Using GIS to Comply with Phase II Storm Water Program Requirements

South Kingstown's Mobile Infrastructure Inspection Application

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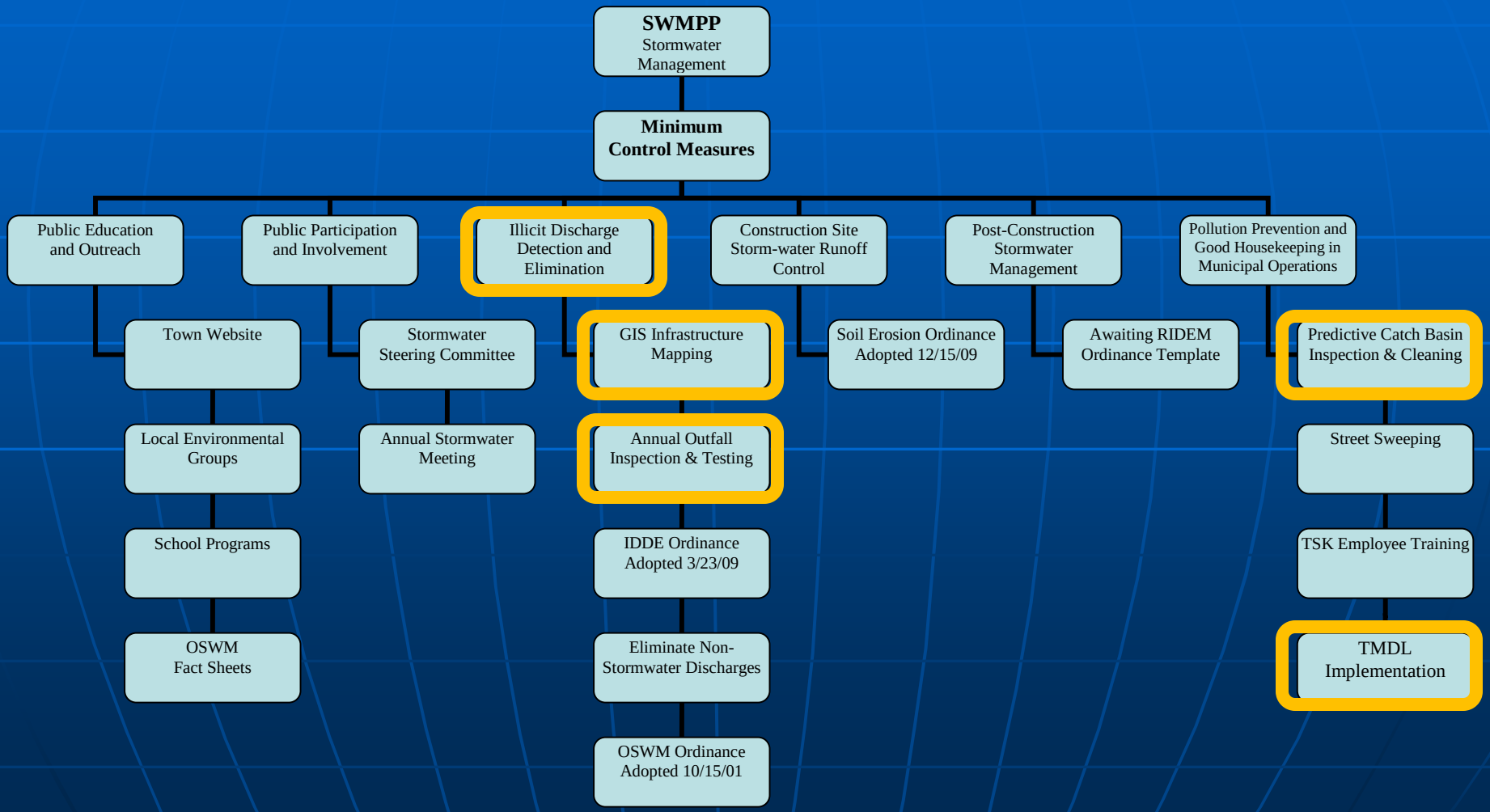
Town of South Kingstown, Rhode Island

RIGIS User Group
December 1, 2016

Talk Overview

- SK Phase II Storm Water Management Plan (SWMPP)
- Development of Storm Water GIS Database
- Mobile App Development and Evolution
- Current iOS app
- Future Collector app

Town of South Kingstown
Municipal Separate Storm Water & Sewer System

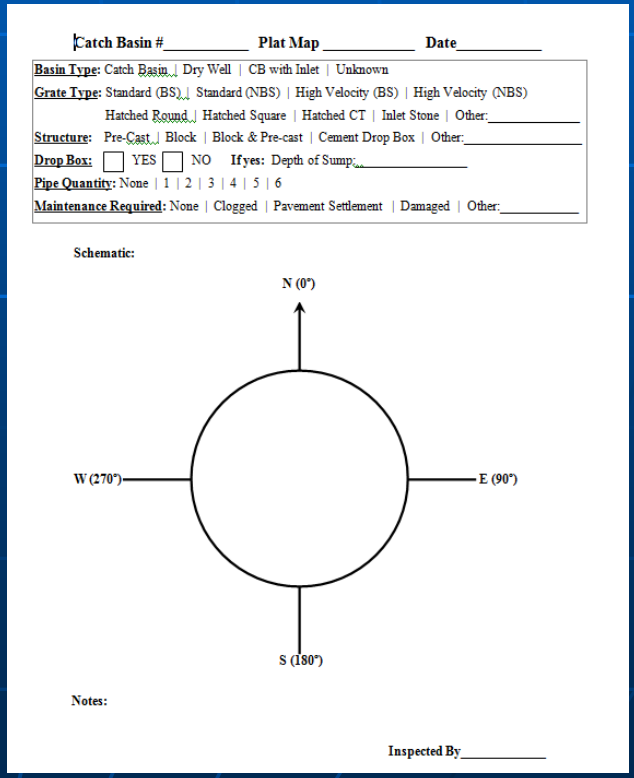


Development of GIS Storm Water Database
GPS DATA COLLECTION (2002)

- **Features collected: Updated regularly**
  - Catch Basins : 2600
  - Manholes: 300
  - Inlets: 100
  - Outlets : 360
- **Data Dictionary Attributes**
  - Grate type
  - Structure type
  - Pipe quantity
  - Condition
  - Maintenance required
  - Pipe type
- **Outfall Photos Taken**

Creating Drainage Pipe Network

- Few, if any, as-builts
- Data sheets created
- Highway crews sent out during winter months
- Pulled all catch basins and manholes
- Noted pipe size and direction
- Pipe network developed by outside contractor



Catch Basin #_____ Plat Map _____ Date_____

Basin Type: Catch Basin | Dry Well | CB with Inlet | Unknown

Grate Type: Standard (BS) | Standard (NBS) | High Velocity (BS) | High Velocity (NBS)
Hatched Round | Hatched Square | Hatched CT | Inlet Stone | Other:_____

Structure: Pre-Cast | Block | Block & Pre-cast | Cement Drop Box | Other:_____

Drop Box: ☐ YES ☐ NO **If yes:** Depth of Sump:_____

Pipe Quantity: None | 1 | 2 | 3 | 4 | 5 | 6

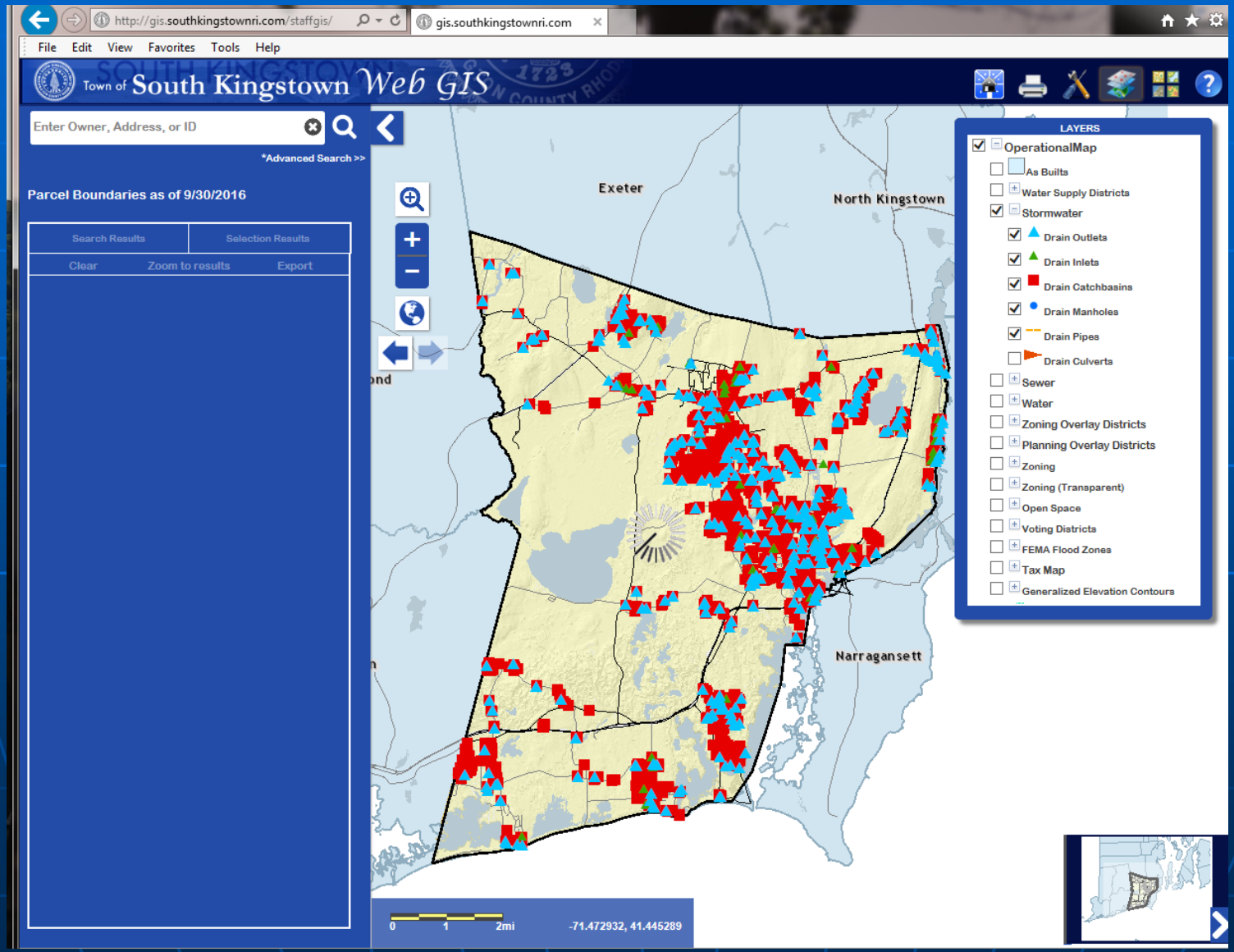
Maintenance Required: None | Clogged | Pavement Settlement | Damaged | Other:_____

