

VDOT Saves \$20 Million by Retrofitting Aging Variable Message Signs

Since the mid 1980s, the Virginia Department of Transportation (VDOT) has used variable message signs (VMS) to provide timely information to motorists. Many of the older 'flip-disk' signs are no longer being manufactured and the companies that provided them no longer support that product. As a result, maintenance has become increasingly difficult and costly, with VDOT staff resorting to cannibalizing or hand-repairing defective parts.

While many signs have been kept operational by creative maintenance, this approach was becoming unworkable in certain areas. But replacing the old VMS signs with newer models is not that simple. As VDOT Operations & Security administrator Tom Phillips explained, "A full engineering evaluation is necessary because introducing a new VMS to existing supports introduces the possibility of overload or instability due to change from the original design."

After engineering evaluations revealed no issues with the sign gantries, VDOT was able to focus on just replacing the VMS units. Then staff had the idea: What if the existing VMS could be retrofitted with new technology while retaining the original sign cases and other structural elements? Evaluating this approach began with a review of available technology and a trial run of implementing new sign materials within refurbished VMS sign cases.

A site near Washington D.C. was selected to represent Virginia's Northern Region. The older VMS sign was removed from the support structure and a manufacturer was selected to fabricate retrofit kits that could be installed by VDOT's ITS maintenance contractor.

The company chosen to carry out the work used existing VMS components as a template for sizing replacement modules.

The resulting kit was configured to the company's standard products, but with sign attachment hardware specifically fabricated for the existing sign.

Existing electrical and communication cabling was removed and replaced with new cabling, connections and power service using the existing raceway. The VMS cabinet was refurbished at an off-site location using finishes designed to last for many years and give a 'like new' appearance to the travelling public. After being installed back on the gantry it had been removed from, the refurbished sign underwent operational tests through the regional ITS control center's advanced traffic management system.

Additional tests validated the kit's ability to operate in the harsh environment of Northern Virginia while providing reliable messages to the public. Because off-site techniques were used for refurbishment, the impact to drivers was minimized.

After testing and evaluation of the prototype kit as installed in the refurbished VMS sign case, the contractor refurbished 15 additional signs that represented different vendors' products and sign configurations supplied over the years.

VDOT's approach to retrofitting old variable message signs has been an unqualified success. By the end of 2011, 100 existing signs had been refurbished at a cost of approximately \$100,000 each, saving an estimated \$200,000 per sign over the cost of a new VMS. In addition, by using the latest technology, the new signs offer improved visibility and reduced maintenance while using half as much power, which is expected to save VDOT approximately \$300,000 per year in electricity and maintenance costs. ■

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