

ACKNOWLEDGEMENTS

The successful completion of the Boone County Transportation Study was possible because of the commitment, dedication and collaboration of many people. On behalf of the entire Project Management Team, Balke American wishes to express our sincere appreciation and gratitude to all who participated in the study.

Project Leadership

Ohio-Kentucky-Indiana Regional Council of Governments
William F. Miller, Project Manager
Karen Whitaker, Project Administrator

Consultant

Balke American, a Division of American Consulting Engineers, PLC
F. Thomas Creasey, P.E., Project Manager
Craig A. Kowalski, AICP, Deputy Project Manager
Valerie Robbins, Transportation Planner
Pallab Ghosh Choudhuri, GIS Mapping
Chris Young, Environmental Scientist

Project Sponsors

Boone County Fiscal Court
Hon. Gary W. Moore, Judge/Executive

Ohio-Kentucky-Indiana Regional Council of Governments
Mark R. Policinski, Executive Director

Kentucky Transportation Cabinet
Bill Nighbert, Acting Secretary

Boone County Transportation Plan

PROJECT MANAGEMENT TEAM

Hon. Gary W. Moore, Boone County Judge/Executive

James E. Parsons, County Administrator

Kevin P. Costello, AICP, Executive Director, Boone County Planning Commission

Greg Sketch, P.E., Boone County Engineer

Shawn Cox, Boone County Community Development Director

David Geohegan, AICP, Director, Planning Services Division, Boone County Planning Commission

Carol Callan-Ramler, Kentucky Transportation Cabinet, District 6

James Brannon, Kentucky Transportation Cabinet, District 6

Amy Thomas, Kentucky Transportation Cabinet, Division of Planning

William F. Miller, Project Manager, Ohio-Kentucky-Indiana Regional Council of Governments

Mark R. Policinski, Executive Director, Ohio-Kentucky-Indiana Regional Council of Governments

Boone County Transportation Plan

STAKEHOLDERS

Boone County Judge Executive Gary Moore
Airport Area Industrial Association – Jeffrey Bender
Bawac, Inc. Community Rehabilitation Center – Ken Schmidt
Boone County Businessmen – Pete Michels
Boone County Commissioner – Charles Kenner
Boone County Commissioner – Terri Moore
Boone County Commissioner – Cathy H. Flaig
Boone County Emergency Management – Dan Maher
Boone County Fiscal Court – Jim Parsons
Boone County Planning Commission – Kevin Costello
Boone County Planning Commission – Arnold Caddell
Boone County PSCC – Mike Stern
Boone County Public Works – Greg Sketch
Boone County Schools – Randy Poe
Boone County Sheriff’s Department – Michael Helmig
Cincinnati Bell – Mark Romito
Cincinnati/Northern Kentucky International Airport – William Martin
Cinergy – Tom Birkenhauer
Citizen Representative – Phyllis Sparks
Citizen Representative – Ruth Ella Girvin
Citizen Representative – Mary Shinkle
Citizen Representative – Durran Alexander
City of Florence – Patricia Wingo
City of Union – Mayor Don Kirby
City of Walton – Mayor Philip Trzop
Cycling Group – Steve Wilmhoff
Fire Chiefs Association – Shaun Klaserner
Home Builders Association of Northern Kentucky – Mike Kegley
Kentucky Transportation Cabinet – Jim Brannon, Carol Callan-Ramler, Amy Thomas
Northern Kentucky Area Development District – Casey Grady
Northern Kentucky Chamber of Commerce – Steve Stevens
Northern Kentucky Tri-Ed – Danny G. Fore
Owen Electric Cooperative – Chuck Gill
Sierra Club – Daniel Mathew
State Representative – Addia Wuchner
State Representative – Paul H. Marcotte
State Senator – Richard L. Roeding
Transit Authority of Northern Kentucky (TANK) – Andrew Aiello
Walton-Verona Board of Education – Janis Tomlinson

