

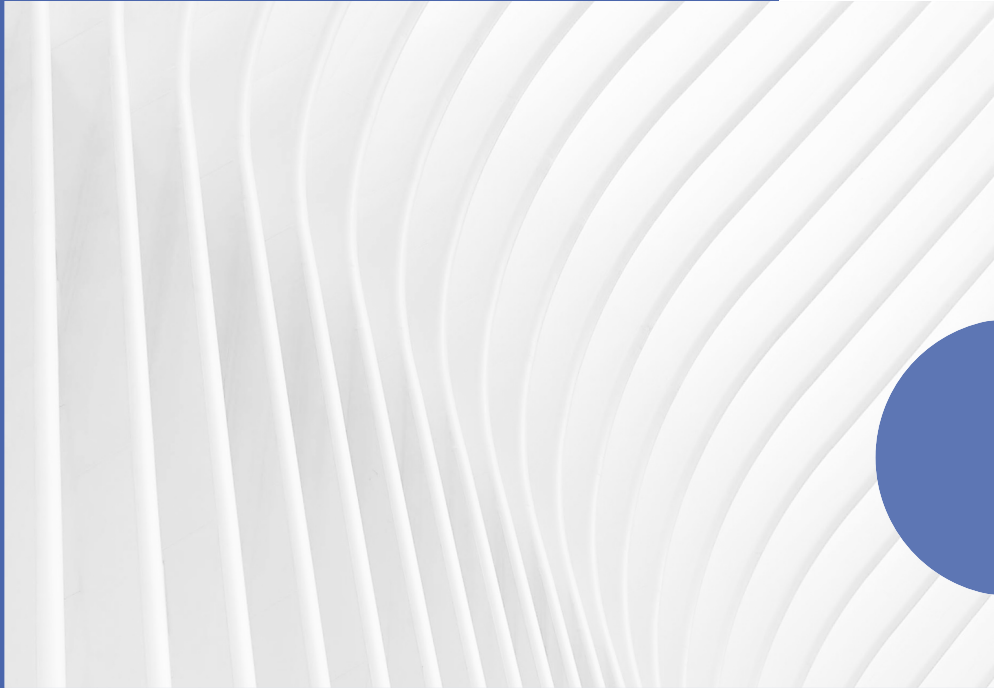
NEW BRITAIN TOWNSHIP

# **ROADBOTICS PROGRAM**

**JUNE  
2023**



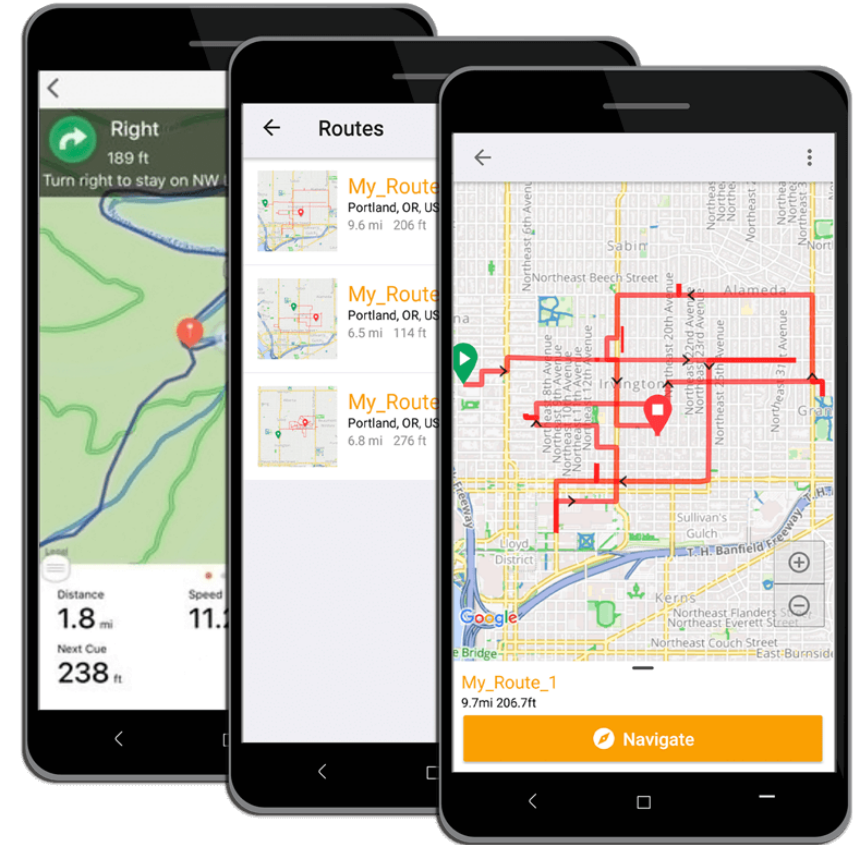
# BACKGROUND



- Intended to provide quantitative data to support institutional knowledge of NBT Public Works
- RoadBotics software used to survey road conditions November 2022
- Data received from RoadBotics March 2023
- GIS analysis conducted April-May 2023

# ROADBOTICS DATA COLLECTION

- Phone with RoadNav application provided by RoadBotics
- Pre-programmed routes driven with phone mounted to dash to take photos every 10 feet
- Photos analyzed by RoadBotics
- Each photo assigned a rating based on road condition
  - Rating 1 - Great condition, no signs of wear
  - Rating 2 - Good condition, minor signs of wear
  - Rating 3 - Fair condition, moderate signs of wear
  - Rating 4 - Poor condition, significant signs of wear
  - Rating 5 - Significant damage, needs immediate repair
- Resulting data analyzed in Township's GIS software