Schematic:

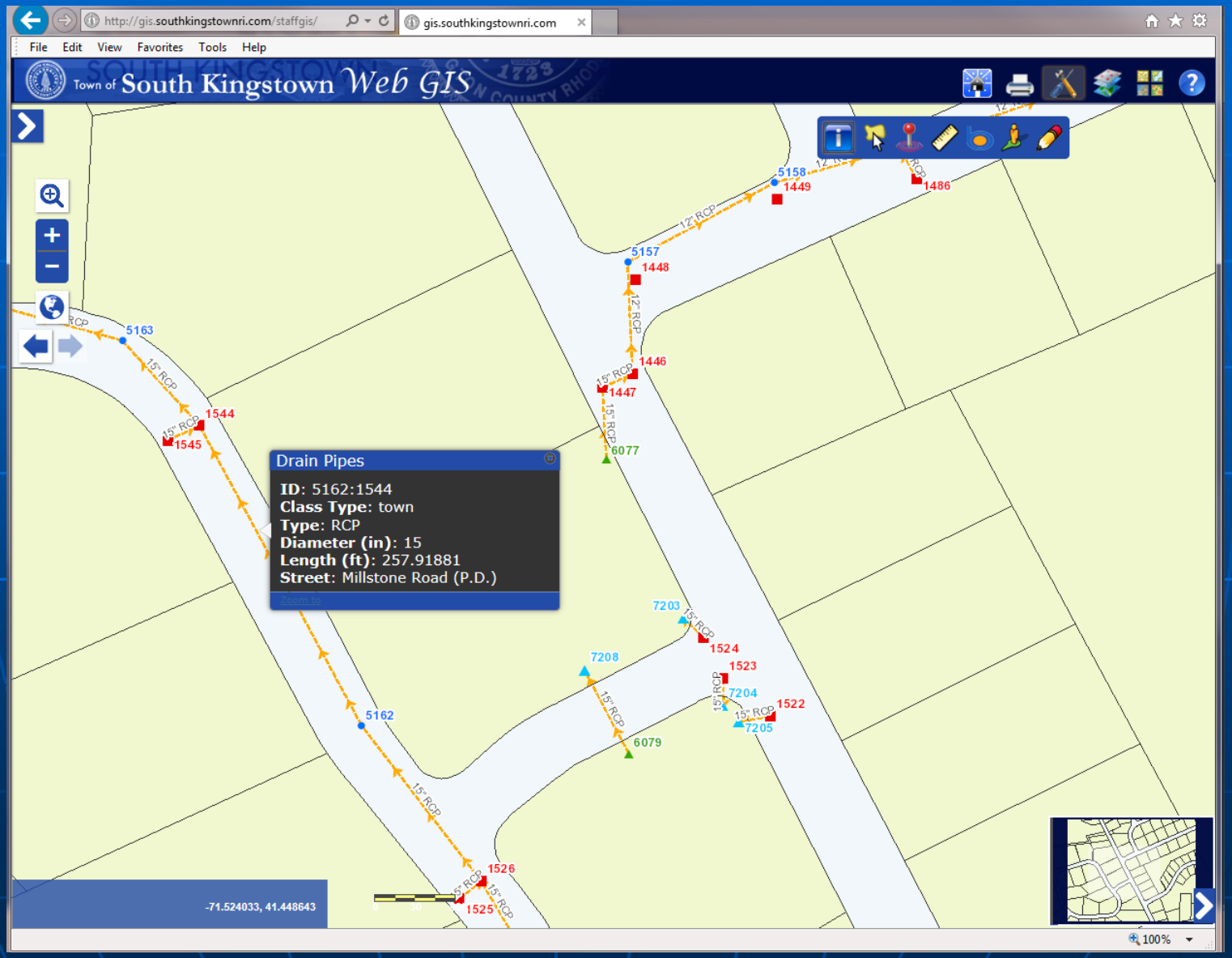
Notes:

Inspected By_____

SKGIS Storm Water Data



SKGIS Storm Water Data



MS4 Program

Infrastructure Inspections

- Outfalls: 2x / year: Spring and Fall
  - Inspect after 2 days no rain
  - Lab testing for those with flow
- Catch Basins: 1x / year: Summer
  - Clean fullest basins based on available funds

SKGIS Mobile Apps Evolution

- **2005-2012:**
  - Hardware: Compaq Ipaq Handheld
  - Software: ArcPad / Application Builder
    Developed and maintained by SKGIS
- **2013-2016**
  - Hardware: iPad /Ruggedized Case
  - Software: Customized iOS app
    Developed and Hosted by CDM Smith
- **2017**
  - Hardware: iPad / Ruggedized Case (iPhones?)
  - Software: Collector – ArcGIS Online
    Developed by SKGIS and hosted by Esri

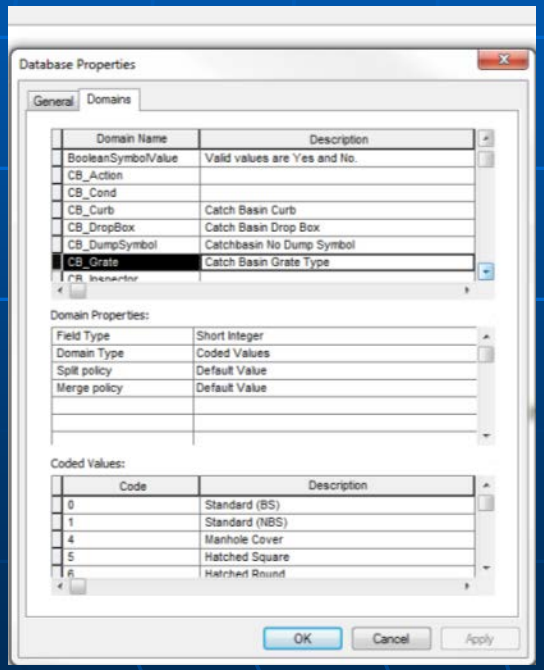
SK iPad Stormwater App

- **GIS/Inspection data reads directly from GeoDatabase schema**
- **One to Many Relationships (Inspections)**
- **Inspection Status: Color Coded**
  - Inspected
  - Uninspected
  - In Progress

Mobile Data Preparation

- It's all about the data !
- Domains, Domains, Domains

Geodatabase



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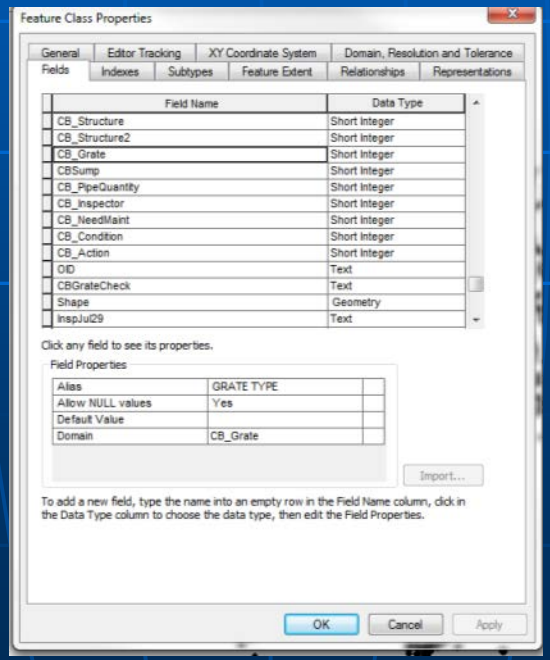

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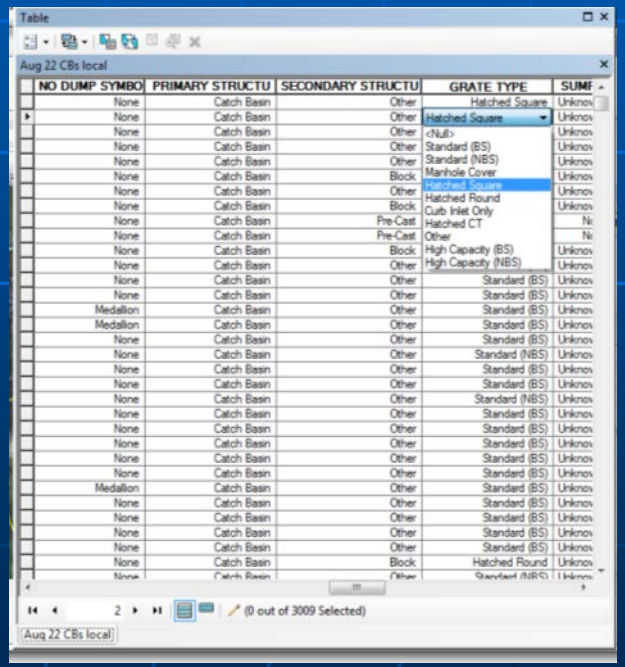

