



TECHNICAL ADVISORY COMMITTEE

January 27, 2016

10:00 – 11:30 a.m.

McCloskey Room (#135)

- I. Call to Order and Introductions
- II. Elections
 - a. Chair & Vice-Chair
- III. Approval of Minutes:
 - a. November 18, 2015
- IV. Communications from the Chair and Vice-Chair
- V. Reports from Officers and/or Committees
- VI. Reports from Staff
- VII. Old Business
 - a. Federal Functional Classifications*
- VIII. New Business
 - a. Highway Safety Improvement Program Applications
 - (1) Smith Pike and SR 46 Safety Improvements*
 - b. Transportation Improvement Program Amendment
 - (1) Smith Pike and SR 46 Safety Improvements*
- IX. Communications from Committee Members (*non-agenda items*)
 - a. Topic suggestions for future agendas
- X. Upcoming Meetings
 - a. Technical Advisory Committee – February 24, 2016 at 10:00 a.m. (McCloskey Room)
 - b. Citizens Advisory Committee – February 24, 2016 at 6:30 p.m. (McCloskey Room)
 - c. Policy Committee – February 12, 2016 at 1:30 p.m. (Council Chambers)
- XI. Topic Suggestions Under Consideration for Future Discussion

Adjournment

(*Recommendations Requested / *Public comment prior to vote – limited to five minutes per speaker)



Bloomington/Monroe County Metropolitan Planning Organization

Technical Advisory Committee Meeting Minutes
November 18, 2015 McCloskey Room 135, City Hall

Technical Advisory Committee Minutes are transcribed in a summarized outline manner. Audio recordings of the meeting are available in the Planning & Transportation Department for reference.

Technical Advisory Committee: Jane Fleig, Lew May, Perry Maull, Jim Ude, Amy Leyenbeck, John Collisson, John Carter, Kevin Tlilty, Andrew Cibor, Jason Eakin

MPO Staff: Anna Dragovich, Josh Desmond, Vince Caristo

- I. Call to Order and Introductions
- II. Approval of Minutes
 - a. October 28, 2015* – **Mr. Maull motioned to approve, Mr. Cibor seconded. Motion approved.**
- III. Communications from the Chair
- IV. Reports from Officers and/or Committees
 - a. Project Updates
- V. Reports from MPO Staff
 - a. 2016 Meeting Schedule
 - b. Quarterly Tracking Report
- VI. Old Business
 - a. National Highway Network and National Truck Network* **Mr. May motioned to approve, Mr. Maull seconded. Motion approved.**
- VII. New Business
 - a. Highway Safety Improvement Program Applications
 - (1) Pedestrian Safety and Accessibility at Signalized Intersections* **Mr. Maull motioned to approve. Ms. Fleig seconded. Motion approved.**
 - b. Transportation Improvement Program Amendments*
 - (1) *Remove* Moore's Pike Guardrail*
 - (2) *Modify* Allen and Walnut St. RRFB*
 - (3) *Add* Pedestrian Safety and Accessibility at Signalized Intersections**Ms. Fleig motioned to approve, Mr. May seconded. Motion approved.**
- VIII. Communications from Committee Members (*non-agenda items*)
 - a. Topic suggestions for future agendas

Adjournment

**Action Requested / Public comment prior to vote (limited to five minutes per speaker)*

These minutes were adopted by the Technical Advisory Committee at their meeting held on

MEMORANDUM



To: Technical and Citizens Advisory Committees

From: Vince Caristo, MPO Staff

Date: January 21, 2016

Re: Federal Functional Classification Review

BACKGROUND

In August 2013, INDOT initiated a request of all Indiana MPOs for a comprehensive review of the federal functional classification networks within their respective jurisdictions. The Federal Highway Administration has final approval for modifications.

The Policy Committee has twice previously considered this issue, on November 8, 2013 and September 11, 2015, each time moving to defer action to allow for further review.

To assist with this review, members of each of the MPO committees were invited to attend an informational discussion with representatives from the Federal Highway Administration and INDOT. That discussion took place on October 29, 2015, and was well attended by representatives from each of the MPO committees, the City of Bloomington, and Monroe County.

Federal Functional Classification Networks

Functional classification is the grouping of roadways based on the character of service roadways are intended to provide, with mobility and land access being the primary determinants. The functional classification of the nation's roadways provides important inputs into the Highway Performance Management System (HPMS) program and into the apportionment of federal funds, such as for the National Highway System (NHS) and Surface Transportation Program (STP).

In 2008, FHWA initiated a change in system of functional classes from 12 classes to 7 classes, which are as follows: Interstate; Other Freeways or Expressways; Other Principal Arterial; Minor Arterial; Major Collector; Minor Collector; Local.

The federal functional classifications from the old 12-class system are provided in this packet as reference point for understanding the impact of this change.

Funding Implications

In general, STP projects may not be located on *local roadways* or *rural minor collectors*. However, there are many exceptions to this rule, including: Road ADHS local access roads, bridge and tunnel replacement and rehabilitation (not new construction), bridge and tunnel inspection, carpool projects, fringe/corridor parking facilities, bike/pedestrian walkways, safety infrastructure, Transportation Alternatives, recreational trails, port terminal modifications, minor collectors in NHS corridors, and the two new bridge eligibilities brought over from the HBP.

Bloomington/Monroe County Metropolitan Planning Organization

Process for Changes

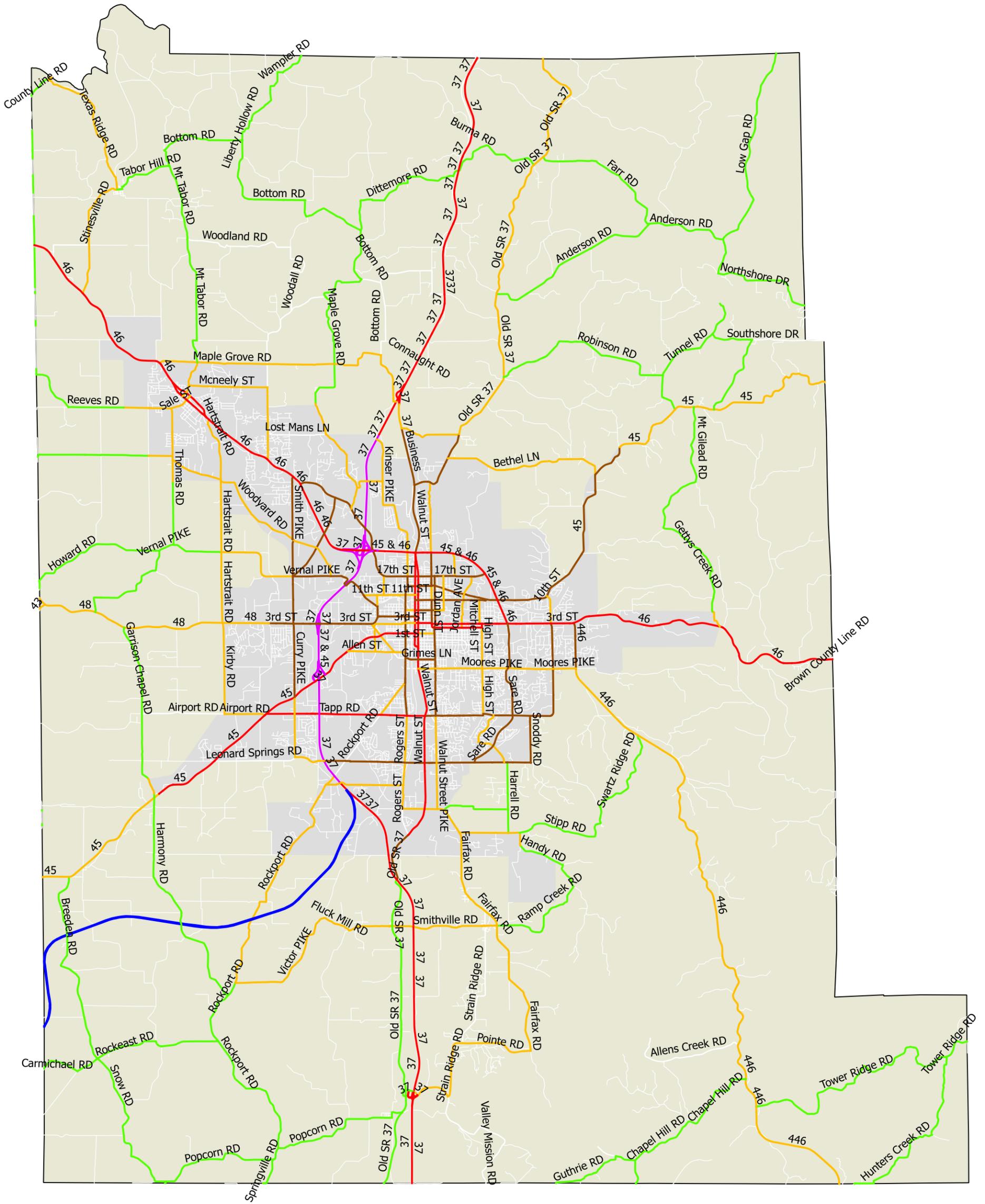
Requests or functional classification changes can be made at any time to INDOT. At a minimum, federal functional classifications are updated after each decennial census.