# ROADBOTICS DATA COLLECTION





# STUDY AREA

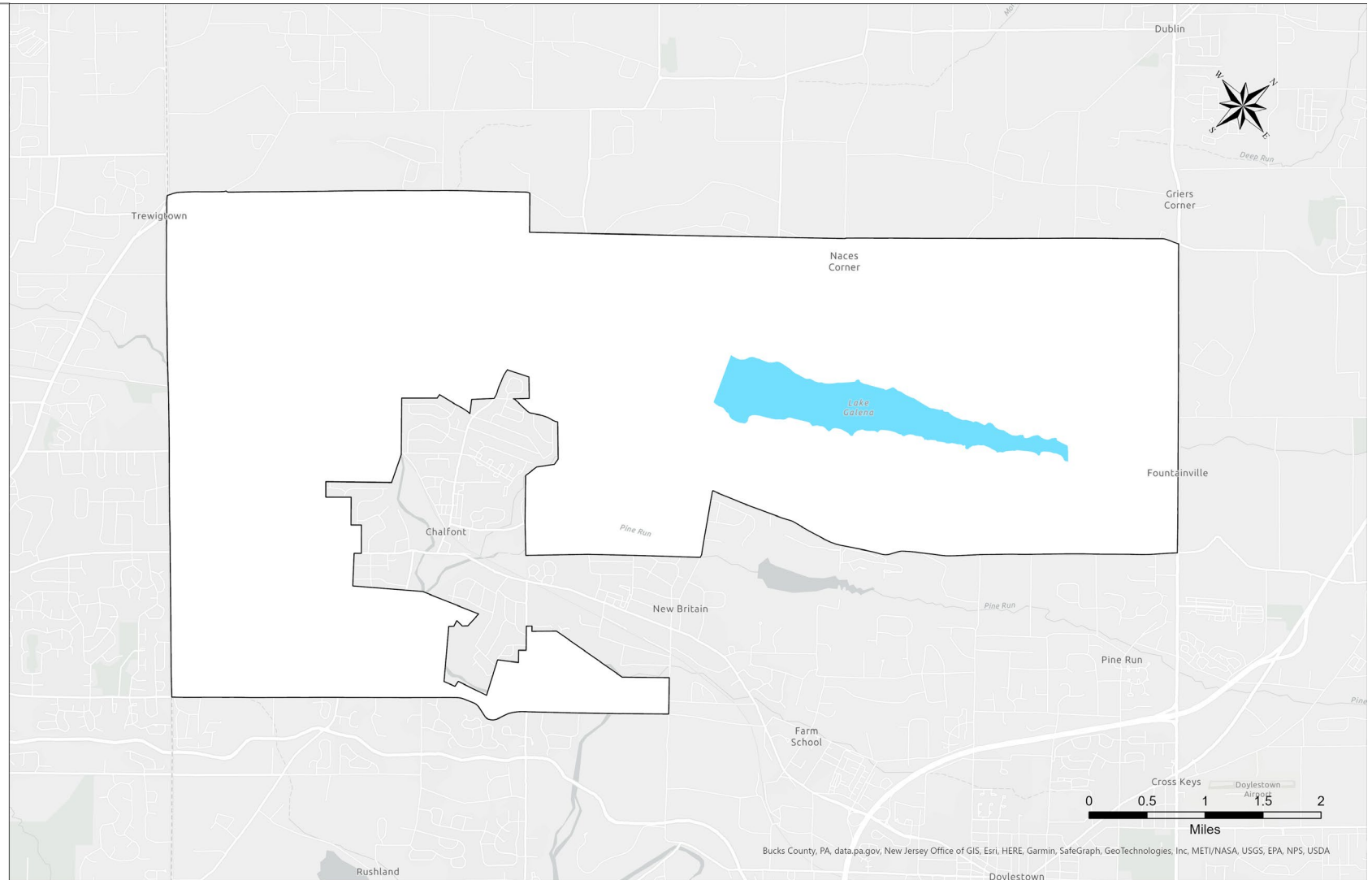
## New Britain Township Bucks County, PA

**Population:** 12,335 (2021)

**Land Area:** 15.29 sq. mi.

**Pop. Density:** 806.7  
people/sq. mi.

**Median HH Income:**  
\$115,704



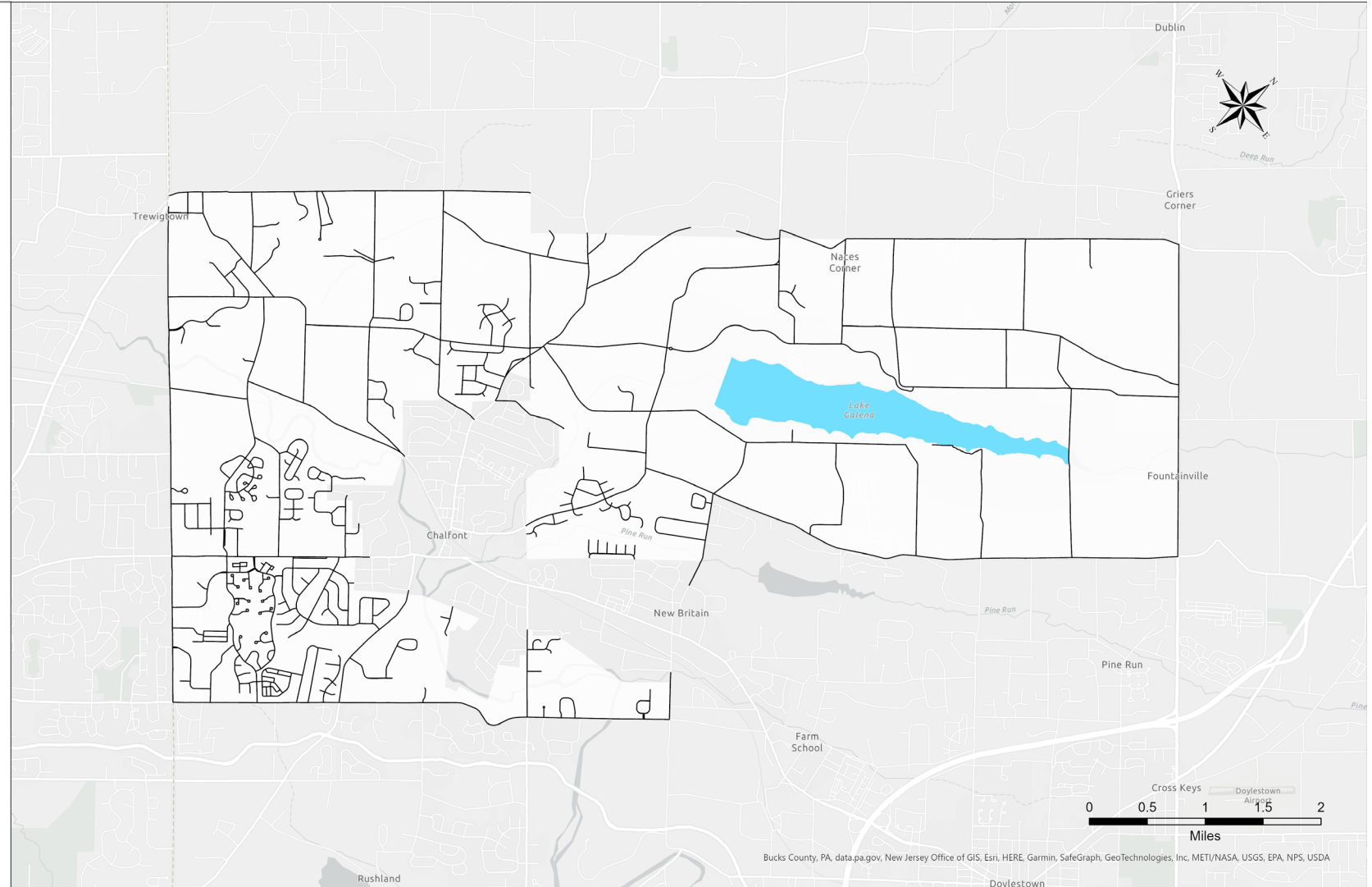
# ROADS IN STUDY AREA

## Township Roads

**Total Overall Road Length:**  
525,632.6 ft (99.5 mi)

### Road Owners:

- PennDOT
- Bucks County
- New Britain Township
- Hilltown Township
- Chalfont Borough
- Warrington Township
- Doylestown Township
- Private

