# Monroe County, Indiana Thoroughfare Plan

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## Introduction

The purpose of this thoroughfare plan is to document the planned roadway thoroughfares of the County. Typical components of a thoroughfare plan include a functional classification map of existing and future thoroughfares as well as typical cross-sections of each functional classification which show the anticipated right-of-way needs. A thoroughfare plan is an optional subset of a municipality's comprehensive plan. Comprehensive plans establish the vision and policy guidelines for the growth and land use of a municipality for a twenty (20) year period. The report titled "Monroe County: Street and Road Management System, Thoroughfare Plan, and Capital Improvement Program" dated December 1995 contains the County's current thoroughfare plan<sup>1</sup>. The County's current comprehensive plan<sup>2</sup> was adopted February 14<sup>th</sup>, 2012. This report will provide an update to the County's thoroughfare plan to correspond with the updated vision and policy guidelines of the County.

## **Statutory Requirements**

The 500 series of the Indiana Code (IC) 36-7-4 provides the requirements and guidelines of a municipality's comprehensive plan. Section 506 of the Indiana Code (IC 36-7-4-506) lists the specific requirements and guidelines of thoroughfare plans. The following provides a brief summary of IC-36-7-4-506:

- A thoroughfare plan may determine lines for new, extended, widened, or narrowed public ways (thoroughfares) within the municipality.
- The thoroughfare plan does not constitute the opening, establishment, or acceptance of public land for purposes of the thoroughfares.
- Once established, thoroughfares may be located, changed, widened, straightened, or vacated only in the manner indicated by the comprehensive plan and thoroughfare plan.
- The plan commission may recommend the order in which thoroughfare improvements should be made.



## **Primary Components of a Thoroughfare Plan**

The previously discussed Indiana Code lists the specific requirements and guidelines of thoroughfare plans. A thoroughfare plan for a municipality should consist of the following components at a minimum to adhere to the Indiana Code requirements:

- Component #1: A functional classification map of existing and future thoroughfares.
- Component #2: Typical cross-sections for arterials, collectors, and local roads which show the anticipated right-of-way needed for these functional classifications.

The two (2) components listed above meet the requirements of the Indiana Code by documenting the planned thoroughfares of the municipality. However, additional components can be included within a thoroughfare plan if they further advance the vision and goals of the municipality.

## **Primary Component #1: Functional Classification Map**

A functional classification map is a planning document which defines the general hierarchy of the roadway network. Each roadway within the network is categorized into the following five (5) general functional classifications:

- Interstate A roadway with high-speed, free-flow traffic movements for which access is only allowed via a grade-separated interchange.
- **Freeway** A roadway with high-speed traffic movements for which access is provided either through at-grade intersections or grade-separated interchanges.
- Arterial The main function of an arterial is to facilitate the through movement of traffic. Access to an arterial should ideally be limited to public roads as opposed to access driveways.
- **Collector** A collector roadway provides a variable mix of functionality for both through traffic movement and driveway access.
- Local A local road's main function is to provide driveway access.

A roadway classification can be designated as either major or minor (primary or secondary) to further clarify its main function of either facilitating through traffic or providing access.



**Figure 1A** through **Figure 1E** in Appendix A shows the County's updated functional classification map. The map was updated based on the following information:

- A recent update<sup>3</sup> to the functional classification map submitted to INDOT for purposes of the Federal Highway Administration (FHWA) functional classification database.
- Future thoroughfare extensions (Tapp Road, Fullerton Pike, and Kirby Road) as shown in the MPO's 2035 Long Range Transportation Plan<sup>4</sup>.
- Thoroughfares planned for construction within the near future (Hartstrait Road / Daniels Way and Industrial Park Drive extension).

## **Primary Component #2: Typical Cross-Sections**

Typical cross-sections for the arterial, collector, and local road functional classifications were updated for this thoroughfare plan to document the necessary right-of-way. The updated cross-sections take into account the needs of vehicular traffic as well as the needs of pedestrian / bicycle traffic. The following figures in Appendix A provide the typical cross-sections:

- Figure 2A Arterials (Divided & Undivided)
- Figure 2B Collectors (Divided & Undivided)
- Figure 2C Local Roads (Urban & Rural)

The figures above illustrate the cross-sectional elements and typical dimensions that meet the needs of each travel mode for each functional classification. Arterials typically require four (4) travel lanes to meet the needs of vehicular traffic. However, pedestrian and bicycle needs can still be accomplished via sidewalk, multi-use paths, and a five (5) foot landscaping buffer. Arterials may also be able to provide additional pedestrian and bicycle amenities such as wider landscaping buffers. Collectors and local roads require only two (2) travel lanes to meet the needs of vehicular traffic which reduces the necessary right-of-way width.

These typical cross-sections have been updated from the County's previous thoroughfare plan to incorporate the design practices of "complete streets". Complete streets is a general term used to describe current roadway design practices that place more focus on pedestrian and bicycle needs. Examples of this include the addition of sidewalk, bike lanes, and/or multi-use paths for all roadway functional classifications, not just for local residential streets. An



increased landscaping buffer between sidewalks or multi-use paths is another example of a complete streets design. The typical dimensions for the cross-sectional elements for each of the functional classifications were determined from multiple sources such as complete street guidelines, roadway design standards, and the Manual for Construction Within and Adjacent to Monroe County Right-Of-Way.

## Additional Components for County's Thoroughfare Plan

The functional classification map and typical cross-sections previously discussed provide the primary components of a thoroughfare plan by documenting the planned thoroughfares of the County. The following additional components have been included within this report to provide additional assistance for the thoroughfare planning process:

- Future Roadway Projects
- Major Intersections Map
- Existing All-Way Stop Locations
- Traffic Signal Implementation Guidelines
- Roundabout Implementation Guidelines
- Congestion Map

## **Future Roadway Projects**

**Figure 1A** through **Figure 1E** in Appendix A shows the functional classification map of the County's roadways, including future roadway projects. The figures show other planned roadway improvements for existing roadways. Table 1 on the following page lists each of the future roadway projects.



## Table 1 - Future Roadway Projects

Roadway	APPROXIMATE LIMITS	<b>P</b> ROJECT TYPE	ESTIMATED YEAR OF CONSTRUCTION
Sample Road	East of I-69 to Old SR 37	Roadway reconstruction	2019
Simpson Chapel Road	Bottom Rd to West of I-69	Roadway reconstruction	2020
Hartstrait Road & Daniels Way	Hartstrait Rd, Daniels Way, & Wellness Way	Extension	2018
Industrial Park Drive / Profile Parkway	Industrial Park Dr to Profile Pkwy	Extension	2021
Kirby Road	Airport Rd to SR 45	Extension	No date set
Airport Road	SR 45 to Curry Pike	Extension	No date set
Fullerton Pike	Rockport Rd to Gordon Pike	Extension	2025
Church & Rogers		Intersection realignment	No date set
Hunter Valley Road	Arlington Rd to SR 46	Extension	No date set

## **Major Intersections Map**

**Figure 3** in Appendix A shows the existing all-way stops, traffic signals, and roundabouts within the County. The map also shows traffic signals and roundabouts that are planned for the near future. The purpose of this map is to show the location of major intersections. The location of planned traffic signals or roundabouts were based on the following information:

- Construction projects listed in the MPO's 2016-2019 Transportation Improvement Program<sup>5</sup>.
- Discussions with the County engineering department.

The following pages provide additional discussion for the major intersections such as tables listing each of the intersection types and implementation guidelines to help decide when to upgrade an intersection to a traffic signal or roundabout.



## **Existing All-Way Stop Locations**

**Figure 3** in Appendix A and the table below shows the County's existing all-way stop locations. The existing all-way stop locations (or other stop sign locations) may be upgraded in the future to either a traffic signal or roundabout when needed to improve traffic safety and traffic capacity. The timeframe for when a stop sign is upgraded should be determined on a case-by-case basis using implementation guidelines as discussed on the following pages. However, a preliminary assessment was made for purposes of this thoroughfare plan by estimating how close the intersection is to warranting a traffic signal (or roundabout) based on the average daily traffic (ADT) counts of the intersecting roadways. The results of the preliminary warrant assessment are listed in the table below while the detailed calculations are located in Appendix B.

