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<http://bit.ly/ERA-IAFSM-2017>

Engaging the Public Through Online Platforms

Online Flood Surveys

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Engineering Resource Associates, Inc.



Jenny Loewenstein, P.E., CFM, CPESC

jloewenstein@eraconsultants.com

630.393.3060

www.eraconsultants.com



Cody Frovarp

cfrovarp@eraconsultants.com

630.393.3060

www.eraconsultants.com



Using an Online Platform for Flood Surveys

Structure

- Engagement
- Images
- Education
- Comments
- Data Upload
- Geospatial Data
- Skip Logic

Analytics

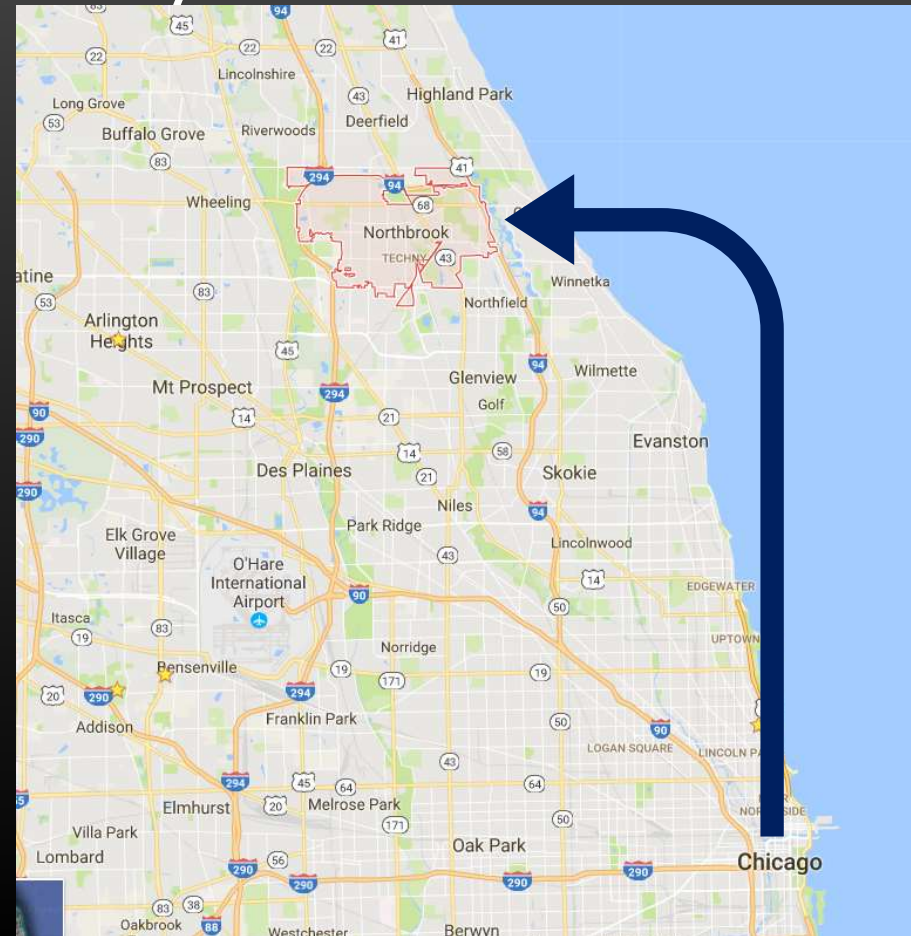
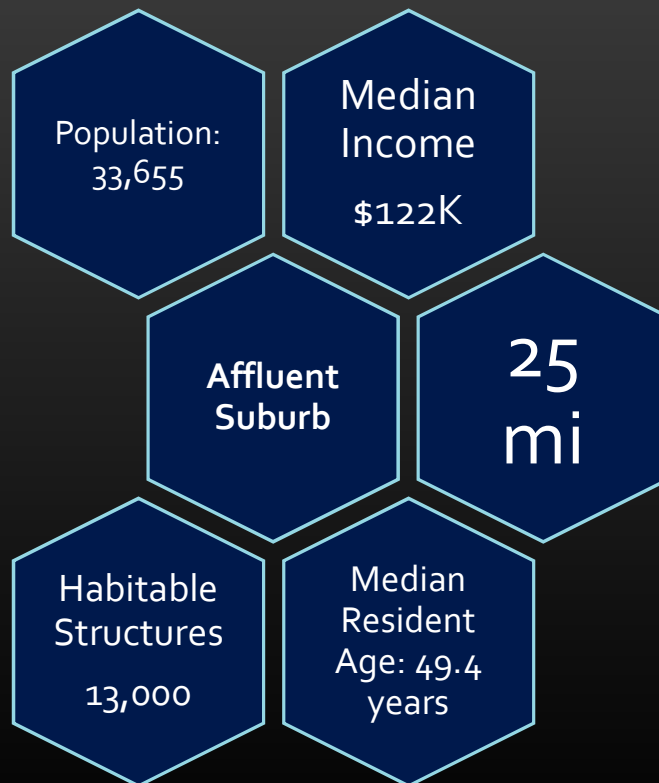
- Metadata
- Demographics
- Correlations
- Statistics

Distribution

- Accessibility
- Distribution Channels
- Cost Effectiveness

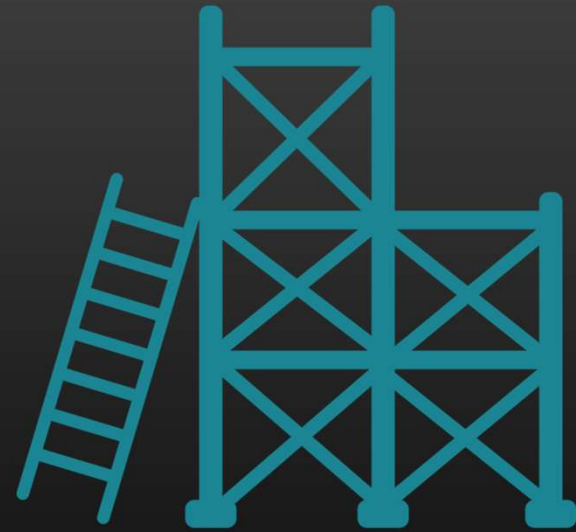


Online Survey Case Study



Flood Survey Structure

- Engagement
- Images
- Education
- Comments
- Data Upload
- Geospatial Data
- Skip Logic



Interactive Heat Maps

Very Frequent Flooding (5+ times a year)



Frequent Flooding (3-4 times a year)



Occasional Flooding (1-2 times a year)



Infrequent Flooding (once every few years)