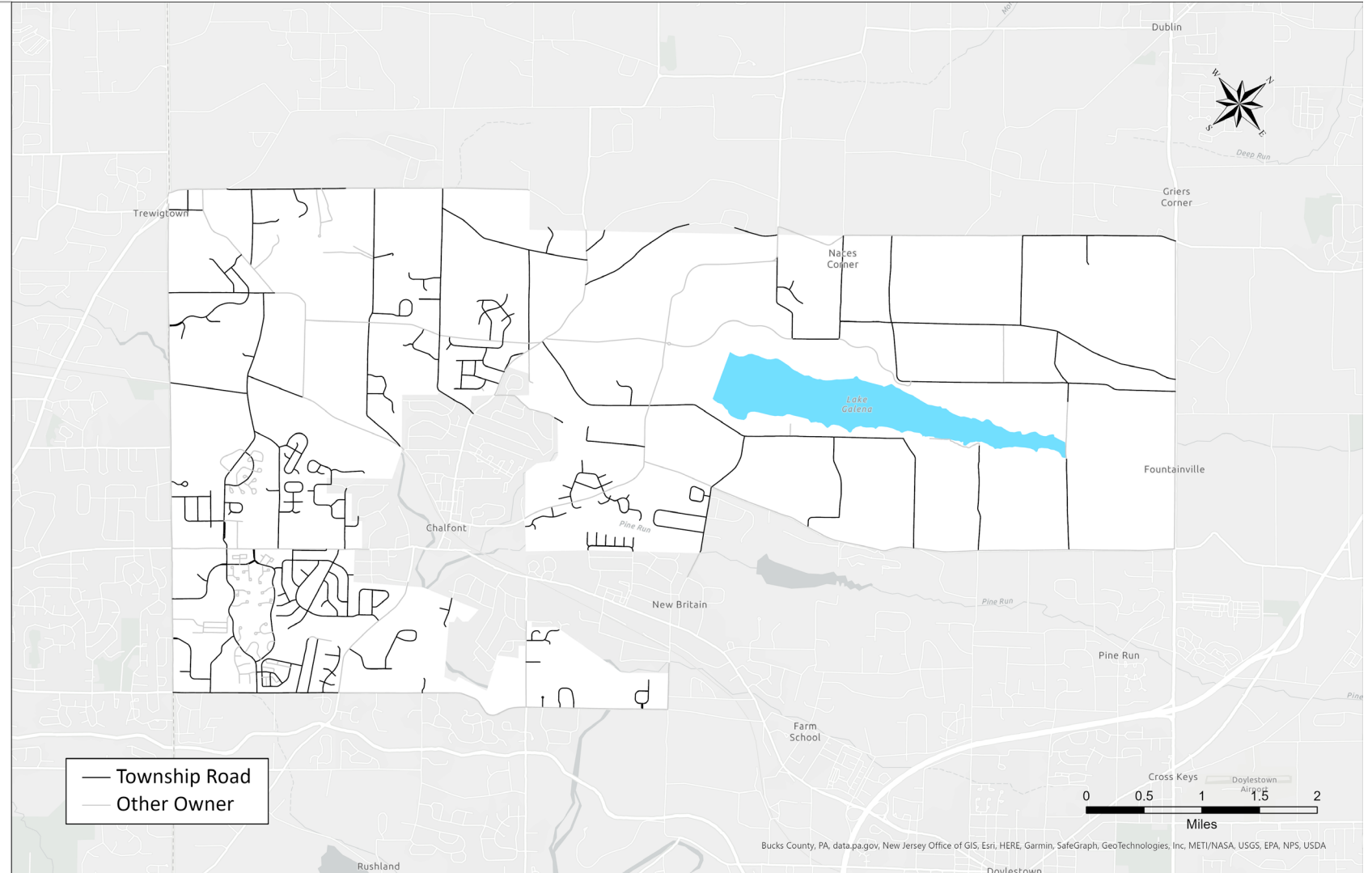


# ROADS IN STUDY AREA

## Township Roads

**Total Township Road Length:**

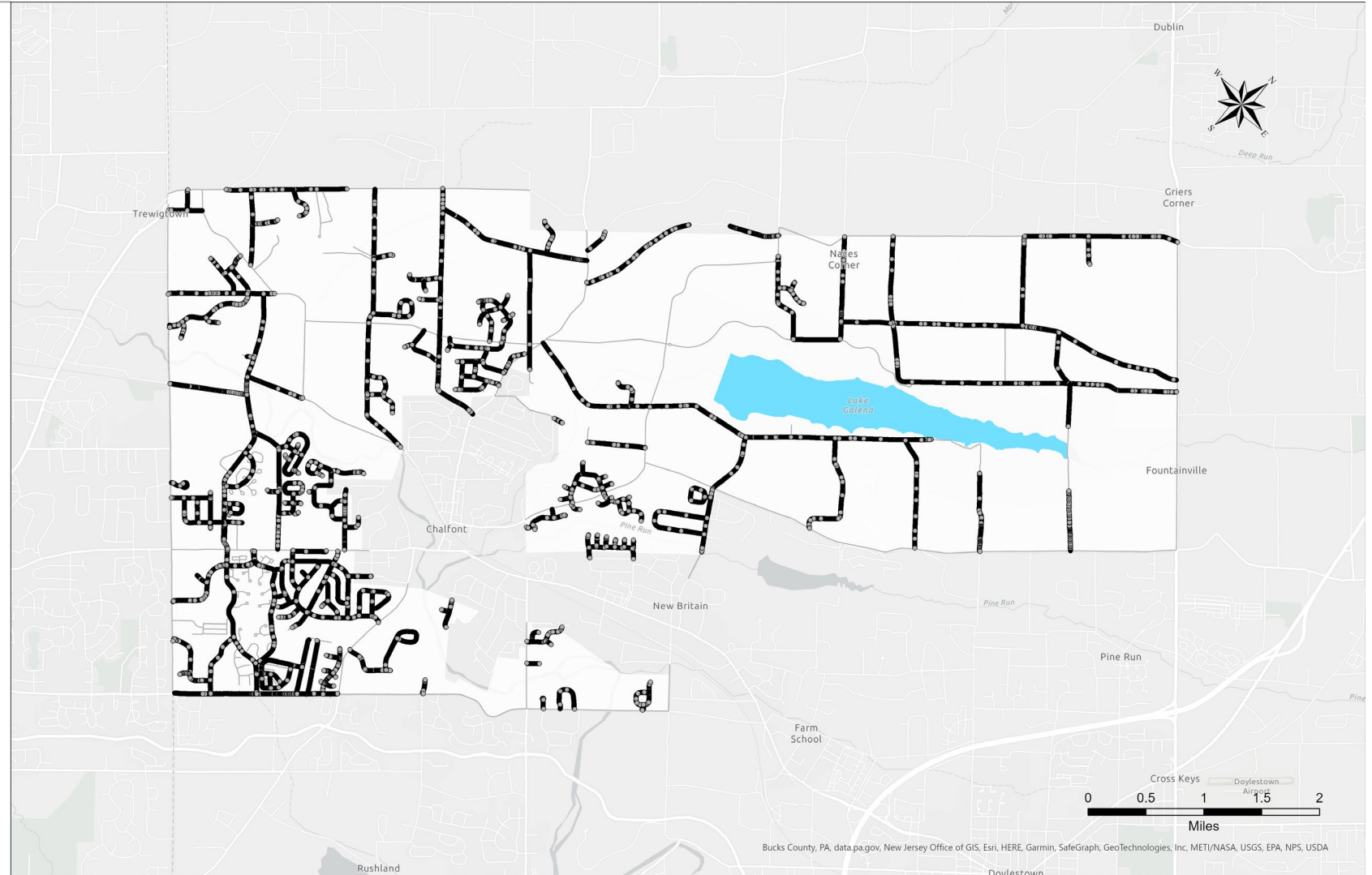
321,243.1 ft (60.8 mi)