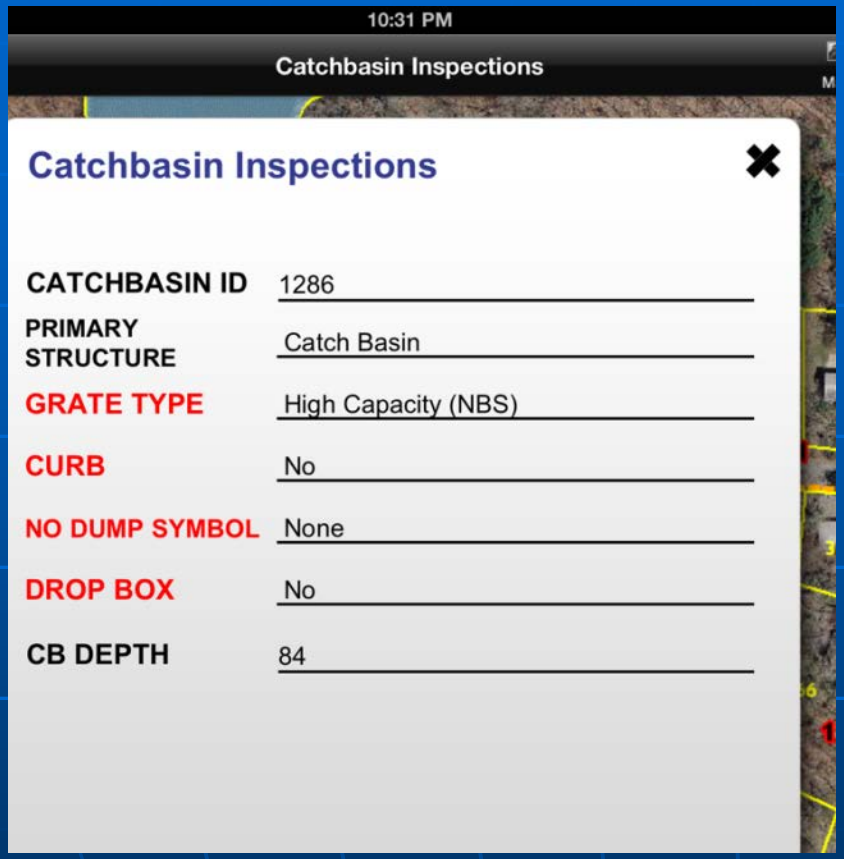
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Catchbasin Inspections
Catchbasin Inspections
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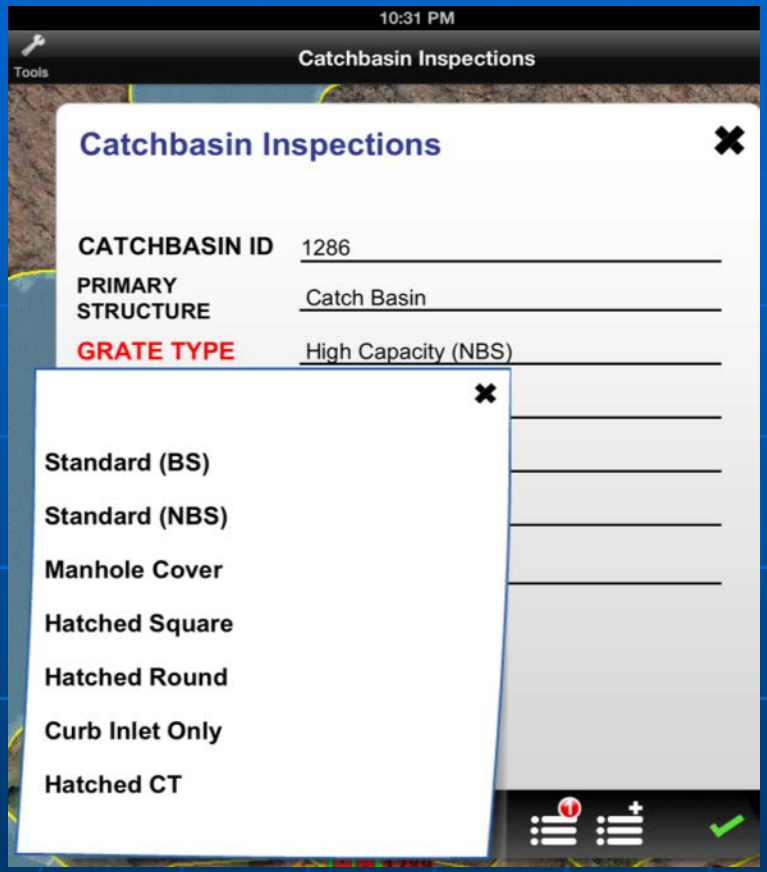
PRIMARY STRUCTURE Catch Basin
GRATE TYPE High Capacity (NBS)
CURB No
NO DUMP SYMBOL None
DROP BOX No
CB DEPTH 84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Tools
Catchbasin Inspections
Catchbasin Inspections
CATCHBASIN ID 1286
PRIMARY STRUCTURE Catch Basin
GRATE TYPE High Capacity (NBS)
Standard (BS)
Standard (NBS)
Manhole Cover
Hatched Square
Hatched Round
Curb Inlet Only
Hatched CT