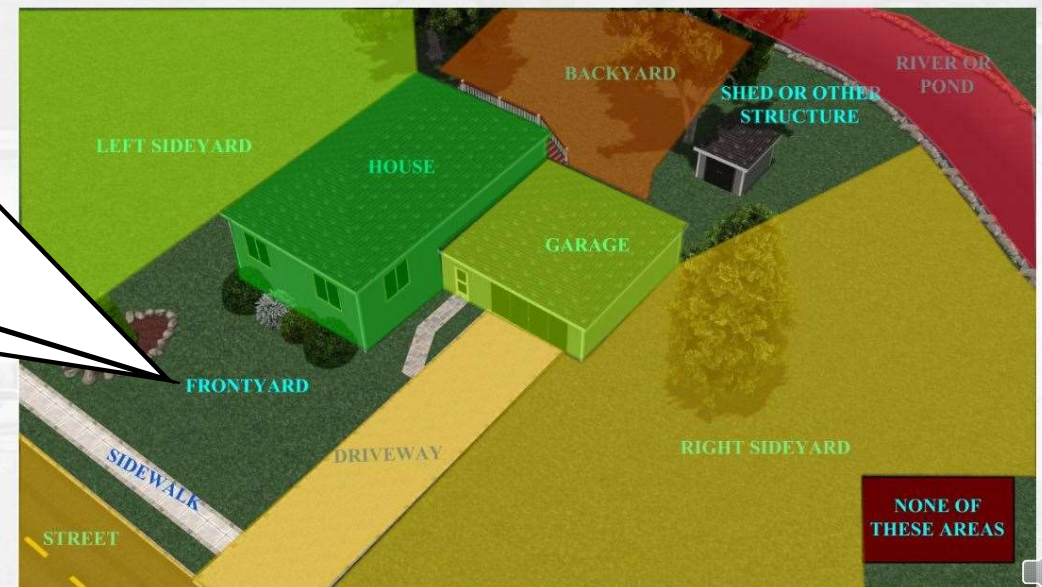


Never Experiences Flooding

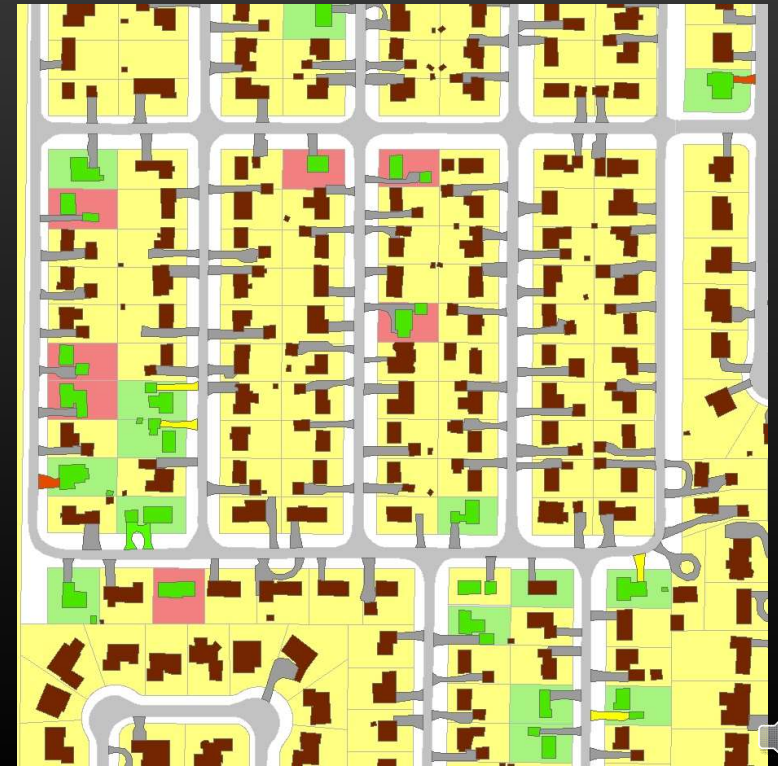


Please click on each of the regions at your location that have experienced flooding. When a region is selected, you will be asked to choose the frequency of flooding that each area experiences.

Each text location represents a unique area. Click on as many areas as necessary. If none of these areas have flooded, please click on the red box to continue. (When taking the survey on a phone, click the area twice for the selection to pop up)



Geospatial Results and GIS



Diagrams



Demonstrative Images



Do you have a storm sump pump in your building?

☐ Yes

☐ No



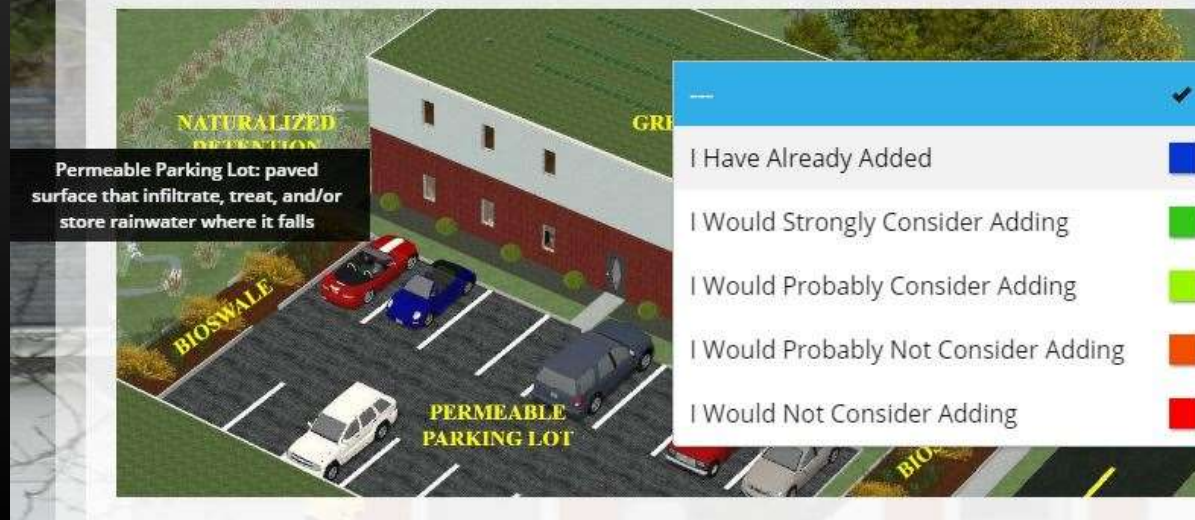
Education – Getting on the Same Page



Education – Getting on the Same Page

Which of these green infrastructure practices that reduce stormwater runoff would you be willing to consider implementing or have already implemented on your property or in your community (Definition Source: EPA)? When a region is selected, you will be asked to choose whether or not you would consider adding this improvement.

Click each area as identified by the text to indicate your preference. Hovering over the area with your mouse will also provide a description of the green infrastructure practice. (When taking survey on phone, click the area once for a description and once more for the selection to pop up)



Comments and Opinions

74%

*"When there is heavy rain, **the storm sewers** get backed up quite frequently.... The storm sewers in our neighborhood, or where the sewers drain to, **are inadequate.**"*

*"...the Village could provide **community education to teach people** strategies to safely disperse storm water runoff, without flooding neighbors' yards and their own homes."*

"Why? Nothing will be done."



Data Upload Option



Uploaded:

- **135 Photos**
- **11 videos**



Skip Logic

Legend:

(Forced Response) This question is not optional

(Branch to Page 14) Skip Logic

☐ Only One Selection Possible

☐ Multiple Selections Possible

Fill in the Blank Question

Q2. First and Last Name

(Optional)

Q3. House Number (Forced Response)

Q4. Street Name

Q5. What is your relationship to this property? (Forced Response)

- ☐ Residential Owner
- ☐ Residential Renter
- ☐ Commercial Renter (Branch to Page 7)
- ☐ Commercial Owner (Branch to Page 7)
- ☐ Commercial Employee (Branch to Page 7)
- ☐ Public Property Manager (Branch to Page 7)
- ☐ Other (Branch to Page 7)

☐ Other (Branch to Page 7)

☐ Public Property Manager (Branch to Page 7)



