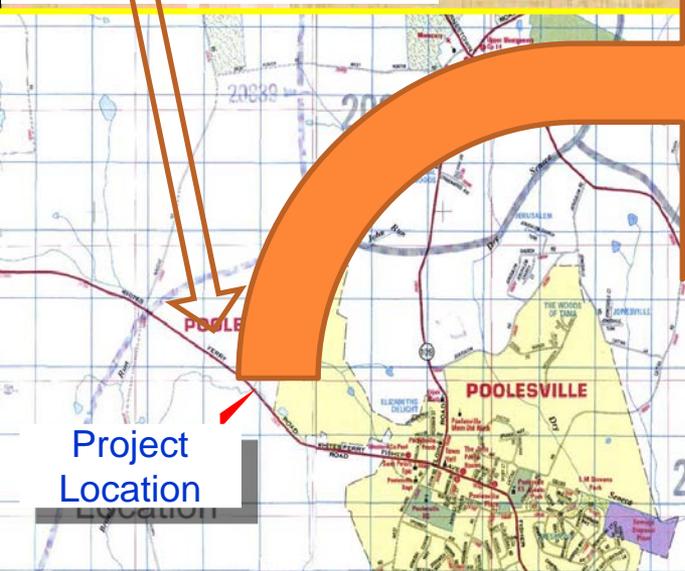
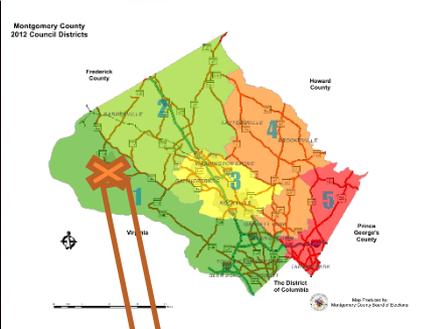
- Recognition
- Project Information/Background
- Project Purpose and Need
- Project Elements
- Schedule and Funding
- Project Challenges
- Lessons Learned
- Resources
- Questions

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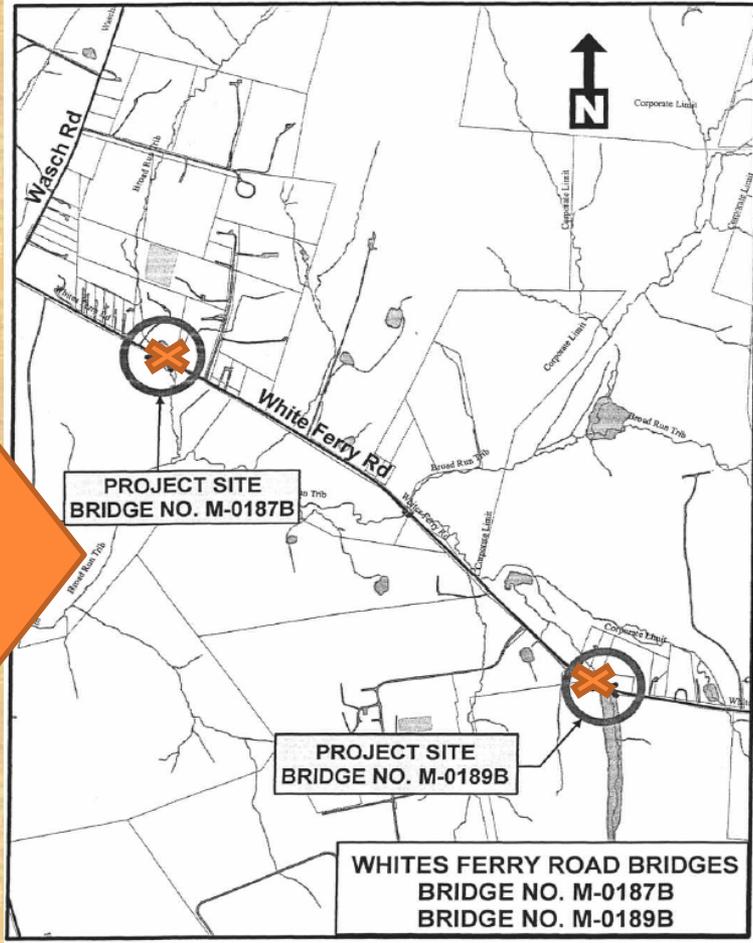