INTERSECTION	% OF ADT Warrant Met For Traffic Signal	YEAR OF ADT COUNTS	Notes
Maple Grove Rd West & Union Valley Rd	30%	2006	
Maple Grove Rd West & Maple Grove Rd North	15%	2006	
Lentz Rd & Earl Young Rd	Unknown		Limited sight distance
Reeves Rd & Louden Rd	40%	2006	
Hartstrait Rd & Vernal Pike	40%	2006	
Profile Pkwy & Zenith Dr	Unknown		
Kirby Rd & Airport Rd	60%	2004	
Rogers Rd & Snoddy Rd	40%	2002	
Elwren Rd & Elwren Run Around	Unknown		Limited sight distance
W Leonard Springs Rd & Wilson Rd	15%	2004	
Gordon Pike & Bachelor Middle School Driveway	40%	2006	
Rhorer Rd & Snoddy Rd	70%	2009	
That Rd & Victor Pike / Eagleview Dr	40%	2009	
Swartz Ridge Rd & Moores Creek Rd	10%	2009	
Strain Ridge Rd & Smithville Rd	30%	2005	
Rogers St & Gordon Pike	> 100%	2009	Planned roundabout 2020
Walnut St Pike & Rhorer Rd	> 100%	2008	Traffic signal 2018
S Leonard Springs Rd & Fullerton Pike	> 100%	2006	
Hedrick Rd & Foster Fiscus Rd	Unknown		Limited sight distance

## Table 2 - Existing All-Way Stop Locations



## **Traffic Signal Implementation Guidelines**

The Indiana Manual on Uniform Traffic Control Devices (Indiana MUTCD)<sup>6</sup> provides standards and guidelines for the design and implementation of traffic control devices such as signs, pavement markings, and traffic signals. Chapter Eight (8) of the Indiana MUTCD states that an engineering study shall be performed to determine whether a traffic signal is warranted at a particular intersection in order to improve traffic safety and traffic capacity. This engineering study is often referred to as a Traffic Signal Warrant Analysis and considers several warrant criteria such as traffic volumes (both vehicles and pedestrians), crash history data, and location specific details (intersection sight distance, distance to nearby intersections, etc.)

**Figure 3** in Appendix A shows the traffic signals within the study area. The following table lists the existing and planned traffic signals that are under the jurisdiction of the County.

INTERSECTION	Notes	ESTIMATED YEAR OF CONSTRUCTION
Curry Pike & Woodyard Rd	Planned conversion to roundabout	
Curry Pike & Vernal Pike	Existing w/ flashing yellow arrow	
Curry Pike & Profile Pkwy	Existing	
Curry Pike & Jonathan Dr	Existing	
Curry Pike & Gifford Rd	Existing	
Walnut St & Rhorer Rd	Existing - Upgrade to flashing yellow arrow - City owned	2018
Old SR 37 & Fairfax Rd	Existing	
Walnut St Pike & Rhorer Rd	Planned conversion from all-way stop	2018
Liberty Dr & Baxter	Existing	

## Table 3 - Traffic Signal Locations & Future Projects



## **Roundabout Implementation Guidelines**

#### INTRODUCTION

The Indiana MUTCD provides standards and guidelines for the design of signage and pavement markings at roundabouts, but does not provide a set of warrant criteria for implementation as it does for traffic signals. However, the traffic signal warrant criteria (e.g. traffic volumes, crash history, etc.) from the Indiana MUTCD can be used as guidance to determine when a roundabout should be considered at an intersection to improve traffic safety and traffic capacity. There are several other industry resources which document the benefits, costs, and decision making criteria for roundabouts. The following pages provide a brief set of roundabout implementation guidelines as obtained from these industry standard resources:

- Indiana MUTCD
- FHWA's Roundabouts: An Information Guide, 2<sup>nd</sup> Edition (NCHRP Report 672)<sup>7</sup>.
- Ch. 51-12 from the INDOT Design Manual<sup>8</sup>
- Indiana LTAP Roundabout Maintenance Manual<sup>9</sup>

**Figure 3** in Appendix A shows the roundabouts within the study area. The following table lists the existing and planned roundabouts that are under the jurisdiction of the County.

INTERSECTION	Notes	ESTIMATED YEAR OF CONSTRUCTION
Tapp Rd & Adams St	Existing - City owned	
Sare Rd & Rogers Rd	Existing - City owned	
Curry Pike & Woodyard Rd	Planned conversion from signal	2021
Leonard Springs & Fullerton Pike	Planned	No date set
Fullerton Pike & Rockport Rd	Planned	2025
Gordon Pike & Rogers St	In design	2020
Rhorer Rd & Sare Rd	Planned	No date set

## Table 4 - Roundabout Locations & Future Projects



#### TRAFFIC SAFETY & TRAFFIC CAPACITY

In the past, the general question often was asked "why a roundabout?" In other words, why implement a roundabout at this particular intersection as opposed to a traffic signal? However, the current question that has been asked for the past couple of decades is "why <u>not</u> a roundabout?" as roundabouts typically provide greater traffic safety and traffic capacity benefits than a traffic signal. The FHWA roundabout guide provides the following discussion concerning the safety and capacity benefits for a roundabout in comparison to a traffic signal:

- 1. Traffic Safety
  - a. *Crash Severity* Roundabouts reduce crash severity for all roadway users (vehicles, pedestrians, etc.) due to the reduced vehicle speeds. Crashes that might result in a fatality at a traffic signal due to high vehicle speeds (40 to 55 mph) would most likely result in only an injury or property damage at a roundabout due to lower vehicle speeds (15 to 20 mph).
  - b. Conflict Points Roundabouts have fewer overall conflict points and no left-turn conflict points. A conflict point is a location where travel paths cross each other, and as such, is an opportunity for human error and a resulting crash. A traffic signal at the intersection of two-lane roadways has 32 potential vehicle conflict points while a corresponding one-lane roundabout has only eight (8) potential vehicle conflict points.
- 2. Traffic Capacity
  - a. *Peak Hours* If sized properly, roundabouts can reduce vehicle delay and queue lengths during the peak hours (aka the "rush hours") in comparison to an equally sized signalized intersection.
  - b. Non-Peak Hours Vehicle delay for the left-turn movements along the minor street approaches are drastically reduced during the non-peak hours. This is because the left-turn movement along the minor approach would be required to wait "for the green light" so that signal progression / coordination is maintained along the major street. With a roundabout, all movements are converted to right-turn gap acceptance movements for which the left-turn movement along the minor street approach can quickly find a gap in traffic during non-peak hours.



#### **COMMON MISCONCEPTIONS**

The following provides common misconceptions of modern roundabouts.

- 1. *"Roundabouts cannot accommodate large trucks."* A mountable curbed section called a truck apron is provided at the center island of roundabouts to accommodate tractor trailer trucks, buses, and fire trucks. Also, the inscribed diameter of a roundabout (aka the size of a roundabout) is determined during the design to accommodate the largest anticipated design vehicle, similar to how the intersection turning radius is determined for intersections controlled by a stop sign or traffic signal.
- 2. "Roundabouts are <u>always</u> more expensive than traffic signals." The construction cost of a signalized intersection can cost the same or more than a roundabout if multiple turn lanes are needed (e.g. dual or triple left-turn lanes, dual right-turn lanes). Roundabouts at multiple locations along a major thoroughfare can reduce the overall construction cost of the thoroughfare by reducing pavement via:
  - Reducing the number of turn lanes and/or the deceleration length of turn lanes
  - Eliminating the number of intersections through access control
  - Potentially eliminating the need for additional through lanes
- 3. "Roundabouts are too difficult to maintain and plow for snow." The Indiana Local Technical Assistance Program (Indiana LTAP) publishes a Roundabout Maintenance Manual which provides current maintenance practices for all seasons. A key statement from the manual is that no special equipment is needed for plowing and de-icing roundabouts.



#### SIZE GUIDANCE

The following table shows the typical size and capacity ranges for roundabouts. This table represents planning level guidance that can be used to preliminarily assess if a one-lane or two-lane roundabout may be needed at an intersection.

