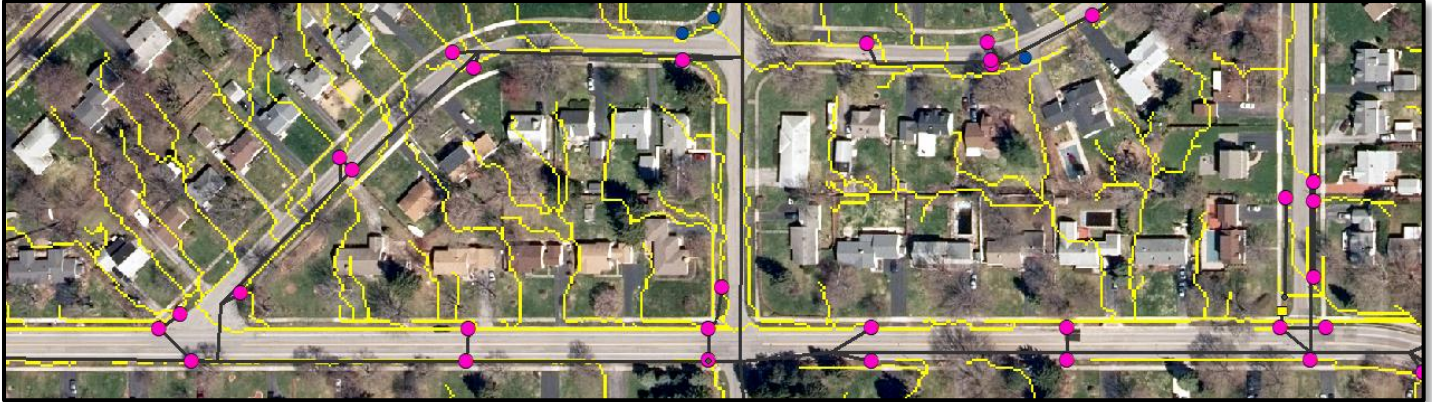


# Mapping Existing Drainage: Town of Greece Evaluates Retrofit Options



## The Problem

The Town of Greece in Monroe County NY is located along the shoreline of Lake Ontario. In recent years, high lake levels coupled with heavy rains have caused nuisance flooding along the lakefront, inundating roads and residences and overwhelming existing stormwater infrastructure. GroundPoint Engineering, under a subcontract with Bergmann Associates, was hired to evaluate drainage conditions as part of developing recommendations for potential infrastructure improvements.

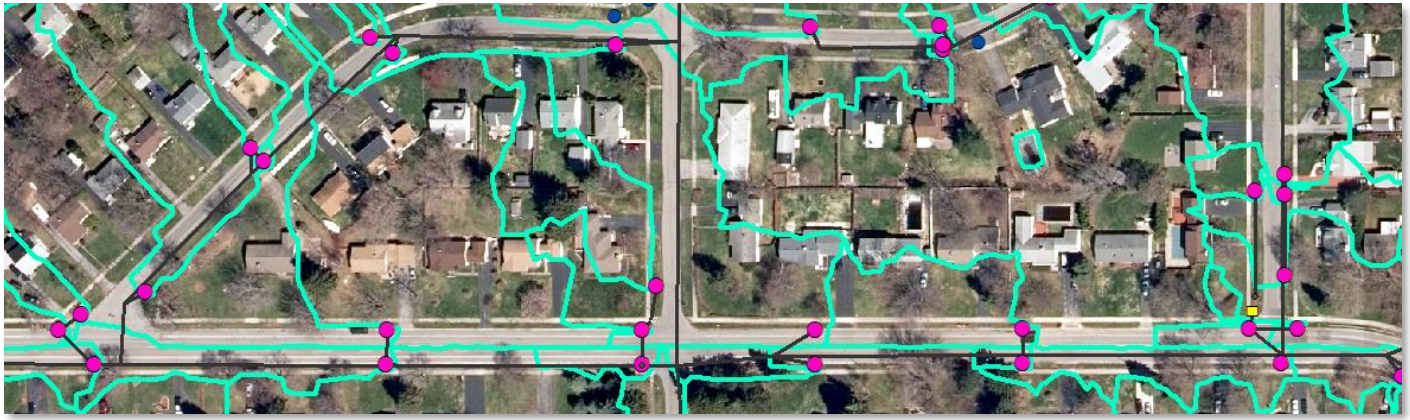
## Challenges

The area along the lakefront is very flat and poorly drained. Existing storm water infrastructure is isolated in small segments characterized mostly by underground conveyance pipes fed through catch basins located along street curbs. GroundPoint Engineering team worked with the Monroe County GIS team on behalf of the Town of Greece to use recent high-resolution airborne LiDAR data to analyze current drainage conditions and characterize problem areas.

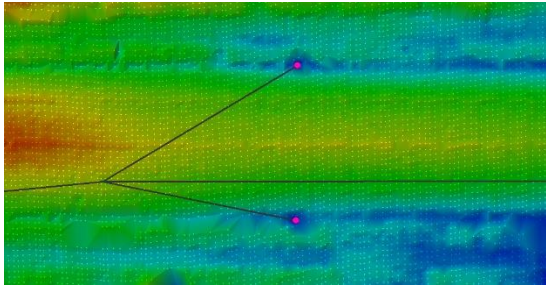
## Solutions

Using the high-resolution airborne LiDAR data from Monroe County, GroundPoint was able to show how the surface drains at scales down to individual catch basins. The surface model showed that much of the infrastructure was working as designed, validating the flow model. But in some cases, surface flow appeared to bypass existing inlets or not be captured at all. In other cases, we were able to show that flow was concentrated to some inlets and not others. In those cases upsizing inlets, adding new inlets, or extending drainage pipes might all be viable options.





GroundPoint initially developed an enhanced surface model from the County LiDAR data. The process included some limited editing of the surface model associated with culverts, and critically evaluating the point cloud in areas of concern to ensure flow was not impacted by digital artifacts. In most cases, the LiDAR data provided excellent coverage of the surface. An unexpected value of the project was an independent QC of the Town's Storm Water GIS data, which helped



the Town identify inconsistencies in the data model. Additional catchment characteristics such as total area, average slope, time of concentration, and average runoff curve number were derived in order to calculate peak flow estimates based on NOAA Atlas 14 precipitation predictions. The approach was adapted from work developed at the Cornell Water Resources Institute (WRI) based on the Soil Conservation Service TR55 Runoff Model.

### Results

The derived flow paths and catchment areas to each catch basin in the GIS inventory validated that the mapped drainage was accurate and that in a significant amount of the infrastructure was capturing runoff as designed. The confidence established in those areas extended to other areas where it was clear from the results where the infrastructure was not performing adequately. Several categories of potential concern were established to help the design Engineers and the Town evaluate retrofit options.

*An unexpected value of the project was an independent QC of the Town's Storm Water GIS data, which helped the Town identify inconsistencies in the GIS data model and make necessary changes.*

### About GroundPoint Engineering

GroundPoint Engineering is a professionally licensed engineering firm that specializes in high resolution topographic mapping and drainage analysis. Working with data from airborne LiDAR and UAVs, GroundPoint creates data that supports detailed analysis and provides the input to more complex runoff and water quality modeling packages.

For more information visit [drainagemapping.com](http://drainagemapping.com) or contact us at 845.224-7780

