

# Cairo Bridge Project

## Secondary and Cumulative Effects

### Ritchie County, West Virginia



**U.S. Department of Transportation  
Federal Highway Administration**



**West Virginia Department of Transportation  
Division of Highways**



**February 2017**

## **Secondary and Cumulative Impacts**

This qualitative assessment included field views, a telephone interview with the executive director of the Ritchie County Economic Development Authority and a review of secondary source data. As determined from existing trends and current plans, commercial or industrial growth is limited in the area.

Guidelines prepared by the Council on Environmental Quality (CEQ) for carrying out NEPA requirements broadly define secondary impacts as those that are caused by an action and are later in time or further removed in distance, but are still foreseeable (1978). Secondary impacts can be associated with development that may result from the construction of a facility, such as a transportation improvement project, but differ from impacts directly associated with the construction and operation of the facility itself. Generally, these impacts are stimulated by an initial action and comprise a wide variety of indirect effects, such as changes in land use, development patterns, economic activity, population density, and related impacts on air, water, and other natural systems, including ecosystems. Indirect impacts may result in increased development pressure on open space, farmlands, and other natural resources.

Cumulative impacts, on the other hand, result from the incremental consequences of an action when added to other past, present, and reasonably foreseeable future actions (CEQ 1997), regardless of what agency, person, or organization undertakes such actions. Cumulative impacts result from past, present, and future actions. When considered as a whole and in concert with other foreseeable developments and projects, they can result in a combined effect greater than considering separate elements independently.

### **1.0 Secondary Impacts**

Secondary impacts are those normally associated with development that may result from the construction of a facility, such as a transportation improvement project, but differ from those impacts directly associated with the construction and operation of the facility itself. Secondary impacts are commonly referred to as induced development. Generally, these impacts are stimulated by an initial action and comprise a wide variety of secondary effects, such as changes in land use, development patterns, economic activity, utility service capacity, and population density.

Factors that typically induce secondary, or indirect, development are new access to potential development areas, increased roadway capacity, existing development plans, suitable terrain, and economic incentives. The potential for indirect development to occur in any particular area is determined in great part by individual municipal planning objectives. Although secondary impacts may result in increased development pressure on open space and other natural resources, the small-town character of the project area limits secondary impacts primarily to areas with some infrastructure in place. The current availability of land and transportation infrastructure in Cairo indicates that secondary development is most likely to occur north of the existing bridge while redevelopment of existing properties could occur within the town's central business district.

The distance from US 50 and Interstate routes 77 and 79 has hindered commercial and industrial development in the area. While US 50, the major east-west route in the area, is only about four miles away traveling on WV 31, access to I-77 is over 21 miles away in Parkersburg and access to I-79 is nearly 60 miles away in the Clarksburg-Bridgeport area. A new bridge in Cairo will alleviate localized transportation problems and stimulate local economic activity, but is unlikely to affect the overall regional transportation network or economy to any measurable degree.

Although residential growth could occur almost anywhere, it is constrained by topography and the limits of existing public water and sewer systems. Suitable land, the availability of public water, the availability of public sewer service, and suitable transportation are typically used as appropriate development features that can be used to predict growth (Kulkarni 1976). The opportunity for induced development is strongest when all four elements are in place and almost nonexistent when none of them are. Economic pressures on the local community, coupled with national trends, are also likely to limit development in the region and growth in the corridor is constrained by the finite availability of flat land and sufficient infrastructure. Thus, development is expected to be limited to infill occurrences and the likelihood of indirect impacts is minimal and induced development from the project can be accommodated in an orderly manner. Although unlikely, any secondary development would be an economic benefit to the community and supports the project's needs.

## **2.0 Cumulative Impacts**

Taken individually, the impacts from an action may have little effect on the environment. When viewed as a sequence of events, however, different actions may add up to, or cause, additional

effects over time. Thus, the cumulative impact may be of more consequence than isolated, individual impacts.

Past projects since 1970 and planned actions through the year 2030 were reviewed to complete a qualitative assessment of cumulative impacts in central Ritchie County. Primary data sources included interviews with local economic development officials, study area field views, and secondary data sources. Consequently, a qualitative analysis rather than a quantitative trends analysis emerged.

Cumulative impacts or effects are a result of the incremental impacts of an action when added to other past, present, and reasonably foreseeable future actions (RFFAs). Cumulative effects can be difficult to understand because they are not clear cut. They can accrue from similar impacts, from multiple actions, or be the product of unrelated impacts from a variety of actions. In addition, some actions may offset the effects of other actions, lessening the overall impact. Cumulative effects can also arise from actions which may only be connected by their common impacts on similar resources, ecosystems, or human communities.