NUMBER OF ENTRY LANES <sup>a</sup>	TYPICAL INSCRIBED DIAMETER <sup>b</sup>	TYPICAL TRAFFIC VOLUME CAPACITY <sup>c</sup>
One-Lane Entry	90 to 180 feet	1,000 to 1,400 veh/h
Two-Lane Entry	150 to 220 feet	1,800 to 2,300 veh/h

### Table 5 - Roundabout Size Guidance

#### Table Notes

- a. The number of entry lanes is the number of approach lanes that enter into the roundabout circulatory lanes. A two-lane entry along an approach would require two-circulatory lanes for the roundabout (aka a two-lane roundabout). A right-turn by-pass lane is often used at roundabouts to accommodate heavy right-turn movements along a specific approach to then require only one circulatory lane (aka a one-lane roundabout).
- b. The inscribed diameter is the distance across the circle inscribed by the outer curb (or edge) of the circulatory roadway.
- c. The traffic volume capacity, in vehicles per hour (veh/h), is the sum of the entering and circulatory volumes at any given approach of the roundabout. Industry standard assumptions can be used to convert the two-way average daily traffic (ADT) volumes along the intersecting roadways into peak hour intersection turning movements:
  - Peak hour volume is 10% of the ADT
  - Peak hour directional distribution of the two-way traffic is 60% / 40%



## **Congestion Map**

#### INTRODUCTION

Traffic congestion occurs when the traffic volume demand exceeds the available capacity of a roadway network. Several quantitative methodologies are available to analyze the capacity of a roadway network. The most common method is a level-of-service (LOS) analysis. The LOS is a report card grading system (A to F) which measures how well the capacity of a roadway segment or intersection accommodates the traffic volume demand. Roadway segments or intersections which have unacceptable LOS typically result in traffic congestion during the peak hours of a workday (aka the morning and evening work commutes; the "rush hours").

For interstates and freeways, the roadway segment LOS (aka mid-block LOS) is the primary measure of capacity since traffic is free-flowing along these roadways. For arterials, collectors, and local roads, intersection LOS is the primary measure of capacity as opposed to the midblock LOS. This is because an intersection represents the location where multiple travel paths cross each other, resulting in reduced capacity, while the roadway segments in between the intersections have free-flowing traffic operations. If the intersections are operating at good LOS along arterials, collectors, and local roads, then so too are the connecting roadway segments.

Performing an intersection LOS analysis requires collection of peak hour intersection turning movement traffic counts. This data collection can be time consuming, especially for large study areas such as a county's roadway network. However, a LOS analysis for the roadway segments along the arterials, collectors, and local roads can be performed which provides a cursory assessment of congestion for a municipality's roadway network. The following pages document the process used to develop a congestion map for this thoroughfare plan based on the roadway segment LOS (aka mid-block LOS).



#### **ROADWAY SEGMENT LOS**

Average daily traffic (ADT) volume counts that have been previously collected along the County's roadway segments were provided by the County's engineering department. Additional ADT data from INDOT's website<sup>10</sup> was used for state routes such as SR 45. The methodologies from the 2010 Highway Capacity Manual (2010 HCM)<sup>11</sup> were used to provide a LOS for the study area roadway segments. The majority of the County's roadways are two-lane (one lane in each direction). The HCM methodology for two-lane roadways is primarily based on a factor called Percent Free Flow Speed (PFFS). PFFS is a measure of how often vehicles are able to drive at the desired speed in relation to the posted speed limit.

The following table lists the range of PFFS for each LOS letter grade. Industry standard assumptions were used to convert the PFFS ranges into estimated ADT capacity ranges for each LOS letter grade in order to streamline the analysis. The ADT counts provided were then compared to the estimated ADT capacities for each of the study area two-lane roadway segments. The following table also shows the LOS threshold between "acceptable" and "unacceptable" operations (aka uncongested or congested).

LOS	PERCENT FREE FLOW SPEED (PFFS)	ESTIMATED ADT CAPACITY	ACCEPTABLE LOS AND UNACCEPTABLE LOS	
А	> 91.7	0 to 2,500		
В	83.4 to 91.7	2,500 to 7,500	LOS "D" or better is typically	
С	C 75.1 to 83.3 7,50	7,500 to 12,500	(uncongested).	
D	66.8 to 75.0	12,500 to 17,500		
E	<= 66.7	> 17,500	LOS "E" is typically considered as an unacceptable LOS for roadway segments (congested). However, intersections along the roadway segment may still operate at an acceptable LOS (uncongested).	

## Table 6 - LOS Descriptions for Two-Lane Roadway Segments



#### **CONGESTION MAP & TABLE - EXISTING**

**Figure 4A** and **Figure 4B** in Appendix A are congestion maps which show the roadway segment LOS based on the readily available ADT data. This map provides a preliminary assessment of existing congestion for the County. Some of the roads shown on this map were not analyzed such as I-69, SR 37, and roadways within Bloomington. The map shows that the vast majority of the County's roadways are currently operating well under congested levels (LOS "C" or better). Only two (2) roadway segments under the County's jurisdiction are operating at LOS "D" (close to congestion) as listed in the table below.

ROADWAY SEGMENT	JURISDICTION	ADT	YEAR OF TRAFFIC COUNT	LEVEL OF SERVICE (LOS)
<b>Curry Pike</b> from SR 45 to Beasley Dr (two-lane section)	County	14,789	1996	D
Liberty Drive from SR 45 to SR 48	County / City	13,200	2010	D
<b>Tapp Road</b> from Weimer Rd to Rockport Rd (two-lane section)	City	14,450	2004	D
<b>SR 46</b> from Stinesville Rd to Maple Grove Rd West	INDOT	13,616	2014	D
SR 45 west of Leonard Springs Rd	INDOT	15,747	2013	D
SR 45 from Leonard Springs Rd to Curry Pike	INDOT	16,012	2013	D

#### Table 7 - Congested Roadway Segments - Existing

The table above shows that SR 45 outside of Bloomington may be operating at LOS "D" (close to congestion). However, the LOS assessment was based on ADT data that was collected prior to I-69 being opened to traffic, for which I-69 may have reduced traffic along SR 45. Appendix B provides the ADT count, the date of the ADT count, and resulting LOS for all roadway segments analyzed for this thoroughfare plan. The data is organized by both roadway alphabetized order and ADT descending order. Some of the roadway segments are four-lane roadways for which the multi-lane HCM methodology was used to determine the LOS.



#### **CONGESTION MAP & TABLE - FUTURE**

**Figure 5A** and **Figure 5B** in Appendix A are congestion maps which show the roadway segment LOS based on the year 2035 ADT volumes from the I-69 Engineer's Report<sup>12</sup>. This map provides a preliminary assessment of future congestion for the County after completion of I-69. Roadway segments were not analyzed if year 2035 ADT volumes were not provided from the I-69 Engineer's Report.

ROADWAY SEGMENT	JURISDICTION	ADT	YEAR	LEVEL OF SERVICE (LOS)
<b>Curry Pike</b> from SR 45 to Beasley Dr (two-lane section)	County	17,130	2035	D
Fullerton Pike from SR 37 to Rockport Rd	County	14,030	2035	D
<b>Tapp Road</b> from Weimer Rd to Rockport Rd (two-lane section)	City	14,470	2035	D
SR 46 from Smith Pike to Curry Pike	INDOT	46,700	2035	D
SR 45 from Airport Road to Curry Pike	INDOT	13,500	2035	D

### Table 8 - Congested Roadway Segments - Future

The table above shows roadway segments that may be operating at LOS "D" (close to congestion) by year 2035 and after construction of I-69. Appendix B provides the year 2035 ADT volume and resulting LOS for each of the roadway segments analyzed. Some of the roadway segments are four-lane roadways for which the multi-lane HCM methodology was used to determine the LOS.



## **Documented References**

<sup>1</sup> Monroe County, Street and Road Management System, Thoroughfare Plan and Capital Improvement Program, Bernardin, Lochmueller & Associates, Inc., December 1995.

<sup>2</sup> *Monroe County Comprehensive Plan*, Monroe County, adopted February 14<sup>th</sup>, 2012, effective March 20, 2012, maps adjusted for accuracy June 2013.

