

Environmental Assessment

for the

BlueBird Media, LLC Northern Missouri Ultra-High Capacity Middle-Mile Broadband Network

prepared for

bluebird 



**National Telecommunications
and Information Administration**

June 2011



Environmental Assessment

for the

BlueBird Media, LLC Northern Missouri Ultra-High Capacity Middle-Mile Broadband Network

prepared for

National Telecommunications and Information Administration

June 2011

Project No.: 59130

prepared by

**Burns & McDonnell Engineering Company, Inc.
Kansas City, Missouri**



TABLE OF CONTENTS

EXECUTIVE SUMMARY I

1.0 PURPOSE AND NEED FOR THE PROPOSED PROJECT1-1

1.1 Introduction..... 1-1

1.2 Proposed Action..... 1-1

1.3 Purpose and Need 1-6

2.0 ALTERNATIVES2-1

2.1 Wireless System..... 2-1

2.2 Trenched Fiber Optic System 2-1

2.3 Aerial System..... 2-1

2.4 Preferred Alternative..... 2-2

2.4.1 Fiber Routes 2-2

2.4.2 Nodes 2-3

2.4.3 Community Anchor Institutions 2-3

2.5 No Action Alternative..... 2-5

2.6 Alternatives Considered but Eliminated from Further Discussion 2-5

2.7 Summary Comparison of Alternatives and Impacts 2-5

3.0 AFFECTED ENVIRONMENT3-1

3.1 Noise 3-13

3.1.1 Existing Ambient Noise 3-15

3.1.2 Regulatory Background 3-15

3.2 Air Quality and GHG Emissions 3-16

3.3 Geology, Soils, and Farmland..... 3-18

3.4 Water Resources 3-21

3.4.1 Surface Water..... 3-21

3.4.2 Groundwater 3-29

3.4.3 Floodplains..... 3-30

3.4.4 Wild and Scenic Rivers..... 3-34

3.5 Biological Resources 3-35

3.5.1 Vegetation 3-39

3.5.2 Wildlife 3-40

3.5.3 Aquatic Habitat and Fisheries 3-42

3.5.4 Threatened and Endangered Species 3-43

3.5.5 Wetlands 3-48

3.6 Historic and Cultural Resources 3-50

3.6.1 Architectural Resources 3-50

3.6.2 Native American Resources 3-53

3.7 Aesthetic and Visual Resources..... 3-63

3.8 Land Use 3-68

3.8.1	Existing Land Use.....	3-68
3.8.2	Parks, Recreational, Conservation, and Wildlife Areas.....	3-74
3.9	Infrastructure.....	3-82
3.9.1	Broadband.....	3-82
3.9.2	Rail.....	3-83
3.9.3	Other.....	3-84
3.10	Socioeconomic Resources.....	3-84
3.10.1	Population Growth Trends.....	3-84
3.10.2	Racial and Ethnic Characteristics.....	3-86
3.10.3	Employment and Income.....	3-89
3.10.4	Community Facilities.....	3-91
3.11	Human Health and Safety.....	3-91
4.0	ENVIRONMENTAL CONSEQUENCES	4-1
4.1	Noise.....	4-1
4.1.1	No Action.....	4-1
4.1.2	Construction and Operation Impacts of the Proposed Project.....	4-1
4.1.3	Noise Summary.....	4-3
4.2	Air Quality and GHG Emissions.....	4-3
4.2.1	No Action.....	4-3
4.2.2	Construction and Operation Impacts of the Proposed Project.....	4-3
4.2.3	GHG Emissions.....	4-4
4.2.4	Air and GHG Summary.....	4-5
4.3	Geology, Soils, and Farmland.....	4-5
4.3.1	Geologic Resources.....	4-5
4.3.2	Soil Resources.....	4-6
4.3.3	Geology and Soils Summary.....	4-9
4.4	Water Resources.....	4-9
4.4.1	Surface Water.....	4-9
4.4.2	Groundwater.....	4-11
4.4.3	Floodplains.....	4-12
4.4.4	Wild and Scenic Rivers.....	4-13
4.4.5	Water Resources Summary.....	4-14
4.5	Biological Resources.....	4-14
4.5.1	Vegetation.....	4-14
4.5.2	Wildlife.....	4-16
4.5.3	Aquatic Habitat and Fisheries.....	4-16
4.5.4	Threatened and Endangered Species.....	4-17
4.5.5	Wetlands.....	4-21
4.5.6	Biological Resources Summary.....	4-22
4.6	Historic and Cultural Resources.....	4-22
4.6.1	Archaeological and Native American Resources.....	4-24
4.6.2	Architectural Resources.....	4-26
4.6.3	Cultural Resources Summary.....	4-28
4.7	Aesthetic and Visual Resources.....	4-28
4.7.1	No Action.....	4-28

