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## 2016 Great Bend of the Wabash River Watershed Urban Resident Survey Executive Summary Wabash River Implementation Project



**Prepared December 2016 by:**  
Yuling Gao, Sarah P. Church, and Linda S. Prokopy  
Natural Resources Social Science Lab  
Department of Forestry and Natural Resources  
Purdue University

*The Natural Resources Social Science Lab studies how human interactions with the environment impact natural resources. Our research, teaching, and engagement activities focus on how to best motivate farmers, stakeholders, and citizens of all kinds to participate in more environmentally friendly behaviors and practices. For more information, please go to <https://www.purdue.edu/fnr/prokopy>*

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## Introduction

In the following pages, we highlight key findings from the 2016 Wabash Watershed social indicators survey of urban residents and report on significant changes from 2006 to 2016. The survey asked respondents about themselves and their residence, their perceptions about local water quality, their usage, perceptions, and attitudes of conservation practices, and their awareness of various local outreach efforts. First, we present the methods used to conduct the survey, followed by overall key findings from the 2016 survey. We then highlight significant differences in responses between the 2014 and 2016 surveys, and significant differences in river attitudes responses between the 2006 and 2016, and the 2009 and 2016 surveys.

## Methods

The survey data presented here comes from mail surveys conducted by the Natural Resources and Social Science lab at Purdue University in 2006 (fall), 2009 (spring), 2014 (fall) and 2016 (summer). The 2006 (n=1000), 2009 (n= 850), 2014 (n=1100) and 2016 (n=1000) surveys were mailed to urban residents in Tippecanoe County, Indiana. The address lists for both surveys were purchased from Survey Sampling International. The Dillman (2000)<sup>1</sup> Tailored Design Method was used to contact residents on the address list up to five times.

- **2006:** Advance letter, 1<sup>st</sup> mailing of paper survey, reminder postcard, 2nd mailing of paper survey, 3rd mailing of a paper survey with a reminder postcard. The 2014 response rate was 37.9% (% not including bad addresses. n=352, excluding duplicated or invalid responses).
- **2009:** Advance letter, 1<sup>st</sup> mailing of paper survey, reminder postcard, 2nd mailing of paper survey, 3rd mailing of a paper survey with a reminder postcard. The 2014 response rate was 39.4% (% not including bad addresses. n=309, excluding duplicated or invalid responses).
- **2014:** Advance letter, 1<sup>st</sup> mailing of paper survey, reminder postcard, 2nd mailing of paper survey, 3rd mailing of a paper survey with a reminder postcard. The 2014 response rate was 27.4% (% not including bad addresses. n=278, excluding duplicated or invalid responses).
- **2016:** Advance letter, 1<sup>st</sup> mailing of paper survey, reminder postcard, in-person drop-off and pick-up for single family homes and 2<sup>nd</sup> mailing of survey to apartment dwellers, 3rd mailing of a paper survey with a reminder postcard. The 2016 response rate was 31.4% (% not including bad addresses. n=255, excluding duplicated or invalid responses).

Survey instructions asked that the survey be completed by the person in each household who makes most of the landscaping and lawn care decisions. In order to provide a comparison between 2014 and 2016, most questions on both surveys remained the same. Several other questions were adapted from the 2014 survey in order to provide more specific data in terms of practice adoption and participants' perceptions and attitudes of the practices in 2016. The 2016 survey included additional questions about attitudes towards the Wabash River, in order to understand how residents interact with the Wabash River and their general environmental attitudes. Two statements were from a 2006 Wabash River Survey and 17 were from a 2009 Your Views of the Wabash River Survey.

## Overall Key Findings 2016

The following section reports on key findings found in the 2016 Wabash Survey Descriptive Report. All percentages reported have been rounded.

### Characteristics of Urban Respondents and their Residence

- A total of 255 urban residents of Tippecanoe County responded to the survey, ranging in age from 19 – 98 years (average=56.5).