Verizon LTE
3:06 PM
60%
Messages
FaceTime
Photos
Camera
Maps
Clock
Photo Booth
Friday
27
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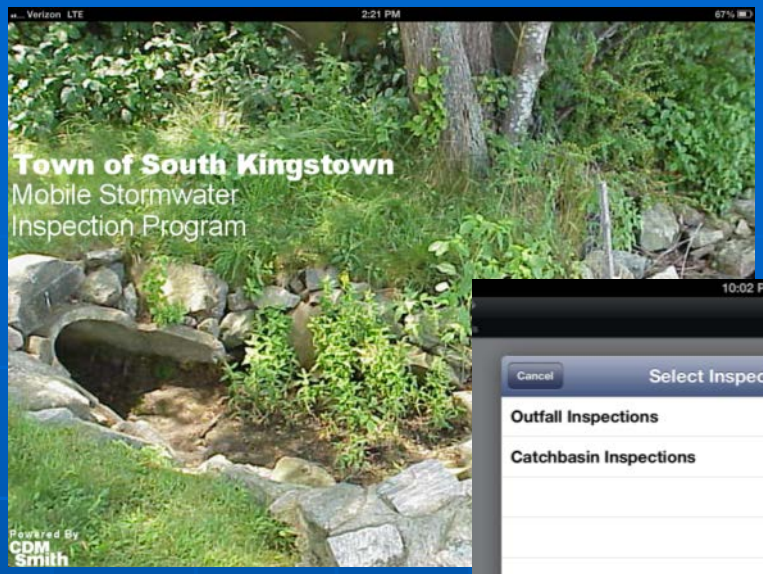
Notes
Reminders
Newsstand
iTunes
App Store
Game Center
Settings
Find iPhone
Videos
Mail
SK Storm
Safari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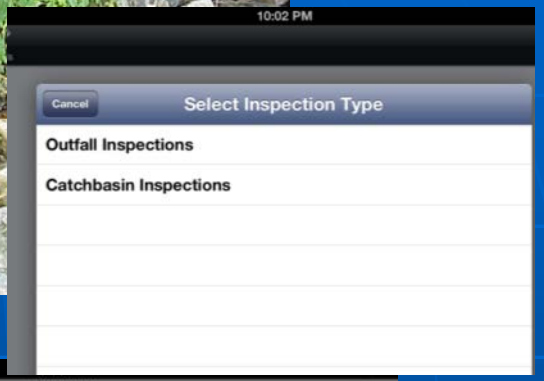
Town of South Kingstown
Mobile Stormwater
Inspection Program
Powered By
CDM Smith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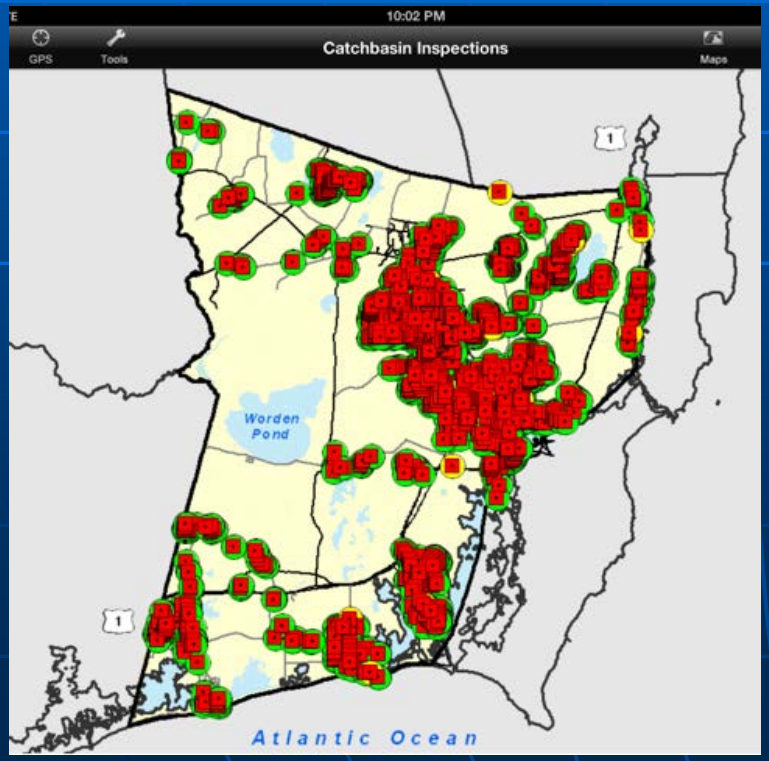
Select Inspection Type
Outfall Inspections
Catchbasin Inspections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Tools
Catchbasin Inspections
Maps
Worden Pond
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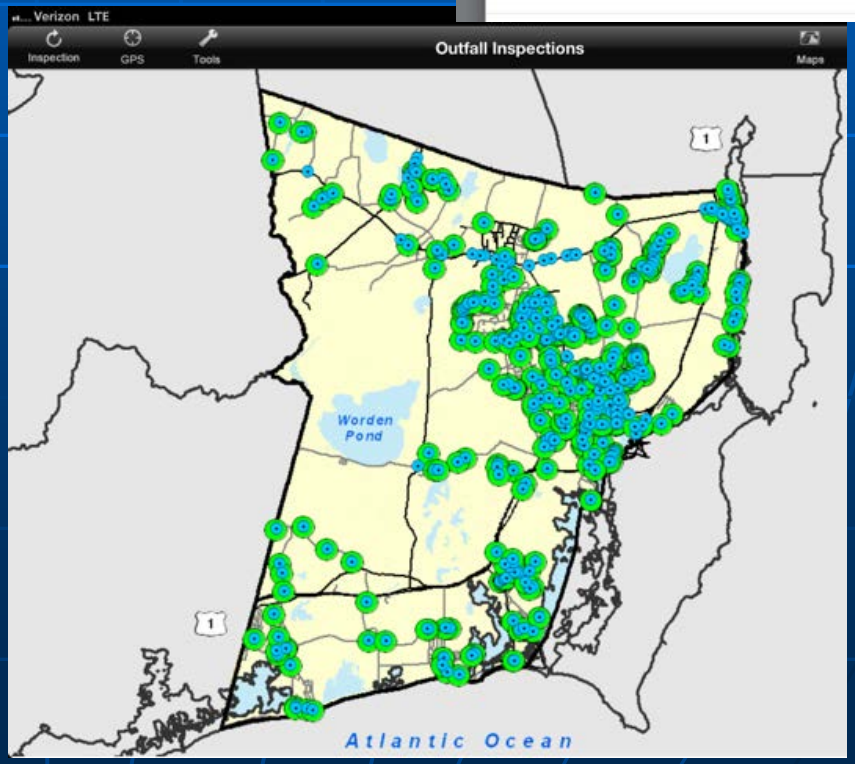
Atlantic Ocean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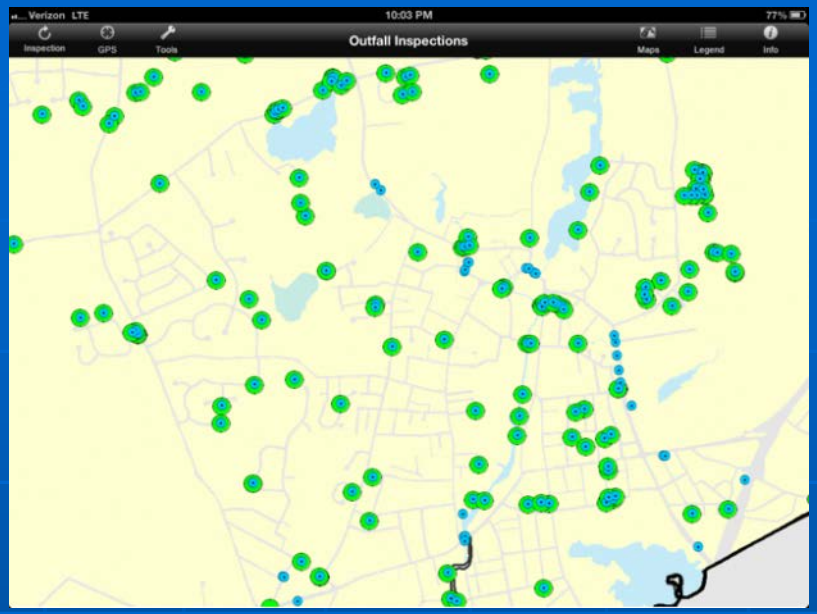
Inspection
GPS
Tools
Outfall Inspections
Maps
Worden Pond
1
Atlantic Ocean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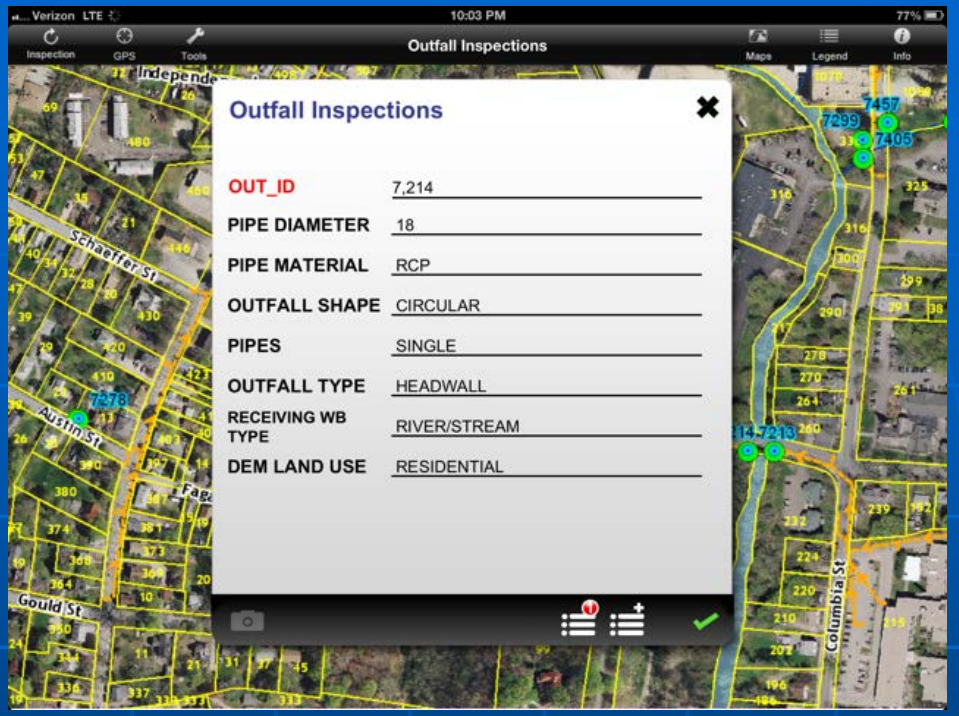
Inspection
GPS
Tools
Outfall Inspections
Maps
Legend
Info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Inspection
GPS
Tools
Outfall Inspections
Maps
Legend
Info
Outfall Inspections
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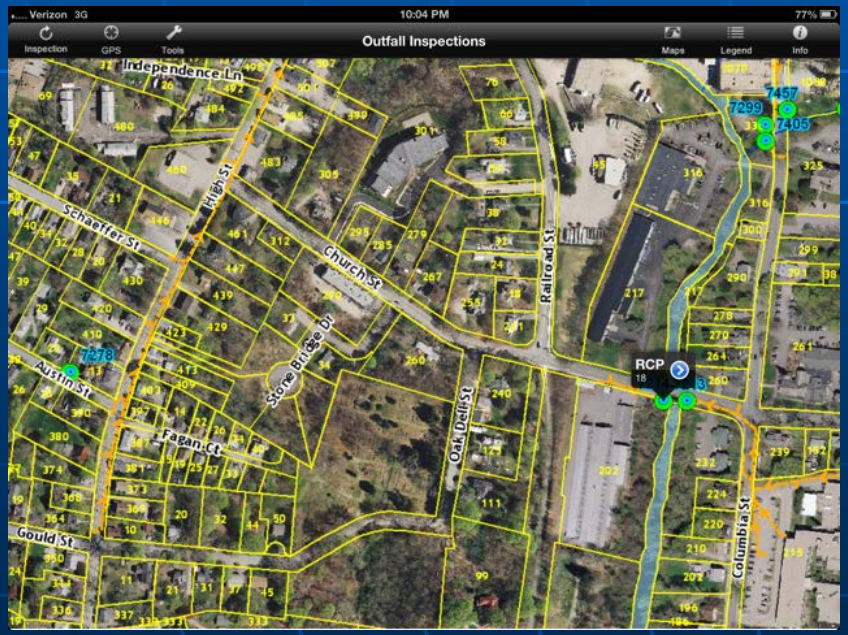
PIPE DIAMETER 18
PIPE MATERIAL RCP
OUTFALL SHAPE CIRCULAR
PIPES SINGLE
OUTFALL TYPE HEADWALL
RECEIVING WB TYPE RIVER/STREAM
DEM LAND USE RESIDENTIAL
Schaeffer St
Austin St
Gould St
Columbia St
7457
7299
7405
7278
7213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GPS
Tools
Outfall Inspections
Maps
Legend
Info
Independence Ln
Schaeffer St
High St
Church St
Railroad St
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Columbia St
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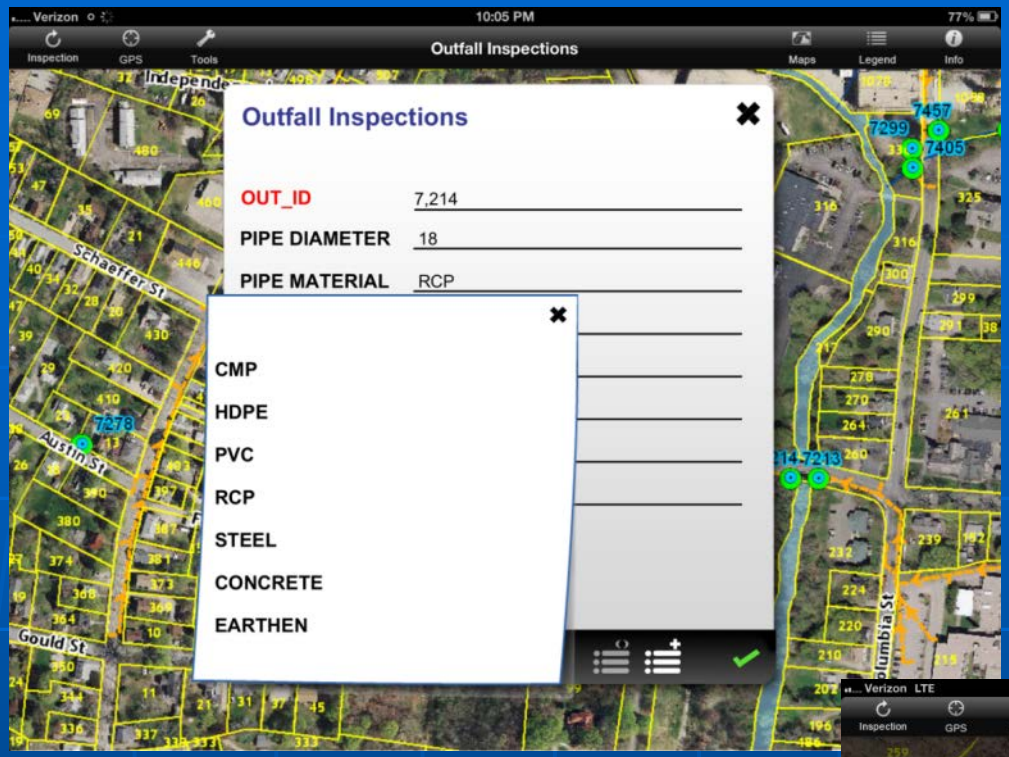
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Tools
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Maps
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Info
Outfall Inspections
OUT_ID 7,214
PIPE DIAMETER 18
PIPE MATERIAL RCP
CMP
HDPE
PVC
RCP
STEEL
CONCRETE
EARTHEN
Schaeffer St
Austin St
Gould St
Columbia St
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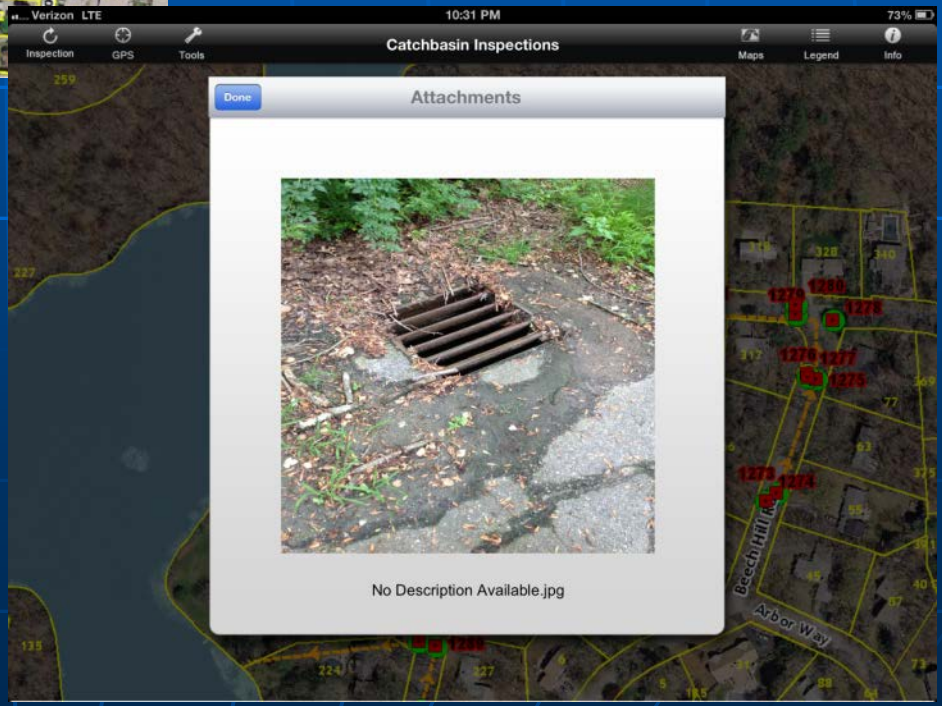
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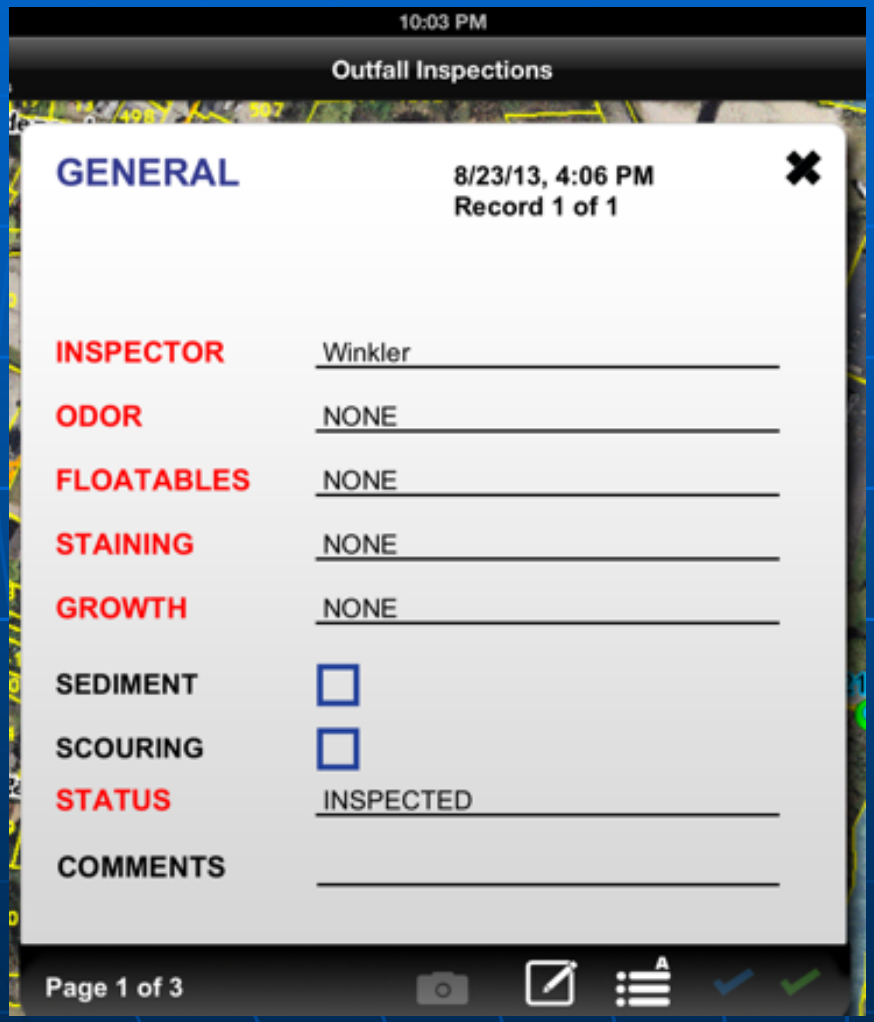
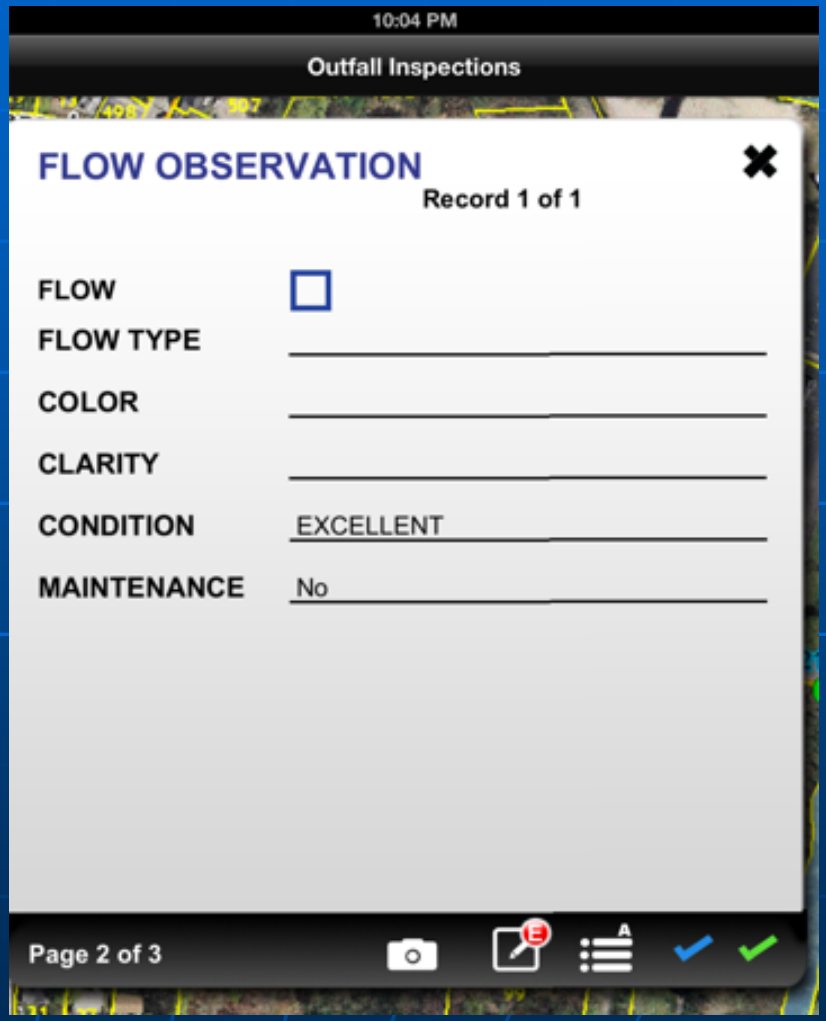
Arbor Way