Action Requested

The TAC and CAC are asked to approve the Federal Functional Classification network in Monroe County as proposed in the attachment to this memo.

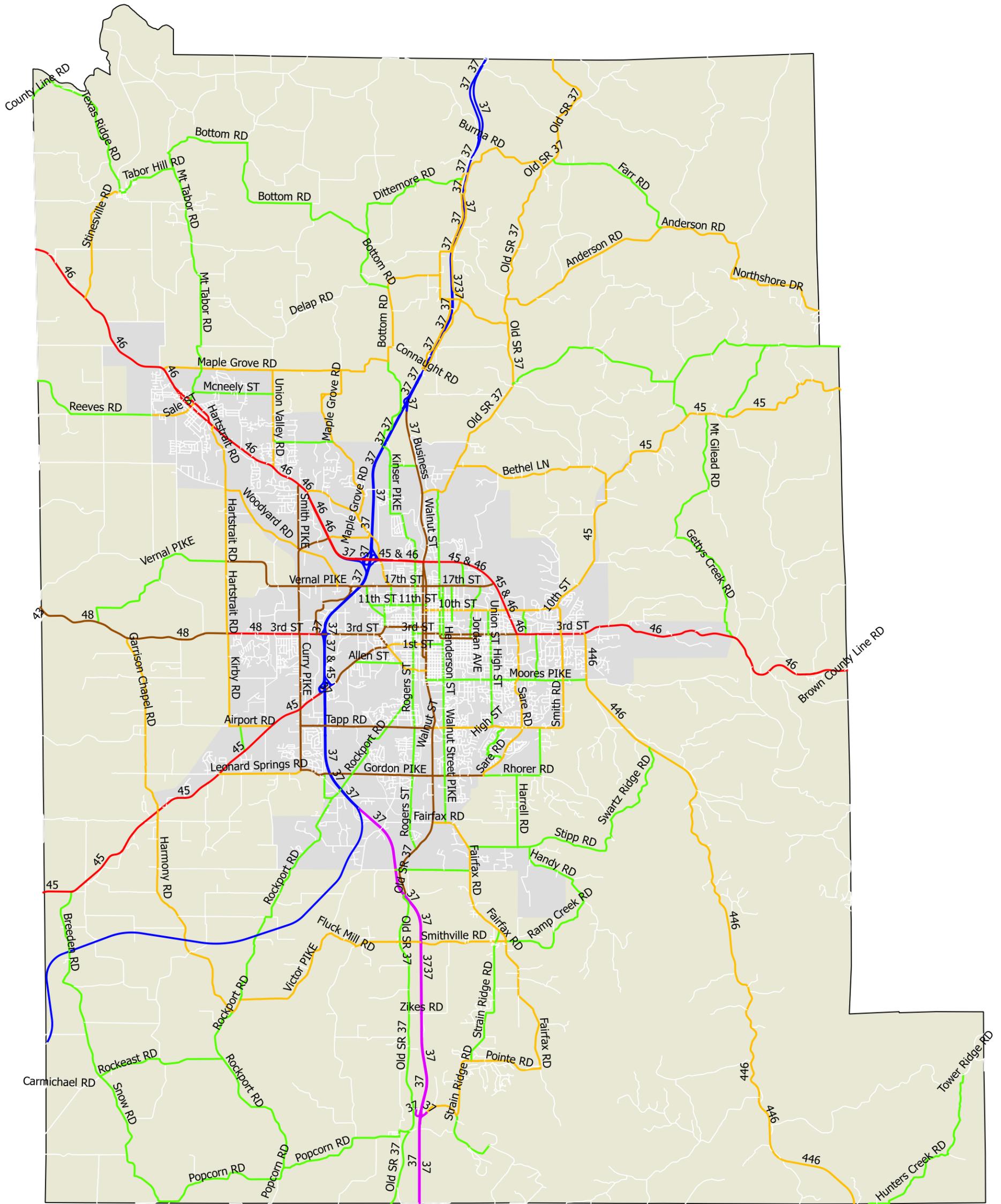
Federal Functional Classifications

Existing, August 2015



Functional Classification

- Interstate
- Other Freeway
- Other Principal Arterial (OPA)
- Minor Arterial
- Major Collector
- Minor Collector
- MPO Urban Area Boundary



Functional Classification

- █ Interstate
- █ Other Freeway
- █ Other Principal Arterial (OPA)
- █ Minor Arterial
- █ Major Collector
- █ Minor Collector
- MPO Urban Area Boundary

MEMORANDUM

To: MPO Citizens Advisory and Technical Advisory Committee
From: Anna Dragovich, Senior Transportation Planner
Date: January 27, 2016
Re: FY 2018 HSIP Funding Awards & Transportation Improvement Program (TIP) Amendments

Background

The Highway Safety Improvement Program (HSIP) provides federal funding to LPAs for projects that reduce fatal and incapacitating injury crashes on the local road network. There are two project categories for HSIP funding outlined in the BMCMPO HSIP Guidelines: low-cost systematic improvements (e.g., sign replacement, backing plates on signal heads, pedestrian countdown signals, etc.), and site-specific improvements (e.g., roadway realignment/reconfiguration, new signals, etc.). The complete HSIP Guidelines document can be found online [here](#).

In keeping with statewide and federal goals, low-cost systematic strategies are preferred as they can be implemented more quickly. Project selection procedures differ for low-cost systematic and site-specific projects. Generally, site specific projects require a greater burden of proof on the applicant to demonstrate the cost-effectiveness of the proposed strategy. A Road Safety Audit (RSA) must be performed for all proposed HSIP projects, regardless of type. The following memo outlines the submitted project applications and options for the awarding of HSIP funds.

Project Applications

Two HSIP project applications have been submitted to the MPO for funding in fiscal year 2018, one by Monroe County and one by the City of Bloomington. The TAC and CAC reviewed the City of Bloomington project on November 18, 2015, ultimately recommending that the Policy Committee approve the HSIP award and amend the TIP accordingly. The Monroe County project is being presented to the committees for the first time at the January meeting, with the idea that both projects will be considered for funding by the Policy Committee on February 12.