Ritchie County is one of West Virginia's more rural counties and the identification and analysis of RFFAs presents many challenges. The county does not have a comprehensive plan nor a countywide planning department. Proponents of future actions may be reluctant to reveal information for a number of reasons. Plans may be uncertain and project sponsors, both private and public, may not see a benefit in disclosing them. Furthermore, project sponsors may not completely understand the importance of their plans on other projects, or understand the potential impact inherent in those plans on others. Detailed design and operational information is generally not available for proposed projects. At the preliminary stage of project development, locations may not be set. Project size and magnitude may not have been determined. Usage estimates or projections may not be sufficiently rigorous. Many factors also affect the timing, location, and design of future actions. If programming and funding requirements have not been finalized, future actions may be delayed, downsized, or modified significantly over time. If definitions of future actions are too liberal, future impacts may be predicted as being too high. If definitions are too conservative, future impacts may be underestimated.

Actions that may contributed to cumulative effects in the area include: water and sewer system improvements in Cairo, Harrisville, and Pennsboro; transportation improvements throughout

Ritchie County; and conversion of farm or forest land to commercial or residential development. These activities could have a cumulative impact on terrestrial habitat, land use, water quality, wetlands, air quality, traffic, and cultural resources.

Development projects would have mixed impacts to most resources. Properly functioning water and waste water treatment systems, regardless of type, can encourage economic growth. When public water is available and a community has adequate sewer facilities in place, as it does in Cairo, public health improves and the community becomes more attractive as a place to live or work. When such systems are not in place, however, or not functioning properly, pollution can result. If not replaced or improved, older systems may not be able to accommodate growth and can result in negative impacts to environmental resources.

Development also can affect wetlands, terrestrial habitat, and sensitive animal and plant species by consuming land and infringing on natural ecosystems. Properly designed development can offset negative impacts, however, and assist in preserving valued elements of the landscape.

Additional development could also increase traffic and subsequently cause air quality problems or require future transportation improvements. The potential effects could be mitigated by the design of future developments and the regulatory environment. Positive effects to recreation and socioeconomic resources would be expected, primarily through improved facilities or better access.

Increased safety, efficiency, and congestion management are the principal reasons for surface transportation projects. Short-term local income and revenues would increase as a result of future transportation projects, including bridge renovations, highway rehabilitations and upgrades, and new roadways. Significant changes to population, property values, local taxes, and existing land use patterns could occur, however, if roadway locations are changed or shifted.

There could be mixed impacts to water quality, wetlands, terrestrial habitat, and sensitive species as a result of converting land to highway use. Effects would be mitigated in various ways, including avoidance, minimization, and replacement.

Effects to air quality, recreation resources, and socioeconomics would be expected to be generally positive. Additionally, although the effects of transportation projects on cultural

resources are mixed, these projects are tied to federal funding or permitting and, therefore, are subject to Section 106 and Section 4(f) compliance. These regulatory processes ensure that the significance of individual cultural resources is considered during project development.

Long-term positive impacts would be associated with improved environmental conditions guaranteed through the regulatory environment. These regulations are especially important where there are numerous development opportunities and the potential for threats to the natural environment to occur. All three levels of government (federal, state, and local) have created laws or programs to address negative effects.

A concerted effort by government and the private sector has also occurred over the past 20 to 30 years to bring about economic redevelopment in the area. These efforts have enhanced the quality of life for the area's citizens and businesses without imposing an inordinate cumulative impact on the natural, cultural, or socioeconomic environment.

### **3.0 Conclusion**

Secondary development is expected to be limited to infill occurrences. The likelihood of indirect impacts is minimal and induced development from the project can be accommodated in an orderly manner. Any future cumulative effects are expected to benefit the community rather than harm it.

### **4.0 References**

Council on Environmental Quality. 1978. *National Environmental Policy Act – Regulations, Federal Register, Vol. 43, No. 230*. Washington, District of Columbia.

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Kulkarni, Gopal, Ph.D. 1976. *Quantitative Techniques in Geography*. Unpublished lecture notes. Indiana University of Pennsylvania. Indiana, Pennsylvania.

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### Legend

- PROPOSED BRIDGE DESIGN
- PROPOSED RIGHT-OF-WAY
- PROPOSED DETOUR AND TEMPORARY CROSSING

NIGHT OWL  
WELL  
SERVICE

NORTH FORK HUGHES RIVER

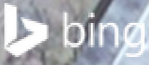
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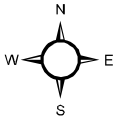
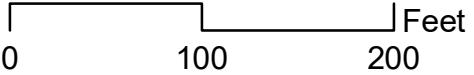
212  
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Lewter St

Preferred Alternative



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3 SPAN REPLACEMENT  
ON EXISTING ALIGNMENT