Inspection Tables





Table

Outfall_Inspection

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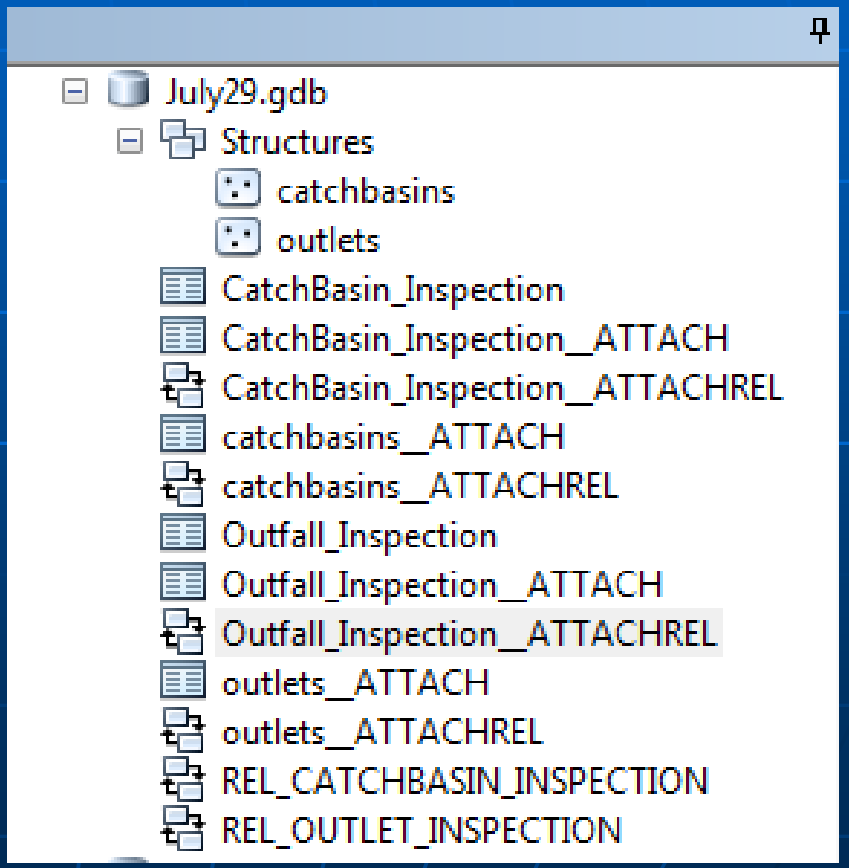
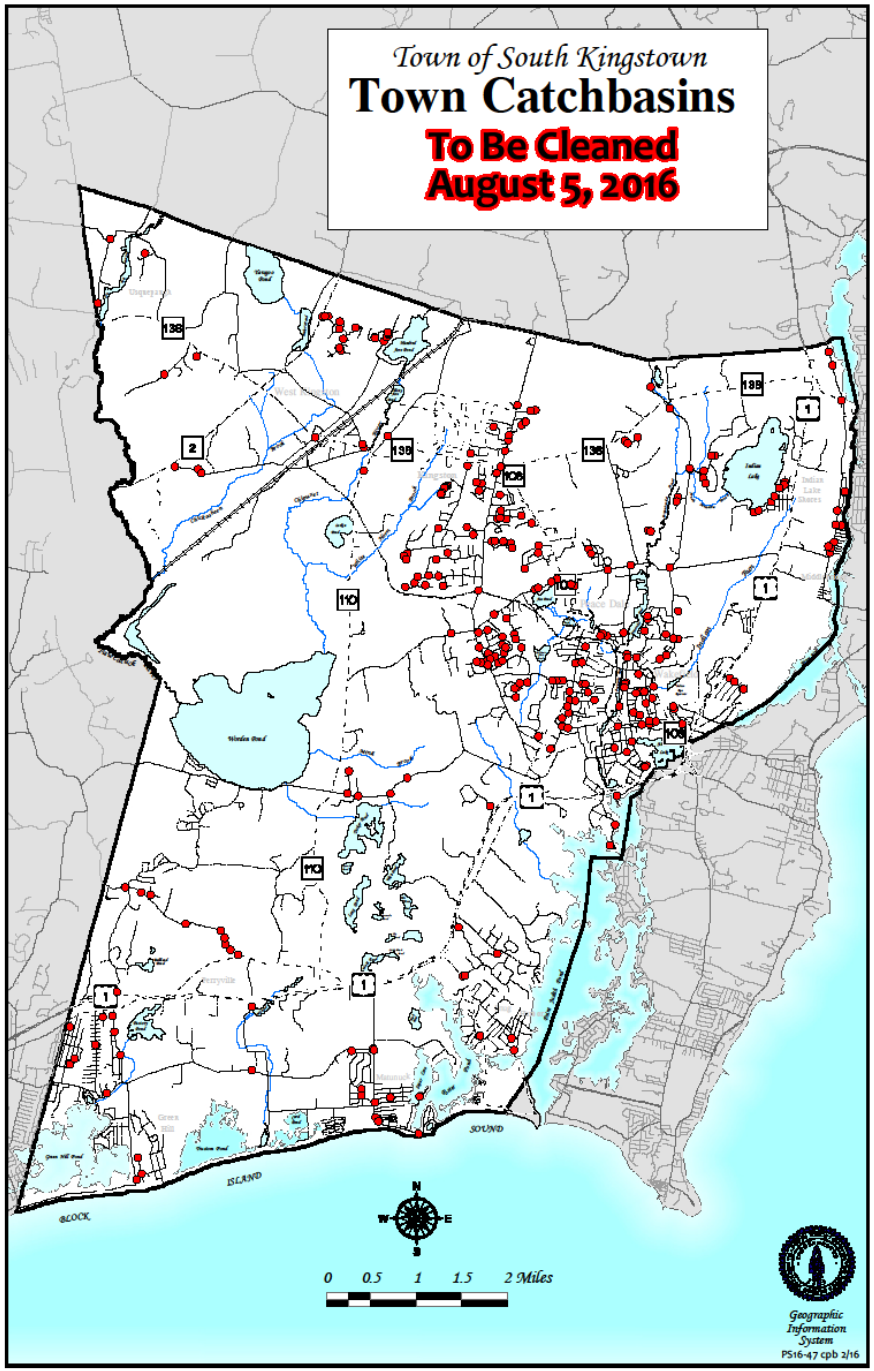
0 (0 out of 399 Selected)