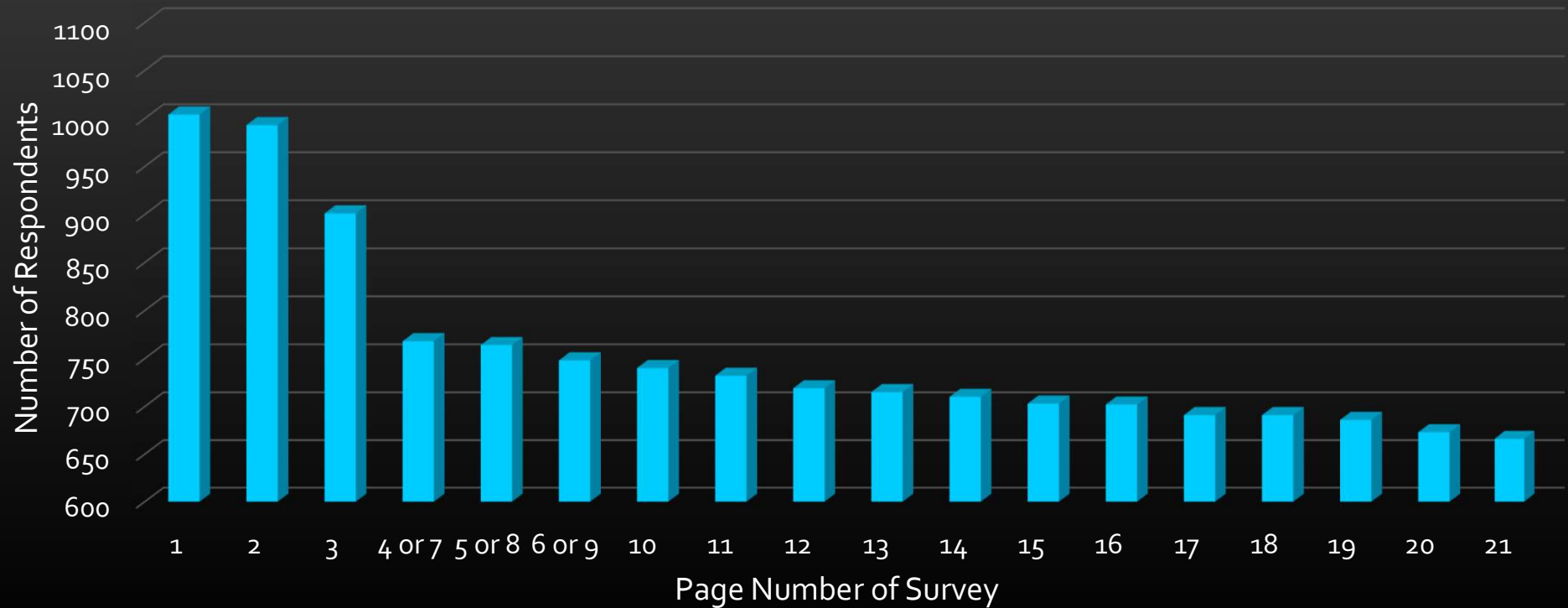
Flood Survey Analytics

- Metadata
- Demographics
- Correlations
- Statistics



Public Survey Design-Completion Rate Analysis

Survey Drop Off By Page Number



Eliminate Required Response for Address?

Pros

- Potential for lower drop out rate
- Simplified ethical disclosure

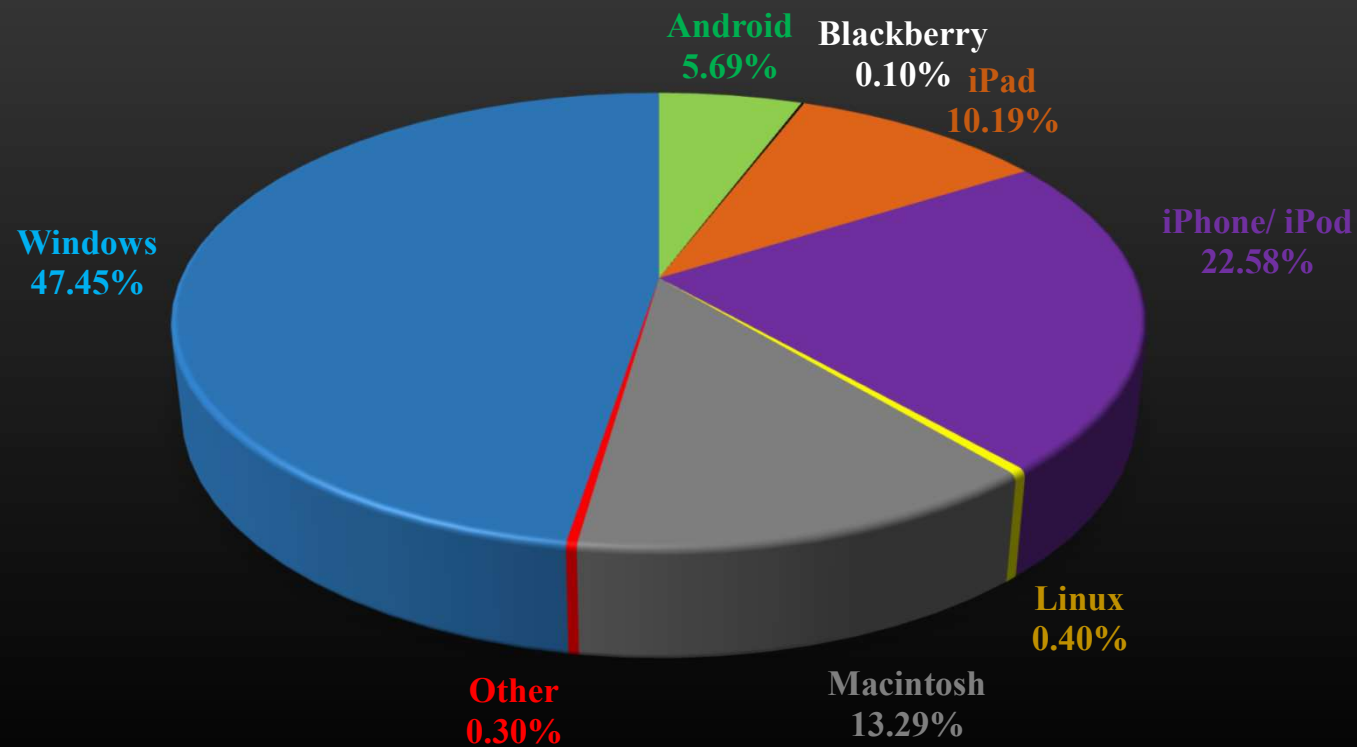
Cons

- No geospatial data for analysis
- Difficulty determining duplicates resulting in errors
- Ethical concerns if participants are identified using other methods