<sup>3</sup> Monroe County Federal Functional Class - Final Draft 01.27.16.

<sup>4</sup> 2035 Long Range Transportation Plan, Bloomington / Monroe County Metropolitan Planning Organization, adopted May 8<sup>th</sup>, 2015.

<sup>5</sup> *Transportation Improvement Program, Fiscal Years 2016 to 2019*, Bloomington / Monroe County Metropolitan Planning Organization, adopted May 8<sup>th</sup>, 2015.

<sup>6</sup> Indiana Manual on Uniform Traffic Control Devices (Indiana MUTCD), Indiana Department of Transportation (INDOT), 2011 Edition with Revisions 1, 2, and 3.

<sup>7</sup> *Roundabouts: An Informational Guide, Second Edition (NCHRP Report 672)*, Federal Highway Administration (FHWA) and Transportation Research Board (TRB), 2010.

<sup>8</sup> *Indiana Design Manual*, Indiana Department of Transportation (INDOT), <u>http://www.in.gov/indot/design\_manual/design\_manual\_2013.htm#</u>

<sup>9</sup> *Roundabout Maintenance Manual*, Indiana Local Technical Assistance Program (Indiana LTAP), January 2015.

<sup>10</sup> *INDOT Traffic Count Database System*, Indiana Department of Transportation (INDOT), <u>http://www.in.gov/indot/2469.htm</u>

<sup>11</sup> 2010 Highway Capacity Manual (2010 HCM), Transportation Research Board (TRB), December 2010.

<sup>12</sup> I-69 Evansville to Indianapolis Tier 2 Studies, Section 5 - Final Engineer's Report, Figure 4-4: 2035 Traffic Volumes on major Road Segments - Build Alternative (2 of 2), page 4-7, August 2013.



# Appendix A: Figures

Figure 1A -	Functional Classification Map	)	(Entire County)
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# Arterial (Divided)







NOTES

- 1. Left-turn and right-turn lanes to be provided at intersections as needed.
- 2. TWLTL = Two-Way Left-Turn Lane

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Adopted: December 12th, 2018

Figure 2A

Typical Cross-Sections (Arterials)

# **Collector (Divided)**







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NOTES

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- 1. Left-turn and right-turn lanes to be provided at intersections as needed.
- 2. TWLTL = Two-Way Left-Turn Lane

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Adopted: December 12th, 2018

Figure 2B

Typical Cross-Sections (Collectors)

# Local Road (Urban)



# Local Road (Rural)







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Figure 2C

Typical Cross-Sections (Local Roads)

## NOTES

1. Left-turn and right-turn lanes to be provided at intersections as needed.









Lawrence County







## Appendix B: Data

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Level of Service	(Alphabetical)	3 pages
Level of Service	(ADT Count, Descending)	3 pages
Level of Service - Year 2035	(Alphabetical)	1 page

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										% OF A	DT MET	
									CONDI	TION A1	CONDI	FION B1
INTERSECTION	MAJOR STREET	# OF LANES	DATE	ADT	MINOR STREET	# OF LANES	DATE	ADT	MAJOR STREET	MINOR STREET	MAJOR STREET	MINOR STREET
Maple Grove Rd West & Union Valley	Union Valley Rd	1	5/8/2006	2,492	Maple Grove	1	5/8/2006	964	30%	21%	20%	42%
Maple Grove Rd West & Maple Grove Rd North	Maple Grove W.	1	5/8/2006	916	Maple Grove N.	1	5/8/2006	549	11%	12%	7%	24%
Lentz Rd & Earl Young Rd		1				1						
Reeves Rd & Louden Rd	Reeves Rd	1	4/10/2006	4,390	Louden Rd	1			53%		35%	
Hartstrait Rd & Vernal Pike	Harstrait Rd	1	5/15/2006	3,485	Vernal Pike	1	5/15/2006	1,343	42%	29%	28%	58%
Profile Pkwy & Zenith Dr		1				1						
Kirby Rd & Airport Rd	Kirby Rd	1	6/13/2005	2,849	Airport Rd	1	9/28/2004	2,178	34%	47%	23%	95%
Rogers Rd & Snoddy Rd	Rogers Rd	1	4/15/2002	3,792	Snoddy Rd	1			46%		30%	
Elwren Rd & Elwren Run Around		1				1						
W Leonard Springs Rd & Wilson Rd	Leoanard Springs	1	10/13/2004	1,476	Wilson Rd	1			18%		12%	
Gordon Pike & Bachelor Middle School Driveway	Gordon Pike	1	7/31/2006	3,578	School Drive	1			43%		29%	
Rhorer Rd & Snoddy Rd	Rohrer Rd	1	10/13/2009	7,444	Snoddy Rd	1			90%		60%	
That Rd & Victor Pike / Eagleview Dr	That Rd	1	6/29/2009	3,879	Victor Pike	1	10/12/2009	1,035	47%	23%	31%	45%
Swartz Ridge Rd & Moores Creek Rd	Moores Ceek	1	9/3/2009	364	Swartz Ridge	1	11/9/2004	467	4%	10%	3%	20%
Strain Ridge Rd & Smithville Rd	Strain Ridge Rd	1	6/28/2005	2,289	Smithville Rd	1	6/28/2005	1,439	28%	31%	18%	63%
Rogers St & Gordon Pike	Gordon Pike	1	5/18/2009	9,468	Rogers St	1	6/29/2009	5,519	114%	120%	76%	240%
Walnut St Pike & Rhorer Rd	Rhorer Rd	1	10/13/2009	7,444	Walnut St Pike	1	4/30/2008	6,212	90%	135%	60%	270%
S Leonard Springs Rd & Fullerton Pike	Leoanard Springs	1	9/17/2003	10,946	Fullerton Pike	1	10/2/2006	4,889	132%	106%	88%	213%
Hedrick Rd & Foster Fiscus Rd		1				1						
Note:												
See next page which lists the traffic volume threshol	ds for either Conditio	n A1 or Conditior	ו B1.									

#### 2011 IMUTCD

- A. The vehicles per hour given in both of the 80 percent columns of Condition A in Table 4C-1 exist on the major-street and the higher-volume minor-street approaches, respectively, to the intersection; and
- B. The vehicles per hour given in both of the 80 percent columns of Condition B in Table 4C-1 exist on the major-street and the higher-volume minor-street approaches, respectively, to the intersection.

These major-street and minor-street volumes shall be for the same 8 hours for each condition; however, the 8 hours satisfied in Condition A shall not be required to be the same 8 hours satisfied in Condition B. On the minor street, the higher volume shall not be required to be on the same approach during each of the 8 hours.

Condition A—winimum venicular volume										
Number of lai traffic on ea	nes for moving ich approach	Vehicles per hour on major street (total of both approaches)			Vehicles per hour on higher-volum minor-street approach (one direction only)					
Major Street	Minor Street	100% <sup>a</sup>	80% <sup>b</sup>	70% <sup>c</sup>	56% <sup>d</sup>	100% <sup>a</sup>	80% <sup>b</sup>	70% <sup>c</sup>	56% <sup>d</sup>	
1	1	500	400	350	280	150	120	105	84	
2 or more	1	600	480	420	336	150	120	105	84	
2 or more	2 or more	600	480	420	336	200	160	140	112	
1	2 or more	500	400	350	280	200	160	140	112	

#### Table 4C-1. Warrant 1, Eight-Hour Vehicular Volume Condition A—Minimum Vehicular Volume

Number of la traffic on ea	Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volum minor-street approach (one direction only)				
Major Street	Minor Street	100% <sup>a</sup>	80% <sup>b</sup>	70% <sup>c</sup>	56% <sup>d</sup>	100% <sup>a</sup>	80% <sup>b</sup>	70% <sup>c</sup>	56% <sup>d</sup>
1	1	750	600	525	420	75	60	53	42
2 or more	1	900	720	630	504	75	60	53	42
2 or more	2 or more	900	720	630	504	100	80	70	56
1	2 or more	750	600	525	420	100	80	70	56

<sup>a</sup> Basic minimum hourly volume

<sup>b</sup> Used for combination of Conditions A and B after adequate trial of other remedial measures

<sup>c</sup> May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

<sup>d</sup> May be used for combination of Conditions A and B after adequate trial of other remedial measures when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

