

DC2RVA: Railway Environmental Analysis and Compliance through ArcGIS Online (AGOL)

Bridget Ward HDR
Karen Harrington HDR

The Federal Railroad Administration (FRA) and Virginia Department of Rail and Public Transportation (DRPT) propose passenger rail service and rail infrastructure improvements along a 123-mile corridor spanning 12 jurisdictions between Washington, D.C. and Richmond, VA, collectively known as the Washington, D.C. to Richmond Southeast High Speed Rail (DC2RVA) project. Preparing the Commonwealths largest Tier II Environmental Impact Statement (EIS) requires extensive spatial data that needs to be accessible and understandable by all stakeholders, including CSX Transportation (owner of the Right-of-Way), Amtrak, Virginia Railway Express (VRE), and other government agencies. The data system must also be capable of analytical processing for the identification of potential impacts from proposed infrastructure improvements. Esri ArcGIS Online (AGOL) application has enabled us to leverage the online, mobile mapping environment to develop a critical and comprehensive review of planned infrastructure interactions with environmental and cultural resources within the project corridor.

Since project inception, AGOL has fostered unique collaborations between CAD, GIS, and tabular railway and environmental data. Our teams use of AGOL has evolved into an integral decision-making mechanism for alternatives development, with a primary mapping focus on the projects two-fold environmental screening process. The initial screening assessed environmental fatal flaws, while the second screening evaluated order of magnitude environmental impacts. Fatal flaws are resources adhering to Section 4(f) of the DOT Act of 1966, while second screening data included land analysis (urban, agricultural, etc.), Superfund/CERCLIS sites, wetlands, conservation sites, cemeteries, and state-listed agricultural and forestal districts. The results from these screenings assisted in the development of the Build Alternatives to be carried forward into the Draft EIS. The use of AGOL for compiling this wide-array of environmental and railway data into a centralized platform has both increased project efficiency and improved cross-sector communication.

AGOL has enhanced our environmental efforts by equipping us with abilities to collect, review, and analyze data in a readily-understandable centralized platform, serving as a secure data gateway for desktop-created and field-collected information. For a project reduced from eight to three years, AGOL has maximized project time for the environmental effort; environmental field work and desktop analysis efforts can occur simultaneously through the AGOL application.

Our teams combined usage of rail alternative alignments, natural resources, and planning data has been facilitated by the use of AGOL to display results and enable engineers and scientists to manipulate webmaps for spatial analysis. This online network has simplified the process of posting data for environmental analyses and has bridged the geographic divide, enabling project staff to work together across multiple offices and states.

However, AGOLs project success is not without its challenges. Managing environmental GIS information involved with large, complex engineering projects such as DC2RVA requires thorough planning and clear directives. Decisions regarding management of environmental and railway data additions and updates

throughout the project lifecycle have significant impacts on productivity and efficiency. DC2RVAs GIS team has implemented standardized data structures and consistent approaches to maintaining these critical datasets.

DC2RVAs AGOL configuration has been a fundamental platform for communication and presentation in the projects environmental sector; it is a paradigm application of AGOL for environmental railway analysis. At its core, AGOL has served as a common data pathway for rail engineers, environmental scientists, GIS professionals, and key stakeholders throughout project development. It has been a vital asset in discussing proposed rail alignments and environmental consequences.