TABLE OF CONTENTS

	<u>Page</u>
Executive Summary	viii
Chapter 1. Key Issues and Project Goals	
KEY ISSUES	1-1
Growth.....	1-1
Development	1-1
Land Use/Transportation System Compatibility	1-2
Airport	1-5
Environmental Resources	1-6
Financing.....	1-6
Ownership of Roads.....	1-6
Alternative Transportation Modes.....	1-6
PROJECT GOALS.....	1-7
Chapter 2. Existing Conditions	
CHALLENGES	2-1
ROADWAY NETWORK.....	2-1
Roadway Pattern.....	2-1
Study Area Network	2-3
Functional Classification	2-3
TRAFFIC CONDITIONS.....	2-7
Daily Traffic Volumes	2-7
Level of Service	2-7
CRASH ANALYSIS	2-9
PLANNED IMPROVEMENTS.....	2-19
PROBLEM LOCATIONS	2-19
TRANSIT	2-22
BICYCLE AND PEDESTRIAN FACILITIES	2-22
Chapter 3. Future Conditions	
OBJECTIVE.....	3-1
COMMITTED IMPROVEMENTS.....	3-1
OKI/MVRPC REGIONAL TRAVEL DEMAND MODEL.....	3-3
SOCIOECONOMIC DATA.....	3-3
YEAR 2030 TRAFFIC FORECASTS AND LEVELS OF SERVICE	3-9
HIGHWAY DEFICIENCIES AND NEEDS	3-16
Chapter 4. Environmental Constraints	
METHODS USED TO IDENTIFY ENVIRONMENTAL CONSTRAINTS.....	4-1
DESCRIPTION OF SIGNIFICANT ENVIRONMENTAL FEATURES	4-2
Streams.....	4-2
National Wetland Inventory (NWI) Mapped Wetlands	4-2
Federal and State Threatened and Endangered Species	4-10
Wells and Springs	4-13
FEMA Mapped 100-Year Floodplains.....	4-13
Cultural and Historic Resources.....	4-17
REFERENCES.....	4-24

Boone County Transportation Plan

Chapter 5. Operational Improvement Plan

IDENTIFICATION OF PROBLEM LOCATIONS	5-1
RECOMMENDED OPERATIONAL IMPROVEMENT PLAN PROJECTS.....	5-3
PRIORITIZATION	5-3
COST INFLATION.....	5-3

Chapter 6. Recommended Long-Range Transportation Improvements

OBJECTIVES.....	6-1
RECOMMENDED HIGHWAY IMPROVEMENTS.....	6-1
YEAR 2030 TRAFFIC VOLUMES AND LEVELS OF SERVICE.....	6-9
PROJECT COST ESTIMATES	6-11
PRIORITIES.....	6-19
STUDIES.....	6-19
KY 18 Access Management Study.....	6-19
US 42 Corridor Study	6-21
South Dixie Highway Small Area Plan.....	6-21
CONNECTORS.....	6-21
TRANSIT	6-23
BICYCLE AND PEDESTRIAN FACILITIES	6-26
Florence Sidewalk Projects	6-26
Florence Bike Projects.....	6-26
Intersection Projects	6-27
Union, Walton and Unincorporated Areas	6-27
Funding for Pedestrian and Bike Projects.....	6-27
IMPLEMENTATION	6-30

Chapter 7. Financial Assessment

OBJECTIVE.....	7-1
FUNDING PROGRAMS	7-1
HISTORICAL TRENDS.....	7-1
REVENUE PROJECTIONS.....	7-2
FUNDING COMMITMENTS.....	7-4
OPTIONS FOR NEW FUNDS.....	7-5
Tax Increment Financing.....	7-5
Local Option Motor Vehicle Fuel Tax	7-6
Local Option Sales Tax	7-6
Local Occupational Payroll Tax.....	7-6
Development Impact Fees.....	7-6
Accommodations Tax	7-6
Utility Fees.....	7-7
Parking Fees.....	7-7
Vehicle Registration Fees.....	7-7
Public-Private Partnerships.....	7-7