# Project Information/Location



Project Location



➤ One of the main arterials in western, rural MoCo



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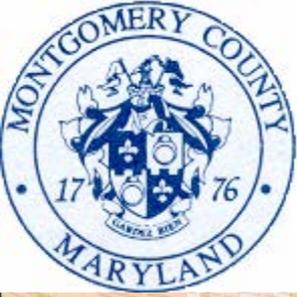




# Project Background

- Whites Ferry Road - designated as a county arterial road.
- Bridges located just outside Poolesville
- Bridge No. M-0187B is located approximately 0.3 miles southeast of the intersection of Waesche Road and Whites Ferry Road
- Bridge No. M-0189B located approximately 1.3 miles southeast of the intersection of Waesche Road and Whites Ferry Road.
- The existing single cell culvert is approximately 275 feet northeast of Bridge No. M-0189B and is downstream from the existing bridge.





# Project Background

The project involved:

- Replacing the existing deteriorated bridges and existing single cell culvert
- Reconstructing approximately 800 feet of approach roadway
- Closure of one bridge at a time during bridge construction while maintaining traffic with a detour.

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# Project Background

Existing Bridge M-187B



- Built in 1920
- 16-foot long single span
- 24'-4" clear roadway

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# Project Background

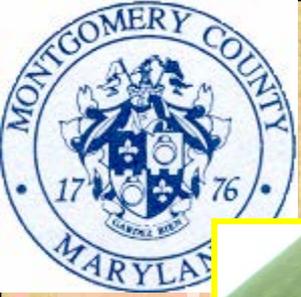
## Existing Bridge M-189B



- Built in 1920
- 10-foot long single span
- 23'-8" clear roadway

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# Project Background

## Existing Bridge M-187B structural defects



- Map cracking with efflorescence in slab soffit;
- Spalls with exposed reinforcing in slab soffit
- Vertical crack at joint of west abutment and northwest wing wall
- Heavy efflorescence at the south end of the east abutment



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# Project Background

Existing Bridge M-189B  
structural defects



- Spalls in the soffit with exposed and corroded reinforcement,
- Full height crack in west abutment,
- Crack and spall in the west abutment,
- Spall in southeast wingwall,
- Spall in the east abutment, does not meet FHWA Safety Standards,
- Spalling on east and west end of north railing



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# Project Objectives



- Improve structural performance
- Increase hydraulic performance (10-yr event)
- Provide bicycle compatible roadway
- Address SWM needs

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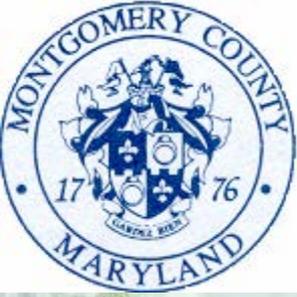


# Project Elements

## Existing Bridge M-187B

- ❖ Existing vertical profile and horizontal alignments were maintained
- ❖ New 46-foot-span bridge
  - ❖ Solid, precast, pre-stressed concrete beams
  - ❖ Cast in place deck overlay
  - ❖ Beams supported on new RC caps with steel H-piles.
  - ❖ Bridge was widened to 30-foot clear roadway (2X11'+2X4')
  - ❖ Safe on-road bicycling - in accordance with the Master Plan
  - ❖ Removed Load restrictions