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<sup>1</sup> Dillman, D.A., 2000. Mail and Internet Surveys: The Tailored Design Method, 2nd edition. John Wiley Co., New York.

- 50.6% of the respondents were female, and 49.4% were male.
- 49.5% earned a bachelor's degree or higher.
- The majority of respondents (83.7%) owned their homes while 16.3% were renters.
- Most lived on ¼ of an acre or less (63.0%) while none lived on lots larger than five acres.

## Sources of Water Pollution

- We asked respondents to report how much of a problem 18 sources of water pollution are in Tippecanoe County. Overall, mean responses fell between 2 (slight problem) and 3 (moderate problem), suggesting that respondents do not feel a sense of urgency about pollution sources in their area.
- Respondents' thought the following pollution sources were the most problematic:
  - *Excessive use of fertilizers and/or pesticides on lawns*  $n=243$  (mean response = 3.0; 57% moderate to severe problem).
  - *Excessive use of fertilizers for crop production*  $n=244$  (mean response = 3.0; 55% moderate to severe problem).
  - *Discharges from industry into rivers and streams*  $n=244$  (mean = 2.9; 50% moderate to severe problem).
  - *Littering/illegal dumping of trash*  $n=245$  (mean = 2.9; 54.3% moderate to severe problem).
  - Essentially, this "problem" list shows some concern over pollution sources of three different stakeholder groups: households, agriculture, and industry. However, household use of fertilizers/pesticides was seen as more problematic than fertilizer from crop production.
- *Waste material from pets*  $n=243$  (mean = 2.1; 21% moderate to severe problem) was seen as least problematic, although almost 26% of respondents to this question indicated that they didn't know whether pet waste was a problem.
- In fact in almost every statement, between 20 and 30 percent of respondents did not know if the pollution source was a problem in their area. Almost half of respondents didn't know if *channelization of streams*  $n=245$  (45.7%) was a problem in their area, followed by *improperly maintained septic systems*  $n=242$  (36.8%), and *soil erosion from shorelines and/or streambanks*  $n=242$  (31.4%).

## Attitudes and Perceptions of the Wabash River

- We asked respondents to report their level of agreement with several statements about their attitudes about and opinions of the Wabash River (strongly agree = 1; disagree = 2; neither agree nor disagree = 3; agree = 4; strongly agree = 5).
- Overall, respondents had positive attitudes about the Wabash River.
  - *The Wabash River is a symbol of the region*  $n=243$  (mean = 4.4; 92% agree or strongly agree).
  - *There is potential to make the Wabash cleaner and healthier*  $n=244$  (mean = 4.3; 89% agree or strongly agree).
  - *The Wabash River is important to me*  $n=241$  (mean = 4.2; 83% agree or strongly agree).
  - *It is important for community members to take an active role in determining the future of the Wabash*  $n=244$  (mean = 4.2; 83% agree or strongly agree).
  - *Local funding to revitalize the Wabash is a great investment in our future*  $n=244$  (mean = 4.1; 78% agree or strongly agree).
- However, respondents appeared to have less confidence in their understanding of the natural processes of the river: *I don't know very much about the natural processes of the Wabash*  $n=244$  (mean = 3.4; 55% agree or strongly agree) and *I don't know a whole lot about what the Wabash provides to our community or myself*  $n=244$  (mean = 3.1; 41% agree or strongly agree). Although they did agree that *the*

