Water Main Break Correlations

Water main breaks can be detrimental to communities, as they typically create a water outage, which is similar to a power outage. Replacing mains is an extremely expensive endeavor, so predicting main breaks has been a focus for many water utilities throughout the United States. Predictions concentrate around pipe attributes, location, temperatures and weather. The majority of main breaks occur during winter presumably due to the stress of frost and changing temperatures, however the root cause may be different (e.g. a compromised section of pipe due to corrosive soil). Citizens Energy Group is seeking to determine correlations between water main breaks and the following factors:

- Material
- Age
- Water Temperature
- Air Temperature, Changes in Temperature
- Pressure
- Surface Condition (i.e. if under pavement)

A combination of factors should be considered. Citizens has previously conducted extensive work, so utilization of previous studies will be a key to success.

Data Available from Citizens Energy Group

- GIS data including pipe length, diameter, material, year of installation, historical main break data (location, break type, etc.), soil types, roadway locations
- Daily water temperature data
- Water pressure data, including zones and minimum and maximum modeled pressure

Other Data Expected to be Useful

- City of Indianapolis pavement temperature monitors
- Weather data (air temps, etc.)

Potential Deliverables

- Correlation graphs indicating probability of water main breaks based on factors or combination of factors.
- Operational recommendations to prevent water main breaks
- Predictive tool (i.e. predict when a pipe will break based on previous breaks and other factors)
- Recommendations for other data to track