# ROADBOTICS DATA POINTS

## Resulting Dataset

- **Raw data compiled by RoadBotics**
  - 32,280 total points
- **Each data point has corresponding rating**
  - 1 through 5





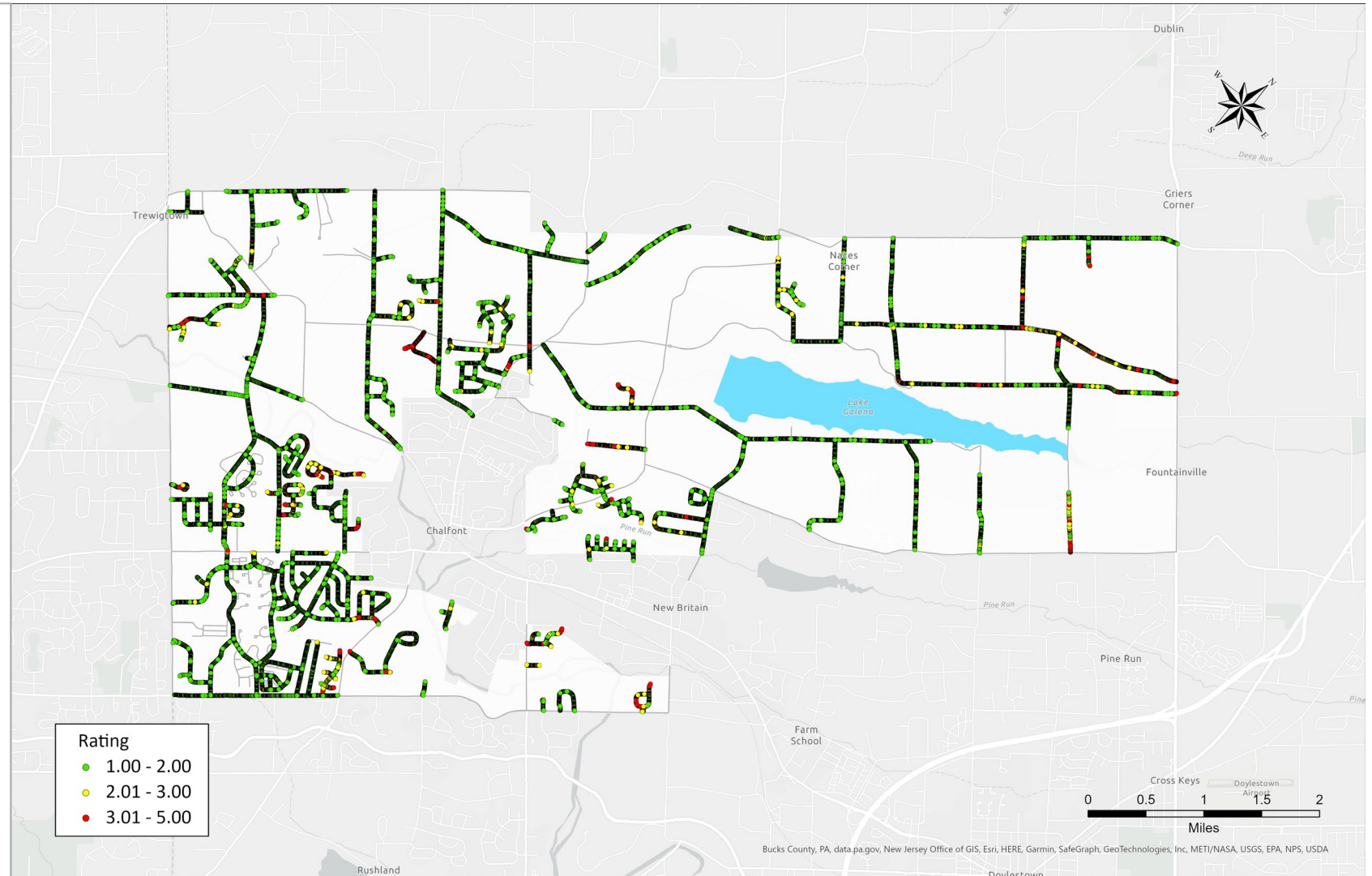
# ROADBOTICS DATA POINTS



# ROADBOTICS DATA POINTS

## Resulting Dataset

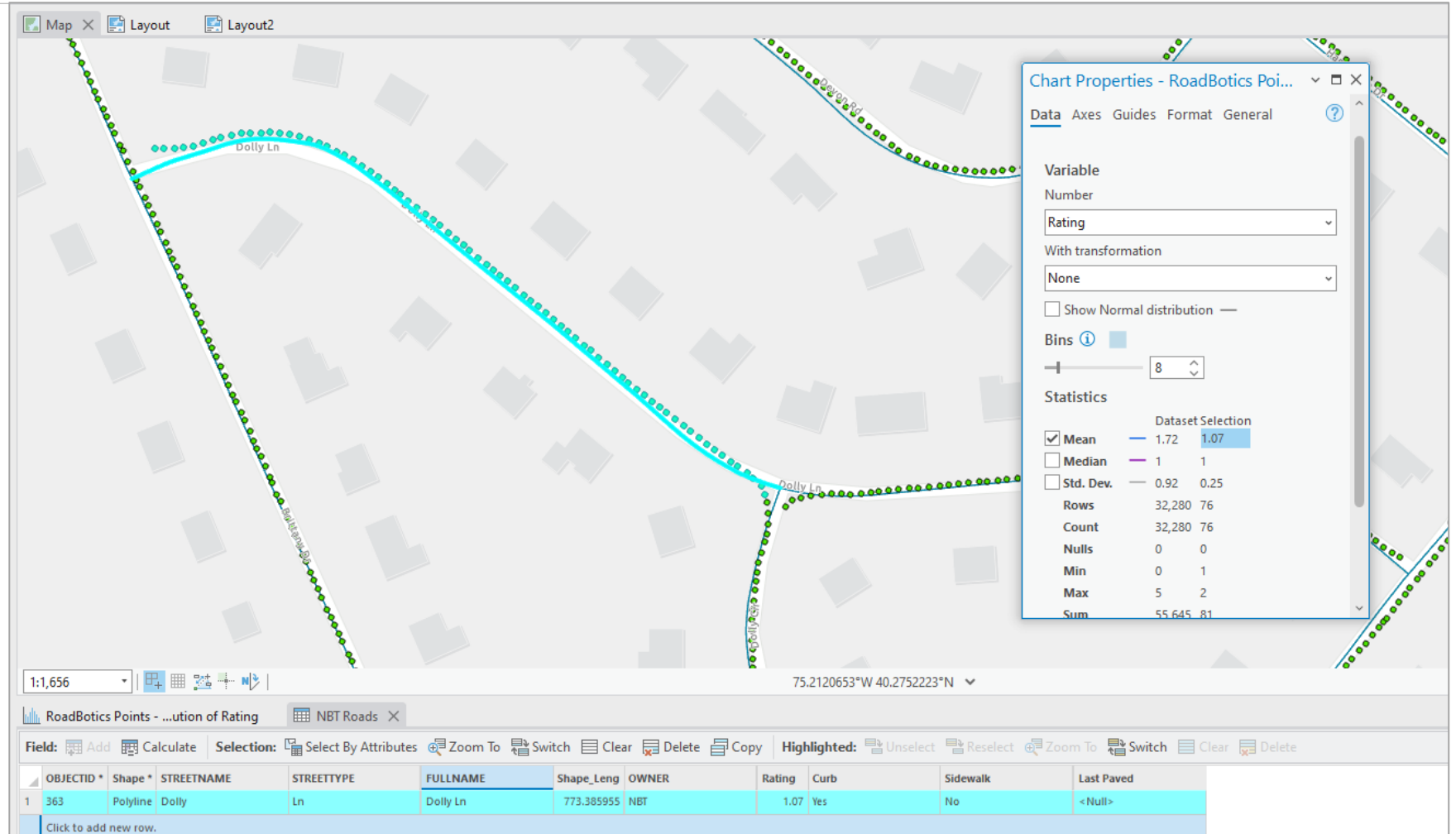