4.7.2	Construction and Operation Impacts of the Proposed Project	4-28
4.7.3	Summary of Visual Impacts.....	4-31
4.8	Land Use	4-31
4.8.1	No Action.....	4-31
4.8.2	Construction and Operation Impacts of the Proposed Project.....	4-31
4.8.3	Summary of Land Use Impacts.....	4-34
4.9	Infrastructure.....	4-34
4.9.1	No Action.....	4-34
4.9.2	Construction and Operation Impacts of the Proposed Project.....	4-35
4.9.3	Infrastructure Summary	4-38
4.10	Socioeconomic Resources	4-38
4.10.1	No Action.....	4-38
4.10.2	Construction and Operation Impacts of the Proposed Project.....	4-39
4.10.3	Environmental Justice.....	4-40
4.10.4	Socioeconomic Summary	4-43
4.11	Human Health and Safety	4-43
4.11.1	No Action.....	4-43
4.11.2	Construction and Operation	4-43
4.11.3	Health and Safety Summary	4-46
4.12	Cumulative Effects.....	4-46
5.0	APPLICABLE ENVIRONMENTAL PERMITS AND REGULATORY REQUIREMENTS	5-1
6.0	AGENCIES AND PERSONS CONSULTED.....	6-1
7.0	REFERENCES	7-1
APPENDIX A - AGENCY LETTERS AND CORRESPONDENCE		
Appendix A-1 - US Fish and Wildlife Service Coordination		
Appendix A-2 - US Army Corps of Engineers Coordination		
Appendix A-3 - State Historic Preservation Officer and National Park Service Coordination		
Appendix A-4 - Natural Resources Conservation Service Coordination		
Appendix A-5 - Missouri State Agency Coordination		
Appendix A-6 - Tribal Coordination		
APPENDIX B - ROUTE MAPS		

LIST OF TABLES

<u>Table No.</u>	<u>Page No.</u>
Table 2-1: Summary Comparison of Alternatives and Impacts	2-5
Table 3-1: Typical Sound Pressure Levels Associated with Common Noise Sources.....	3-13
Table 3-2: EPA Noise Levels Identified to Protect Public Health and Welfare.....	3-15
Table 3-3: Prime Farmland Along Proposed Project Route Segments.....	3-19
Table 3-4: Streams Crossed by Route Segment.....	3-22
Table 3-5: Section 10 Navigable Waters Traversed by Route Segment.....	3-26
Table 3-6: Impaired Missouri Streams Crossed by Route Segments	3-27
Table 3-7: Distance Each Proposed Project Route Segment Traverses the 100-Year Regulatory Floodplain.....	3-30
Table 3-8: Route Segments That Cross Nationwide Rivers Inventory (NRI) Streams	3-36
Table 3-9: Representative Wildlife Present within the Proposed Project Route Segments	3-41
Table 3-10: Representative Fish and Mussels Present in Aquatic Habitats within the Proposed Project Route Segments.....	3-42
Table 3-11: Threatened and Endangered Species Known or Likely to Occur within the Counties Containing the Proposed Project Route Segments and Nodes.....	3-44
Table 3-12: Wetlands (NWI) Present within the Proposed Project Route Segments	3-48
Table 3-13: Mitigation Wetlands within the Proposed Project Route Segments	3-50
Table 3-14: NRHP-listed Properties Adjacent to Fiber Routes	3-51
Table 3-15: Historic Districts Intersected by Proposed Project Routes.....	3-52
Table 3-16: Cultural Resources by Proposed Project Route Segment.....	3-62
Table 3-17: Parks and Other Public Lands	3-63
Table 3-18: Scenic Byways	3-68
Table 3-19: Existing Land Use by Proposed Project Route Segment	3-69
Table 3-20: Existing Land Use at Proposed Project Nodes.....	3-72
Table 3-21: Parks and Other Public Lands by Proposed Project Route Segment	3-74
Table 3-22: Parks and Other Public Lands at Proposed Project Nodes.....	3-76
Table 3-23: Potential Railroad Crossings by Proposed Project Route Segment	3-83
Table 3-24: Population by County.....	3-84
Table 3-25: Ethnic Characteristics in Northern Missouri.....	3-87
Table 3-26: Income and Employment	3-89
Table 3-27: Superfund Sites Adjacent to Proposed Project Route Segments.....	3-92