# Project Elements

## Existing Bridge M-189B

- ❖ Existing horizontal alignment was maintained
- ❖ Vertical profile was raised by app. 1 foot at the bridge to reduce the likelihood of flooding
- ❖ New 24-foot-span bridge
  - ❖ Solid, precast, pre-stressed concrete beams
  - ❖ Cast in place deck overlay
  - ❖ Beams supported on new RC caps with steel H-piles.
  - ❖ Bridge was widened to 30-foot clear roadway (2X11'+2X4')
  - ❖ Safe on-road bicycling - in accordance with the Master Plan.
  - ❖ Replaced railing
  - ❖ Removed Load restrictions



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# Project Elements

Culvert Near Bridge M-189B



- ❖ Existing - 4-foot clear opening
- ❖ Proposed – 11'-6" clear opening
- ❖ Driveway/Access road reconstructed to match new width and road grade
- ❖ Work included providing temporary ped bridge for home owners

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# Project Elements

## SWM Facilities



- ❖ Bio-swales were constructed alongside both bridges
- ❖ Addressed additional impervious area
- ❖ Constructed as the last item on the project
- ❖ Additional landscaping

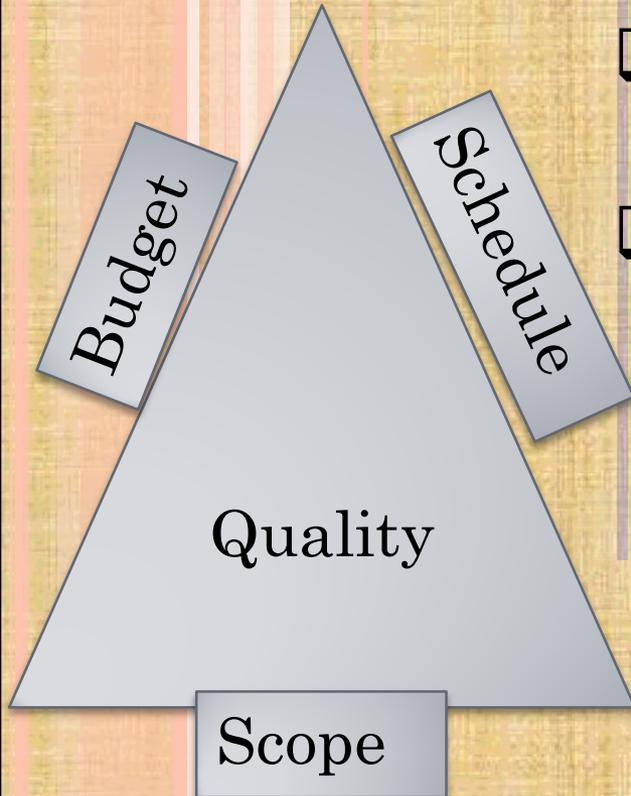
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# Project Schedule and Funding

- ❑ Project was funded solely by County funds.
- ❑ The total construction contract was for **\$2,026,000**.
- ❑ At project completion, the total amount paid to the contractor was **\$1,950,000** including incentive payments for early completion.



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# Project Schedule and Funding



- ❑ It took more than **four years** to develop project plans, obtain community and stakeholder support, secure funding, acquire land and relocate utilities
- ❑ It took **less than two and a half months** to complete

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# Project Challenges

## ➤ Construction Duration (summer construction) and Road Closure:

- MCPS designated school route
- Complete all construction during the summer break (**June 15 – August 25**)
- Diverted traffic versus proposed route along rural roads (condition of roads)
- MCDOT made **preventive maintenance** such as filling potholes, and trimming tree branches.
- Project staff also **documented existing and developing conditions of the detour route roads** through photographs and field notes.
- In an effort to expedite the construction work, MCDOT also included in the contract an **Incentive/disincentive amount of \$10,000/day.**



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# Project Challenges

## ➤ **Impact on Businesses:**

- Several business owners and community members expressed concerns regarding **the impact of closing the road**
- MCDOT worked closely with the DED and CE office to develop a work plan that would minimize business impacts
- The owner of Whites Ferry was concerned with **the loss of potential revenue due to the road closure and detour**
- Offered Businesses to develop and submit **certified business reports** (if they wished to do so) which would then be reviewed by the County's Department of Economic Development
- A **public outreach and communication effort** – public meetings and public hearings
- A **Variable Message Sign (VMS)** was erected at the start of the detour clearly stating that the Ferry was open during construction



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# Project Challenges

## ➤ **Impact to Ferry users/commuters:**

- Whites Ferry Road is one of the main arterials that runs through and connects the rural communities in the western part of Montgomery County to the rest of the county
- In addition, a large number of drivers use the Ferry to cross over the Potomac River on a daily basis.