## Table 4C-2, Eight-Hour Vehicular Volume (ADT Equivalent)

#### Condition A1—Minimum Vehicular Volume (ADT Equivalent)

Number of lanes for moving traffic on each approach		Equivalent Average Daily Traffic Volum Approaching From Both Directions Or				
Major Street	Minor Street	Major Street	Minor Street			
1	1	8,300	4,600			
2 or more	1	10,000	4,600			
2 or more	2 or more	10,000	6,000			
1	2 or more	8,300	6,000			

Either condition

#### Condition B1—Interruption of Continuous Traffic (ADT Equivalent)

Number of lanes for moving traffic on each approach		Equivalent Average Daily Traffic Volumes Approaching From Both Directions On:				
Major Street	Minor Street	Major Street	Minor Street			
1	1	12,500	2,300			
2 or more	1	15,000	2,300			
2 or more	2 or more	15,000	3,100			
1	2 or more	12,500	3,100			

## Preliminary Warrant Assessment (Conditions)

Level of Service (Alphabetical)								
ROAD NAME	LOCATION	DATE	ADT COUNT	LOS	NOTES			
AIRPORT ROAD	1500' WEST OF SR 45	9/28/2004	2,178	Α				
ANDERSON ROAD	500' EAST OF OLD SR 37 NORTH	6/15/2014	819	Α				
ARLINGTON ROAD	BETWEEN STONEYBROOK AND N MAPLE GROVE RD	6/22/2009	4,778	В				
BAYLES ROAD	BETWEEN OLD SR 37 N AND NORTHWOODS LANE	11/17/2009	399	Α				
BETHEL LANE	WEST OF ROB'S LANE	6/12/2005	2,287	Α				
BOTTOM ROAD	800' EAST OF MT TABOR ROAD	12/9/1996	795	Α				
BOTTOM ROAD	400' NORTH OF KINSER PIKE	4/30/2012	772	Α				
BOTTOM ROAD	2400' WEST OF SIMPSON CHAPEL	10/22/2001	399	Α				
BREEDEN ROAD	2400' SOUTH OF TOM PHILLIPS ROAD	9/2/2008	688	Α				
BUNGER ROAD	1500' NORTH OF SR 45	9/28/2004	1,733	Α				
BUSINESS 37 NORTH	NORTH OF BAYLES ROAD	6/13/2005	10,717	С				
CHAMBERS PIKE	200' EAST OF SR 37	5/21/2012	457	Α				
CHURCH LANE	BETWEEN VICTOR PIKE AND ROGERS STREET	5/25/2009	2,302	Α				
CURRY PIKE	NB LANES ONLY, 1500' NORTH OF PROFILE (GE CLOSED)	8/6/2003	19,986	В	4-Lane Roadway			
CURRY PIKE	BY CURRY COURT	9/23/1996	14,789	D	ADT used to analyze 2 lane section of Curry Pike			
DILLMAN ROAD	BETWEEN OLD SR 37 SOUTH AND SR 37	2/6/2012	1,328	Α				
DILLMAN ROAD	WEST OF SR 37	6/20/2005	1,270	Α				
DITTEMORE ROAD	1 MILE WEST OF CROSSOVER ROAD	10/22/2001	434	Α				
FAIRFAX ROAD	BETWEEN WALNUT STREET PIKE AND MOFFETT LANE	5/25/2009	8,575	С				
FAIRFAX ROAD	350' N OF STRAIN RIDGE ROAD	7/21/2004	4,603	В				
FAIRFAX ROAD	JUST SOUTH OF SMITHVILLE ROAD	6/28/2005	3,440	В				
FARR ROAD	1320' WEST OF FISH ROAD	11/4/2002	323	Α				
FLUCKMILL ROAD	300' EAST OF VICTOR PIKE	10/29/2013	229	Α				
FULLERTON PIKE	WEST OF SR 37	10/2/2006	4,889	В				
FULLERTON PIKE	500' EAST OF SR 37	2/1/2006	782	Α				
GARRISON CHAPEL ROAD	1000' NORTH OF SR 45	10/13/2004	755	Α				
GARRISON CHAPEL ROAD	500' NORTH OF HENDRICKS ROAD	10/6/2008	660	Α				
GORDON PIKE	BETWEEN ROGERS STREET AND OLD SR 37 SOUTH	5/18/2009	9,468	С				
GORDON PIKE	800' WEST OF ROGERS STREET	7/31/2006	3,578	В				
HANDY ROAD	3500' NORTH OF SHIELDS RIDGE	10/26/2004	1,082	Α				
HARMONY ROAD	1455' SOUTH OF SR 45	9/8/2009	1,565	Α				
HARRELL ROAD	SOUTH OF SCHACHT ROAD	10/26/2004	1,241	Α				
HARRODSBURG ROAD	2600' SOUTH OF POPCORN ROAD	2/2/2010	336	Α				
HARTSTRAIT ROAD	.40 MILE NORTH OF VERNAL PIKE	5/15/2006	3,485	В				
HARTSTRAIT ROAD	JUST SOUTH OF HARBISON ROAD	3/6/2006	3,261	В				
HOBART ROAD	WEST OF OLD SR 37 SOUTH	8/8/1988	1,608	Α				
HUNTERS CREEK ROAD	300' EAST OF SR 446	5/7/2013	200	Α				
INDUSTRIAL DRIVE	BY HANNA TRUCKING	9/12/1997	731	Α				
KETCHAM ROAD	.7 MILE EAST OF FLUCKMILL ROAD	9/9/2002	797	Α				
KINSER PIKE	BETWEEN BAYLES RD AND OLD KINSER PIKE	5/13/2002	647	Α				
KINSER PIKE	100' SOUTH OF BELL ROAD	4/30/2012	244	Α				
KIRBY ROAD	SOUTH OF GIFFORD ROAD	6/13/2005	2,849	В				
KIRBY ROAD	SOUTH OF SR 48	10/6/2003	2,636	В				