Table 3-28: Brownfield/Voluntary Cleanup Program Sites Adjacent to Proposed Project Route Segments and Nodes 3-92

Table 4-1: Noise Ranges of Typical Construction Equipment 4-1

Table 4-2: Typical Outdoor Construction Noise Levels 4-2

Table 4-3: Predicted CO₂ Emissions 4-5

Table 4-4: Nodes and Prime Farmland 4-7

Table 4-5: Invasive plants within the Proposed Project Route Segments 4-15

Table 4-6: Known Occurrences of Threatened and Endangered Species and Sensitive Resources along the Proposed Project Route Segments and within the Vicinity of the Proposed Nodes 4-18

Table 4-7: Roads by Route Segment 4-36

Table 4-8: CAIs in Environmental Justice Counties 4-42

Table 4-9: Summary of Cumulative Impacts Assessment 4-47

Table 5-1: Permits and Approvals Applicable or Potentially Applicable to Proposed Project 5-1

LIST OF FIGURES

<u>Figure No.</u>	<u>Page No.</u>
Figure 1-1: Fiber Network	1-2
Figure 2-1: Typical Node Site Plan.....	2-4
Figure 3-1: Ecoregions	3-9
Figure 3-2: Public Lands	3-78
Figure 3-3: Availability of Broadband Service in Missouri.....	3-82

ACRONYM LIST

ACHP	Advisory Council on Historic Preservation	FIRM	Flood Insurance Rate Map
APE	area of potential effect	FONSI	Finding of No Significant Impact
ARRA	American Recovery and Reinvestment Act of 2009	GHG	greenhouse gas
bgs	below ground surface	GigE	gigabit Ethernet frames per second
BMPs	best management practices	Hz	Hertz
BTOP	Broadband Technology Opportunities Program	Ldn	average sound levels over a 24-hour period
BVCP	Brownfield/Voluntary Clean Up Program	Leq	equivalent continuous sound level
CAI	Community Anchor Institution	LTS	long-term stewardship
CEQ	Council on Environmental Quality	Lx	exceedance sound level
CFR	Code of Federal Regulations	MDC	Missouri Department of Conservation
CO	carbon monoxide	MDNR	Missouri Department of Natural Resources
CO ₂ e	carbon dioxide equivalent	Meg	megabits per second
Dark fiber	an already-installed fiber optic cable that is available for rental or lease by BlueBird	MoDOT	Missouri Department of Transportation
dB	decibel	NAAQS	National Ambient Air Quality Standards
dba	A-weighted decibels	NASA	National Aeronautics and Space Administration
dbh	diameter at breast height	NEPA	National Environmental Policy Act
DOC	Department of Commerce	NHL	National Historic Landmark
EA	environmental assessment	NHPA	National Historic Preservation Act
EMF	electromagnetic field	NOAA	National Oceanic and Atmospheric Administration
EO	Executive Order	NPDES	National Pollutant Discharge Elimination System
EPA	U.S. Environmental Protection Agency	NPS	National Park Service
ESA	Endangered Species Act	NRCS	Natural Resources Conservation Service
FCC	Federal Communications Commission		
FEMA	Federal Emergency Management Agency		
FHWA	Federal Highway Administration		