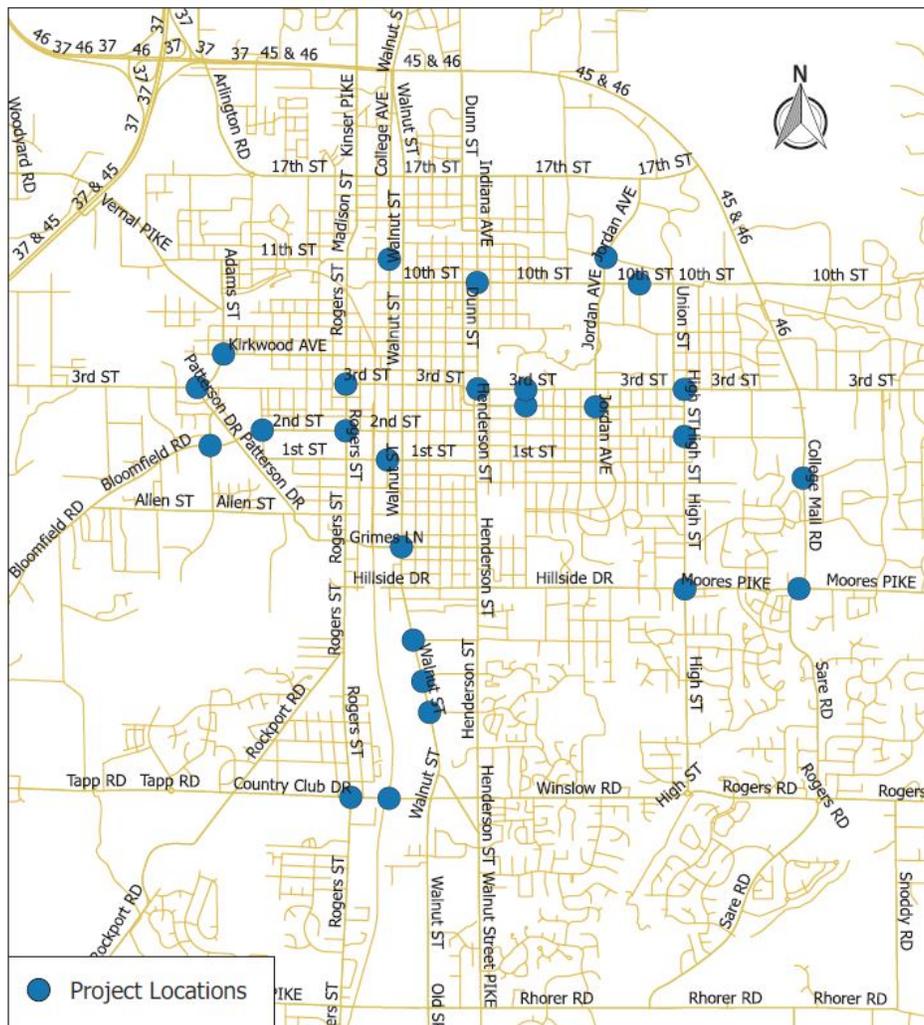
The City of Bloomington has requested for their project, Pedestrian Safety and Accessibility at Signalized Intersections, \$507,150 in HSIP funding in FY 2018. Both the preliminary engineering and right-of-way phases will be paid for with local funds while the construction phase will utilize federal funds. The local split for the construction phase is \$56,350. Details have been provided below.

The Monroe County project involves safety improvements at the intersection of Smith Pike and SR 46. Monroe County has requested a total of \$88,200 in HSIP funds for FY 2018 that would cover design, construction, and construction engineering. The local split for this project is \$9,800. Further details on this project can be found in the attached application materials. Details have been provided below.

Available HSIP funding in FY 2018 amounts to \$507,304. Both projects combined have requested \$595,350 in HSIP funding for FY 2018 or \$88,046 more than what is available. Both projects cannot be funded fully in FY 2018, so the MPO must consider a couple of options in deciding how to allocate the HSIP funding in that year.

1. The City of Bloomington's HSIP award could be reduced to accommodate the County's project, allowing both projects to be programmed in FY 2018.
2. One of the two projects could be moved to a different fiscal year. There is currently enough unprogrammed funding in 2019 to fund one of the projects. With this option, one project would be programmed in FY 2018 and the other would be programmed in FY 2019.

Pedestrian Safety and Accessibility at Signalized Intersections					
Project Phase	Fiscal Year	Federal Source	Federal Funding	Local Match	Total
PE	2016	n/a	\$ -	\$ 55,000	\$ 55,000
RW	2017	n/a	\$ -	\$ 75,000	\$ 75,000
CN	2018	HSIP	\$ 507,150	\$ 56,350	\$ 563,500
Totals			\$ 507,150	\$ 186,350	\$ 693,500



Smith Pike and SR 46 Safety Improvements					
Project Phase	Fiscal Year	Federal Source	Federal Funding	Local Match	Total
PE	2018	HSIP	\$ 36,000	\$ 4,000	\$ 40,000
CN			\$ 45,000	\$ 5,000	\$ 50,000
CE			\$ 7,200	\$ 800	\$ 8,000
Totals			\$ 88,200	\$ 9,800	\$ 98,000



Action Requested

The MPO TAC and CAC are asked to make a project funding recommendation to the Policy Committee.

- f. Support for the Project (ie: Local plans, LRTP, TDP, etc.):
Local plans and the project fulfills HSIP criteria by addressing one of the intersections in the MPO top 50 list.
- g. Allied Projects (other projects related to this one): SR 46 Mill & Fill (INDOT 2015);
- h. Does the project have an Intelligent Transportation Systems component? No
If so, is the project included in the MPO's ITS architecture? _____
- i. What is the anticipated construction letting date for the project? April 2018

4. Financial Plan:

Identify *ALL* anticipated project costs for all phases, including total anticipated project costs beyond the four years to be programmed in the TIP, as well as construction engineering costs.

Note: FY 2016 starts 7/1/15 and ends 6/30/16

Phase	Funding Source	FY 2016	FY 2017	FY 2018	FY 2019	Outlying Years
PE	HSIP	\$	\$	\$ 36000	\$	\$
	Local	\$	\$	\$ 4000	\$	\$
		\$	\$	\$	\$	\$
RW		\$	\$	\$	\$	\$
		\$	\$	\$	\$	\$
		\$	\$	\$	\$	\$
CE	HSIP	\$	\$	\$ 7200	\$	\$
	Local	\$	\$	\$ 800	\$	\$
		\$	\$	\$	\$	\$
CN	HSIP	\$	\$	\$ 45000	\$	\$
	Local	\$	\$	\$ 5000	\$	\$
		\$	\$	\$	\$	\$
Totals:		\$	\$	\$ 98000	\$	\$

Construction Engineering/Inspection:

- a. Does the above project financial plan include an acceptable percentage of construction costs set aside for construction engineering or inspections? Yes No N/A

Year of Implementation Cost:

- a. Has a four percent (4%) inflation factor been applied to all future costs? Yes No

5. Complete Streets Applicability and Compliance – Check one of the following:

Not Applicable – If project is Not Applicable, please skip to Section 5. The project is not subject to the Complete Streets Policy because it is a transit project, a non-road project, a resurfacing activity that does not alter the current/existing geometric designs of the roadway, a ‘grandfathered’ local roadway project included in the TIP before the adoption of the policy, or is a project that uses federal funds which the BMCMPPO does NOT have programming authority. *No Additional Information items (below) have to be provided for projects to which the Complete Streets Policy does not apply.*

Compliant - The project will accommodate all users of the corridor. The project is new construction or reconstruction of local roadways that will use federal funds through the BMCMPPO for **any** phase of project implementation. *Additional Information items 1-8 (below) must be submitted for compliant projects.*

Exempt - The project is unable to accommodate all users of the corridor due to certain circumstances or special constraints, as detailed in Section IV of the CS Policy. *Additional Information items 1, 4-8 (below) must be submitted for exempt projects.*

Reason for exemption: _____

6. Additional Information – Attach to this application form the following information as required by the Complete Streets Policy. If any fields are unknown at the time of application, the applicant may indicate that “specific information has not yet been determined.”

- 1) **Detailed Scope of Work** – Provide relevant details about the project that would be sufficient to use when seeking consulting services (detailed project description, vehicular elements, non-vehicular elements, new construction/reconstruction).
- 2) **Performance Standards** – List specific performance standards for multimodal transportation, including, but not limited to transit, pedestrian, bicycle, and automobile users, ADA and Universal Design, environmental, utilities, land use, right of way, historic preservation, maintenance of services plan, and any other pertinent design component in relation to current conditions, during implementation/construction, and upon project completion.
- 3) **Measurable Outcomes** – Identify measurable outcomes the project is seeking to attain (e.g. safety, congestion and/or access management, level-of-service, capacity expansion, utility services, etc.).
- 4) **Project Timeline** – Identify anticipated timelines for consultant selection, public participation, design, right-of-way acquisition, construction period, and completion date.
- 5) **Key Milestones** – identify key milestones (approvals, permits, agreements, design status, etc.).
- 6) **Project Cost** – Identify any anticipated cost limitations, additional funding sources, project timing, and other important cost considerations not included in the table above.
- 7) **Public Participation Process** – Describe the public participation process (types of outreach, number and type of meetings, etc.), and the benchmark goals for the project (participation rates, levels of outreach, levels of accountability and corresponding response methods to input received, etc.).
- 8) **Stakeholder List** – Identify the key parties/agencies/stakeholders/interest groups anticipated to be engaged during project development and their respective purpose and roll for being on the list.



