

**Shady Spring to Beaver/Beaver to
South Eisenhower Drive Projects
(Beckley Z-Way)**

**Secondary and Cumulative
Effects Analysis**

Raleigh County, West Virginia

State Project Number: X341-ZWA/Y-1.00 00

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



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



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1.0 Background

This qualitative assessment included field views, interviews with local planning and development officials, 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 (CEQ 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.

2.0 Demographic Overview

The population of West Virginia at the 2010 U.S. Census was 1,852,994 (USCB 2010). Population in Raleigh County peaked in 1950 when it reached 96,273. It has been relatively stable over the past 20 years, with the most recent population estimate of 78,241 in 2014 (USCB 2015). Population projections for the area indicate the county's population will decline slightly over the next 15 years (WVU 2014); however, the population of West Virginia is expected to grow by 1.4 percent to by the year 2035.

3.0 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. 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 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 the project area indicates that new development is most likely to occur along Airport Road (WV 307), at the Pinecrest Business and Technology Park, at the Raleigh County Airport Industrial Park, and as infill along US 19, and in downtown Beckley. Redevelopment of existing properties could occur anywhere along US 19. Summaries of this locations are found below:

- Along Airport Road – There are several vacant or underutilized, large parcels available for redevelopment and new commercial development on Airport Road between US 19, the county airport, and I-64. Proximity to the interstate highway, the airport, existing commercial development in Beckley and its southern environs, and residential development in the US 19 southern corridor makes this section of WV 307 one of the most attractive development areas in Raleigh County.
- Pinecrest Business and Technology Park – All utilities are available at this industrial park located on the north side of I-64, less than one mile from Interchange 124. Approximately 180 acres are available for development at this relatively new business park.
- Raleigh County Airport Industrial Park – The Raleigh County Airport Industrial Park is a mature 492-acre business park located adjacent to the county airport. All utilities are available at the park, including runway access. The industrial park is

located on the north side of I-64, approximately one mile from Interchange 125. Approximately 125 acres, or about 25 percent of the park, are still available for development.

- US 19 Infill – The US 19 corridor south of Beckley has public water and sewer service as well as many large parcels that could be developed for housing or commercial use.
- Downtown Beckley – West Virginia University (WVU) is relocating its Montgomery campus (WVU Institute of Technology) to downtown Beckley beginning for the 2017-2018 academic area. The new WVU facilities are located on the old Mountain State University campus on S. Kanawha Street, within the Beckley central business district, but about seven miles northeast of the project area. Although the next few years will see students on both campuses, by 2024, approximately 1,800 students are expected to be on the Beckley campus.

Traffic congestion has hindered commercial and industrial development in the area, however. Widening US 19 will alleviate localized transportation problems and stimulate local economic activity, but is unlikely to affect the overall regional 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.

4.0 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. 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.

The identification and analysis of RFFAs present many challenges. 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 Beckley and within the Shady Spring Public Service District; transportation improvements throughout Raleigh County; the WVU campus in downtown Beckley; 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. There will likely be a cumulative impact to the area as a result of the project because it will improve local transportation and provide better access to development sites. This could also stimulate growth and result in future impacts. Actions that will contribute to cumulative effects are shown in Table 1.

**TABLE 1
Major Actions in the Study Area**

Activity	Location	Environmental Issues that are Cumulative
Water and sewer system improvements	Throughout Raleigh County	Land use, water quality, wetlands, traffic, noise, air quality, cultural resources
Build out of existing industrial sites	Earl Ray Tomblin Industrial Park, Logan Manufacturing Facility, McDonald Airfield, and Three Mile Curve	Terrestrial habitat, water quality, noise, air quality, traffic
Transportation system improvements	Throughout Raleigh County, but especially other Z-Way projects	Land use, water quality, wetlands, traffic, noise, air quality, cultural resources
Commercial development	Along US 19 and Airport Road	Terrestrial habitat, water quality, wetlands, noise, air quality, traffic, cultural resources

Once RFFAs were identified, a matrix of probability and potential impact was developed. The matrix connects RFFAs and their anticipated effects on resources so that judgments can be made on the likelihood they will occur. This method was originally developed by the USACE for projects along the Ohio River, but it can serve as a valid method for analyzing any linear project. The use of matrices to analyze cumulative effect is one of the recognized techniques identified by the CEQ for measuring cumulative impacts (CEQ 1997). Matrices provide two-dimensional checklists that quantify interactions between human activities and resources and assess both magnitude and importance.

Analysis of the matrix was based on several things, best illustrated by a series of questions. During what time period will the action occur or how frequently will the RFFA take place? Two time periods were used, including within 10 years and between 10 and 20 years from now. What is the importance, or impact, of the action on the resource? Three rankings were used to determine importance, including high, medium, and low. What is the probability of occurrence of the RFFA? Three rankings were used for occurrence probability, including high, medium, and low. And finally, what are the anticipated effects of the RFFA on the resource? Three rankings were used, including positive, negative, and mixed effects (whereby both positive and negative effects could occur). The results of the analysis are shown in Table 2.

**TABLE 2
Potential Impact of RFFAs on Resources**

RFFA	Time Period	Importance	Occurrence Probability	Water Quality	Wetlands	Terrestrial Habitat	RTE Species	Air Quality	Recreation Resources	Socioeconomics	Cultural Resources
Water and sewer system improvements	1	M	H	+	+	+/-	+/-	+/-	+	+	+/-
Build out of existing industrial sites	2	M	M	+/-	+	-	+/-	+/-	+	+	+/-
Transportation system improvements	1,2	H	H	+/-	+/-	+/-	+/-	+	+	+	+/-
Commercial development	1,2	H	M	+/-	+/-	+/-	+/-	+/-	+	+	+/-
Regulatory environment	1,2	H	+	+	+	+	+	+	+	+	+
Time period: 1 = within 10 years, 2 = between 10 and 20 years from now											
Importance/Occurrence probability: H = high, M = medium, L = low.											
Impacts: + = positive. - = negative, +/- = mixed effects, 0 = none.											

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 within the project area, 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.

5.0 Conclusion

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.

6.0 References

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