NRHP	National Register of Historic Places	RFFA	reasonably foreseeable future action
NRI	Nationwide Rivers Inventory	ROI	region of influence
NSBP	National Scenic Byways Program	ROW	right-of-way
NTIA	National Telecommunications and Information Administration	SHPO	State Historic Preservation Office
NWI	National Wetland Inventory	SIP	State Implementation Plan
OSHA	Occupational Safety and Health Administration	SWPPP	Storm Water Pollution Prevention Plan
PA	Programmatic Agreement	TSP	total suspended particulates
PM _{2.5}	particulate matter smaller than 2.5 micrometers in size	USACE	U.S. Army Corps of Engineers
PM ₁₀	particulate matter smaller than 10 micrometers in size	USC	United States Code
PSD	prevention of significant deterioration	USDA	U.S. Department of Agriculture
		USFWS	U.S. Fish and Wildlife Service
		VOC	volatile organic compound
		VoIP	voice-over internet protocol

* * * * *

EXECUTIVE SUMMARY

Agency Proposed Action. The National Telecommunications and Information Administration (NTIA) seeks to expand broadband access to un-served and underserved communities in the U.S. through its Broadband Technology Opportunities Program (BTOP), authorized by the American Recovery and Reinvestment Act of 2009 (ARRA). BlueBird Media LLC (BlueBird) is a public-private partnership established to expand the broadband network to underserved and disadvantaged areas in northern Missouri. In addition, the network would provide broadband to local community anchor institutions (CAIs), including local governments, schools, and hospitals. NTIA has granted \$45.1 million to the BlueBird public-private partnership to expand broadband coverage to CAIs and other organizations serving vulnerable populations such as the low-income and unemployed, and to promote job creation.

BlueBird Proposed Action. To expand broadband access in northern Missouri, BlueBird would construct a buried fiber system. The buried fiber would be placed in existing utility corridors along state highway right-of-way (ROW), allowed through a public-private partnership with the Missouri Department of Transportation (MoDOT). To augment the network, BlueBird would use existing dark fiber, defined as already-installed fiber optic cable that is available for rent or lease. The buried fiber and dark fiber system would connect nodes, which are huts containing electronic equipment needed to regenerate and maintain the broadband signal. BlueBird proposes to construct 38 nodes. The project would directly connect 102 CAIs to the nearest node locations. CAI connections would be either via fiber optic cable or existing community dark fiber. These types of connections would involve installation of a small rack of equipment within the building to serve as the termini for the high-speed data connection.

Purpose and Need. Rural northern Missouri has extensive areas that are un-served or underserved by broadband technology. Broadband is needed for job creation and economic growth and is an essential infrastructure for business, healthcare, education, and government. By increasing broadband coverage in rural northern Missouri, home-based businesses, educational classes, national and international collaboration, and medical treatment would be possible from locations where it was not possible before.

Alternatives. Alternative approaches to expanding broadband include a fully wireless system, an aerial system, or an all-trenched fiber system. A fully wireless system to deliver middle-mile broadband would be limited in the bandwidth that could be provided to end users and would require closely spaced towers (every 25 miles) to achieve acceptable broadband speeds. An aerial system would rely on cable installation on existing utility poles and would be vulnerable to outages during periods of inclement weather. In addition, it would require specially trained workers to maintain connections on power poles

due to the proximity of high voltage wires. An all-trenched fiber system would be the most reliable system, but would be more costly to install to all last-mile users. Because of the limitations of the wireless, aerial, and all-trenched systems, BlueBird's preferred alternative (the proposed Project) is to install trenched fiber where needed and utilize dark fiber where available for lease.

No Action Alternative. If the proposed Project were not built, rural areas would need to find other sources of broadband or would continue to be un-served and underserved by broadband technology.

Environmental Impacts

Construction and operation of the proposed Project would result in impacts to the environment as follows:

Noise. Construction noise would result from equipment use along the fiber segments. There would be no change in the ambient noise post-construction. Emergency generators located at each node would only operate when there is a power outage and during scheduled maintenance. Temporary and infrequent noise associated with these facilities would be similar to traffic noise levels that residents close to highways normally experience.