Level of Service (Alphabetical)								
ROAD NAME	LOCATION	DATE	ADT COUNT	LOS	NOTES			
LEONARD SPRINGS ROAD (W)	SOUTH OF SR 45	9/17/2003	10,946	С				
LEONARD SPRINGS ROAD (W)	1000' EAST OF SR 45	10/13/2004	1,476	А				
LIBERTY DRIVE	SR 45 TO SR 48	4/5/2010	13,200	D				
LOST MANS LANE	.06 MILE EAST OF UNION VALLEY ROAD	3/13/2006	511	А				
MAPLE GROVE RD NORTH	BETWEEN ARLINGTON ROAD AND ACUFF ROAD	7/7/2009	1,281	А				
MAPLE GROVE RD NORTH	1 MILE NORTH OF LOST MANS LANE	5/8/2006	549	А				
MAPLE GROVE RD WEST	200' WEST OF UNION VALLEY ROAD	5/8/2006	964	А				
MAPLE GROVE RD WEST	.30 MILE WEST OF MAPLE GROVE RD NORTH	5/8/2006	916	А				
MAPLE GROVE RD WEST	BETWEEN BARBARA ST AND MATTHEWS DRIVE	7/7/2009	748	А				
MAPLE GROVE RD WEST	1500' WEST OF BOTTOM ROAD	4/2/2009	623	А				
MATTHEWS DRIVE	BETWEEN MCNEELY STREET AND WEST MAPLE GROVE	4/2/2009	2,635	В				
MCNEELY STREET	BETWEEN MATTHEWS DR AND CHANDLER DRIVE	7/15/2009	928	А				
MOFFETT LANE	260' WEST OF HARRELL ROAD	10/16/2002	2,342	А				
MONROE DAM ROAD	EAST OF SR 37	6/28/2005	3,013	В				
MONROE DAM ROAD	1000' EAST OF STRAIN RIDGE ROAD	2/2/1993	547	Α				
MOORES CREEK ROAD	3000' NORTH/WEST OF SWARTZ RIDGE ROAD	9/3/2009	364	А				
MT GILEAD ROAD	100' NORTHEAST OF GETTYS CREEK ROAD	9/3/2009	277	А				
MT TABOR ROAD	200' SOUTH OF WOODLAND	10/26/2004	1,246	А				
MT TABOR ROAD	700' SOUTH OF BOTTOM ROAD	7/14/2009	542	А				
NORTHSHORE DRIVE	350' SOUTH OF ANDERSON ROAD	5/20/2014	503	А				
OLD SR 37 NORTH	BETWEEN WALNUT ST AND STONE MILL RD	7/7/2009	4,980	В				
OLD SR 37 NORTH	530' NORTH OF MEL CURRIE ROAD	11/17/2009	2,015	А				
OLD SR 37 NORTH	1900' SOUTH OF BRYANTS CREEK ROAD	5/27/2014	420	А				
OLD SR 37 SOUTH	BETWEEN RHORER ROAD AND FAIRFAX ROAD	5/13/2008	11,513	С				
OLD SR 37 SOUTH	BETWEEN ROGERS STREET AND DILLMAN ROAD	2/6/2012	7,470	В				
OLD SR 37 SOUTH	JUST SOUTH OF KETCHAM RUNAROUND	8/7/2006	6,199	В				
OLD SR 37 SOUTH	2800' NORTH OF HARRODSBURG	10/13/2008	2.021	А				
POINTE ROAD	EAST OF STRAIN RIDGE ROAD	6/27/2005	2.094	А				
POPCORN ROAD	270' EAST OF KETCHAM ROAD	9/28/2004	1.036	А				
POPCORN ROAD	500' WEST OF ROCKPORT ROAD	8/17/2009	565	А				
RAMP CREEK ROAD	JUST EAST OF FAIRFAX ROAD	6/28/2005	991	A				
REEVES ROAD	500' EAST OF EDGEWOOD DRIVE	4/10/2006	4,390	В				
RHORER ROAD	BETWEEN TWO CREEKS AND SARE ROAD	10/13/2009	7,444	В				
ROBINSON ROAD	2500' NORTH OF OLD SR 37 NORTH	4/20/2016	1.365	A				
ROCKEAST ROAD	2.400' EAST OF SNOW ROAD	9/8/2008	197	A				
ROCKPORT ROAD	JUST NORTH OF TAPP ROAD	6/15/2004	2,866	В				
ROCKPORT ROAD	SOUTH OF TRAMWAY ROAD	8/17/2009	275	A				
ROGERS ROAD	250' WEST OF CURVE AT SMITH ROAD	4/15/2002	3.792	В				
ROGERS STREET	BETWEEN THAT ROAD AND BAYWOOD DRIVE	6/29/2009	5 519	B				
SAMPLE ROAD	JUST WEST OF SR 37	5/15/2012	582	A				
SAMPLE ROAD	125' EAST OF SR 37	5/15/2012	522	A				
SHUFFLE CREEK ROAD	NORTH OF SR 45	7/23/2003	958	Α				
SIMPSON CHAPEL ROAD	200' WEST OF SR 37	6/19/2012	446	Α				

Level of Service (Alphabetical)									
ROAD NAME	LOCATION	DATE	ADT COUNT	LOS	NOTES				
SMITH PIKE	BETWEEN SR 46 AND WOODYARD ROAD	3/6/2006	7,649	С					
SMITH ROAD	NORTH OF MOORES PIKE	6/15/2004	5,320	В					
SMITHVILLE ROAD	75' WEST OF FAIRFAX ROAD	6/28/2005	1,439	А					
SNOW ROAD	1400' SOUTH OF ROCKEAST ROAD	9/2/2008	222	А					
SOUTHSHORE DRIVE	1320' WEST OF SHUFFLE CREEK ROAD	7/23/2003	510	А					
SR 446 (KNIGHTRIDGE)	JUST SOUTH OF MOORES PIKE	10/8/2001	4,873	В					
SR 45 EAST	WEST OF MT GILEAD ROAD	10/8/2001	6,225	В					
SR 45 WEST	LEONARD SPRINGS ROAD TO CURRY PIKE	11/5/2013	16,012	D	Obtained ADT from INDOT Database				
SR 45 WEST	GARRISON CHAPEL ROAD TO LEONARD SPRINGS ROAD	11/5/2013	15,747	D	Obtained ADT from INDOT Database				
SR 45 WEST	COUNTY LINE TO GARRISON CHAPEL ROAD	11/5/2013	12,342	С	Obtained ADT from INDOT Database				
SR 46 EAST	WEST OF COUNTY LINE	4/1/2014	6,506	В	Obtained ADT from INDOT Database				
SR 46 WEST	SMITH PIKE TO ELLETTSVILLE	3/11/2014	32,074	С	4-Lane Roadway, Obtained ADT from INDOT Database				
SR 46 WEST	INTERCHANGE TO SMITH PIKE	3/11/2014	25,125	В	4-Lane Roadway, Obtained ADT from INDOT Database				
SR 46 WEST	FROM ELLETTSVILLE TO STINESVILLE ROAD	3/11/2014	13,616	D	Obtained ADT from INDOT Database				
SR 46 WEST	FROM STINESVILLE ROAD TO COUNTY LINE	8/26/2014	12,439	С	Obtained ADT from INDOT Database				
SR 48 WEST	300' EAST OF DANIELS WAY	10/2/1997	6,012	В					
STINESVILLE ROAD	500' SOUTH OF WILLIAMS BRIDGE	12/21/2015	757	А					
STIPP ROAD	3500' SOUTH OF SWARTZ RIDGE ROAD	9/3/2009	303	Α					
STRAIN RIDGE ROAD	1584' NORTH OF MONROE DAM ROAD	6/28/2005	2,289	А					
SWARTZ RIDGE ROAD	750' WEST OF SR 446	11/9/2004	467	А					
TABOR HILL ROAD	3150' EAST OF STINESVILLE	10/26/2004	313	А					
TAPP ROAD	400' EAST OF WEIMER ROAD	9/28/2004	14,450	D					
TAPP ROAD	980' WEST OF SR 37	6/19/2012	6,209	В					
TEXAS RIDGE ROAD	300' EAST OF MOON ROAD	4/27/2009	401	А					
THAT ROAD	BETWEEN EAGLEVIEW DRIVE AND ROGERS STREET	6/29/2009	3,879	В					
TOWER RIDGE ROAD	300' EAST OF SR 446	5/7/2013	88	А					
TUNNEL ROAD	BETWEEN ROBINSON ROAD AND SHILO ROAD	4/20/2016	1,004	А					
UNION VALLEY ROAD	160' NORTH OF SR 46	6/18/2007	9,587	С					
UNION VALLEY ROAD	1000' NORTH OF MCNEELY STREET	5/8/2006	2,492	А					
VERNAL PIKE	BETWEEN PACKINGHOUSE AND HENSONBURG RD	4/30/2012	4,869	В					
VERNAL PIKE	500' EAST OF LOESCH ROAD	5/15/2006	3,356	В					
VERNAL PIKE	1000' WEST OF HARTSTRAIT ROAD	5/15/2006	1,343	А					
VERNAL PIKE	450' NORTH OF OARD ROAD	10/27/2009	607	А					
VICTOR PIKE	.9 MILE SOUTH OF FLUCKMILL RD	9/9/2002	3,012	В					
VICTOR PIKE	BETWEEN CHURCH LANE AND THAT ROAD	10/12/2009	1,035	А					
WALNUT STREET PIKE	BETWEEN HEATHER DRIVE AND RHORER ROAD	4/30/2008	6,212	В					
WOODYARD ROAD	JUST EAST OF PIONEER LANE	4/29/2002	3,156	В					