Public Survey Design-Access By Device

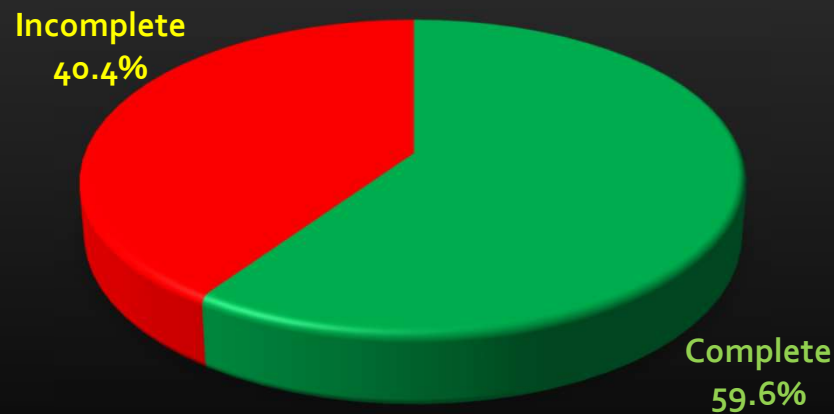
Type of Device



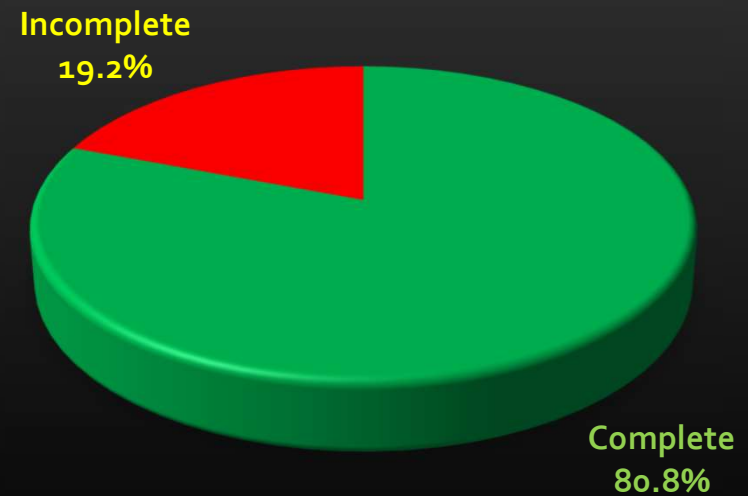
Public Survey Design-Access By Device

Type of Device

PHONE/TABLET

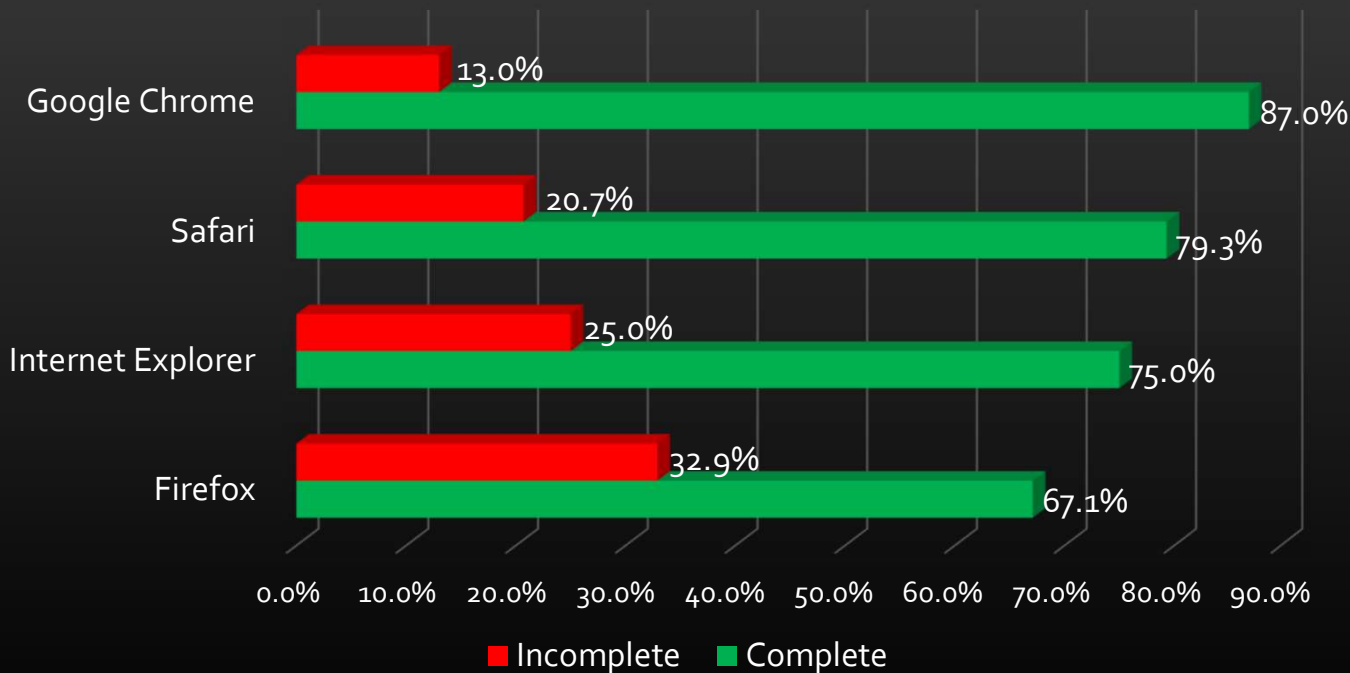


COMPUTER

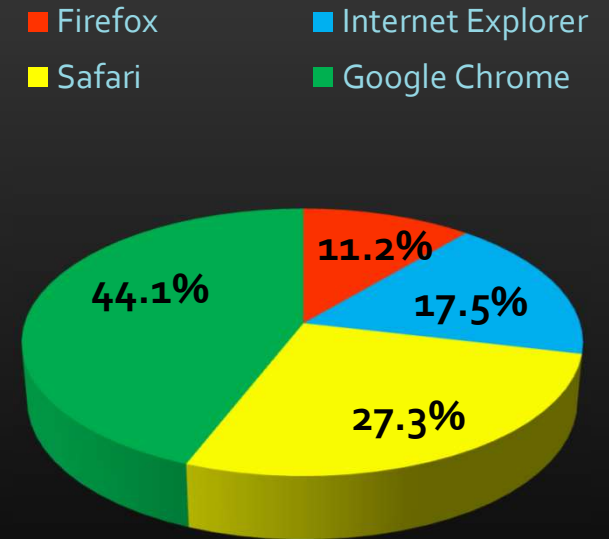


Public Survey Design-Computer Browser

Completion Rate By Browser Type



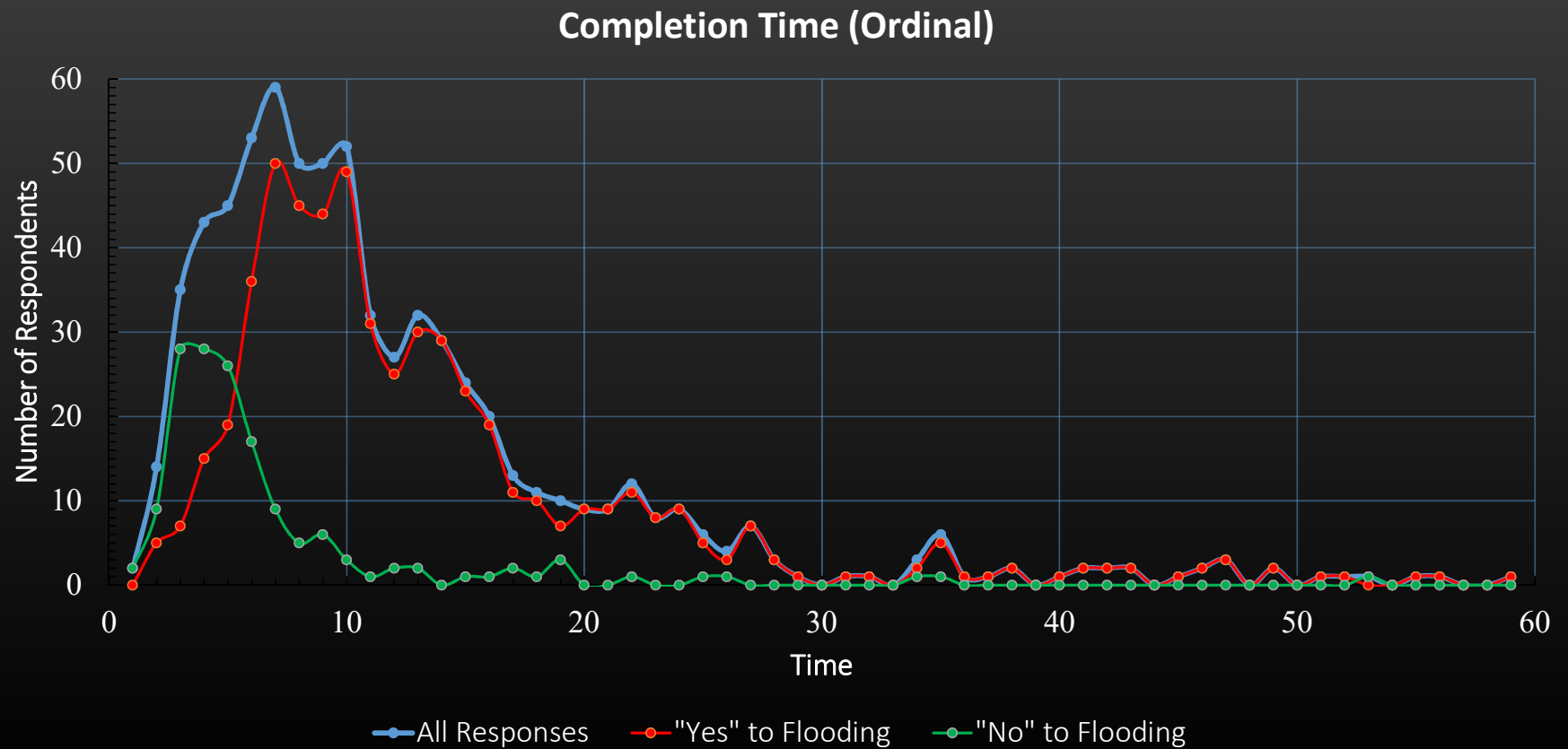
Respondent Browser



*Statistically significant and moderate correlation ($\phi_c = 0.228$)