**MONROE COUNTY HIGHWAY
DEPARTMENT**

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12/23/15

Mr. Josh Desmond, MPO Director
Bloomington/Monroe County MPO
401 N. Morton Street, Suite 130
Bloomington, IN 47401

Re: HSIP Application for Monroe County

Dear Mr. Desmond:

The Monroe County Commissioners would like to thank you for the opportunity to apply for BMCMPPO HSIP funding. Our application for safety improvements to the Intersection of Smith Pike and State Route 46 proposes low-cost systematic improvements to pavement and striping on County-maintained roadway to reduce accidents at two problematic intersections: Smith Pike & S.R. 46 and Smith Pike & Forrest Park Drive.

At number 43 on the MPO's current crash report for crash frequency, the intersection of Smith Pike and S.R. 46 experiences a high volume of northbound traffic turning left onto westbound SR 46. At the PM peak hour, this movement causes significant backups to and through the intersection of Smith Pike and Forrest Park Drive. These backups have caused a spike in the number of accidents at this intersection. A Road Safety Audit (RSA) completed in November 2015 reveals that the number of annual crashes has quadrupled since 2012 for a total of 24 crashes between 2012 and 2014.

When added to the number of crashes over the same period at Smith Pike and S.R. 46 (34 crashes), and the number of accidents attributed to intersection operations at Smith Pike and S.R. 46 could be estimated as high as 58 accidents, which places this segment of roadway in the top 10 crash locations by crash total. Monroe County Commissioners believe that this is compelling evidence that improvements are warranted.

The RSA contained in the following pages was conducted specifically for the intersection of Forrest Park Drive and Smith Pike. The report indicates that traffic backups from the S.R. 46 & Smith Pike traffic signal are a contributing factor in accidents at Forrest Park and Smith Pike. Ultimately, addressing the sight-distance issues at the intersection of Forrest Park and Smith Pike itself would prove too costly and require additional right-of-way. As a result, County Highway discounted the RSA recommendations specific to right-of-way acquisition and focused on improvements that can occur with minor striping and signal modifications as well as minor improvements to drainage and pavement surface.

With this in mind, the Monroe County Commissioners urge the MPO to consider our project for HSIP funding. If questions arise from the application, please contact Lisa Ridge at Monroe County Highway, who serves as the Employee in Responsible Charge and is the Owner's Representative for the project on the Commissioner's behalf. Thank you for your time and consideration of our application.

Sincerely,

Julie Thomas
President, Monroe County Commissioners
Enc.

Bloomington/Monroe County MPO
Call for Projects
HSIP Funding Application

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Rationale of Project Prioritization

Monroe County has identified this project because of its low cost, which is believed to fall under the HSIP Low-Cost Systemic Funding program. However, the County has chosen the longer application because the low-cost funding categories provided do not quite capture the improvements proposed, although they do meet many of the criteria. While a Cost-Benefit worksheet is not required for proposed low-cost systemic improvements, the following rationale addresses how the County arrived at these improvements over other alternatives. Ultimately, a vertical grade correction to improve sight distance on Smith Pike would constitute the ideal solution. This type of project, however, isn't aligned with the stated preference for HSIP funding to include low-cost, systemic improvements. With additional ROW necessary and utility relocation work likely to lower the roadway profile on Smith Pike south of Forrest Park Drive, the project expenses for both design and construction increases significantly. In fact, this is one of the most significant costs in the Tapp Road and Rockport Road intersection improvements, a City project already slated for STP funding in the MPO TIP.

A cheaper alternative to a grade correction to address sight-distance would include the installation of a passing blister on Smith Pike. However, this, too, would require additional ROW and may also cause confusion were the traffic backup on Smith Pike from SR 46 to back into the passing blister, which it frequently would. Also worth consideration is the low volume of traffic on Forrest Park Drive in comparison with volumes on Smith Pike. Smith serves as a cut-through for traffic to short-cut the Curry Pike extension from Woodyard Road to SR 46. At 8600 vpd, Smith Pike provides a shorter route and bypasses a new traffic signal at Arlington Road and SR 46. Most the traffic on Smith Pike between Coffey Lane and SR 46 is taking Smith to go west on SR 46. As a result, the single-lane left turn from Smith Pike to SR 46 backs up significantly in the PM Peak hours. The backup extends to Forrest Park Drive and frequently beyond the intersection (south). This is where the substandard crest vertical curve south of Forrest Park Drive causes issues, specifically rear-end accidents. Also, inclement weather and existing pavement conditions on Smith Pike exacerbate the issue.

Additionally, a very small number of vehicles going northbound on Smith Pike turn left onto Forrest Park Drive. This particular movement is often unexpected when considering that driver expectations are governed by the dominant through movement. The Road Safety Audit (RSA) highlights the issue of intersection recognition at Forrest Park. Many drivers are not expecting a left turn at Forrest Park Drive. While traveling at the posted speed, sight distance is adequate. However, in this stretch of Smith Pike, the posted speed is often exceeded.

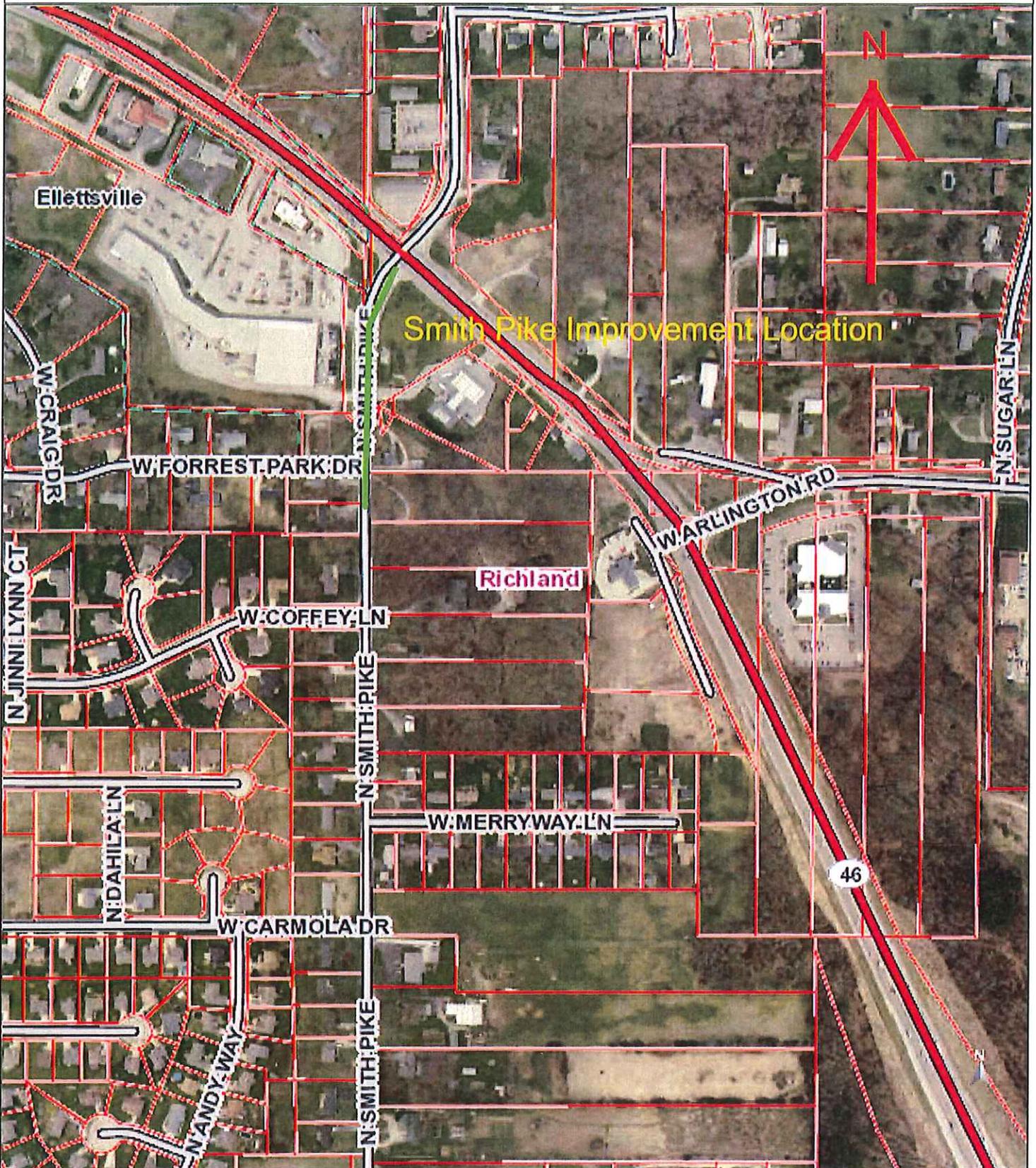
Fixing the backup on Smith Pike will address many of the issues at Forrest Park Drive. The left turn volume on northbound Smith Pike to SR 46 exceeds its left turn lane storage capacity during the PM peak hours. The improvements proposed (see map in the following section) add a second left turn lane on Smith Pike utilizing a wide southbound lane which appears to have been constructed originally as two lanes given evidence of old striping and raised pavement markings delineating two lanes. Certainly, the southbound lanes do not currently function as two lanes, so the improvements propose exchanging one of the southbound lanes for a northbound left turn lane, which should not significantly impact the southbound volume. No additional right-of-way will be necessary.