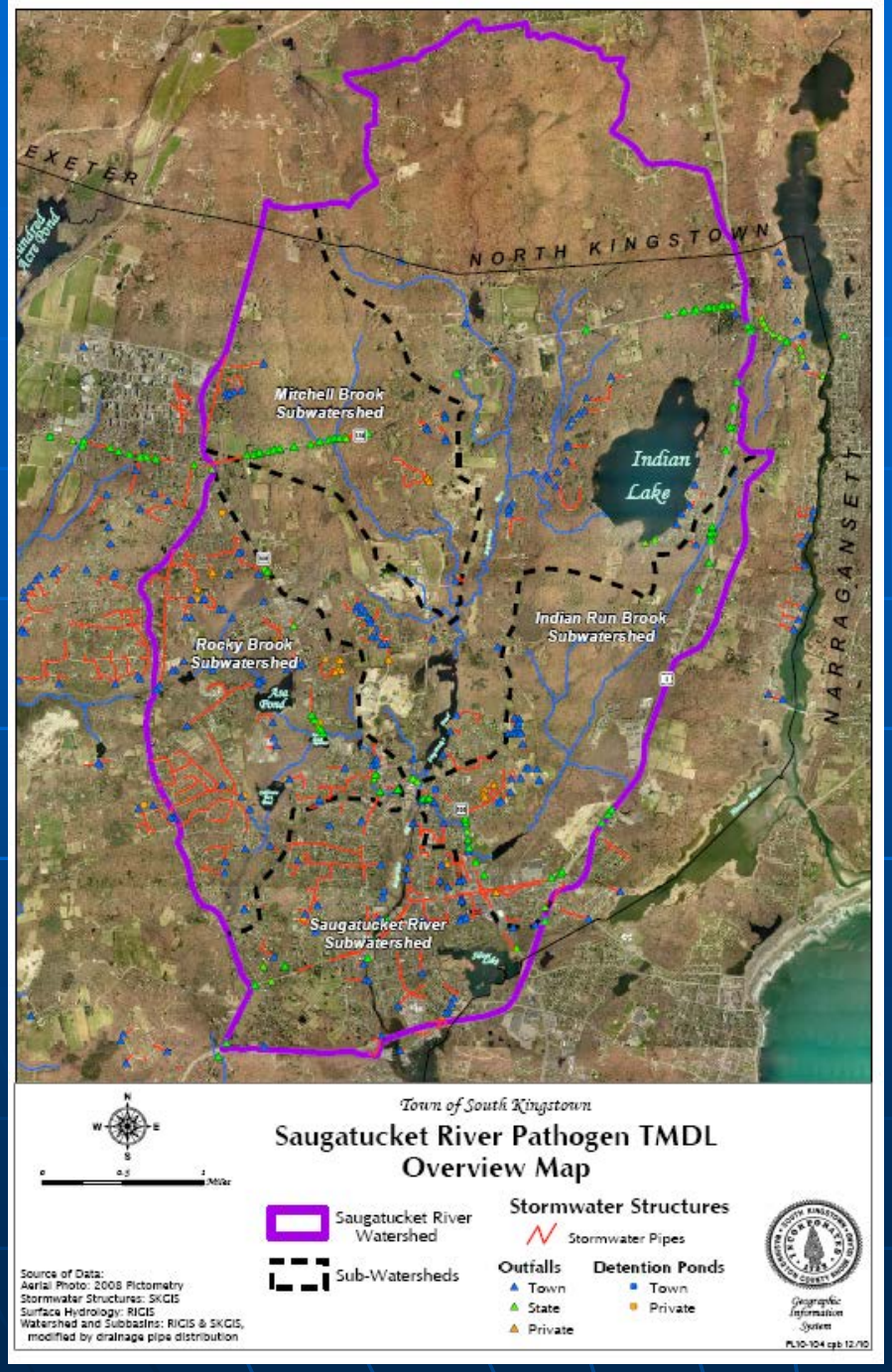
Outfall_Inspection

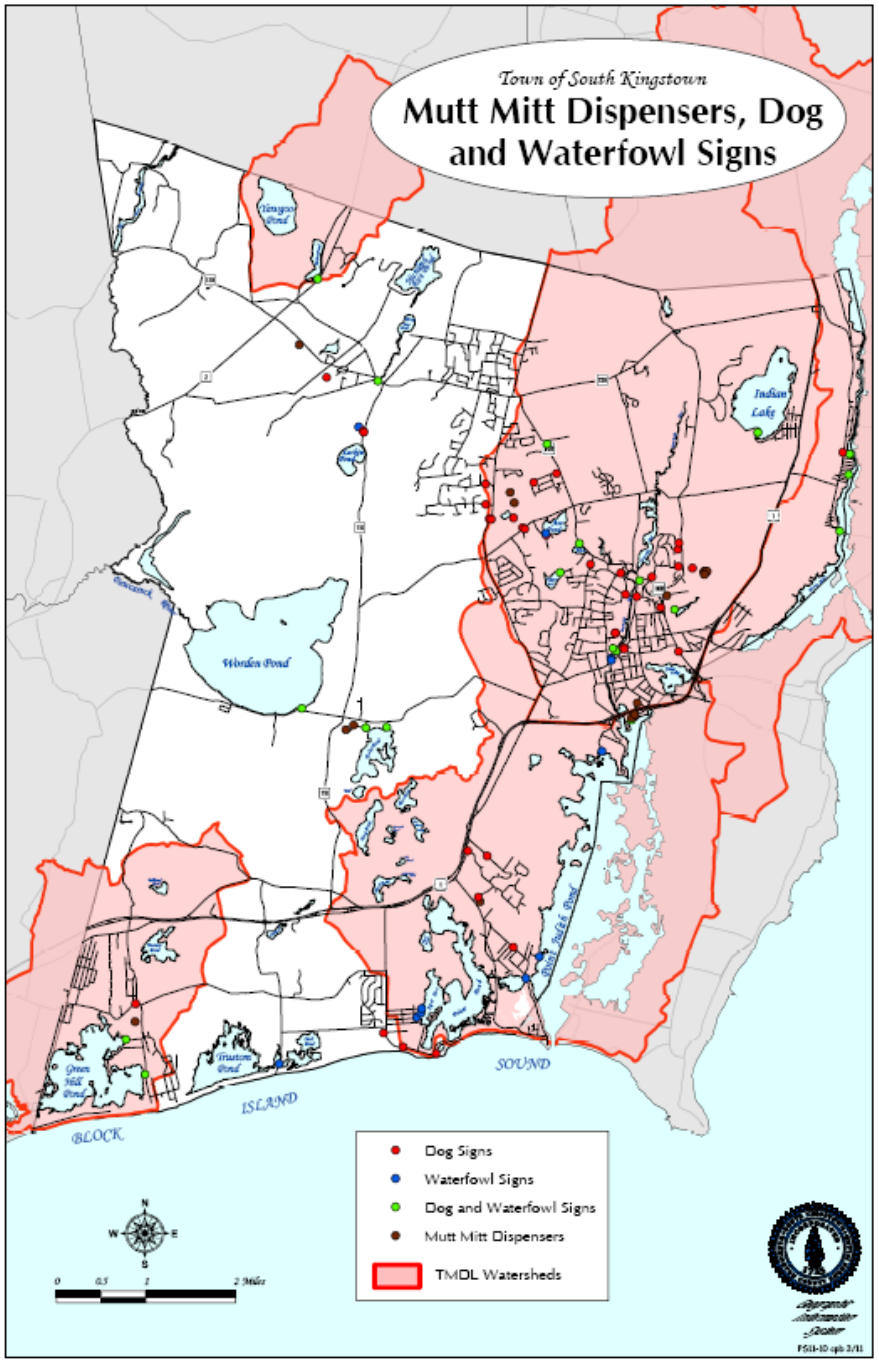
Storm Water GeoDatabase

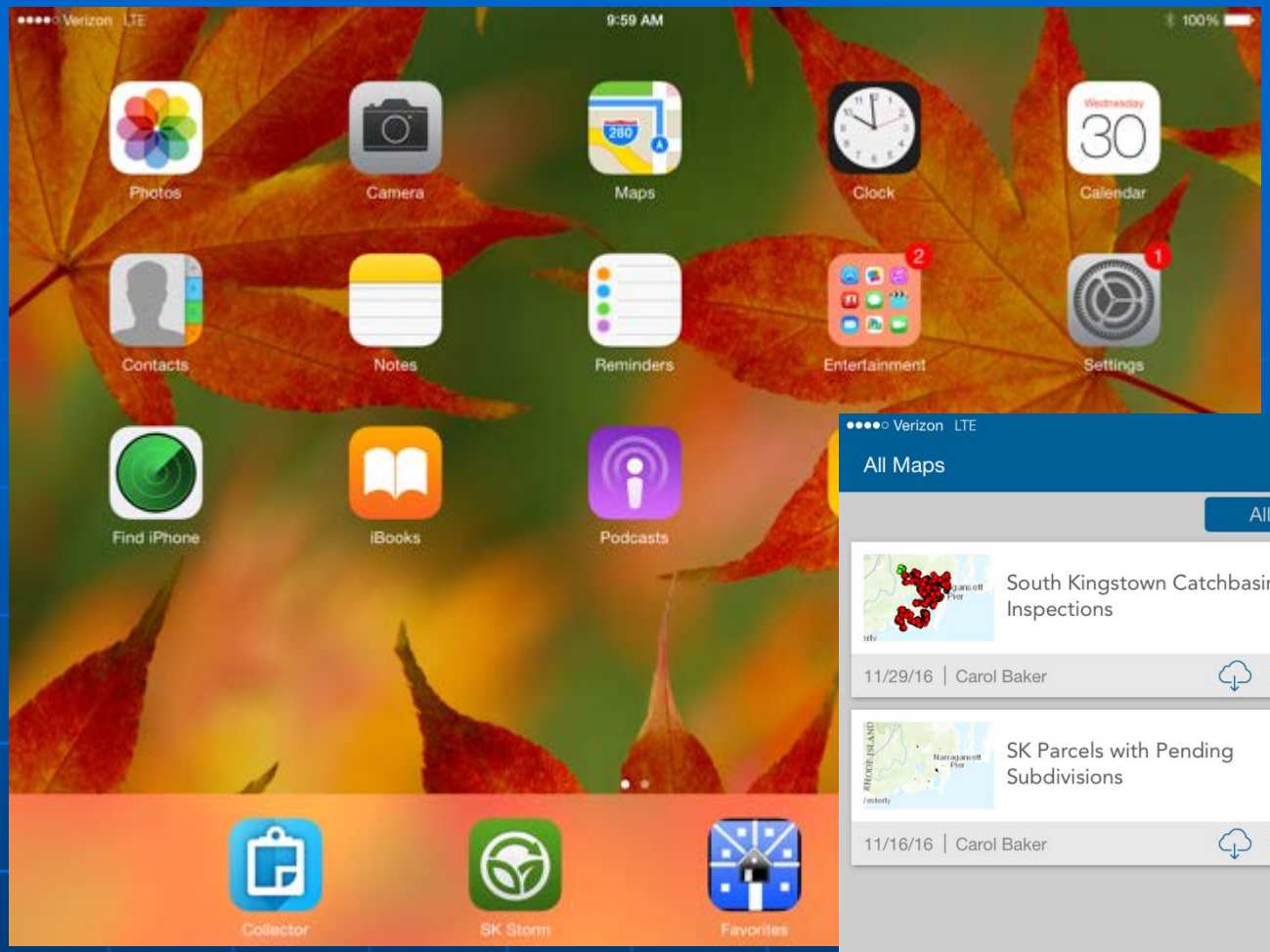
- **Structures: Point Feature Classes**
  - Outfalls
  - Catch Basins
- **Inspection Tables**
  - One to many
  - Linked by Feature ID
- **Inspection Attachments**
  - Pictures




