Callin' Baton Rouge: 311 Calls on Flooding and Stormwater Infrastructure

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Introduction

Local governments are increasingly turning to underlined 311 call systems to improve relations with residents, and performance of city services. In flood-prone East Baton Rouge parish, residents make 311 calls to improve stormwater infrastructure.

One foundational sociological perspective on socio-technical systems that could be brought to bear on flooding is that of Perrow's "normal accidents" (Perrow 1984). Theory on normal accidents showcases that tightly coupled systems can generate accidents because of unanticipated interactions of otherwise contained issues.

We believe that flood risk management is tightly coupled in two ways: first in that stormwater infrastructure elements are tightly coupled with each other (i.e., water conveyed in one element conditions what water is or is not conveyed elsewhere), and, second, that 311 call systems are tightly coupled with stormwater infrastructure as calls are used by local authorities to find sites to better mitigate flooding.

Our research asks: what kinds of impacts do normal accidents have when socio-technical systems are tightly coupled, spatially extensive, and temporally enduring? In particular, we focus on time as a key aspect by analyzing cases where calls were not closed or took a long period of time to close.

Data, Methods, and Measures

We marshal a mixed methodological data set on thousands of 311 calls about stormwater infrastructure in East Baton Rouge parish, Louisiana.

Data:

311 Calls Data:
* East Baton Rouge parish calls from 2021-2022 that pertained to stormwater infrastructure by non-employees (n=8,553)
* Each call had a written summary that was inductively coded by undergraduate researchers.
* Codebook was created based on inductive coding to operationalize key characteristics of calls

Additional Data:
* Census tract-level socio-demographic data
* Parcel-level appraisal and homeowner data

Key Variables on Normal Accidents:
* Blockage Issue
* Damaged Infrastructure
* Erosion or sinkhole

Key Variables on Call-related Characteristics:
* Flooded in past; conveying emotions; leaving contact information
* Mentioning wider neighborhood; raising safety issue; parcel with more calls

Dependent Variables:
* Time to Close: # of days (logged) since call was closed
* Time Open: # of days (logged) since call was closed w/calls still open estimated based on # of days until 6/4/24
* Time Open > 1 Year: Binary variable denoting if open >1 year
* Status: Closed or Open (Status as of 6/4/24)

What is a 311 call?

311 calls are calls made by residents of a locality to report issues that can be addressed by that locality such as missed trash pickup, a streetlight being out, or a clogged storm drain.
* 311 call systems are typically run by cities or counties, who respond to the calls to address the issue.
* In addition to calling the operator, "calls" can be made on an app or online.

Research Question and Descriptive Findings

Key Research Question: What factors are associated with longer wait times or a call being closed?
* We operationalize long wait times and calls not being closed as a normal accident: a failure in technical system of stormwater infrastructure that prompted the call that is coupled with a failure in a social system in not responding to the call.

Descriptive Finding #1: Calls made about stormwater infrastructure are spatially extensive.
* Spatially extensive: median of 349 calls in census tract (approx. a call every other day). Range is 34 to 1,176 calls.