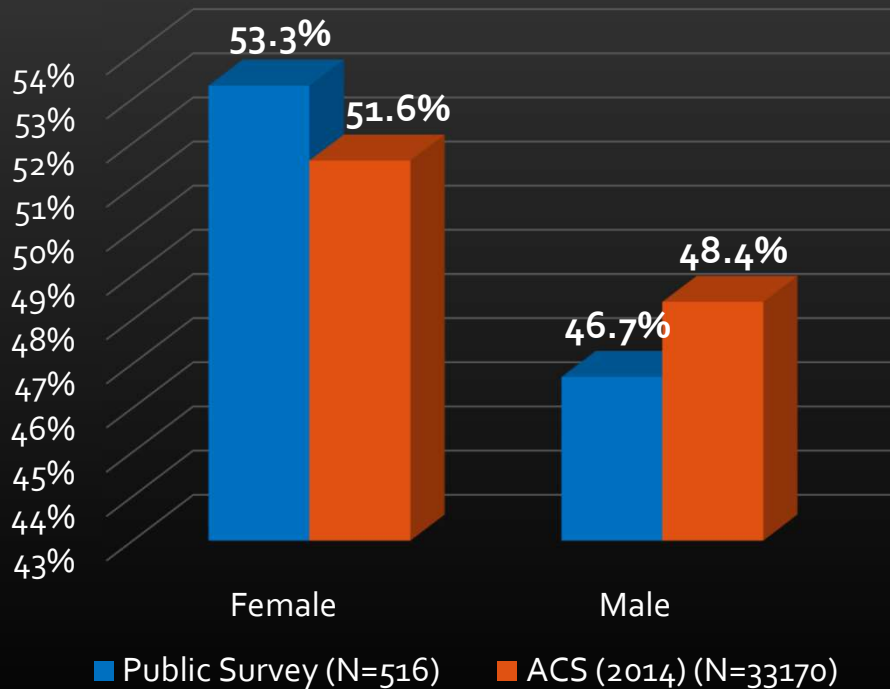


Public Survey Design- Time

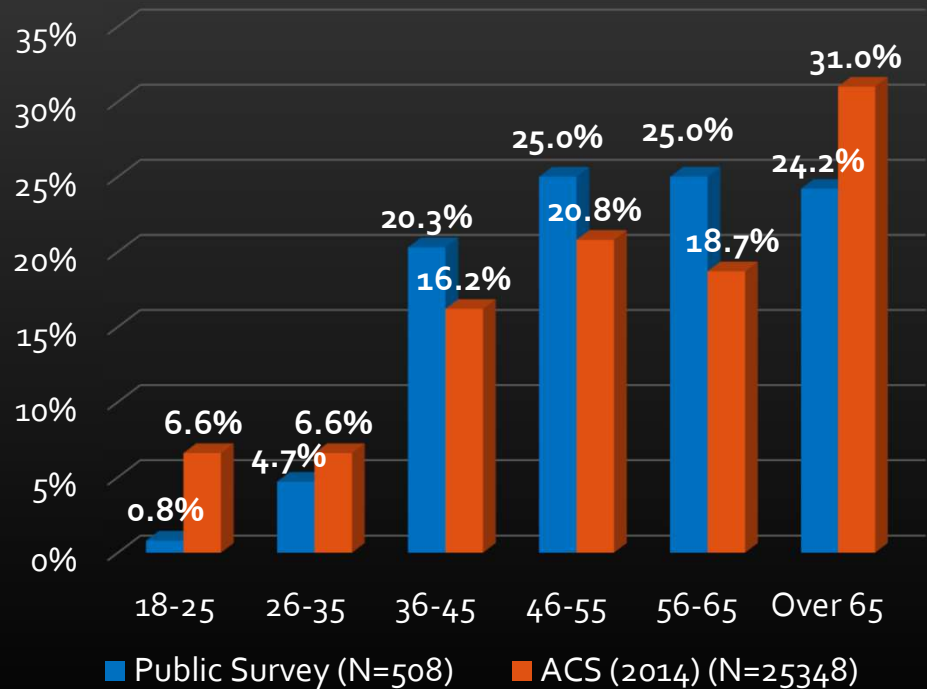


Public Survey Demographics

Gender of Residents

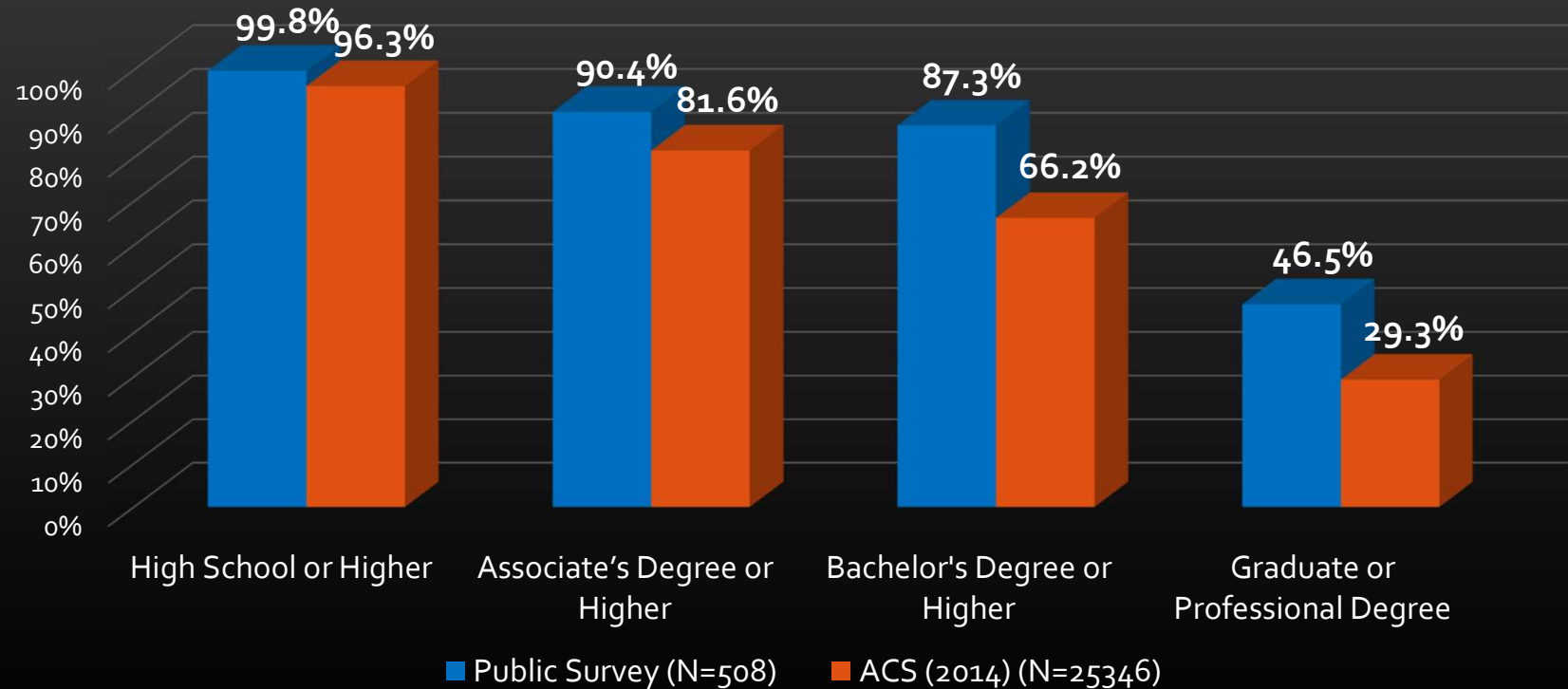


Age of Residents



Public Survey Demographics

Educational Attainment of Residents

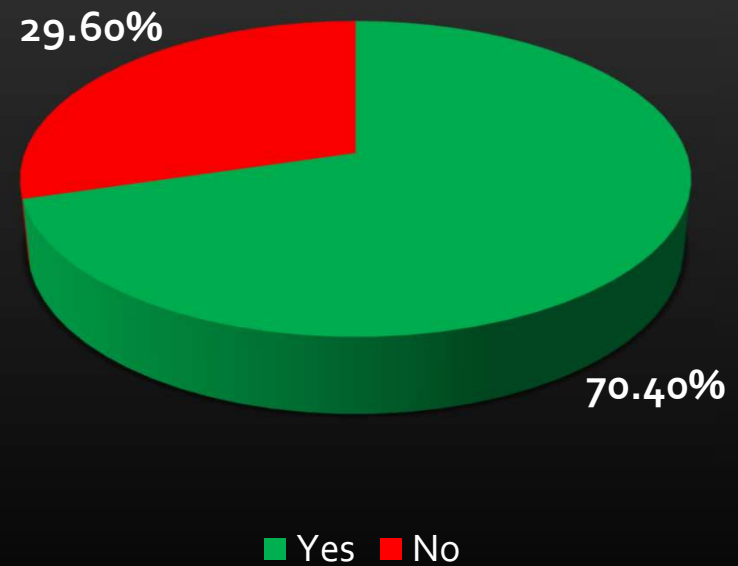


Public Survey Statistical Analysis

[Q16] How much would you be willing to invest in order to reduce future instances from occurring? (Unable Excluded)

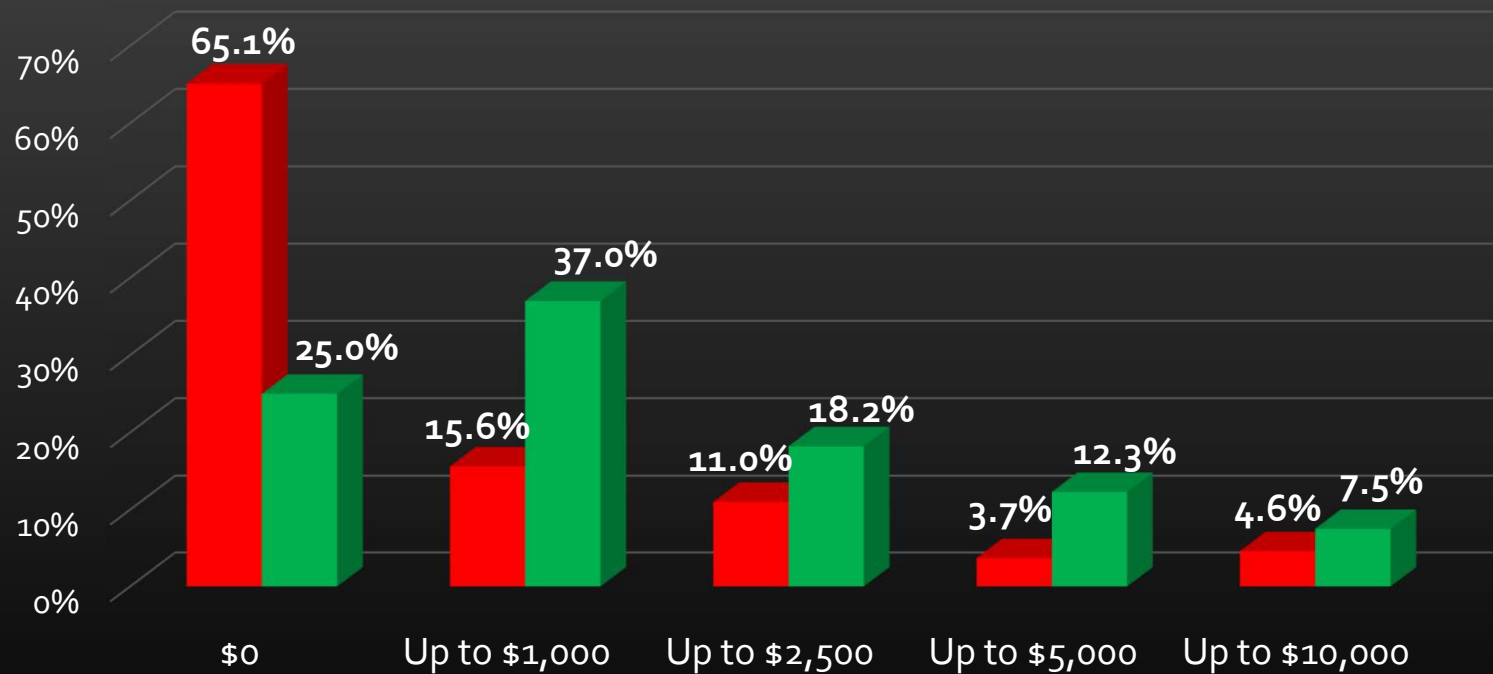
	Yes	N=