Boone County Transportation Plan

List of Exhibits

	<u>Page</u>
Exhibit 1-1. Boone County Population Growth.....	1-1
Exhibit 1-2. 1999 Land Use Plan.....	1-3
Exhibit 1-3. 2025 Land Use Plan.....	1-4
Exhibit 1-4. Land Use Comparison	1-5
Exhibit 1-5. Functional Street Hierarchy.....	1-5
Exhibit 1-6. Airport Runway Expansion.....	1-6
Exhibit 2-1. Boone County Highway Network.....	2-2
Exhibit 2-2. Study Area Highway Network	2-4
Exhibit 2-3. Mobility vs. Access	2-5
Exhibit 2-4. Functional Classification System	2-6
Exhibit 2-5. Existing Levels of Service.....	2-8
Exhibit 2-6. Existing Level of Service Analysis – Interstates.....	2-10
Exhibit 2-7. Existing Level of Service Analysis – Arterials	2-11
Exhibit 2-8. Existing Level of Service Analysis - Two-Lane Highways	2-12
Exhibit 2-9. Fatal Crash Locations (2001 - 2003)	2-15
Exhibit 2-10. Roadway Sections with Crash Rate Greater Than Critical Crash Rate.....	2-16
Exhibit 2-11. Intersections/Spots with Crash Rate Greater Than Critical Crash Rate.....	2-17
Exhibit 2-12. All Locations with Crash Rate Greater Than Critical Crash Rate.....	2-18
Exhibit 2-13. Problem Locations Not Addressed by Six Year Plan Projects	2-22
Exhibit 2-14. Problem Locations Map	2-23
Exhibit 2-15. Current TANK Routes	2-25
Exhibit 2-16. Current TANK Routes Versus Population Density by TAZ	2-26
Exhibit 2-17. Current TANK Routes Versus Employment Density by TAZ.....	2-27
Exhibit 2-18. Proposed Bicycle Corridors - 1996 Boone County Transportation Plan.....	2-28
Exhibit 2-19. Proposed Bicycle Project Lists - 1996 Boone County Transportation Plan.....	2-29
Exhibit 2-20. Proposed Pedestrian/Bicycle System for Florence - 1996 Boone County Transportation Plan.....	2-30
Exhibit 2-21. Bicycle/Pedestrian Facilities and Recommendations – Northeast Boone County Transportation Plan.....	2-31
Exhibit 3-1. Boone County Six Year Plan Projects	3-2
Exhibit 3-2. Boone County Traffic Analysis Zones (TAZ's)	3-4
Exhibit 3-3. Boone County Socioeconomic Data by Traffic Analysis Zone.....	3-6
Exhibit 3-4. Population Growth 2000 – 2030.....	3-7
Exhibit 3-5. Employment Growth 2000 – 2030	3-8
Exhibit 3-6. Summary Map - Year 2030 Projected Daily Traffic Volumes and Levels of Service..	3-10
Exhibit 3-7. Year 2030 Projected Daily Traffic Volumes and Levels of Service – Interstates.....	3-11
Exhibit 3-8. Year 2030 Projected Daily Traffic Volumes and Levels of Service – Arterials.....	3-12
Exhibit 3-9. Year 2030 Projected Daily Traffic Volumes and Levels of Service – Two-Lane Highways.....	3-13
Exhibit 4-1. Streams and FEMA 100-Year Floodplain.....	4-3
Exhibit 4-2. Summary of USGS Blueline Streams and Lakes Occurring in Boone County, Use Designations Support and KDOW Monitoring.....	4-4
Exhibit 4-3. Satellite-Mapped Wetlands	4-8
Exhibit 4-4. Summary of National Wetland Inventory-Mapped Wetland Features in Boone County	4-9