- Symbolized by rating
- Next step: conflating points to line segments



# ROADBOTICS DATA ANALYSIS

## Data Analysis

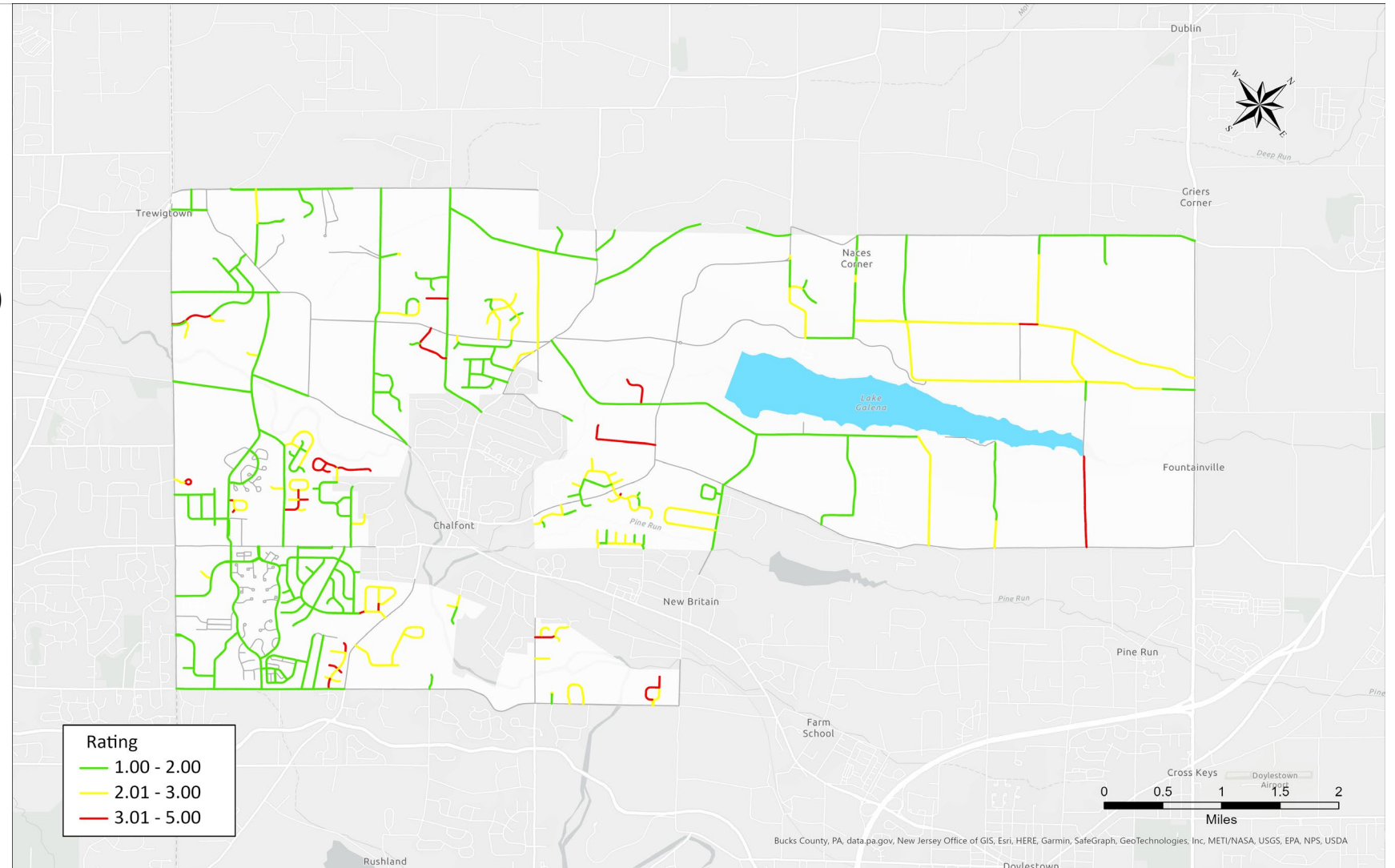
- Intersection to intersection
- Points corresponding with road segment
- Average rating assigned to road segment
- 32,280 points to 442 line segments
- **Avg road rating: 1.7**