The addition of the dual turn lane would allow the queued left turn traffic onto SR 46 to be kept north of the Forrest Park intersection thereby reducing the potential rear-end accidents at or near Forrest Park. Also, adding the left turn lane increases the intersection capacity and would likely not result in signal

timing changes. However, a new signal head would be necessary, as well as some pavement markings through the SR 46/Smith Pike intersection. SR 46 in this area was the recent recipient of a mill and - resurface, so the pavement will not need to be replaced. However, we propose to repave Smith Pike from SR 46 to approximately 300 ft. south of the intersection of Smith Pike and Forrest Park Drive. This will address the pavement condition issue identified in the RSA. The RSA also identifies inadequate pavement drainage as an issue. The County proposes that this be corrected by regrading roadside swales using their own equipment and separate from the project.

As stated in the cover letter, the County's stance is that the Smith Pike/SR 46 intersection, listed number 43 in the 2012-2014 MPO Crash Report for crash frequency, is a contributing factor for accidents at Smith Pike and Forrest Park Drive. If the total accidents at each intersection are added together, the number of accidents places this segment of the Smith Pike corridor in the top 10 intersections by crash frequency. This intersection is also ranked 50th on the MPO crash locations by crash rate. Of the remaining list of intersection crash locations, only the intersection of Walnut Street Pike and Rhorer Road ranked higher, and there is already a project slated for MPO STP funding to correct issues at this intersection. As a result, Smith Pike safety improvements as proposed are the County's second highest priority for projects with the express purpose of reducing or eliminating accidents.

Monroe County, IN



Smith Pike / SR 46 Proposed Safety Improvements



Smith Pike - Posted Speed 35 MPH

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Imagery Date: 5

Data Collection Plan

The data collection plan for pre-treatment has already occurred as part of both the Road Safety Audit specific to Forrest Park/Smith Pike and MPO Crash Report ranking the Smith Pike/SR 46 intersection in the top 50 intersections.

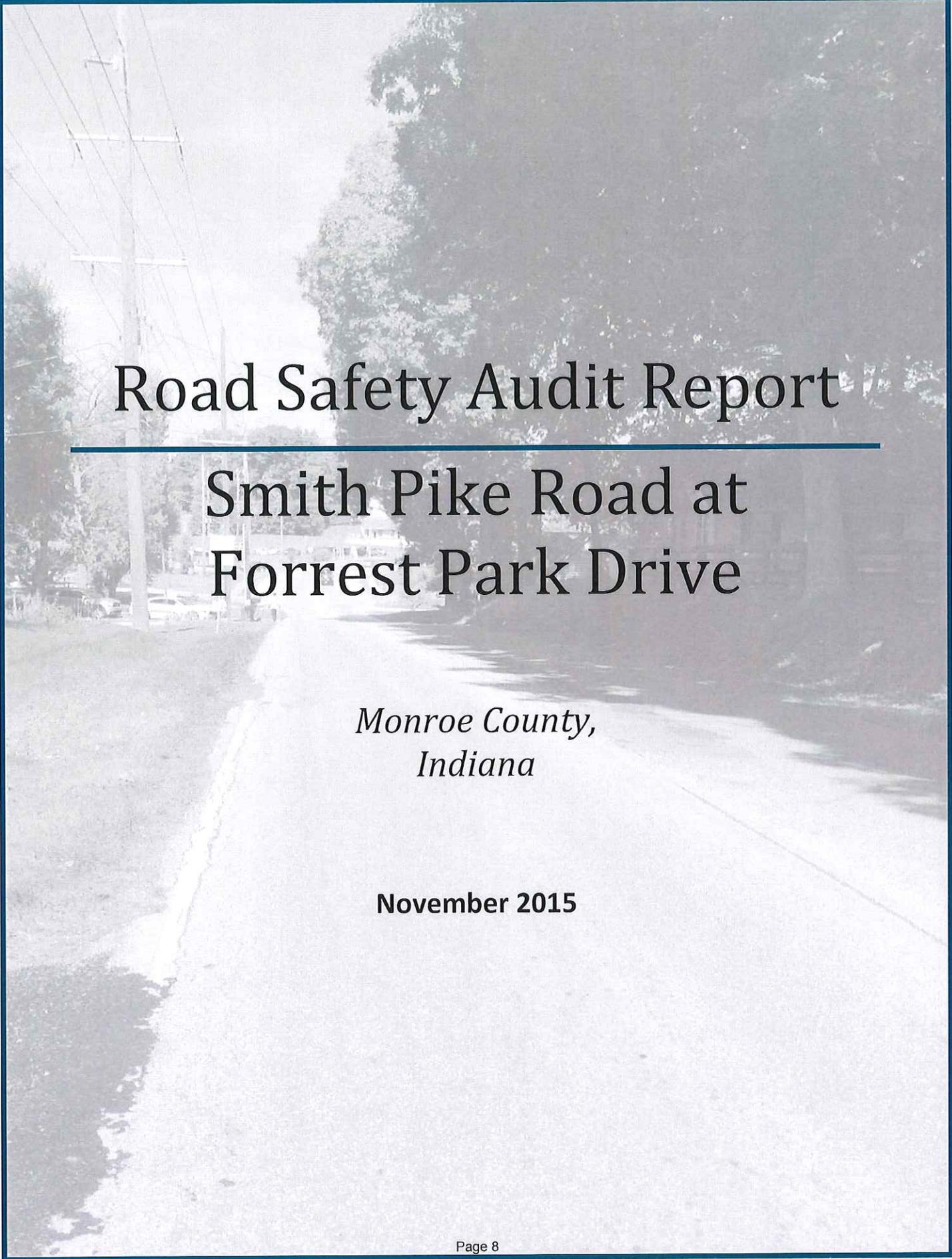
The post-treatment comparison will be conducted in accordance with the HSIP Guidelines provided by the MPO three (3) years after the improvements have been completed. County Highway will collect accident information from the years following completion of the improvements for Smith Pike and Forrest Park Drive. The information from the MPO Crash Report for the same years will be generated by MPO staff. Ideally, the Smith Pike/SR 46 intersection would no longer be in the top 50. But the analysis itself will include specifics regarding the category of crashes, frequency of crashes, etc.

Preliminary Cost Estimates

Preliminary Engineering is estimated at \$40,000. ROW acquisition is not applicable and will not be a phase of the project. Construction costs are estimated to be \$58,000. The improvements themselves are proposed to be low-cost improvements including new pavement overlay, striping and signal modifications. However, the federal aid process creates a scenario whereby the up-front engineering costs rival the construction costs. The total request is \$98,000. The County's match will be \$9800, and the MPO HSIP contribution is \$88,200.

Timeline

This application proposes using MPO HSIP funding for FY 2018. This would require preliminary engineering beginning in July 2017. While the design itself does not take a lot of time, the federal process adds time for submission reviews and administrative procedures. However, utilizing the low-cost systemic HSIP route would trim some time off of the environmental approvals typically needed for these projects. It's realistic that construction could be completed in Autumn 2017 or Spring 2018 before the end of the INDOT 2018 Fiscal Year. For purposes of MPO programming, Monroe County Highway could easily slide the project up to FY 2017 or back to FY 2019 depending on City commitments and any inter-local agreements made between City and County.