Descriptive Finding #2: Calls made about stormwater infrastructure are temporally enduring.
* Temporally enduring: 34% of calls not closed. 30.2% of calls that were closed took 6+ months, and 12% took at least 1 year.
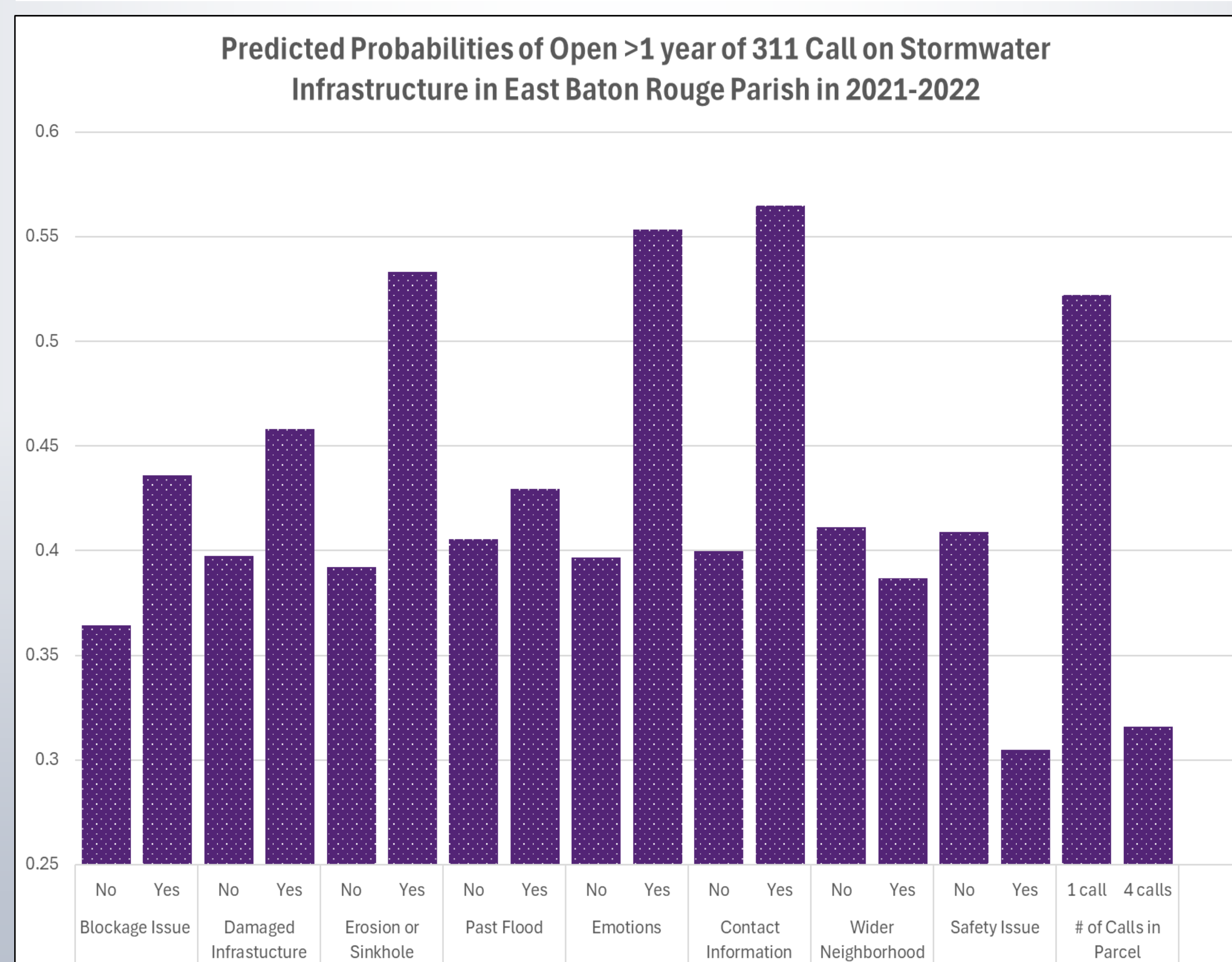
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Regression Findings

Main Finding #1: Calls made about normal accidents to stormwater infrastructure were associated with longer wait times and lower odds of being closed.
* Three characteristics -- blockage or drainage issue, damaged infrastructure, and erosion or sinkhole – have this association.

Main Finding #2: Call characteristics framing personal involvement were associated with longer wait times and lower odds of being closed.
* Three characteristics – mentioning that they flooded in the past, conveying emotions, and leaving contact information – have this association.

Main Finding #3: Call characteristics framing wider issues were associated with shorter wait times and higher odds of being closed.
* Three characteristics – mentioning that the issue is part of the wider neighborhood, raising a safety issue, and making more calls in a parcel – have this association.

Conclusion

* 311 call systems are a pivotal part of integrating resident input into improving stormwater infrastructure. But the 311 call system in East Baton Rouge parish has challenges in response times.
* Highlighting issues that bear on normal accidents lead to longer responses times
* Framing personal issues lead to longer response times
* Framing wider issues lead to shorter response times
* Tight coupling of socio-technical systems like stormwater infrastructure and 311 call systems can lead to longer wait times, which we believe to be a normal accident

Next Steps

* Qualitative coding of subset of calls (n=596) that met three conditions: (a) were open at least 1 year, (b) had one of normal accidents variables, and (c) had one of three characteristics associated with longer wait times.
* Integration of environmental and temporal measures to geospatial research design (e.g., hourly rainfall, flood risk, and more)

Source : East Baton Rouge parish.

Reference: Perrow, C. (1984). *Normal accidents: Living with high risk technologies.* Princeton university press.