- The Whites Ferry has been in service since the 1940s and is the only cable ferry service that carries cars, bicycles, and pedestrians across the Potomac River.
- Visitors also come to the location for fishing and other water recreation including canoeing.





# Project Challenges

## ➤ **Impact to Ferry users/commuters:**

- It was observed that, in atypical work day, during rush hour, **more than 100 commuters utilize the Ferry**
- Most of the commuters work or live in parts of **Montgomery County and Loudoun County, Virginia**
- The Ferry provides a convenient, dependable and faster access to these locations
- MCDOT developed **a detour plan** that took into account access and travel time to the Ferry
- Appropriate **guiding signs** were provided to drivers along the Detour routes



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# Project Challenges

## ➤ Fire and Emergency:

- Closing Whites Ferry Road for an extended period of time also raised concerns about **emergency response**.
- MCDOT worked closely with the **Department of Fire and Rescue Service (MCFRS)** to mitigate this issue
- Because the length of the detour route would have caused critical delay during emergency response, **MCDOT installed two 21,000 Gallon Closed Top Frac-Tanks**.
- Minor complaints were received **regarding placement of the water supply tanks and available site distance** which were immediately addressed by installing additional signs
- Thankfully, there was **no emergency** that required the use of these tanks and the tanks did not pose any disruption or cause any accidents



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# Project Challenges

## ➤ Utility relocations:

- Foot print of the roadway became wider
- Overhead utilities alongside the road had to be relocated.
- Despite MCDOT's relentless push for the timely relocation of utilities, **communication lines remained in place**
- In order to meet the project timeline and avoid further damage to these bridges, **MCDOT allowed work to start while aggressively pushing for the relocation of the utilities**
- After review of the site conditions with the Contractor (Charles J Merlo) it was determined that **at bridge 189B the relocation was not needed and the Contractor could proceed while using caution during grading.**



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# Project Challenges

## ➤ **Utility relocations (Continued):**

- At the 187B bridge, the **electrical overhead lines were relocated** to their final location but the poles remained in place with the communication lines.
- Since the top of the poles were cut to a reasonable height, the Contractor again was able to complete their work near but not in conflict with the **Verizon and Comcast lines** still in place.
- The contractor had to **maneuver his equipment surgically in order to avoid damaging these lines**. With close coordination and tact, the bridge elements were installed without damaging any of the utility lines.





## Project Challenges

### ➤ **Change in design requirements (Post-tensioning):**

- The slab beams were designed with an old post-tensioning requirement that specified a post tensioning force of 120 kips applied once just prior to grouting the rod holes.
- In the midst of construction, during the shop drawing process, a new directive was issued for a two-step post-tensioning process. This caused some minor delays and confusion during construction.
- MCDOT also had to pay the Contractor additional money due to the fact that the post-tensioning (Sub Contractor) had to visit the site on multiple occasions to complete the tensioning.



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# Success Factors

Community Engagement

Cooperative Contractor

Effective Communication



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# Lessons Learned

Early Utility Coordination

Interaction Between Units

Persistence



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# Project Photos – Completed



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# Project Photos – Completed



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# Resources

- **County Home Page:**  
<http://www.montgomerycountymd.gov/index.aspx>

- **MCDOT:**  
<http://www.montgomerycountymd.gov/dot/index.html>



@MCDOTnow

- **MCDOT -DTE Projects**  
<http://www.montgomerycountymd.gov/dot-dte/index.html>



@MoCo\_DTE



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