Level of Service (ADT Count, Descending)								
ROAD NAME	LOCATION	DATE	ADT COUNT	LOS	NOTES			
SR 46 WEST	SMITH PIKE TO ELLETTSVILLE	3/11/2014	32,074	С	4-Lane Roadway, Obtained ADT from INDOT Database			
SR 46 WEST	INTERCHANGE TO SMITH PIKE	3/11/2014	25,125	В	4-Lane Roadway, Obtained ADT from INDOT Database			
CURRY PIKE	NB LANES ONLY, 1500' NORTH OF PROFILE (GE CLOSED)	8/6/2003	19,986	В	4-Lane Roadway			
SR 45 WEST	LEONARD SPRINGS ROAD TO CURRY PIKE	11/5/2013	16,012	D	Obtained ADT from INDOT Database			
SR 45 WEST	GARRISON CHAPEL ROAD TO LEONARD SPRINGS ROAD	11/5/2013	15,747	D	Obtained ADT from INDOT Database			
CURRY PIKE	BY CURRY COURT	9/23/1996	14,789	D	ADT used to analyze 2 lane section of Curry Pike			
TAPP ROAD	400' EAST OF WEIMER ROAD	9/28/2004	14,450	D				
SR 46 WEST	FROM ELLETTSVILLE TO STINESVILLE ROAD	3/11/2014	13,616	D	Obtained ADT from INDOT Database			
LIBERTY DRIVE	SR 45 TO SR 48	4/5/2010	13,200	D				
SR 46 WEST	FROM STINESVILLE ROAD TO COUNTY LINE	8/26/2014	12,439	С	Obtained ADT from INDOT Database			
SR 45 WEST	COUNTY LINE TO GARRISON CHAPEL ROAD	11/5/2013	12,342	С	Obtained ADT from INDOT Database			
OLD SR 37 SOUTH	BETWEEN RHORER ROAD AND FAIRFAX ROAD	5/13/2008	11,513	С				
LEONARD SPRINGS ROAD (W)	SOUTH OF SR 45	9/17/2003	10,946	С				
BUSINESS 37 NORTH	NORTH OF BAYLES ROAD	6/13/2005	10,717	С				
UNION VALLEY ROAD	160' NORTH OF SR 46	6/18/2007	9,587	С				
GORDON PIKE	BETWEEN ROGERS STREET AND OLD SR 37 SOUTH	5/18/2009	9,468	С				
FAIRFAX ROAD	BETWEEN WALNUT STREET PIKE AND MOFFETT LANE	5/25/2009	8,575	С				
SMITH PIKE	BETWEEN SR 46 AND WOODYARD ROAD	3/6/2006	7,649	С				
OLD SR 37 SOUTH	BETWEEN ROGERS STREET AND DILLMAN ROAD	2/6/2012	7,470	В				
RHORER ROAD	BETWEEN TWO CREEKS AND SARE ROAD	10/13/2009	7,444	В				
SR 46 EAST	WEST OF COUNTY LINE	4/1/2014	6,506	В	Obtained ADT from INDOT Database			
SR 45 EAST	WEST OF MT GILEAD ROAD	10/8/2001	6,225	В				
WALNUT STREET PIKE	BETWEEN HEATHER DRIVE AND RHORER ROAD	4/30/2008	6,212	В				
TAPP ROAD	980' WEST OF SR 37	6/19/2012	6,209	В				
OLD SR 37 SOUTH	JUST SOUTH OF KETCHAM RUNAROUND	8/7/2006	6,199	В				
SR 48 WEST	300' EAST OF DANIELS WAY	10/2/1997	6,012	В				
ROGERS STREET	BETWEEN THAT ROAD AND BAYWOOD DRIVE	6/29/2009	5,519	В				
SMITH ROAD	NORTH OF MOORES PIKE	6/15/2004	5,320	В				
OLD SR 37 NORTH	BETWEEN WALNUT ST AND STONE MILL RD	7/7/2009	4,980	В				
FULLERTON PIKE	WEST OF SR 37	10/2/2006	4,889	В				
SR 446 (KNIGHTRIDGE)	JUST SOUTH OF MOORES PIKE	10/8/2001	4,873	В				
VERNAL PIKE	BETWEEN PACKINGHOUSE AND HENSONBURG RD	4/30/2012	4,869	В				
ARLINGTON ROAD	BETWEEN STONEYBROOK AND N MAPLE GROVE RD	6/22/2009	4,778	В				
FAIRFAX ROAD	350' N OF STRAIN RIDGE ROAD	7/21/2004	4,603	В				
REEVES ROAD	500' EAST OF EDGEWOOD DRIVE	4/10/2006	4,390	В				
THAT ROAD	BETWEEN EAGLEVIEW DRIVE AND ROGERS STREET	6/29/2009	3,879	В				
ROGERS ROAD	250' WEST OF CURVE AT SMITH ROAD	4/15/2002	3,792	В				
GORDON PIKE	800' WEST OF ROGERS STREET	7/31/2006	3,578	В				
HARTSTRAIT ROAD	.40 MILE NORTH OF VERNAL PIKE	5/15/2006	3,485	В				
FAIRFAX ROAD	JUST SOUTH OF SMITHVILLE ROAD	6/28/2005	3,440	В				
VERNAL PIKE	500' EAST OF LOESCH ROAD	5/15/2006	3,356	В				
HARTSTRAIT ROAD	JUST SOUTH OF HARBISON ROAD	3/6/2006	3,261	В				
WOODYARD ROAD	JUST EAST OF PIONEER LANE	4/29/2002	3,156	В				

Level of Service (ADT Count, Descending)							
ROAD NAME	LOCATION	DATE	ADT COUNT	LOS	NOTES		
MONROE DAM ROAD	EAST OF SR 37	6/28/2005	3,013	В			
VICTOR PIKE	.9 MILE SOUTH OF FLUCKMILL RD	9/9/2002	3,012	В			
ROCKPORT ROAD	JUST NORTH OF TAPP ROAD	6/15/2004	2,866	В			
KIRBY ROAD	SOUTH OF GIFFORD ROAD	6/13/2005	2,849	В			
KIRBY ROAD	SOUTH OF SR 48	10/6/2003	2,636	В			
MATTHEWS DRIVE	BETWEEN MCNEELY STREET AND WEST MAPLE GROVE	4/2/2009	2,635	В			
UNION VALLEY ROAD	1000' NORTH OF MCNEELY STREET	5/8/2006	2,492	А			
MOFFETT LANE	260' WEST OF HARRELL ROAD	10/16/2002	2,342	А			
CHURCH LANE	BETWEEN VICTOR PIKE AND ROGERS STREET	5/25/2009	2,302	Α			
STRAIN RIDGE ROAD	1584' NORTH OF MONROE DAM ROAD	6/28/2005	2,289	Α			
BETHEL LANE	WEST OF ROB'S LANE	6/12/2005	2,287	Α			
AIRPORT ROAD	1500' WEST OF SR 45	9/28/2004	2,178	Α			
POINTE ROAD	EAST OF STRAIN RIDGE ROAD	6/27/2005	2,094	А			
OLD SR 37 SOUTH	2800' NORTH OF HARRODSBURG	10/13/2008	2,021	А			
OLD SR 37 NORTH	530' NORTH OF MEL CURRIE ROAD	11/17/2009	2,015	А			
BUNGER ROAD	1500' NORTH OF SR 45	9/28/2004	1,733	А			
HOBART ROAD	WEST OF OLD SR 37 SOUTH	8/8/1988	1,608	А			
HARMONY ROAD	1455' SOUTH OF SR 45	9/8/2009	1.565	А			
LEONARD SPRINGS ROAD (W)	1000' EAST OF SR 45	10/13/2004	1,476	А			
SMITHVILLE ROAD	75' WEST OF FAIRFAX ROAD	6/28/2005	1,439	А			
ROBINSON ROAD	2500' NORTH OF OLD SR 37 NORTH	4/20/2016	1,365	A			
VERNAL PIKE	1000' WEST OF HARTSTRAIT ROAD	5/15/2006	1.343	А			
DILLMAN ROAD	BETWEEN OLD SR 37 SOUTH AND SR 37	2/6/2012	1,328	A			
MAPLE GROVE RD NORTH	BETWEEN ARLINGTON ROAD AND ACUFF ROAD	7/7/2009	1,281	A			
DILLMAN ROAD	WEST OF SR 37	6/20/2005	1.270	A			
MT TABOR ROAD	200' SOUTH OF WOODI AND	10/26/2004	1 246	A			
HARRELL ROAD	SOUTH OF SCHACHT ROAD	10/26/2004	1 241	A			
HANDY ROAD	3500' NORTH OF SHIFLDS RIDGE	10/26/2004	1.082	A			
POPCORN ROAD	270' FAST OF KETCHAM ROAD	9/28/2004	1.036	A			
		10/12/2009	1,000	Δ			
	BETWEEN ROBINSON ROAD AND SHILO ROAD	4/20/2016	1,000	Δ			
	IUST FAST OF FAIRFAX ROAD	6/28/2005	991	Δ			
MAPLE GROVE RD WEST		5/8/2005	964	Δ			
	NORTH OF SR 45	7/23/2003	958	A			
		7/15/2000	900	^			
		F/9/2009	920	A			
		6/15/2000	910	A			
		0/15/2014	019	A			
		9/9/2002	797	A			
		12/9/1996	795	A			
		2/1/2006	782	A			
		4/30/2012		A			
STINESVILLE ROAD	500' SOUTH OF WILLIAMS BRIDGE	12/21/2015	757	A			
GARRISON CHAPEL ROAD	1000' NORTH OF SR 45	10/13/2004	755	Α			