Town of South Kingstown
Town Catchbasins
To Be Cleaned
August 5, 2016
138
2
1
108
110
SOUND
ISLAND
BLOCK
N
W
E
S
0 0.5 1 1.5 2 Miles
Geographic Information System
PS16-47 cpb 2/16


EXETER
NORTH KINGSTOWN
NARRAGANSETT
Mitchell Brook Subwatershed
Indian Lake
Indian Run Brook Subwatershed
Rocky Brook Subwatershed
Saugatucket River Subwatershed
Town of South Kingstown
Saugatucket River Pathogen TMDL Overview Map
Saugatucket River Watershed
Sub-Watersheds
Stormwater Structures
Stormwater Pipes
Outfalls
Town
State
Private
Detention Ponds
Town
Private
Source of Data:
Aerial Photo: 2008 Pictometry
Stormwater Structures: SKGIS
Surface Hydrology: RIGIS
Watershed and Subbasins: RIGIS & SKGIS, modified by drainage pipe distribution
Geographic Information System


Town of South Kingstown
Mutt Mitt Dispensers, Dog and Waterfowl Signs
Indian Lake
Worden Pond
SOUND
ISLAND
BLOCK
Dog Signs
Waterfowl Signs
Dog and Waterfowl Signs
Mutt Mitt Dispensers
TMDL Watersheds



Verizon LTE 10:32 AM 98%

All Maps

Search maps

All | On Device

3 maps

South Kingstown Catchbasin Inspections

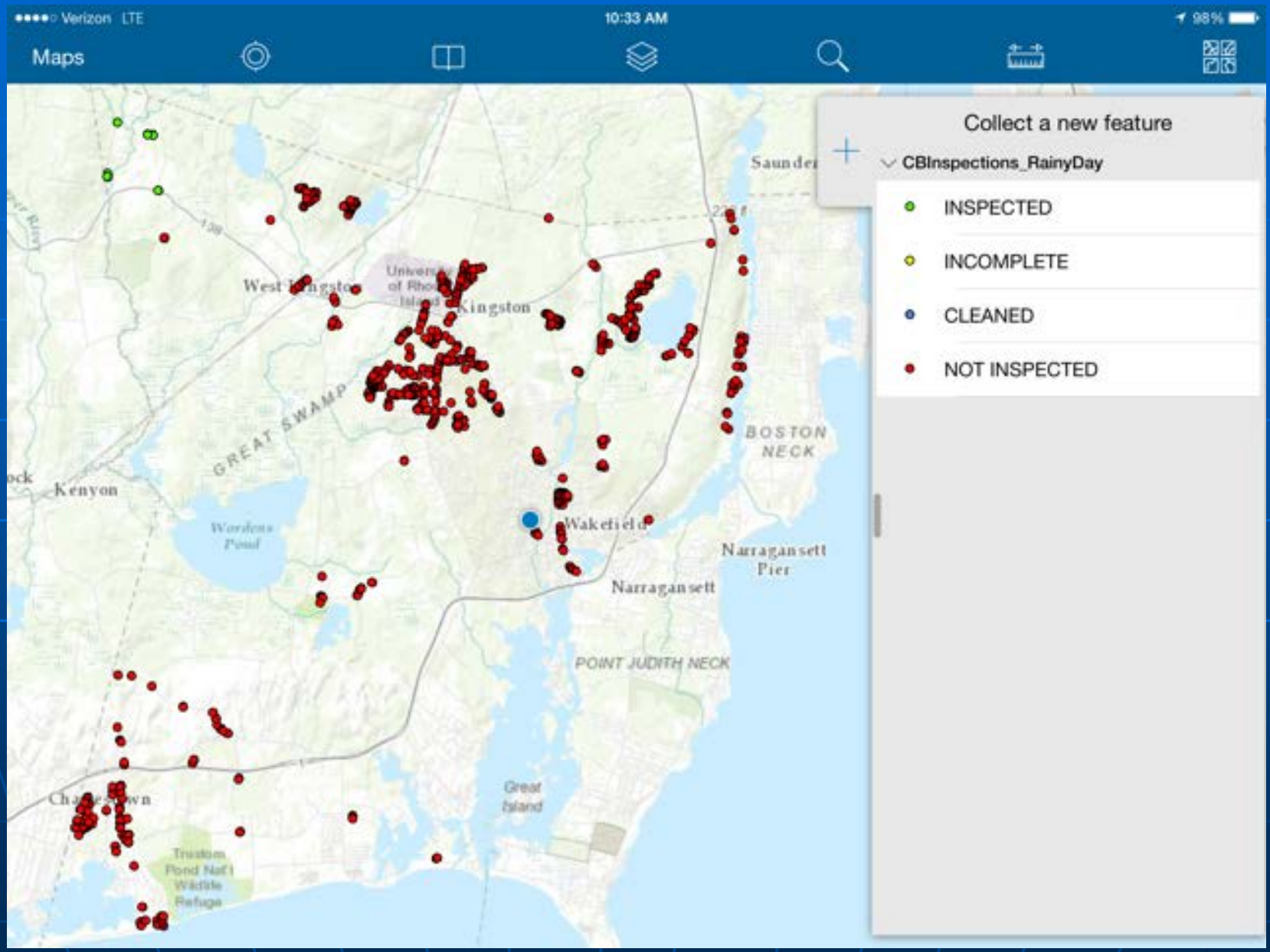
11/29/16 | Carol Baker

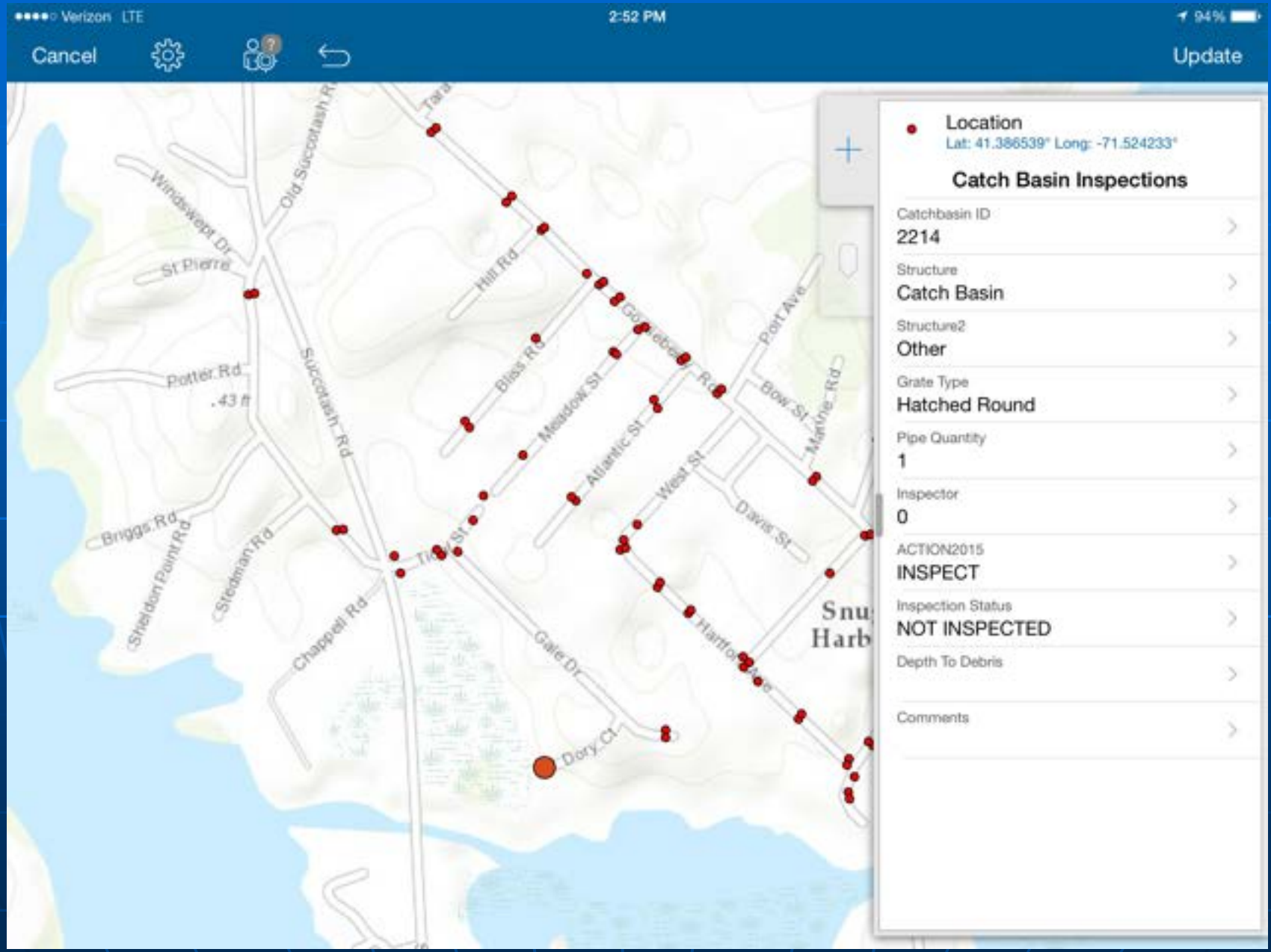
NEARC2016CBWebMap

10/17/16 | Carol Baker

SK Parcels with Pending Subdivisions

11/16/16 | Carol Baker


Verizon LTE
10:33 AM
98%
Maps
Collect a new feature
CBInspections_RainyDay
INSPECTED
INCOMPLETE
CLEANED
NOT INSPECTED
Kingston
GREAT SWAMP
Kenyon
Wakefield
BOSTON NECK
Narragansett Pier
Narragansett
POINT JUDITH NECK
Great Island