\$0	36.2%	146
Up to \$1,000	31.0%	125
Up to \$2,500	16.1%	65
Up to \$5,000	9.9%	40
Up to \$10,000	6.7%	27

[GreenYN] Are you interested in green infrastructure? (N=713)



Public Survey Statistical Analysis

Comparison of a respondent's interest in *Green Infrastructure* and a respondent's *Willingness to Invest* in flood mitigation



[Q16] How much would you be willing to invest in order to reduce future instances from occurring?

Interested in Green Infrastructure?

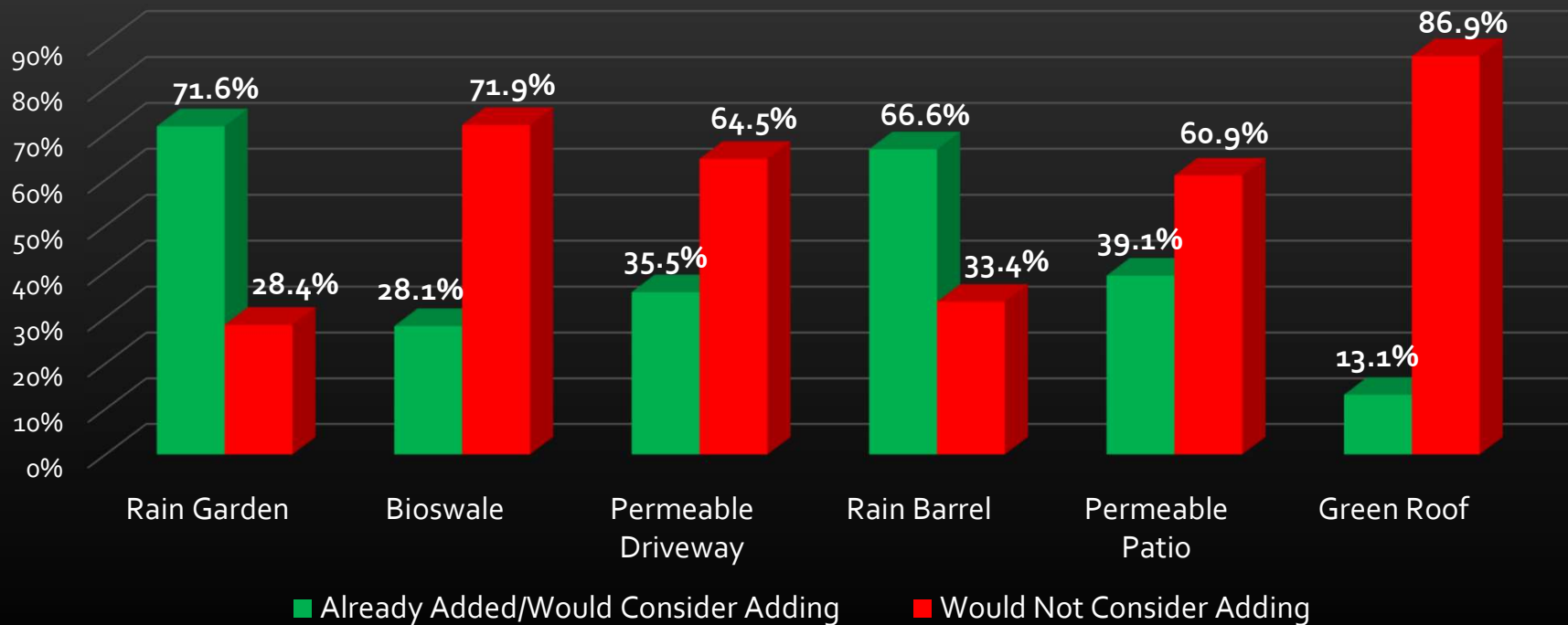
■ No (N=109) ■ Yes (N=292)