Level of Service (ADT Count, Descending)							
ROAD NAME	LOCATION	DATE	ADT COUNT	LOS	NOTES		
MAPLE GROVE RD WEST	BETWEEN BARBARA ST AND MATTHEWS DRIVE	7/7/2009	748	A			
INDUSTRIAL DRIVE	BY HANNA TRUCKING	9/12/1997	731	A			
BREEDEN ROAD	2400' SOUTH OF TOM PHILLIPS ROAD	9/2/2008	688	Α			
GARRISON CHAPEL ROAD	500' NORTH OF HENDRICKS ROAD	10/6/2008	660	А			
KINSER PIKE	BETWEEN BAYLES RD AND OLD KINSER PIKE	5/13/2002	647	Α			
MAPLE GROVE RD WEST	1500' WEST OF BOTTOM ROAD	4/2/2009	623	А			
VERNAL PIKE	450' NORTH OF OARD ROAD	10/27/2009	607	Α			
SAMPLE ROAD	JUST WEST OF SR 37	5/15/2012	582	Α			
POPCORN ROAD	500' WEST OF ROCKPORT ROAD	8/17/2009	565	Α			
MAPLE GROVE RD NORTH	1 MILE NORTH OF LOST MANS LANE	5/8/2006	549	Α			
MONROE DAM ROAD	1000' EAST OF STRAIN RIDGE ROAD	2/2/1993	547	Α			
MT TABOR ROAD	700' SOUTH OF BOTTOM ROAD	7/14/2009	542	Α			
SAMPLE ROAD	125' EAST OF SR 37	5/15/2012	522	Α			
LOST MANS LANE	.06 MILE EAST OF UNION VALLEY ROAD	3/13/2006	511	Α			
SOUTHSHORE DRIVE	1320' WEST OF SHUFFLE CREEK ROAD	7/23/2003	510	Α			
NORTHSHORE DRIVE	350' SOUTH OF ANDERSON ROAD	5/20/2014	503	Α			
SWARTZ RIDGE ROAD	750' WEST OF SR 446	11/9/2004	467	Α			
CHAMBERS PIKE	200' EAST OF SR 37	5/21/2012	457	Α			
SIMPSON CHAPEL ROAD	200' WEST OF SR 37	6/19/2012	446	Α			
DITTEMORE ROAD	1 MILE WEST OF CROSSOVER ROAD	10/22/2001	434	Α			
OLD SR 37 NORTH	1900' SOUTH OF BRYANTS CREEK ROAD	5/27/2014	420	Α			
TEXAS RIDGE ROAD	300' EAST OF MOON ROAD	4/27/2009	401	Α			
BAYLES ROAD	BETWEEN OLD SR 37 N AND NORTHWOODS LANE	11/17/2009	399	Α			
BOTTOM ROAD	2400' WEST OF SIMPSON CHAPEL	10/22/2001	399	Α			
MOORES CREEK ROAD	3000' NORTH/WEST OF SWARTZ RIDGE ROAD	9/3/2009	364	Α			
HARRODSBURG ROAD	2600' SOUTH OF POPCORN ROAD	2/2/2010	336	А			
FARR ROAD	1320' WEST OF FISH ROAD	11/4/2002	323	А			
TABOR HILL ROAD	3150' EAST OF STINESVILLE	10/26/2004	313	А			
STIPP ROAD	3500' SOUTH OF SWARTZ RIDGE ROAD	9/3/2009	303	Α			
MT GILEAD ROAD	100' NORTHEAST OF GETTYS CREEK ROAD	9/3/2009	277	Α			
ROCKPORT ROAD	SOUTH OF TRAMWAY ROAD	8/17/2009	275	А			
KINSER PIKE	100' SOUTH OF BELL ROAD	4/30/2012	244	А			
FLUCKMILL ROAD	300' EAST OF VICTOR PIKE	10/29/2013	229	Α			
SNOW ROAD	1400' SOUTH OF ROCKEAST ROAD	9/2/2008	222	Α			
HUNTERS CREEK ROAD	300' EAST OF SR 446	5/7/2013	200	Α			
ROCKEAST ROAD	2,400' EAST OF SNOW ROAD	9/8/2008	197	Α			
TOWER RIDGE ROAD	300' EAST OF SR 446	5/7/2013	88	А			

Level of Service - Year 2035 (Alphabetical)							
ROAD NAME	LOCATION	DATE	ADT	LOS	NOTES		
ARLINGTON ROAD	BETWEEN STONEYBROOK AND N MAPLE GROVE RD	Year 2035	6,040	В			
BUSINESS 37 NORTH	NORTH OF BAYLES ROAD	Year 2035	9,310	С			
CURRY PIKE	NB LANES ONLY, 1500' NORTH OF PROFILE (GE CLOSED)	Year 2035	19,610	В	4-Lane Roadway		
CURRY PIKE	BY CURRY COURT	Year 2035	17,130	D	ADT used to analyze 2 lane section of Curry Pike		
CURRY PIKE	SMITH PIKE TO SR 46	Year 2035	11,990	А	4-Lane Roadway		
FULLERTON PIKE	WEST OF SR 37	Year 2035	10,880	С			
FULLERTON PIKE	500' EAST OF SR 37	Year 2035	14,030	D			
KINSER PIKE	BETWEEN BAYLES RD AND OLD KINSER PIKE	Year 2035	3,600	В			
KINSER PIKE	100' SOUTH OF BELL ROAD	Year 2035	510	А			
LEONARD SPRINGS ROAD (W)	SOUTH OF SR 45	Year 2035	12,200	С			
LEONARD SPRINGS ROAD (W)	1000' EAST OF SR 45	Year 2035	4,670	В			
LIBERTY DRIVE	SR 45 TO SR 48	Year 2035	3,210	В			
MAPLE GROVE RD NORTH	BETWEEN ARLINGTON ROAD AND ACUFF ROAD	Year 2035	1,360	А			
ROCKPORT ROAD	JUST NORTH OF TAPP ROAD	Year 2035	5,280	В			
SAMPLE ROAD	JUST WEST OF SR 37	Year 2035	4,730	В			
SAMPLE ROAD	125' EAST OF SR 37	Year 2035	4,630	В			
SR 45 WEST	LEONARD SPRINGS ROAD TO AIRPORT ROAD	Year 2035	11,500	С	Obtained from Table 4-1		
SR 45 WEST	AIRPORT ROAD TO CURRY PIKE	Year 2035	13,500	D	Obtained from Table 4-1		
SR 46 WEST	INTERCHANGE TO SMITH PIKE	Year 2035	46,700	D	4-Lane Roadway		
SR 48 WEST	300' EAST OF DANIELS WAY	Year 2035	42,240	С	4-Lane Roadway		
TAPP ROAD	400' EAST OF WEIMER ROAD	Year 2035	14,470	D			
TAPP ROAD	980' WEST OF SR 37	Year 2035	11,110	С			
THAT ROAD	BETWEEN EAGLEVIEW DRIVE AND ROGERS STREET	Year 2035	1,220	A			
VERNAL PIKE	BETWEEN PACKINGHOUSE AND HENSONBURG RD	Year 2035	12,260	С			
The level of service (LOS) is based on	he year 2035 average daily traffic (ADT) volumes obtained from Figure	A-4 and Table 4-1	of the August 2013 I-6	9 Engineer's	Report		