Air Quality and Greenhouse Gas Emissions. Construction would create dust emissions and equipment would emit combustion byproducts. These effects would be temporary. Regular operation of the proposed Project would not result in air emissions. Emergency generators would operate infrequently and would not be expected to affect air quality. Construction would also generate greenhouse gas emissions from trucks and construction equipment. If construction equipment to be used in the proposed Project operated for one year, it would generate fewer than 25,000 metric tons of carbon dioxide equivalent and would not contribute measurably to global warming impacts.

Geology and Soils. The proposed Project is located in the Dissected Till Plains, which are a formerly glaciated area to the north of the Missouri River; the Osage Plains, which are in western Missouri to the south of the Missouri River; and the Ozark Highlands, which are in eastern and central Missouri to the south of the Missouri River. Because of the generally gentle geology of this area, there would be no increased risk from landslides, mudslides, or earthquake-related shaking due to the proposed Project. In addition, construction would not impact any scenic geological sites. Some route segments in the Dissected Till Plains and Osage Plains tend to cross prime farmland, with more than 50 percent of the route crossing prime farmland in the Canton to Kahoka, Chillicothe to Trenton, and Old Monroe to Troy segments. However, proposed Project construction would be within highway ROW, which has previously been removed from agricultural production. Also, most nodes would be located within the city limits of towns, which have already been previously committed to urban development. Exceptions would

be the nodes in Brookfield, Kirksville, Lexington, Macon, Maryville, Montgomery City, Trenton, and Troy. For compliance with the Farmland Protection Policy Act, Farmland Conversion Impact Rating Forms were completed for the nodes located outside of city limits. In general, because prime farmland is abundant in this region, a one-half acre node site in these locations would take minimal amounts of farmland out of production; alternative sites to avoid farmland impacts were therefore not evaluated.

Water Quality and Floodplains. The proposed Project would cross approximately 500 perennial streams and 425 intermittent streams. Construction across all streams would be by directional boring; as a result, no impacts to these streams are expected. With the required use of best management practices (BMPs) for erosion and sediment control, impacts to water quality would be minor. The route segments would cross approximately 80 miles of 100-year floodplains. These crossings would be adjacent to existing road crossings. Construction away from the utility easements would not be practicable as a longer, more expensive route would not totally avoid floodplains. For compliance with Executive Order 11988 on Floodplain Management, there is no practicable alternative to construction within the 100-year floodplain. To minimize impacts on floodplains, fiber would be installed in the roadway embankment and roadway causeways where allowed by MoDOT. Permits under Section 10 of the Rivers and Harbors Act would be obtained for directional drill crossings of the Big Blue River, Lamine River, and Missouri River.

Wild and Scenic Rivers. Fiber segments would not cross any designated wild and scenic rivers, but would cross four Nationwide Rivers Inventory (NRI) streams: the West Fork of the Cuiivre River in Lincoln County, Locust Creek in Sullivan County, and the North and South Fabius Rivers in Marion County. To minimize impacts, directional boring would be used to cross NRI streams, or fiber would be installed in existing conduit on existing bridges. Under either option, fiber installation would not impact the scenic, recreational, or biological integrity of the NRI stream segments.

Vegetation and Wildlife. The proposed project would cross the Ozark Highlands, Central Irregular Plains, Western Corn Belt Plains, and Interior River Valleys and Hills ecoregions. Because the proposed Project would be constructed at node sites in towns and within existing utility corridors adjacent to highway ROWs, route segment construction would not require clearing of forest vegetation. However, there will be herbaceous and shrubby communities of various stages of succession along ROW corridors. Construction of the proposed nodes would mostly involve mowed grass sites or impervious sites and not impact any previously undisturbed native plant communities. Impacts to common wildlife species using disturbed plant communities along the roadway are expected to be minor and temporary in nature.

Endangered and Threatened Species. In route segments where rare aquatic species are present, construction would be accomplished by directional drilling or by installation in existing conduit on existing bridges. In habitats where Indiana and gray bats are present, trees greater than 12 inches in diameter at breast height (dbh) would be removed only between November and March to avoid disturbance of bat habitat. Disturbed areas would be replanted with native grasses and forbs to avoid propagating invasive species. With the implementation of these measures, there would be no effects to endangered and threatened species.