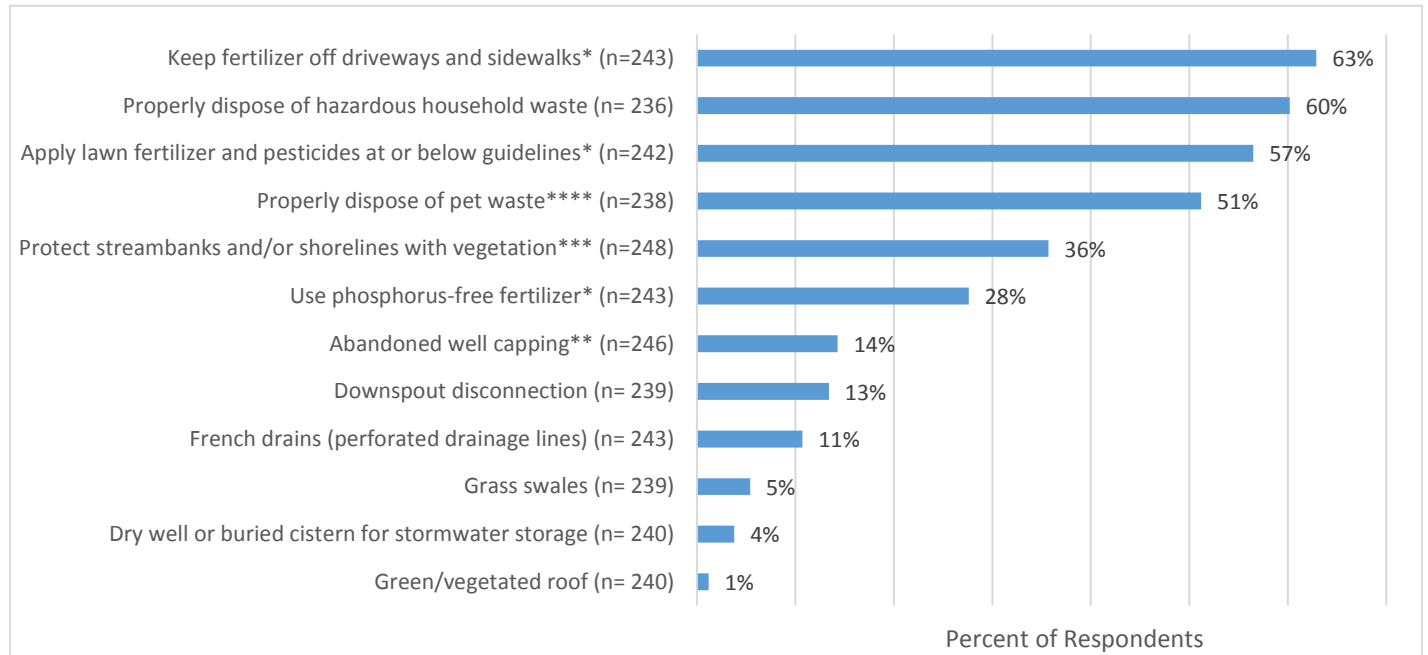
*Wabash corridor provides important habitat for birds and other wildlife n=243 (mean = 4.4; 89% agree or strongly agree).*

- Respondents were generally positive about the influence of water quality on economics and quality of life:
  - *The economic stability of my community depends upon good water quality n=250 (mean = 4.1; 83% agree or strongly agree).*
  - *The quality of life in my community depends on good water quality in local rivers and streams n=247 (mean = 4.0; 78% agree or strongly agree).*
- Respondents also tended to take some amount of personal responsibility for water quality:
  - *It is my personal responsibility to help protect water quality n=250 (mean = 4.0; 82% agree or strongly agree).*
  - *My actions have an impact on water quality n=250 (mean = 3.8; 79% agree or strongly agree).*
  - *The way that I care for my lawn can influence water quality in local rivers and streams (n=249) (mean = 3.8; 75% agree or strongly agree).*
- This sentiment was also reflected in the fact that respondents reported that they would be willing to make changes to their own properties in order to positively impact water quality:
  - *I would be willing to change the way I care for my lawn and yard to improve water quality n=248 (mean = 3.7, 69% agree or strongly agree) even if it cost them more personally, It is important to protect water quality even if it costs me more n=249 (mean = 3.6, 61% agree or strongly agree).*
  - However, respondents were less enthusiastic about paying more to improve water quality through taxes and fees: *I would be willing to pay more to improve water quality (e.g., through local taxes or fees) n=250 (mean = 3.3; 48% agree or strongly agree).*