# ROADBOTICS DATA ANALYSIS

## Data Analysis

- **Low Priority (1.00-2.00)**
  - 304 segments
  - 40 miles
- **Medium Priority (2.01-3.00)**
  - 105 segments
  - 17 miles
- **High Priority (3.01-5.00)**
  - 33 segments
  - 4 miles

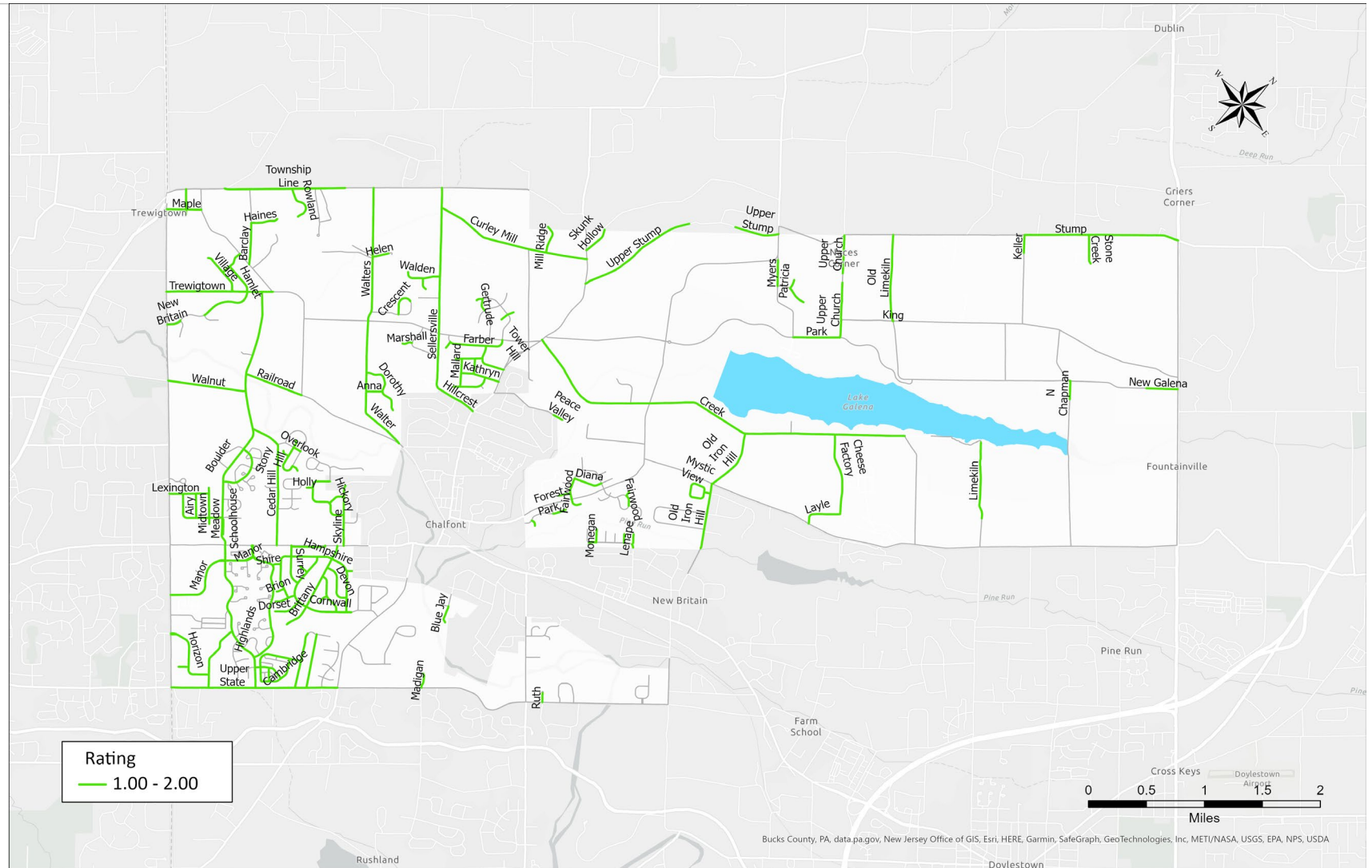




# ROADBOTICS DATA ANALYSIS

## Low Priority Roads

- **Condition:** Great to Good
- **Total Length:** 40 miles  
(704,000 sq yds)
- **Estimated cost to repave:**  
\$12,986,631.68  
(\$324,665.79/mi)



# NEW BRITAIN TOWNSHIP ROAD PAVING PROGRAM

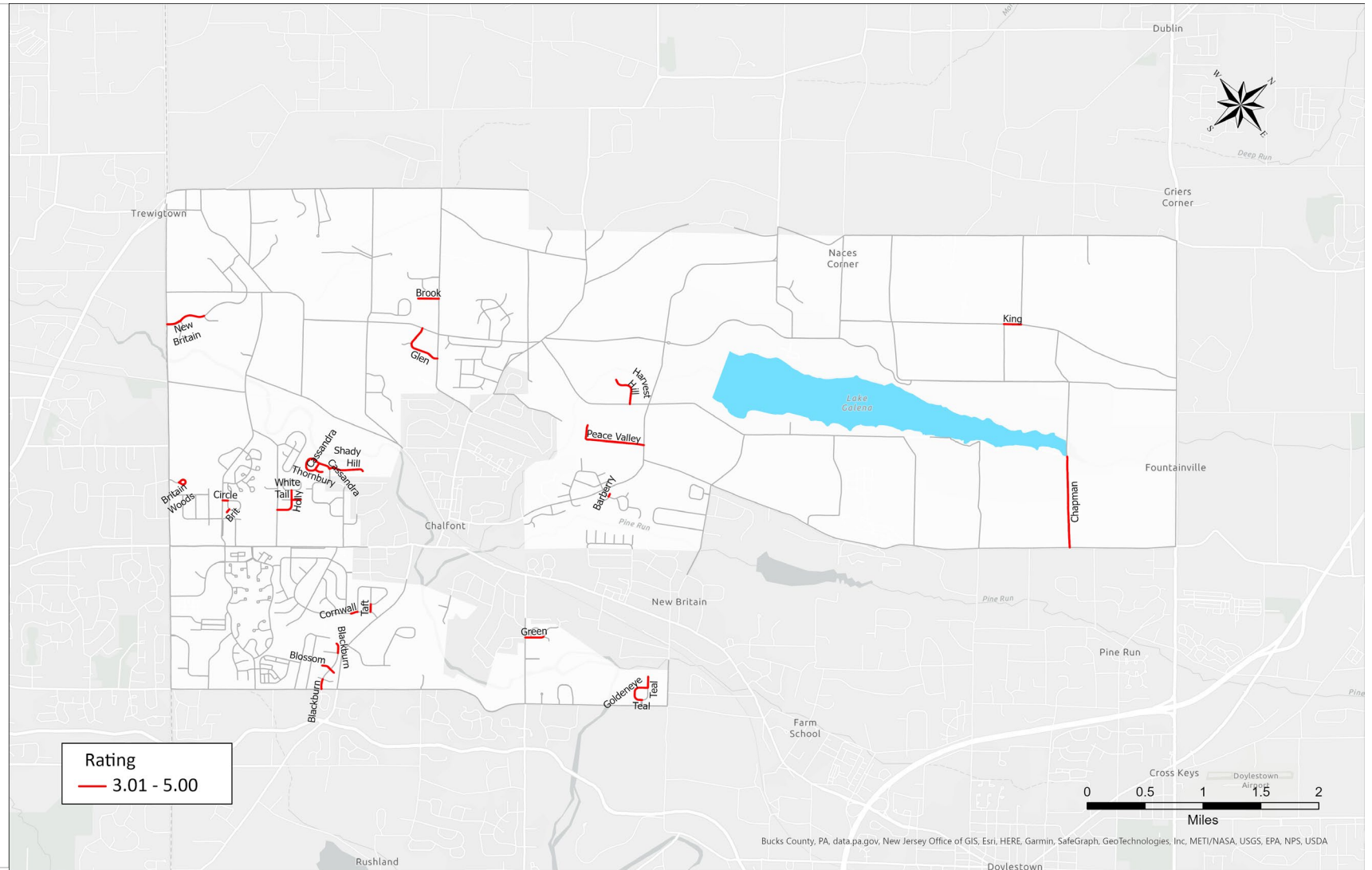
- **Condition:** Good to Fair
- **Total Length:** 17 miles  
(299,200 sq yds)
- **Estimated cost to repave:**  
\$5,519,318.46  
(\$324,665.79/mi)