*Statistically significant and strong correlation ($\phi c = 0.376$)



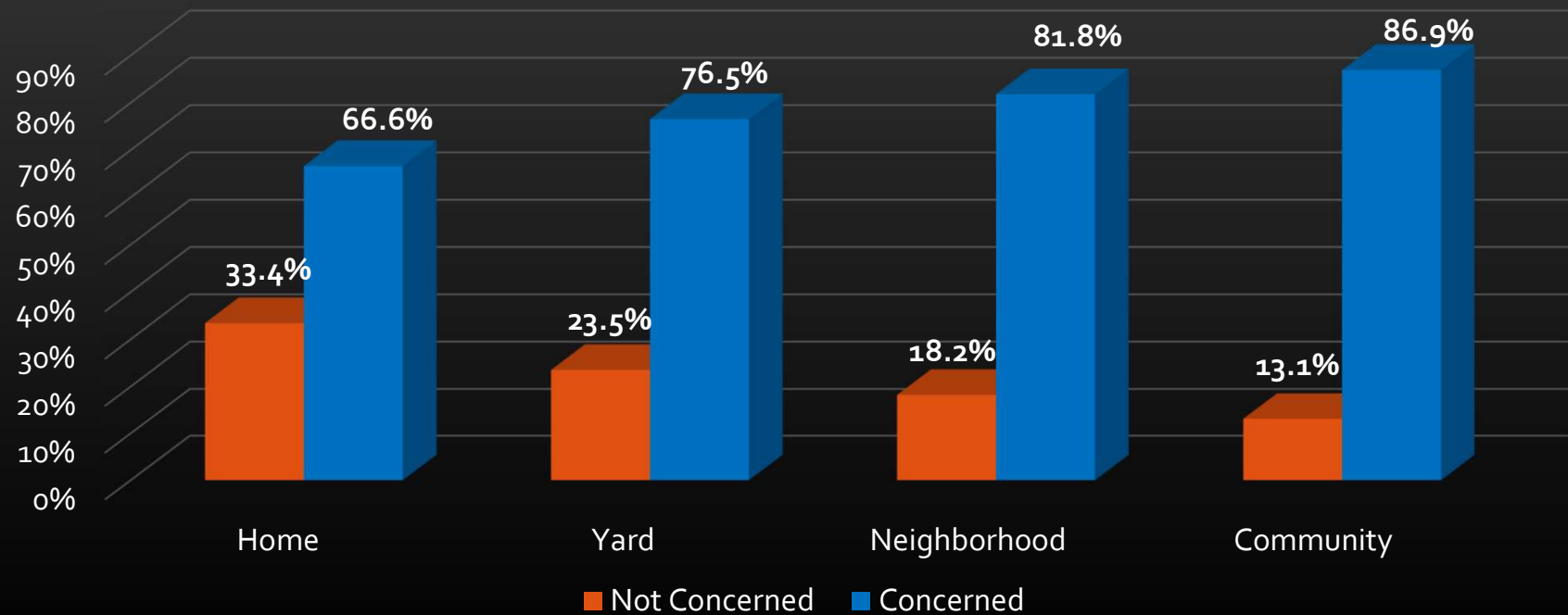
Public Survey Statistics

Residential Green Infrastructure Preferences
(N=299)



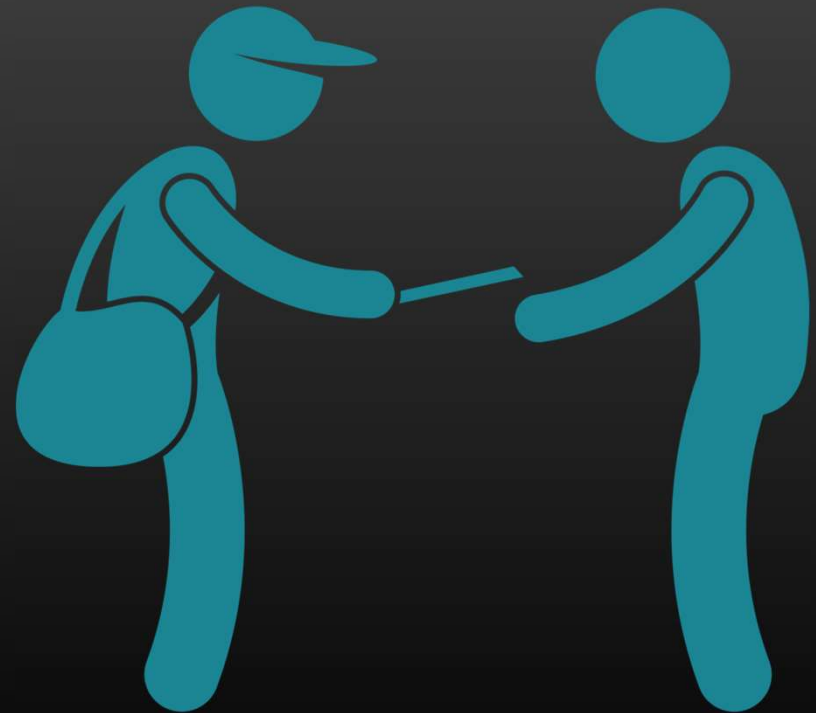
Value of Qualitative Questions

How Concerned Are You About Flooding In...
(N=704)