### Practices to Improve Water Quality

- In terms of adoption of practices to improve water quality (when applicable), the highest percentage of respondents currently *keep fertilizer off driveways and sidewalks n=243 (63%),* followed by *properly disposing of hazardous household waste n=236 (60%).*
- Over half of respondents reported that they currently *apply lawn and fertilizer and pesticide at or below manufacture's guidelines n=242 (57%),* but under a third of respondents reported they *use phosphorus-free fertilizer n=243 (28%).*
- The lowest percentage of reported adoption of practices included structural changes such as *grass swales n=239 (5%), dry well or buried cistern for stormwater storage n=240 (4%),* and *green/vegetated roof n=240 (1%).*

**Figure 1** Usage of Water Quality Improvement Practices: Percent of 2016 survey respondents who currently use the practice



\* 13.6% I do not have a lawn

\*\* 91.5% My property does not have an unused well

\*\*\* 88.7% My property does not border or contain a ditch or waterway

\*\*\*\* 47.5% I do not have a pet

- Many respondents had never heard of several of practices, some of which are more difficult to implement than others:
  - *Grass swales* n=239 (68%)
  - *French drains (perforated drainage lines)* n= 243 (58%)
  - *Downspout disconnection* n=239 (49%)
  - *Green/vegetated roof* n=240 (45%)
  - *Use phosphorus-free fertilizer* n=243 (31%)

- In the 2016 survey, we asked separate, more detailed, questions that were applicable to practices highly promoted by WREC – rain gardens, rain barrels, and pervious pavement. Overall, very few people reported that they had installed/implemented the practice on their property: *rain gardens* (3%), *rain barrels* (8%), *pervious pavement* (1%), and *native plant communities* (8%).
- Respondents were also generally unfamiliar with the practices. Over half of respondents had never heard of *rain gardens* (51%), 53% had never heard of *native plant communities*, and 65% had never heard of *pervious pavement*. *Rain barrels* appear to be more familiar overall: only 12% had never heard of them and 55% were somewhat familiar with them.

**Table 1** 2016 survey respondents' familiarity with rain gardens, rain barrels, and pervious pavement

How familiar are you with...	Rain Gardens (n=248)	Rain Barrels (n=245)	Pervious Pavement (n=243)	Native Plant Communities (n=240)
Never heard of them	51%	12%	65%	53%
Somewhat familiar with them/it	40%	55%	24%	33%
Know how to install one/use it but have not/are not using it	6%	19%	9%	7%
Owned one, haven't installed or no longer use it	n/a	6%	n/a	n/a
Have installed one/use one/it on my property	3%	8%	1%	8%

- Most respondents are also not interested in requesting technical assistance for *rain gardens*  $n=119$  (50%), *rain barrels*  $n=204$  (56%), *pervious pavement*  $n=82$  (56%), and *native plant communities*  $n=110$  (56%). However, a small percentage plan to request technical assistance for *rain gardens* (7%), *rain barrels* (4%), and *native plant communities* (7%). No one planned to ask for technical assistance for *pervious pavement* (0%).
- Survey respondents were asked to indicate their level of agreement with several statements about rain gardens and rain barrels in particular (strongly agree = 1; disagree = 2; neither agree nor disagree = 3; agree = 4; strongly agree = 5).
- Respondents felt fairly positive about rain gardens overall. They were in agreement that rain gardens:
  - *Help improve water quality by effectively managing stormwater*  $n=120$  (mean = 4.1; 83% agree or strongly agree).
  - *Increase the feeling of nature in the surrounding area*  $n=120$  (mean = 3.9; 77% agree or strongly agree).
  - *Improve the appearance of the surrounding area*  $n=120$  (mean = 3.9; 75% agree or strongly agree).
  - *Are a cost-effective way to manage stormwater*  $n=119$  (mean = 3.9; 70% agree or strongly agree).
- Overall, respondents do not appear to be concerned about rain gardens. The highest level of concern reported was in response to the statement *I am concerned that rain gardens... Increase the likelihood of bugs and insects*  $n=120$  (mean = 3.3; 47%), followed by *are not well maintained*  $n=120$  (mean = 3.1; 32%), and *are not allowed due to zoning regulations/Homeowners Association rules*  $n=119$  (mean = 3.1; 23%).
- Respondents were asked their level of agreement for several statements that began with: *Rain barrels should be integrated into our public spaces and yards because they...* (strongly agree = 1; disagree = 2; neither agree nor disagree = 3; agree = 4; strongly agree = 5). Respondents did not appear to be quite as positive about rain barrels as with rain gardens overall. They were in agreement that rain barrels:
  - *Reduce water use for gardening and landscaping*  $n=215$  (mean = 4.0; 85% agree or strongly agree).