# ROADBOTICS DATA ANALYSIS

## High Priority Roads

- **Condition:** Fair to Poor
- **Total Length:** 4 miles  
(70,400 sq yds)
- **Estimated cost to repave:**  
\$1,298,663.17  
(\$324,665.79/mi)





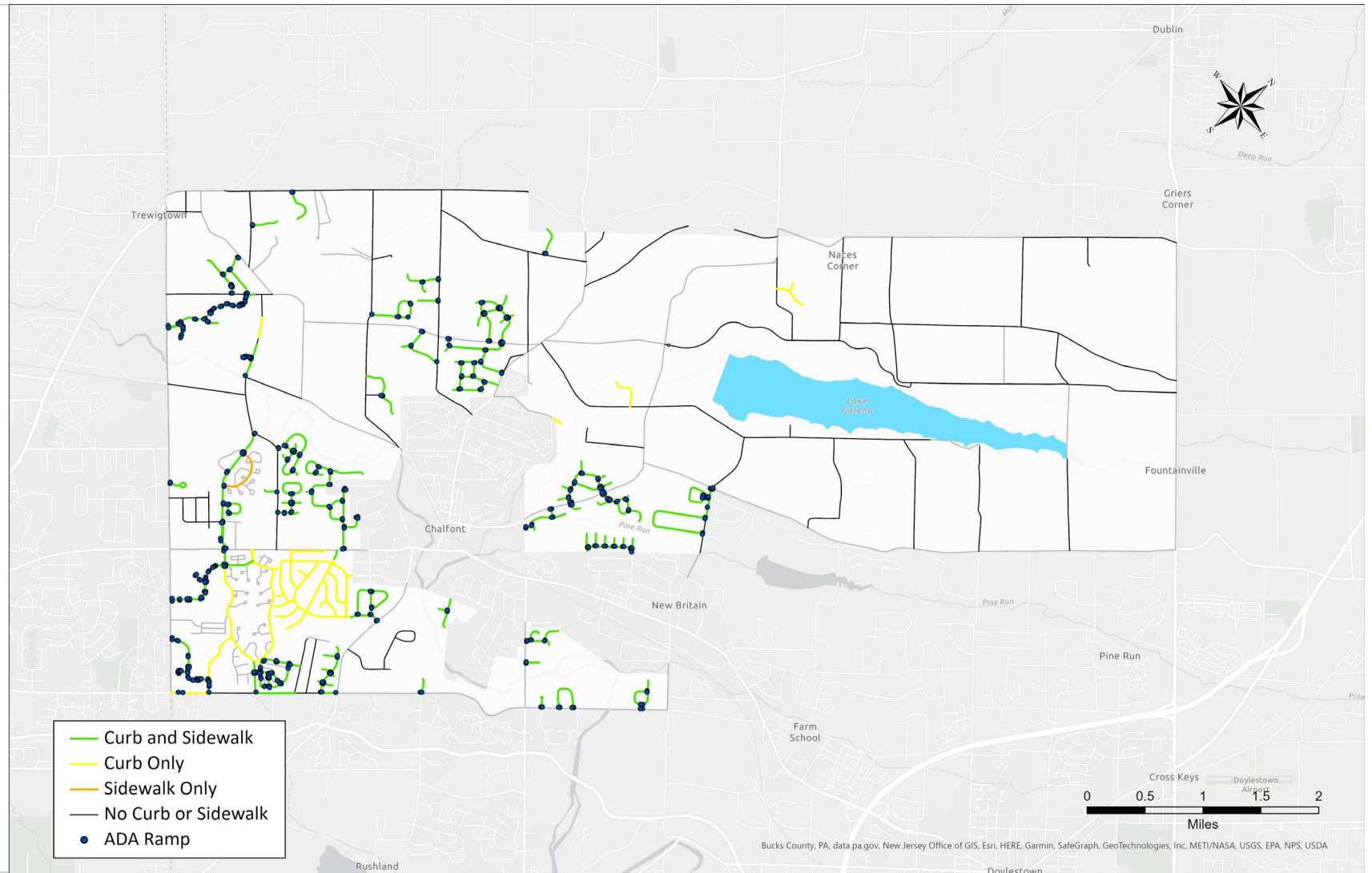
# CURBS, SIDEWALKS AND RAMPS

## Curb/Sidewalk Inventory

- Curb and Sidewalk
  - 124,584 feet (36%)
- Curb Only
  - 40,668 feet (11.7%)
- Sidewalk Only
  - 1,986 feet (0.6%)
- No Curb or Sidewalk
  - 179,046 feet (51.7%)