Boone County Transportation Plan

Exhibit 4-5. Confirmed Threatened and Endangered Species Occurrences	4-11
Exhibit 4-6. Summary of Threatened and Endangered Species Occurrences in Boone County ...	4-12
Exhibit 4-7. Drinking Water, Industrial and Monitoring Wells, Springs, and Karst Potential Areas	4-14
Exhibit 4-8. Summary of Water Well Information in Boone County	4-15
Exhibit 4-9. Summary of FEMA 100-Year Floodplain Information for Boone County	4-16
Exhibit 4-10. National Register of Historic Places in Boone County.....	4-18
Exhibit 4-11. Summary of Information for National Register of Historic Places (NRHP) Properties in Boone County	4-19
Exhibit 4-12. Parks, Preserves, Natural Areas, Farms Woodlands and Other Cultural Resources.	4-23
Exhibit 4-13. Summary of Environmental Resources in Boone County	4-25
Exhibit 5-1. Problem Location Identification Form	5-2
Exhibit 5-2. Operational Improvement Plan Project Locations.....	5-4
Exhibit 5-3. Operational Improvement Plan Project List	5-5
Exhibit 5-4. Prioritization of Operational Improvement Plan Projects	5-17
Exhibit 5-5. Operational Improvement Plan Project Summaries Indexed for Inflation	5-17
Exhibit 6-1. Recommended Long-Range Highway Projects.....	6-2
Exhibit 6-2. Mall Road Extension	6-3
Exhibit 6-3. I-71/75-US 42 Interchange	6-3
Exhibit 6-4. I-71/75-Turfway Road: Alternative A	6-4
Exhibit 6-5. I-71/75-Turfway Road: Alternative B	6-4
Exhibit 6-6. I-71/75-Turfway Road: Alternative C	6-5
Exhibit 6-7. Year 2030 Traffic Volumes and Levels of Service - Recommended Transportation Plan Network.....	6-10
Exhibit 6-8. Year 2030 Recommended Transportation Plan Levels of Service – Interstates	6-12
Exhibit 6-9. Year 2030 Recommended Transportation Plan Levels of Service – Arterials.....	6-13
Exhibit 6-10. Year 2030 Recommended Transportation Plan Levels of Service – Two-Lane State Routes.....	6-14
Exhibit 6-11. Year 2030 Recommended Transportation Plan Levels of Service – Two-Lane Local Routes.....	6-17
Exhibit 6-12. Recommended Transportation Plan Project Cost Estimates.....	6-18
Exhibit 6-13. Recommended Transportation Plan Project Prioritization	6-20
Exhibit 6-14. Connector Streets and Roads.....	6-22
Exhibit 6-15. Current TANK Routes Versus Projected Year 2030 Population Density.....	6-24
Exhibit 6-16. Current TANK Routes Versus Projected Year 2030 Employment Density	6-25
Exhibit 6-17. Recommended Projects, 2002 Florence Pedestrian & Bike Plan.....	6-28
Exhibit 6-18. Multi-Use Trail Network	6-29
Exhibit 7-1. Historical Kentucky Transportation Cabinet Expenditures in Boone County	7-2
Exhibit 7-2. Combined Federal and State Highway Construction Expenditures in Boone County – FY 1995 to 2004.....	7-3
Exhibit 7-3. Federal Highway Construction Expenditures in Boone County – FY 1995 to 2004....	7-3
Exhibit 7-4. Federal Highway Construction Expenditures in Boone County – FY 1995 to 2004....	7-3
Exhibit 7-5. Kentucky Six Year Plan Projects in Boone County.....	7-4
Exhibit 7-6. Long Range Transportation Plan Project Costs Indexed for Inflation	7-5

EXECUTIVE SUMMARY

The Boone County Transportation Study was performed for the purpose of developing a new, county-wide transportation plan. The study updated the original transportation plan that was prepared in 1996.

Several key issues were identified at the onset of the study to be addressed in the plan development. These included:

- Growth
- Development
- Land Use/Transportation System Compatibility
- Cincinnati/Northern Kentucky International Airport
- Environmental Resources
- Financing
- Ownership of Roads
- Alternative Transportation Modes

Four goals were developed to provide guidance for the study. These were:

1. Develop a transportation system plan in anticipation of and compatible with future land use changes.
2. Enhance/improve the existing transportation system through safety and operational improvements.
3. Identify financial shortfalls and implications and develop strategies to address these shortfalls.
4. Recommend changes to policies, regulations and ordinances that will better enable the County to respond to and facilitate proposed or anticipated development. These will be detailed strategies with specific steps and responsibilities.

An Existing Conditions Assessment was performed to provide a “snapshot” of the current state of the transportation system in Boone County. Based on roadway characteristics and daily traffic volumes, levels of service were determined for all roads in the study area network to provide a measure of traffic conditions. Those roads operating near or over capacity on a recurring basis were identified. Vehicle crash data for the three-year period from January 1, 2001 through December 31, 2003 were analyzed to identify those locations where safety problems currently exist.

