

West Virginia Resilient Drainage Initiative Project

The West Virginia Resilient Drainage Initiative is a statewide programmatic shift focused on improving long-term infrastructure durability by replacing temporary corrugated metal pipes (CMP) with resilient, permanent culvert materials. Rather than highlighting a single project, this initiative showcases West Virginia Department of Transportation's (WVDOT) commitment to sustainable, forward-thinking design practices across the state's highway network. The effort is rooted in decades of field experience, research, and policy evolution—and reflects the lessons learned from repeated culvert failures on state roads.

Background and Evolution

The journey toward resilient drainage infrastructure began in December 1996, when a catastrophic CMP failure in Hinton, West Virginia resulted in a road collapse and the loss of a nearby camping trailer. This event prompted early internal discussions about culvert durability and the role of material selection in infrastructure longevity. When a key contributor to this initiative transferred to WVDOT's Hydraulics section in 2001, one of their first responsibilities was to revise Design Directive 503: Selection of Pipe Materials. Although plastic pipe was introduced at that time, efforts to remove CMP from the approved list were initially unsuccessful.

Over the following years, WVDOT continued to experience culvert failures, reinforcing the need for a more robust and unified solution. In 2018, a breakthrough occurred when CMP usage was restricted to very low volume roads with shallow fills. This pivotal change marked the beginning of a broader overhaul that included updated culvert specifications, revised fill height tables, and standardized design details—all aimed at prioritizing durability in culvert selection and construction practices.

Implementation and Impact

Between 2018 and 2021, West Virginia made comprehensive updates to its design standards, ensuring that temporary materials would no longer be used under permanent roads. These improvements were driven by a commitment to long-term performance, public safety, and reduced maintenance costs. As a result, current and future roadway projects throughout the state—including major corridors like US 522 at Berkeley Springs, constructed by Trumbull Corporation—now rely on durable pipe materials, including reinforced concrete, to withstand environmental demands and traffic loading over time.

Leadership and Advocacy

This initiative has been shaped by years of internal advocacy, technical presentations,

and executive support. Presentations and internal documentation have chronicled West Virginia's evolving approach to drainage, highlighting the challenges, lessons learned, and key milestones that shaped the state's transition to more durable culvert design. The initiative received strong leadership support from WVDOT and reflects a statewide commitment to long-term infrastructure resilience.

Conclusion

The West Virginia Resilient Drainage Initiative stands as a model of how sustained leadership, institutional learning, and technical rigor can transform infrastructure policy at a statewide level. By phasing out temporary materials in favor of long-term solutions, WVDOT has raised the standard for drainage design and demonstrated the value of concrete and other durable culvert materials in safeguarding West Virginia's roads for generations to come.

Project Profile

Locations

Statewide, West Virginia (regions including the King Coal Highway, Coalfields Expressway, Corridor H, and US 522)

Installation Completed

Ongoing statewide implementation; policy reforms and standard updates completed between 2018 and 2021

Project Owner

West Virginia Division of Highways (WVDOT)

Contractors

Kokosing, Triton, Bizzack, ALL, Brayman, Orders, Kanawha Stone, and others

ACPA Producers

Rinker Materials, Permatile

Engineer/Designer

West Virginia Division of Highways (WVDOT)