Road Safety Audit Report

Smith Pike Road at Forrest Park Drive

*Monroe County,
Indiana*

November 2015

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**THIS DOCUMENT IS PROTECTED
UNDER THE PROVISIONS OF TITLE 23 UNITED STATES CODE SECTION 409 AS FOLLOWS:**

Title 23 U.S.C. § 409

Discovery and admission as evidence of certain reports and surveys

Notwithstanding any other provision of law, reports, surveys, schedules, lists or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or railway-highway crossings, pursuant to sections 130, 144 and 148 of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such re-ports, surveys, schedules, lists or data.

RSA Background

Location: Intersection of Smith Pike Road and Forrest Park Drive

RSA Date: September 30, 2015

RSA Team Participants:

Nick Batta – Lochmueller Group

Andrew Cibor – City of Bloomington

Richard Condre - Crawford, Murphy & Tilly

Laura Slusher – Indiana Local Technical Assistance Program

Additional resources:

Allen Mullis, Monroe County Sheriff's Department

Lisa Ridge, Monroe County Highway Department (roadway owner)

Existing Conditions:

Audit Type: Existing Roads

Road Owner: Monroe County

Road Type/Classification: T-intersection with a two-lane urban minor arterial and a two-lane urban local road

Adjacent Land Use: Suburban residential, commercial

Terrain: Rolling

Climatic Conditions - Cold winter (freezing, icing possible); snow in winter

RSA Limits:

This Road Safety Audit investigated the intersection and approaches of Smith Pike Road and Forrest Park Drive outside Bloomington, IN. A vicinity map is included in the Appendix.

Crash History:

Smith Pike Rd has a history of rear-end crashes during wet weather in the vicinity of Forrest Park Drive in the northbound direction. This section of roadway has averaged six intersection-related crashes per year from 2010-2014. Of the 30 total intersection-related crashes reported, 17% were injury crashes, 80% were northbound rear-end crashes, and 87% were wet weather crashes (not including snow/ice). A summary of the crash data is included in the Appendix.

Despite previous safety projects, including the addition of warning signs, advisory speeds, and transverse rumble strips on the northbound approach, crashes have continued and increased in recent years.

Traffic Characteristics:

The traffic volume on Smith Pike Road is approximately 8,000 vehicles per day (vpd). Expected traffic usage of these roadways includes vehicles, trucks, and school buses. There is likely a significant percentage of traffic using Smith Pike Rd as a cut-through to SR 46. No pedestrian or bicycle usage has been noticed on Smith Pike Rd by the County. No speed data is available for these roads, but local law enforcement has noted speeding issues on Smith Pike Road.

RSA Observations

Smith Pike Rd is a two-lane roadway with a posted speed limit of 35 MPH and an average width of 23 feet in the analyzed section. Forrest Park Drive is a two-lane roadway with a posted speed of 25 mph and an average width of 19 feet near the intersection. Several driveways exist in the vicinity of the intersection. The analyzed intersection lies approximately 600 feet south of the signalized intersection of SR 46 and Smith Pike Road.

There is an intersection warning sign with an advisory speed of 20 mph on the northbound approach to the intersection. 35-mph speed limit signs are also present in the vicinity of the intersection. All of these signs appear to be in good condition. There are also transverse rumble strips on the northbound approach that help alert drivers to the upcoming intersection.

The roadway cross section is well-crowned and other than a few spots, the pavement appears to be in fair condition. There is some raveling and minimal wheel rutting in the northbound lane, which appears to be the product of the tree canopy over that side of the road. Some polishing is also present, lowering the pavement's skid resistance. This is consistent with the significant number of wet-weather crashes. Centerline and edgeline pavement markings are present, but appear worn and lacking sufficient retroreflectivity.

There is no roadway lighting present. There are hazards present within the clear zone, including power poles, trees, ditches, and drainage devices. There is a tree canopy present, mostly in the northbound lane, which may throw leaves in the roadway in fall and cause icing problems in winter.

There is not much usable or consistent shoulder in the analyzed section of Smith Pike Road. There is significant shoulder drop-off on both sides of the road, which can cause crashes if errant vehicles get a wheel off the pavement. Figure 1 shows the pavement edge drop-off.

Figure 1: Shoulder edge drop-off



The analyzed intersection is north of a crest vertical curve, which may limit stopping sight distance for northbound traffic. A northbound vehicle waiting to turn left onto Forrest Park Drive may surprise a northbound driver coming over the hill, especially when a queue is present. The SR 46 intersection may also cause a queue back to the analyzed intersection. This is consistent with the significant number of rear-end crashes occurring at the analyzed intersection. The operating speeds on Smith Pike Road also exacerbate the limited sight distance condition at the vertical curve. Figure 2 shows the view at the intersection looking south along Smith Pike Road.

Figure 2: At Forrest Park Drive looking south



In addition to the limited stopping sight distance approaching the intersection, there is a general lack of intersection recognition when approaching Forest Park on Smith Pike Road. With the presence of a driveway and power pole within the intersection sight triangle, it is difficult for drivers to recognize Forrest Park Drive. A field determination of the intersection sight distance looking south from Forest Park was measured at approximately 390 feet. Per AASHTO, this intersection sight distance is adequate for the posted speed limit, but can become an issue if vehicles are traveling at higher speeds or if a left-turn queue is present.

The roadway geometry also affects the drainage of Smith Pike Road. Due to the relatively steep slope of the vertical curve, storm water is carried down the roadway. There are drainage ditches present, but they are too shallow and in need of maintenance. A driveway drainage pipe in the ditch line on the east side of the intersection is clogged and damaged. This pipe was not installed by and is not currently maintained by the County; it is also sized too small. The uncontrolled storm water drainage has caused erosion issues along the roadside. Some crash reports noted water in the roadway as a contributing circumstance to the crash.

In summary, five main issues were noted on the RSA field review:

1. Limited sight distance at intersection
2. Intersection recognition
3. Shoulder edge drop-off
4. Pavement condition
5. Drainage issues

The limited sight distance at the intersection, combined with the downhill grade, lack of apparent pavement friction, and drainage issues, is a potentially hazardous combination. All these issues challenge drivers and hinder their reaction ability, especially in wet weather conditions. This is evident by the significant number of northbound rear-end crashes on Smith Pike Road at Forrest Park Drive.

RSA Team Recommendations

The RSA team came up with the following recommendations for Monroe County to consider implementing in part or in whole to improve the safety of drivers at the intersection of Smith Pike Road and Forrest Park Drive. Both short-term, low-cost and long-term, higher-cost improvements are listed for the County's consideration based on their budget and overall need.

Limited Sight Distance: The County's options here include increasing the sight distance through geometric improvements and/or removing the left turn conflicts. These improvements should decrease the significant number of rear-end crashes at the intersection.

- Cut down hill
- Passing blister or left-turn lane
- Contact INDOT District to look at signal timing to address queues on Smith Pike Road

Intersection Recognition

- Warning sign plaque "X Feet Ahead" (W16-2P or W16-2aP) in lieu of an advisory speed plaque
- Overhead flashing beacon, with "Cross Traffic Does Not Stop" plaque (W4-4P)
- Lighting at intersection
- Enhance roadway striping visibility and break lines at the intersection
- Narrow lane width with striping (widen gap between double yellow) on intersection approaches
- Enhance faded rumble strips. Consider using pavement material for rumble strips.

Shoulder Edge Drop-off/Roadside hazards: Shoulder edge drop-offs can cause errant vehicles to lose control.

- Add shoulder stone
- Add safety edge as part of any pavement rehab project
- Install object markers for existing roadside hazards if vehicles do run off the road

Pavement: Increasing the pavement friction has been shown to significantly reduce wet weather crashes.

- Pavement overlay
- High Friction Surface Treatment (Calcined Bauxite); although a higher cost than a regular overlay, HFST will significantly increase the roadway friction when compared to conventional

methods and will last longer.

Drainage Issues: Controlling the storm water run-off will prevent erosion and reduce wet weather crashes.