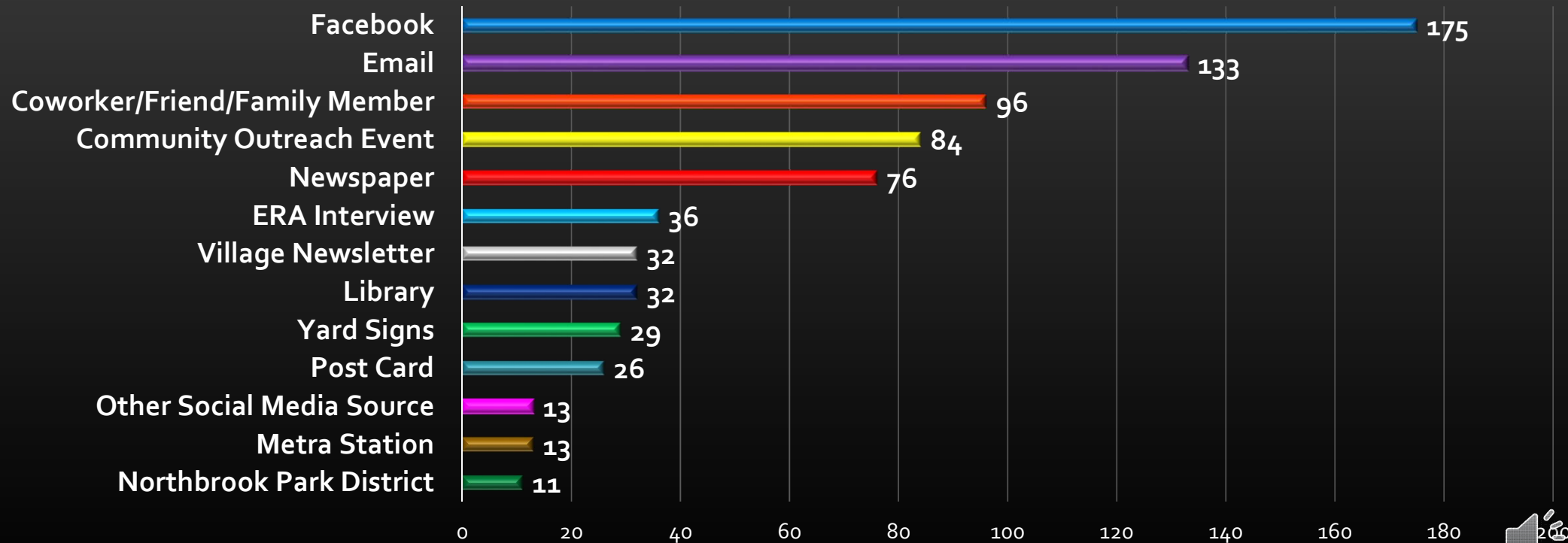
Flood Survey Distribution

- Accessibility
- Distribution Channels
- Cost Effectiveness



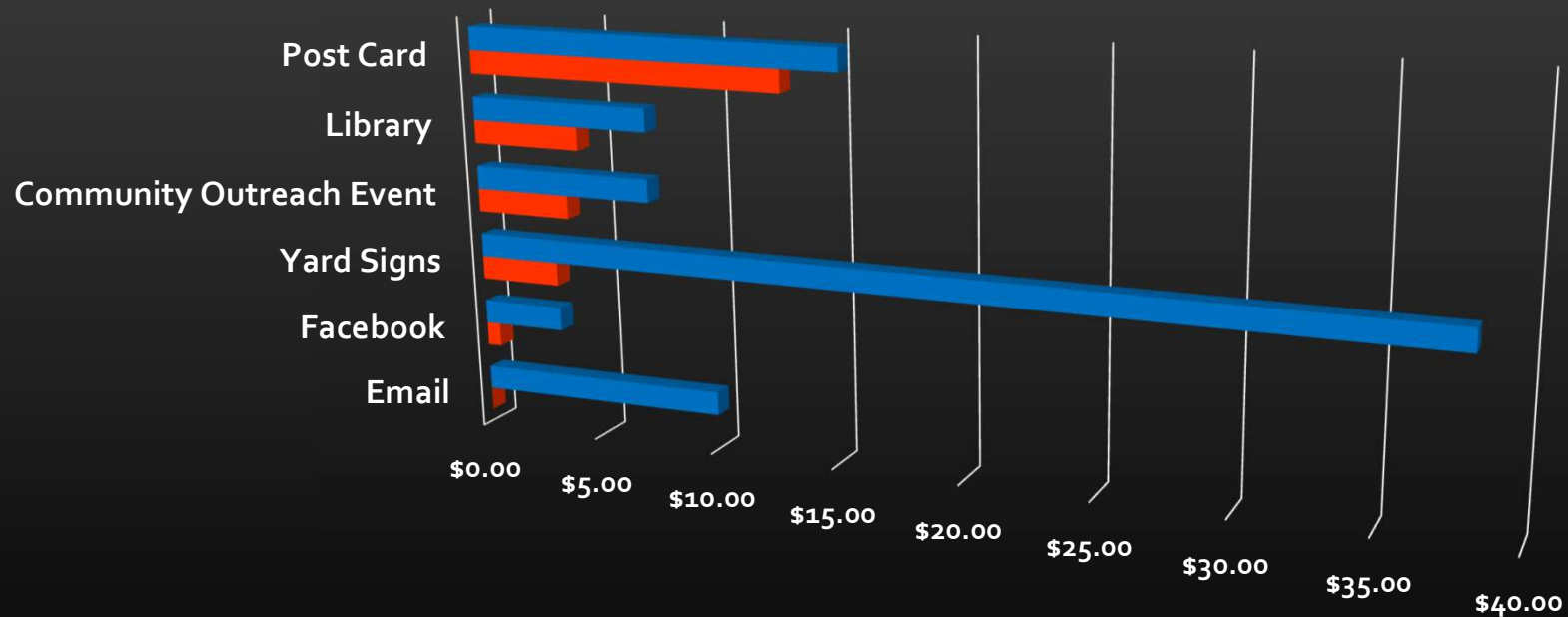
Public Survey Outreach

How Did You Hear About Us?



Public Survey Outreach

Cost Per Response For Different Approaches



	Email	Facebook	Yard Signs	Community Outreach Event	Library	Post Card
■ Highest Cost	\$10.00	\$3.33	\$38.16	\$7.37	\$7.37	\$15.27
■ Lowest Cost	\$0.00	\$0.56	\$3.29	\$3.90	\$4.46	\$12.96



Outreach Method Biases

[Q33] How did you hear about this survey?

		Community Outreach Event	Coworker/ Friend/ Family Member	Email	Facebook	Library	Newspaper	Post Card	Yard Sign	Other	N=
[Gender] Gender	Male	7.8%	9.8%	13.6%	14.6%	3.1%	12.2%	4.1%	2.0%	32.9%	295
	Female	5.8%	9.7%	16.7%	29.7%	4.8%	8.2%	2.7%	1.2%	21.2%	330

Demographics Bias
No Demographics Bias

*Statistically significant and moderate correlation ($\phi_c = 0.241$)



Survey Software

FluidSurveys

- Powerful survey software with options for complex and interactive questions
- Heat Mapping options

FluidSurveys

IBM SPSS Statistics

- Statistics analytical software
- Gamma and Chi-squared tests for statistical significance
- Linear and logistic regressions for policy drafting



Pro's and Con's

Pros


- Survey is a click away
- Easily distributed online
- Use of interactive components
- Data Export
- Immediate feedback compiling
- Flexible and Editable
- Large scale distribution

Cons

- Access discrimination – Internet required
- Age discrimination – upper age range
- Easily distracted online
- Potential to have duplicated responses



Free Google Online Form - <http://bit.ly/IAFSM>



IAFSM Sample Online Urban Flooding Survey

1. Duplicate this google survey for your own use.
2. Change the header image to your own.
3. Rename the title of the survey.
4. Add a description of the survey here. Below is sample language for your use.

The Village/City/Government Agency has identified your house as being located in an area that may have experienced flooding in recent years. We are considering a project (or projects) in the near future to help reduce flooding problems for your neighborhood, but first we would like to hear from you.

This is a short questionnaire that will help us understand exactly what type of flooding and standing water problems you have experienced. Please note the questionnaire is the first of many steps needed to implement an improvement project; therefore, a specific timeline for any potential project(s) is not yet known. In the event an improvement project is slated for your area, the Village/City/Government Agency will host a neighborhood meeting to discuss project details.

This questionnaire may be printed and mailed or hand-delivered to us, or you can complete the online version here. The survey will be open until MM/DD/YYYY.

* Required



References

“Response Rate Statistics for Online Surveys -What Numbers Should You be Aiming For?”
FluidSurveys. Published October 8, 2014. <http://fluidsurveys.com/university/response-rate-statistics-online-surveys-aiming/>

US Census Bureau. 2010-2014 American Community Survey 5-Year Estimates. *American FactFinder*. Accessed August 10, 2016.
<http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=CF>.