A Future Conditions Assessment also was performed. The objective was to portray a “snapshot” of typical daily traffic conditions for the year 2030. It was assumed that only those Boone County projects included in the current version of the Kentucky Six-Year Highway Plan will be constructed by the year 2030. From this snapshot, future highway system deficiencies were identified.

An inventory of important environmental features and resources in Boone County was conducted. The information was obtained through research of secondary source materials and was compiled in a geographic information system (GIS) format. This baseline information will be vital to planners, public agencies, and local officials involved in addressing the County’s transportation issues.

The Boone County Transportation Plan was developed to include the following elements:

- Operational Improvement Plan
- Recommended Long-Range Transportation Improvements
- Recommended Studies
- Connectors
- Transit Recommendations
- Bicycle and Pedestrian Facilities

Boone County Transportation Plan

The Operational Improvement Plan comprises the short-term component of the Boone County Transportation Plan. Its objective is to provide relatively low-cost, easily implemented solutions at locations identified as having traffic congestion and/or safety problems. Twenty-one projects totaling nearly \$2 million are recommended.

Long-range transportation improvements were developed with two key objectives in mind:

1. Improve mobility within the county, particularly north-south mobility within the central part of the county and east-west mobility between Boone County and the north-south corridor to the east, which includes I-71/75 and US 25 Dixie Highway; and
2. Provide a plan that is complimentary to the County's Comprehensive Plan and includes projects that will accommodate the travel demand anticipated from future land use as it is presented in the Comprehensive Plan.

A total of 29 projects are contained in the recommended long-range plan. Highlights include:

- Four recommendations carried forward from the North South Transportation Initiative (NSTI), a comprehensive, multimodal study of the I-75 corridor, conducted by the Ohio-Kentucky-Indiana (OKI) Regional Council of Governments and completed in 2004;
- Eight new roads and/or interchange facilities; and
- Improvements to 15 existing roads.

Including design, construction, utility relocation, and right-of-way acquisition, projects in the Plan are estimated to total \$338

million in present day dollars. Projects were prioritized according to their relative urgency, cost, relation to other projects, and overall importance to improving safety and mobility. Projects were prioritized according to three categories:

- High Priority – Completed within 10 years
- Medium Priority – Completed in 11 to 20 years
- Low Priority – Completed in more than 20 years

Three additional studies are recommended to more thoroughly examine areas of the system where the scope of this study was insufficient. Those studies are:

- KY 18 Access Management Study
- US 42 Corridor Study
- South Dixie Highway Small Area Plan

The Connectors element of the Plan was developed to improve interconnectivity among individual neighborhoods and developments and to complete the functional hierarchy of the Boone County road network. Unlike the other elements, the Connectors element is dynamic in that it will change as desired projects are built and new projects are identified. By association, the Connectors element is incorporated into this plan. The actual list of proposed connector roads will be maintained by Boone County and the County should be consulted for specific details.

Recommendations for transit service and bicycle and pedestrian facilities are provided in the Plan. These are based primarily on existing information that has been compiled and coordinated with the development of the Plan.

Boone County Transportation Plan

Recommendations for Plan implementation are provided, including actions at the County Planning Commission, County Fiscal Court, and MPO levels.

A financial assessment was performed which demonstrated the current and anticipated financial resources and evaluated their capacity to address projected transportation deficiencies/needs through the year 2030. When recommended Transportation Plan projects are indexed for inflation, it is estimated that there will be a \$79 million - \$239 million funding shortfall that would be needed to implement the Plan in its entirety. This does not include funds that will be needed for additional projects that would be identified in the recommended studies.

Several options were identified that are candidates for generating additional transportation infrastructure funds. Some of these would require legislative action by the Kentucky General Assembly. Suggested options to investigate are:

- Tax Increment Financing
- Local Option Motor Vehicle Fuel Tax
- Local Option Sales Tax
- Local Occupational Payroll Tax
- Development Impact Fees
- Accommodations Tax
- Utilities Fees
- Parking Fees
- Vehicle Registration Fees
- Public-Private Partnerships