- Add underdrain behind shoulder in ditch line, fill with stone
- Add curb and gutter with gutter turn-outs
- Pave driveways back to right-of-way line
- Clean out and deepen roadside ditches
- Resize and replace driveway drainage pipe on east side of intersection
- Contain driveway run-off to private properties

Discarded Suggestions

1. Prohibit left turns to/from Forrest Park Drive

Reasons for discarding:

- Alternate routes have other potential safety hazards that may be exacerbated by an increase in traffic; it would not be a low-cost solution to bring alternate routes up to standards
- Insufficient width on Smith Pike Road to add a median divider

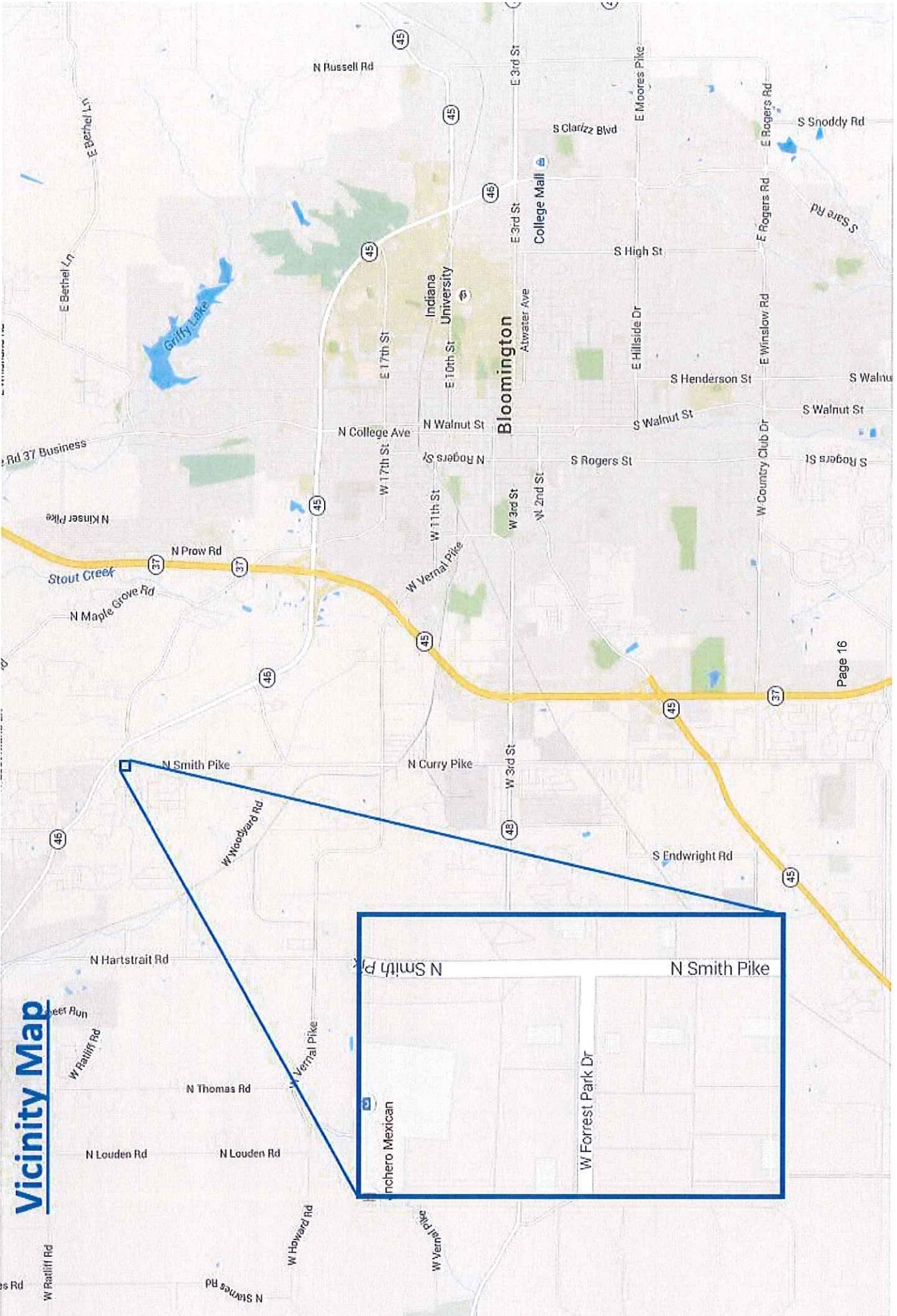
Appendix

Vicinity Map

Crash Summary

Additional Pictures

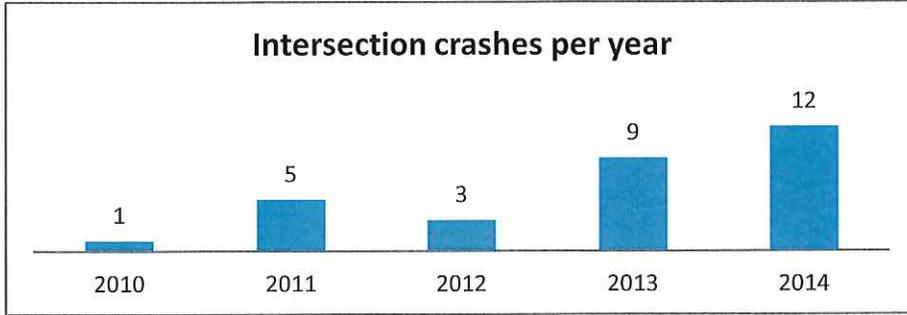
Vicinity Map



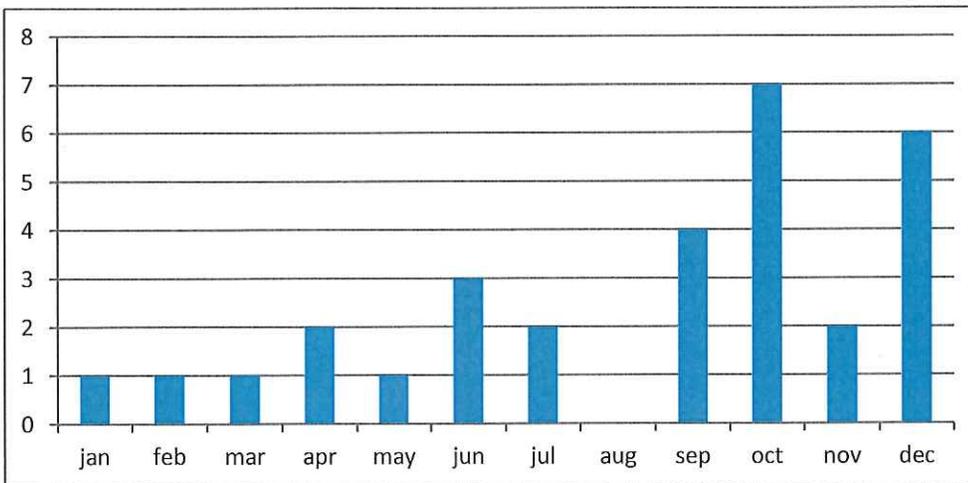
Smith Pike @ Forrest Park Intersection crash summary

2010-2014 (5 years)

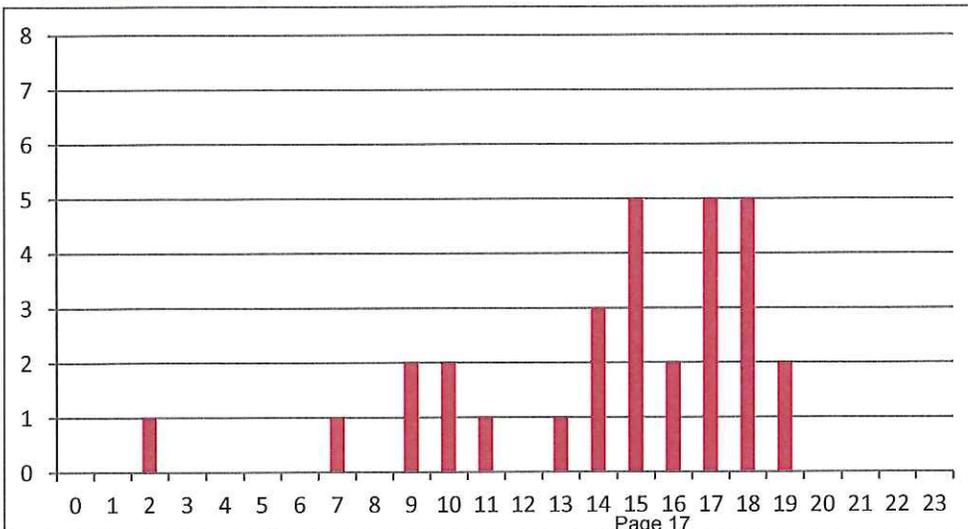
	# of crashes	% of total
Total crashes	30	
Injury crashes	5	17%
NB rear-end crashes (and ROR's to avoid RE's)	24	80%
Wet pvmt crashes (no snow/ice)	26	87%
Dark crashes	3	10%