- Respondents also agreed, but not as strongly as compared with rain gardens, that rain barrels:
  - *Reduce ponding in yards*  $n=215$  (mean = 3.7; 66% agree or strongly agree).
  - *Are a cost-effective way to manage stormwater*  $n=214$  (mean = 3.7; 65% agree or strongly agree).
  - *Help improve water quality by effectively managing stormwater*  $n=215$  (mean = 3.7; 64% agree or strongly agree).
- Survey respondents generally did not have concerns about rain barrels. The highest level of concern came from the statement *I am concerned that rain barrels increase the likelihood of bugs and insects*  $n=210$  (mean = 3.3; 44% agree or strongly agree).
- Respondents were more supportive of reducing stormwater charges for people who had installed a rain garden or rain barrel, rather than government subsidies. For example, there was fairly high agreement that:
  - **Rain Garden:** *Monthly stormwater charges should be reduced for residents of single-family homes who installed one*  $n=120$  (mean = 3.7; 62% agree or strongly agree).
  - **Rain Barrel:** *Monthly stormwater charges should be reduced for residents of single-family homes who installed one*  $n=213$  (mean = 3.6; 58% agree or strongly agree).
- There was less support for:
  - **Rain Garden:** *Cost of installation should be subsidized through EPA programs for residents of single-family homes who want one for a portion of the full cost* ( $n=120$ ) (mean = 3.3; 51% agree or strongly agree).
  - **Rain Barrel:** *Should be subsidized through EPA programs so that residents of single-family homes can buy one for \$25*  $n=214$  (mean = 3.3; 46% agree or strongly agree).
  - **Rain Garden:** *Cost of installation should be provided by the local government at no cost to residents of single-family homes who want one*  $n=120$  (mean = 3.2; 43% agree or strongly agree).
  - **Rain Barrel:** *Should be subsidized by the local government so that residents of single-family homes can buy one for \$25*  $n=213$  (mean = 3.2; 42% agree or strongly agree).

## Outreach Events/Materials

- We asked survey respondents to tell us if they had heard of and attended 13 different water-related events in Tippecanoe County. Most respondents reported that they had never heard about many of the events we listed and very few people said they attended the events even if they had heard of them.
  - 60% of respondents had heard of the *Wabash Riverfest*  $n=226$ , however only 8% said they attended the event.
  - 23% of respondents had heard of the *Wabash Sampling Blitz*  $n=229$ , but 0.4% attended.
  - The most well attended event was the *Tippecanoe County 4H Fair (educational booth)*  $n=229$ ; 13% of respondents reported that they had visited the booth.
- The vast majority of respondents reported that they had not seen various outreach signs within the community. For those who had seen the signage, the most prevalent sighting was at their neighbor's property.
  - *Rain Barrels at Work*  $n=223$  (87% no); 10% saw the sign at a neighbor's property.
  - *Rain Garden at Work*  $n=232$  (91% no); 4% saw the sign at a neighbor's property.
  - *Native Plants at Work*  $n=232$  (94% no); 4% saw the sign on public property.
  - *Pervious Pavement at Work*  $n=232$  (98% no); 0.9% saw the sign at a neighbor's property.
- Respondents were more likely to see actual practices than signage, although it was still a low percentage who reported seeing the practice:
  - *Painted Rain Barrel*  $n=219$  (66% no); 13% saw a painted rain barrel on their neighbor's property.