Verizon LTE
2:52 PM
94%
Cancel
Update
Location
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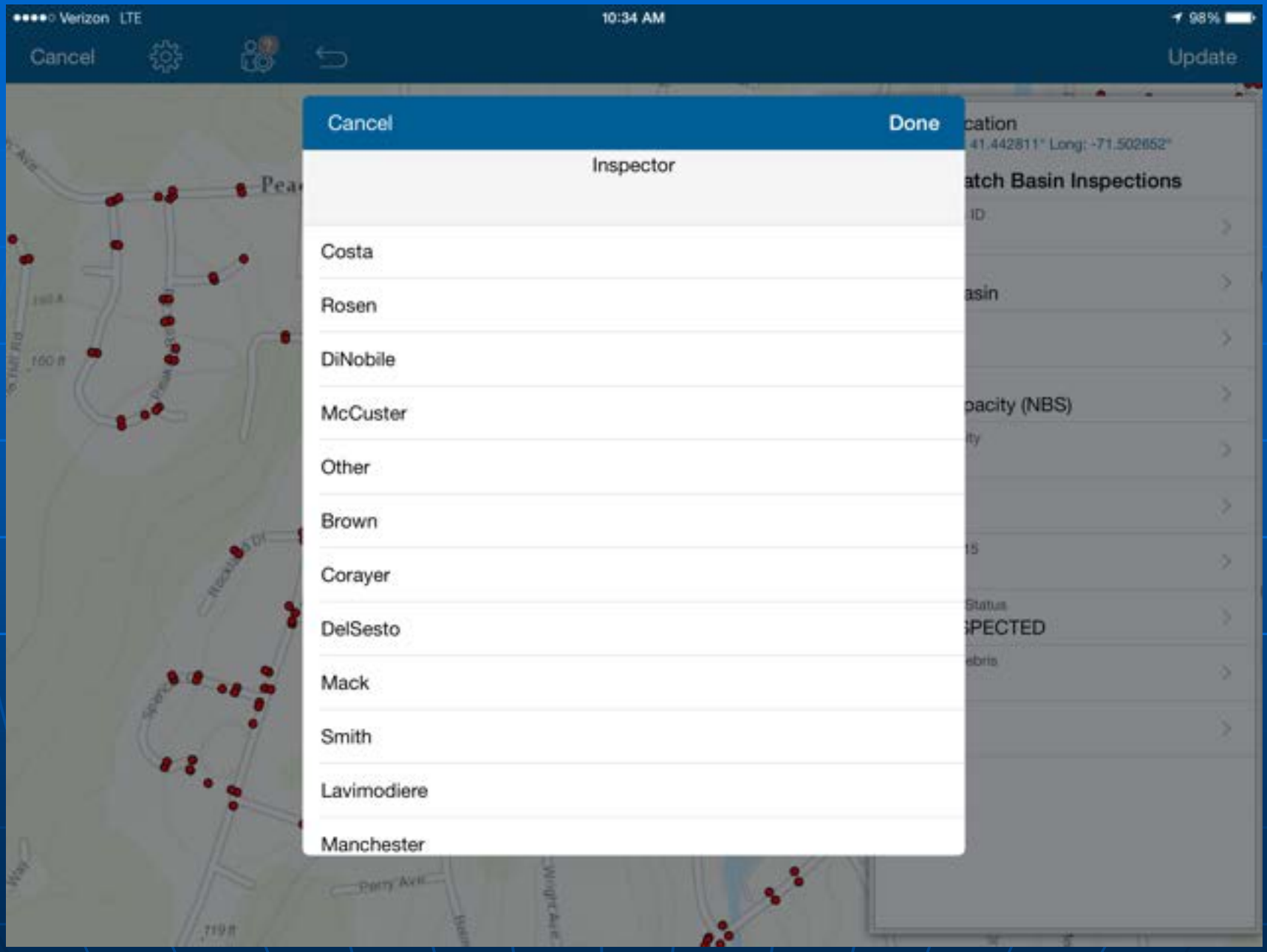
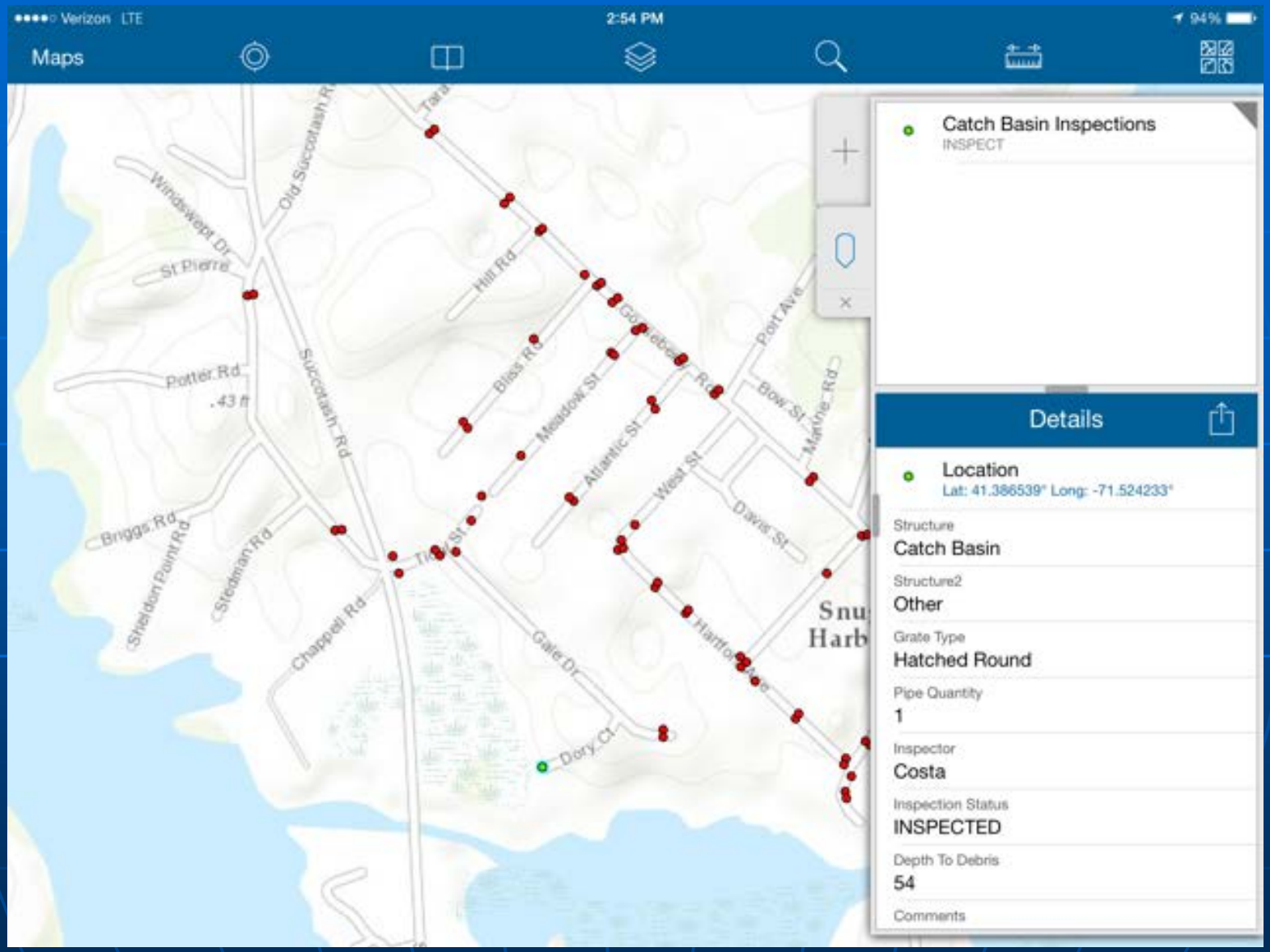
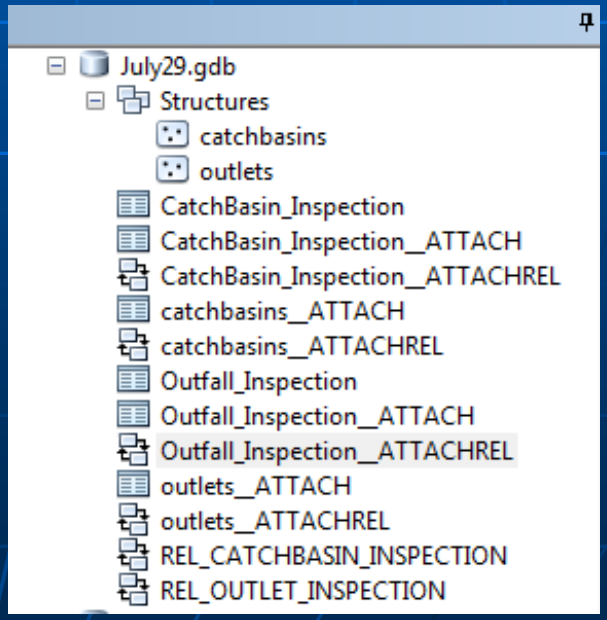
Catch Basin Inspections
Catchbasin ID
2214
Structure
Catch Basin
Structure2
Other
Grate Type
Hatched Round
Pipe Quantity
1
Inspector
0
ACTION2015
INSPECT
Inspection Status
NOT INSPECTED
Depth To Debris
Comments
Windswept Dr
St Pierre
Old Succotash Rd
Hill Rd
Bliss Rd
Meadow St
Atlantic St
West St
Davis St
Port Ave
Bow St
Marine Rd
Potter Rd
.43 ft
Succotash Rd
Briggs Rd
Sheldon Point Rd
Stedman Rd
Chappell Rd
Gale Dr
Dory Ct


Verizon LTE
10:34 AM
98%
Cancel
Update
Cancel
Done
Inspector
Costa
Rosen
DiNobile
McCuster
Other
Brown
Corayer
DelSesto
Mack
Smith
Lavimodiere
Manchester
cation
41.442811° Long: -71.502652°
atch Basin Inspections
ID
asin
pacity (NBS)
Status
SPECTED
Perry Ave


Verizon LTE
2:54 PM
94%
Maps
Catch Basin Inspections
INSPECT
Details
Location
Lat: 41.386539° Long: -71.524233°
Structure
Catch Basin
Structure2
Other
Grate Type
Hatched Round
Pipe Quantity
1
Inspector
Costa
Inspection Status
INSPECTED
Depth To Debris
54
Comments
Windswept Dr
St Pierre
Potter Rd
.43 ft
Old Succotash Rd
Succotash Rd
Hill Rd
Bliss Rd
Meadow St
Atlantic St
West St
Davis St
Port Ave
Bow St
Marine Rd
Briggs Rd
Sheldon Point Rd
Stedman Rd
Chappell Rd
Gate Dr
Dory Ct

Getting Started?

- Start with the GeoDatabase Schema
- Use inspections as a means to create Geodatabase



Questions ?