Crashes by time of year



Crashes by time of day

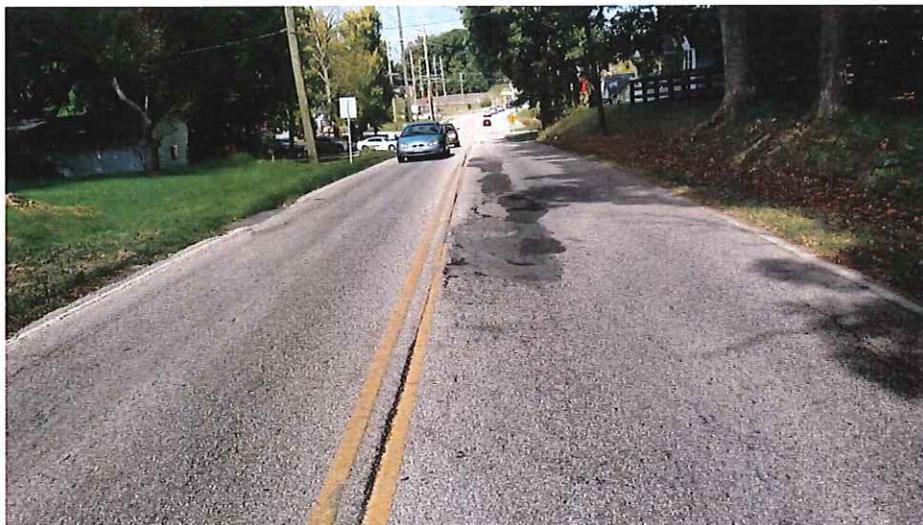


Additional Pictures

Existing warning signs in good condition



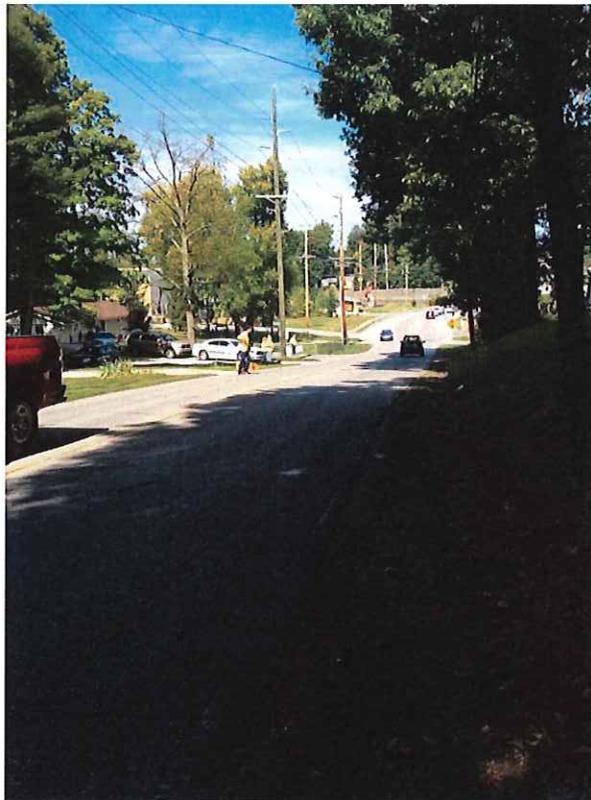
Pavement condition and worn markings



Shallow roadside ditch



Tree canopy on Smith Pike Rd



LPA Response to RSA Recommendations

The LPA's response is captured in both the RSA report and the Rationale of Project Prioritization. To reiterate the main points, the limited sight distance at the intersection of Smith Pike and Forrest Park Drive is noted as one of five main issues in the RSA. The other four include intersection recognition, shoulder edge drop-off, pavement condition, and drainage issues. Correcting the sight distance issue is the most costly solution because of the vertical grade correction that must occur to provide adequate sight distance. As a result, this option is not conducive with the limited funding offered through the MPO HSIP program.

Intersection recognition for Forrest Park Drive has already been conducted in the form signage and rumble strips. The existing countermeasures will be evaluated as part of the proposed project and likely perpetuated in some form with some additional measures calling attention to the hidden intersection. Pavement condition and drainage issues are addressed in previous sections of this application, but to rehash them, a proposed overlay on Smith Pike from SR 46 to approximately 300 ft. south of Forrest Park Drive will address the issues caused by worn pavement surface. Adequate drainage will be re-established via roadside swales by the County using its own resources.

Ultimately, the proposal to address backed up traffic on Smith Pike from the signal at SR 46 will address many of the issues that occur at Smith Pike and Forrest Park Drive, while addressing intersection capacity and safety concerns at one of the MPO's high-frequency crash intersections.

Highway Safety Improvement Program Low Cost Systemic LPA Project Eligibility Request

SPONSOR

Date Submitted by

Local Public Agency

Official Signatory

Office Title

Project Contact

Telephone Email

PROJECT

Request Des No. of existing project

Road Name

Improvement Type

SIGN UPGRADE PROJECT QUESTION

If improvement selected above is a sign retroreflectivity upgrade project, also indicate the following:

Sign Inventory

If installing signs at formerly unsigned locations? (Select if yes)

LOCATION DESCRIPTION

Include start and end points of corridor or number of locations in area. (attach project map) list all that apply:

County
Township
City/Town

SCHEDULE AND FUNDING

If LPA is to contribute more than 10% match Local Contribution Amount

Existing project funding type

P/E Est. Start Date

Land Acquisition Est. Start Date

Construction Est. Start Date

Construction Eng.

Total Page 21

PROJECT INTENT (required)

Provide a short description of the safety improvements to be achieved. Attach a map or aerial photos depicting the proposed project limits.

The intent of the project is to resurface Smith Pike from SR 46 to Forrest Park Drive. To reduce the number of accidents at the intersections of SR 46/Smith Pike and Forrest Park Drive/Smith Pike, the project will also add left turn capacity for northbound Smith Pike onto westbound SR 46 by re-striping the existing roadway. This will reduce traffic backups into the Smith Pike/Forrest Park Drive intersection, where roadway conditions and sight distance issues cause a significant number of accidents to occur at the intersection. Some traffic signal modifications will also be necessary. Please refer to the full application which explains the County's rationale for why these improvements are deemed to be low-cost systemic.

Special Rule Narrative (attach additional pages if needed)

Provide a detailed narrative to explain that the location experiences a higher than normal frequency, rate, and/or risk of fatal and incapacitating injury events (severe crashes); and how the proposed project will reduce severe crashes.

The intersection of Smith Pike and SR 46 is listed in the top 50 crash frequency intersections in the Bloomington/Monroe County MPO 2012-2014 Crash Report. While no fatal accidents have occurred, the normal frequency in this area is significant, and, factoring in the number of crashes specifically to the Smith Pike/Forrest Park Drive intersection, many of which are a result of SR 46/Smith Pike intersection capacity issues, the total number of crashes would place the north end of Smith Pike much higher on the MPO's list. For County-maintained roadways, Smith Pike would rank second in crash frequency on the list. By using the existing roadway width on Smith Pike to add left turn capacity onto SR 46, the proposed project would eliminate backups on Smith Pike which reduce crashes at both the Forrest Park Drive intersection and SR 46 intersection with Smith Pike. Proposed improvements include mill and resurface of Smith Pike, re-striping of Smith Pike, lane and traffic signal modifications to accommodate a second left turn lane, and an evaluation of existing signage to ensure intersection recognition of Forrest Park Drive. A complete rationale is included in the full application. The improvements will require no additional ROW and, individually, would be considered low-cost as described in the HSIP application.