## Significant Differences between 2014 and 2016

In this section, we report on significant changes<sup>2</sup> from 2014 to 2016.

- Although respondents were less likely to agree that their own personal actions can influence local water quality and that it is their personal responsibility to help protect water quality, levels of agreement with these sentiments were still fairly strong. The same was true for attitudes toward water quality protection (strongly agree = 1; disagree = 2; neither agree nor disagree = 3; agree = 4; strongly agree = 5):
  - *The way that I care for my lawn can influence water quality in local rivers and streams*\*\*\*  
2014 mean = 4.1; 2016 mean = 3.8
  - *It is my personal responsibility to help protect water quality*\*\*\*\*  
2014 mean = 4.2; 2016 mean = 4.0
  - *It is important to protect water quality even if it slows economic development*\*\*\*  
2014 mean = 4.0; 2016 mean = 3.8
- In 2016, respondents were more likely to think that a few pollution sources were more of a problem as compared with 2014. However, respondents still generally did not regard these issues as a very big problem (1=not a problem; 2=slight problem; 3=moderate problem; 4=severe problem).
  - *Improper disposal of lawn waste, oils, and chemicals into storm drains*\*\*  
2014 mean = 2.6; 2016 mean = 2.8
  - *Littering/illegal dumping of trash*\*\*  
2014 mean = 2.7; 2016 mean = 2.9
- Respondents were also less likely to have heard about *downspout disconnection*\*\* in 2016 as compared with 2014.
  - 2014 mean = 2.1; 39% never heard of it
  - 2016 mean = 1.9; 49% never heard of it
- Respondents were quite a bit less likely to be familiar with *rain barrels* in 2016 as compared with 2014:
  - *Know how to install one but have not*\*\*\*  
2014 = 32%; 2016 = 19%
- Quite a few more respondents had also *never heard of*\*\* *pervious pavement* in 2016 as compared with 2014.
  - 2014 = 53%; 2016 = 65%
- Respondents were more likely to have attended *Detrash the Wabash*\*\*\*\* in 2016 as compared with 2014. Many more people had also heard about the event in 2016 as compared with 2014.
  - 2014 mean = 1.2; 84% no [I didn't attend], I've never heard of it; 15% no [I didn't attend], but I've heard of it; 1% yes, I did attend.
  - 2016 mean = 1.6; 44% no [I didn't attend], I've never heard of it; 52% no [I didn't attend], but I've heard of it; 4% yes, I did attend.
- Respondents were less likely to have attended a *Green Tour*\*\*\*\* in 2016 as compared with 2014.
  - 2014 mean = 1.7; 38% no [I didn't attend], I've never heard of it; 56% no [I didn't attend], but I've heard of it

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<sup>2</sup> "Significant differences" indicate that differences are statistically significant (meaning that they are unlikely to have occurred by chance) at the p<.10 level (\*\*=p<.05; \*\*\*=p<.01; \*\*\*\*=p<.001). For questions with a "don't know" response option, significance is calculated without accounting for such responses.