Wetlands. With the exception of the Old Monroe to St. Louis route segment, which would cross 14 acres of wetlands, all route segments would cross fewer than three acres of wetlands. Because construction would occur within a 15-foot utility corridor, the cumulative temporary impacts to wetlands for the entire project would be fewer than 30 acres. All wetlands would be crossed by directional drill. However, coordination would occur with the USACE prior to each segment construction to verify that Section 404 permits were not needed. Any wetland crossings would be expected to qualify for Nationwide Permit 12, Utility Crossings. Construction of route segments would not create permanent impacts to wetlands, and wetland mitigation is not expected to be required by permitting agencies. To minimize impacts to wetlands, proposed Project construction would use directional drilling, would install fiber in the roadway embankment and roadway causeways across wetlands where allowed by MoDOT, or would install fiber in existing conduit on existing bridges. BMPs would be implemented to avoid sedimentation from upland construction areas. Alternative construction of the fiber segments away from the utility easements would not be practicable as it would be a longer, more expensive route, would require the acquisition of new easements, and would not avoid crossing of wetlands. Thus, in compliance with Executive Order (EO) 11990 on Protection of Wetlands, there is no practicable alternative to construction of the fiber segments in wetland areas adjacent to the roadsides.

Cultural Resources. Four National Historic Landmarks (NHLs), 41 historic districts, and ten other properties listed on the National Register of Historic Places (NRHP) are adjacent to the fiber routes. A total of 237 previously recorded archaeological sites are also adjacent to the fiber routes. Route segments with a large number of archaeological sites include Albany to Maryville, Boonville to Middleton, Canton to Kahoka, Ellisville to Washington, Marshall to Waverly, and Old Monroe to St. Louis. Because installation would occur in existing utility corridors and in highway rights of way which are generally not included in the site boundaries, impacts to these historic properties are not expected to occur. For archaeological sites in the road ROW, impacts would be avoided by moving to the other side of the road, by directional drilling under the archaeological deposits, or by aerial installation if other avoidance is not possible.

Visual Impacts. Hut construction at 35 nodes would result in potential visual impacts. All parks located near the nodes are city parks that are already subject to visual intrusions from urban development. There are no state parks or federal lands potentially affected by node locations. Thus, the proposed Project would not be expected to result in substantial visual impacts.

Land Use. The project would not change land use or conflict with existing land uses. Fiber construction would intersect the Katy Trail State Park at five locations. To minimize impacts, fiber installation at these locations would be by directional drill or installation in existing conduit on existing bridges. A MoDOT Permit for Work on Right-of-Way would be obtained prior to construction of each fiber segment. No other permits are needed to cross federal or state lands. An Underground Wireline Crossing permit will be obtained from six railroads crossed by the fiber installation routes.

Health and Safety. Fiber routes would pass near one active superfund site and several brownfield sites. These are primarily in the Kansas City and St. Louis areas. Consultation with MoDOT prior to construction in highway ROWs in these areas would ensure that pre-existing contamination would not be disturbed. A Health and Safety Plan would establish minimum distances from residences and buildings for construction, as well as requirements for fencing to limit public access. The project would adhere to all OSHA health and safety requirements for construction and MoDOT traffic control requirements for construction.

Infrastructure. The proposed Project is designed to enhance middle-mile and last-mile broadband infrastructure in Missouri. It is anticipated that the existing roadways could adequately handle the construction traffic and operational maintenance traffic because the roads are high-capacity state highways. Minor amounts of commercial electricity would be needed for equipment shelters at the nodes, and a propane generator and fuel tank would be installed to provide backup power. The proposed Project would have minor and insignificant impacts on existing highway and electrical infrastructure.

Socioeconomics and Environmental Justice. From a socioeconomic standpoint, providing increased broadband access would be expected to benefit educational, healthcare, and governmental facilities. Minority and low-income communities would benefit from the expansion of broadband access. The project would connect with CAIs in counties with environmental justice populations, including Adair, Jackson, St. Louis City, and St. Louis County.

* * * * *