## ADA Ramp Inventory

- Existing/Needed





# FINANCIAL ANALYSIS

## High Priority Roads

### OPTION A

**Update Existing Curbs  
& Sidewalk Resolution**

**NBT covers costs of  
curb replacement**

				YEARS to REPAIR		
PAVING				3	4	5
4 Miles	x	(\$325,000)	= (\$1.3M) /	(\$433,333)	(\$325,000)	(\$260,000)
CURB						
29.5K LF	x	(\$136)	= (\$4M)			
(\$4M)	x	7.5%	= (\$300K) /	(\$100,000)	(\$75,000)	(\$60,000)
ADA RAMPS						
55 Ramps	x	(\$6,000)	= (\$330K)	(\$110,000)	(\$82,500)	(\$66,000)
<b>ESTIMATED TOTAL ANNUAL COST</b>				<b>(\$643,333)</b>	<b>(\$482,500)</b>	<b>(\$386,000)</b>
Average Annual 5-year Liquid Fuels Received				\$415,000	\$415,000	\$415,000
Additional Budgeted General Fund Paving				\$100,000	\$100,000	\$100,000
Estimated Annual Budget Shortfall/Surplus				<b>(\$128,333)</b>	<b>\$32,500</b>	<b>\$129,000</b>

# FINANCIAL ANALYSIS

## High Priority Roads

### PAVING

4 Miles x (\$325,000) = (\$1.3M) /

### ADA RAMPS

55 Ramps x (\$6,000) = (\$330K)

	YEARS to REPAIR		
	3	4	5
	(\$433,333)	(\$325,000)	(\$260,000)
	(\$110,000)	(\$82,500)	(\$66,000)
<b>ESTIMATED TOTAL ANNUAL COST</b>	<b>(\$543,333)</b>	<b>(\$407,500)</b>	<b>(\$326,000)</b>
Average Annual 5-year Liquid Fuels Received	\$415,000	\$415,000	\$415,000
Additional Budgeted General Fund Paving	\$100,000	\$100,000	\$100,000
Estimated Annual Budget Shortfall/Surplus	<b>(\$28,333)</b>	<b>\$107,500</b>	<b>\$189,000</b>

## OPTION B

**Update Existing Curbs  
& Sidewalk Resolution**

**NBT notifies property  
owners of needed  
curb repairs**

**Property owners to  
make required repairs  
when property sells**

**Connected to NBT  
U&O process**

# FINANCIAL ANALYSIS

## High Priority Roads

### PAVING

4 Miles x (\$325,000) = (\$1.3M) /

### CURB

29.5K LF x (\$136) = (\$4M)

(\$4M) x 7.5% = (\$300K)

(\$300K) x 50% = (\$150K) /

### ADA RAMPS

55 Ramps x (\$6,000) = (\$330K)

### ESTIMATED TOTAL ANNUAL COST

Average Annual 5-year Liquid Fuels Received

Additional Budgeted General Fund Paving

Estimated Annual Budget Shortfall/Surplus

### YEARS to REPAIR

3

4

5

(\$433,333) (\$325,000) (\$260,000)

(\$50,000) (\$37,500) (\$30,000)

(\$110,000) (\$82,500) (\$66,000)

(\$593,333) (\$445,000) (\$356,000)

\$415,000 \$415,000 \$415,000

\$100,000 \$100,000 \$100,000

(\$78,333) \$70,000 \$159,000

## OPTION C

No update to Existing  
Curbs & Sidewalk  
Resolution

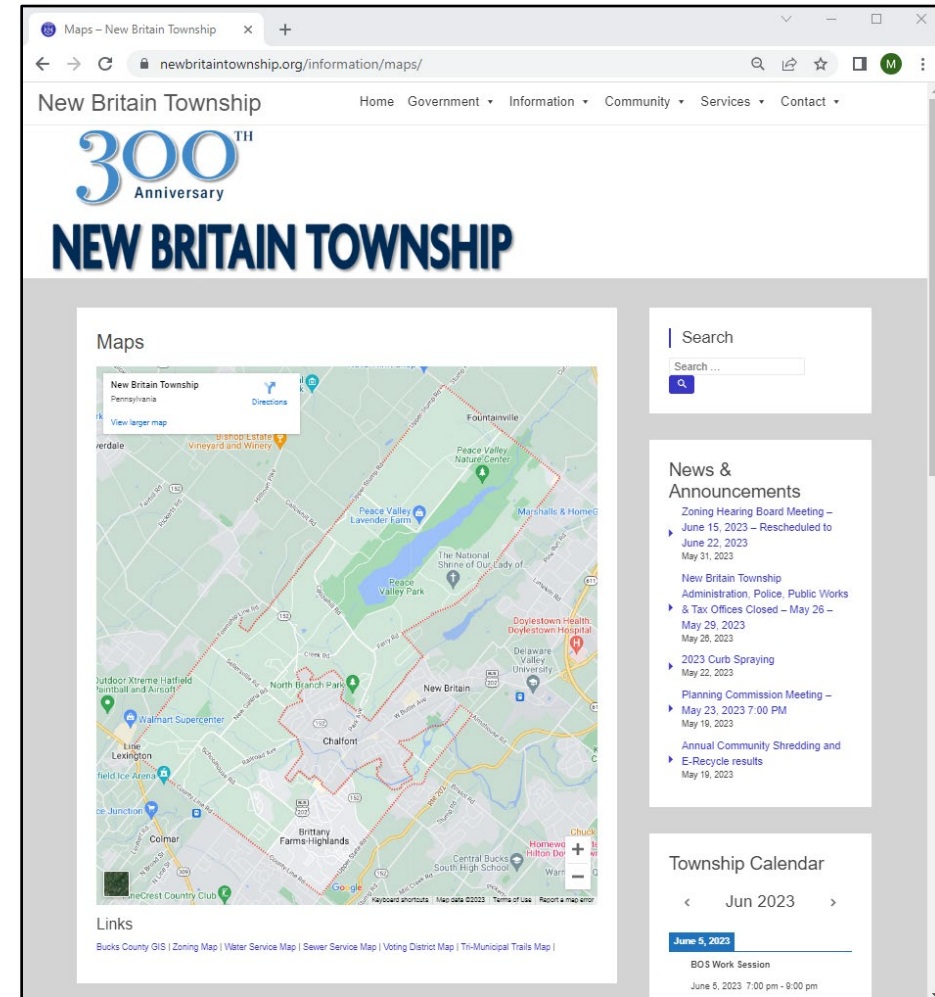
NBT notifies property  
owners of required  
curb repairs no less  
than 12 months  
before start of paving

Property owners to  
make required repairs  
before start of paving  
work

NBT budgets for  
expected non-  
compliance

# NEXT STEPS

- **Written Report**
  - To support annual paving plan
- **Dataset Maintenance**
  - Continued collaboration with Public Works
  - Update ratings at end of paving season
  - Collect RoadBotics data every 3 years
- **Expand Online Mapping Presence**
  - Currently under development
  - Interactive vs static maps
    - Online map of road ratings/priorities
    - Zoning, Water/Sewer, etc.





An aerial photograph of a person walking on a large circular blue area with white diagonal stripes. The person is walking away from the camera towards the bottom left. The background is a dark grey surface with white diagonal stripes.

**THANK YOU**