- 2016 mean = 1.1; 90% no [I didn't attend], I've never heard of it; 10% no [I didn't attend], but I've heard of it
- Respondents were more likely to have attended a *public presentation*\*\* in 2016 as compared with 2014. Many more people had also heard about the event in 2016 as compared with 2014
  - 2014 mean = 1.2; 84% no [I didn't attend], I've never heard of it; 15% no [I didn't attend], but I've heard of it; 0.4% yes, I did attend.
  - 2016 mean = 1.3; 78% no [I didn't attend], I've never heard of it; 20% no [I didn't attend], but I've heard of it; 3% yes, I did attend.
- The ratio of *male*\*\* to *female*\*\* respondents was more evenly distributed in 2016 as compared with 2014.
  - 2014 Male 61%; 2014 Female 39%
  - 2016 Male 49%; 2016 Female 51%

## Significant Differences between 2006 and 2016, and between 2009 and 2016

In this section, we report on significant changes<sup>3</sup> from 2006 to 2016.

- In 2016, respondents were more likely to value the importance of the river as compared with 2006 and 2009 (1=not a problem; 2=slight problem; 3=moderate problem; 4=severe problem).
  - *The Wabash River is important to me.*\*\*  
2006 mean = 4.0; 78% agree or strongly agree (n=344)  
2016 mean = 4.2; 83% agree or strongly agree (n=237)
  - *The Wabash River is a symbol of the region.*\*\*\*\*  
2009 mean = 4.2; 83% agree or strongly agree (n=287)  
2016 mean = 4.4; 92% agree or strongly agree (n=239)
  - *I like having a river in town.*\*\*\*\*  
2009 mean = 4.1; 82% agree or strongly agree (n=292)  
2016 mean = 4.3; 88% agree or strongly agree (n=239)
- In 2016, respondents were also more likely to agree that individuals should take a role in protecting the Wabash River as compared with 2009.
  - *I don't need to get involved because other people are taking care of the problems with the Wabash.*\*\*  
2009 mean = 2.6; 42% disagree or strongly disagree (n=277)  
2016 mean = 2.5; 51% disagree or strongly disagree (n=227)
  - *It is important for community members to take an active role in determining the future of the Wabash.*\*\*  
2009 mean = 4.0; 78% agree or strongly agree (n=292)  
2016 mean = 4.2; 83% agree or strongly agree (n=234)
- In 2016, respondents were also more likely to agree that funding to fix and revitalize the Wabash River is important, and the River has the potential to improve, as compared with 2009.
  - *Local funding to revitalize the Wabash is a great investment in our future.*\*\*\*  
2009 mean = 4.1; 69% agree or strongly agree (n=288)

<sup>3</sup> "Significant differences" indicate that differences are statistically significant (meaning that they are unlikely to have occurred by chance) at the p<.10 level (\*\*=p<.05; \*\*\*=p<.01; \*\*\*\*=p<.001). For questions with a "don't know" response option, significance is calculated without accounting for such responses.

- 2016 mean = 4.2; 78% agree or strongly agree (n=232)
  - *The Wabash is too big of a mess to fix without federal money.\*\*\**  
2009 mean = 3.1; 29% disagree or strongly disagree (n=258)  
2016 mean = 2.8; 38% disagree or strongly disagree (n=191)
  - *There is potential to make the Wabash a more accessible place for recreation.\*\**  
2009 mean = 3.9; 84% agree or strongly agree (n=284)  
2016 mean = 4.1; 88% agree or strongly agree (n=229)
  - *Improvements to the riverfront have helped bring people back to downtown.\*\*\*\**  
2009 mean = 3.4; 47% agree or strongly agree (n=258)  
2016 mean = 3.8; 62% agree or strongly agree (n=213)
- However, respondents were less likely to recreate along the Wabash in 2016 as compared with 2009.
  - *I like outdoor activities, but I don't recreate along the Wabash. \*\*\*\**  
2009 mean = 3.5; 58% agree or strongly agree (n=289)  
2016 mean = 3.8; 69% agree or strongly agree (n=235)
- The ratio of *male \*\*\*\** to *female \*\*\*\** respondents was more evenly distributed in 2016 as compared with 2006 and 2009.
  - 2006 Male 65%; 2006 Female 35%
  - 2009 Male 66%; 2009 Female 34%
  - 2016 Male 49%; 2016 Female 51%