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Merrimack Valley Planning Commission

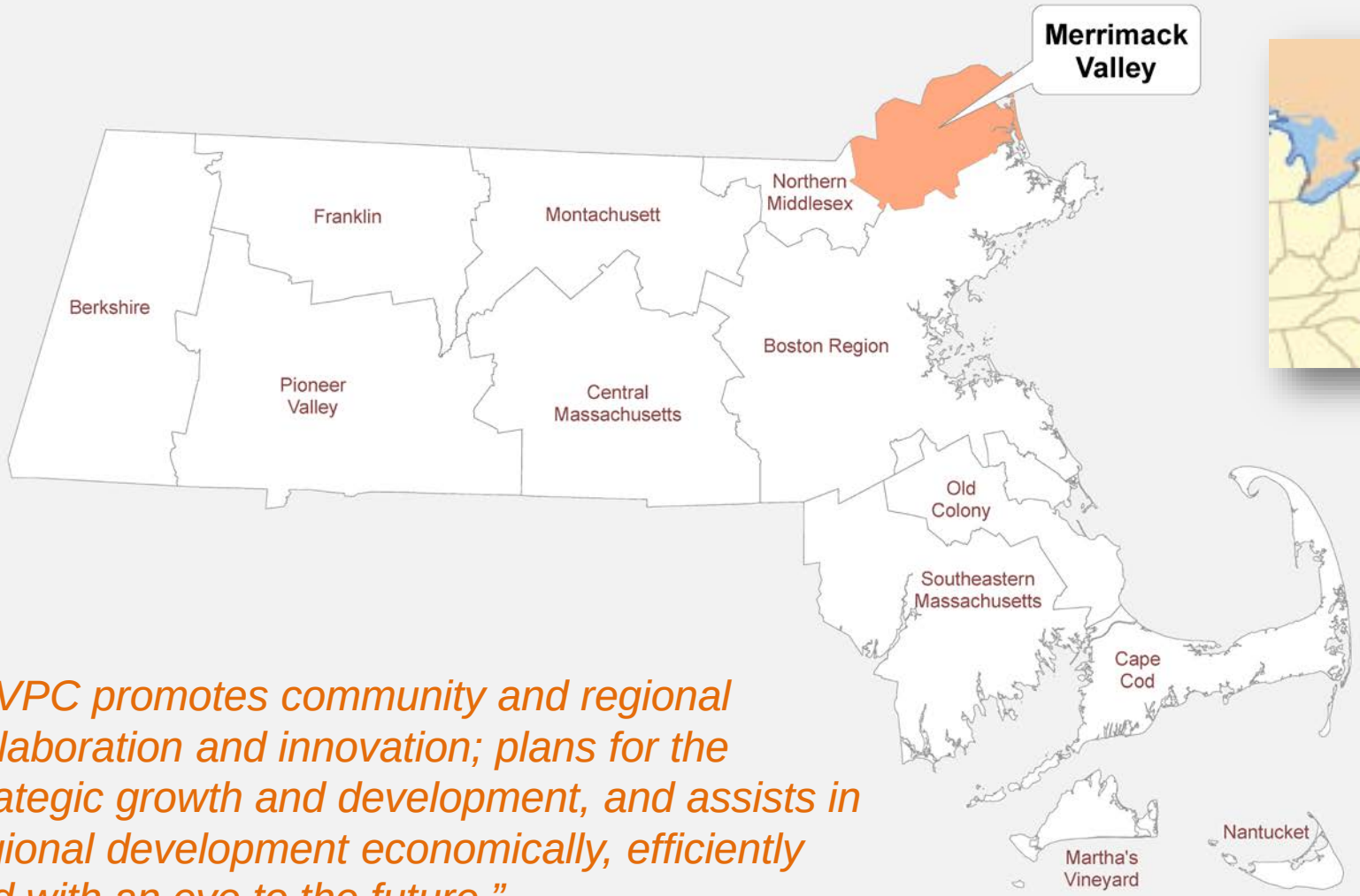
*plan * develop * promote*

Sewer Management using ArcGIS Online and ESRI Apps

ESRI UC 2017

Jerrard Whitten, Steve Lopez, Kelsey Quinlan

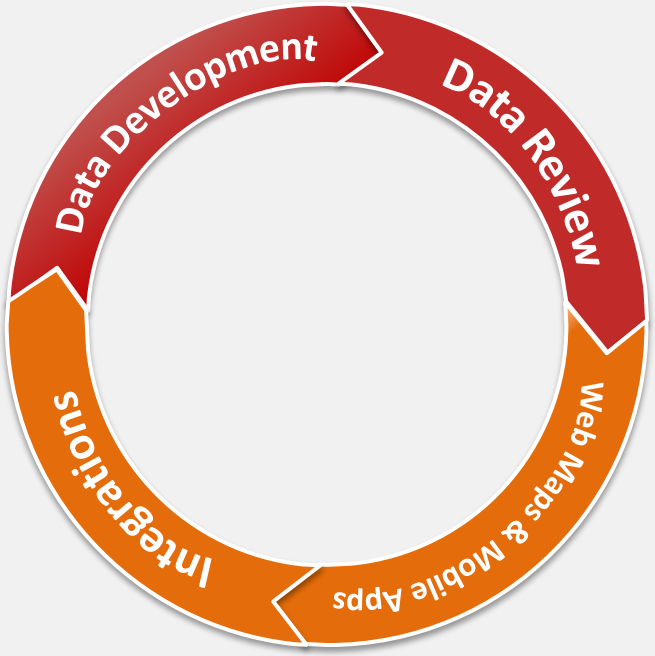
Merrimack Valley Planning Commission



"MVPC promotes community and regional collaboration and innovation; plans for the strategic growth and development, and assists in regional development economically, efficiently and with an eye to the future."

Today's Discussion

- Plum Island
- Vacuum Sewer System
- Winter 2015
- Process and solutions



Winter 2014-2015

March 2015

“Historic” Winter

A costly sewer system failure on Plum Island

Sewage problem on Plum Island

Plum Island sewer system failure displaces hundreds

After three messy weeks of frustration, Plum Island fixes its system and residents can start returning home

Meeting the challenges of so much snow, sewerage outage

Help for Plum Island's sewer woes

More money allocated to study problems

Plum Island


Amesbury
Salisbury
Newburyport
West Newbury
Newbury
Rowley

Vacuum Sewer Systems

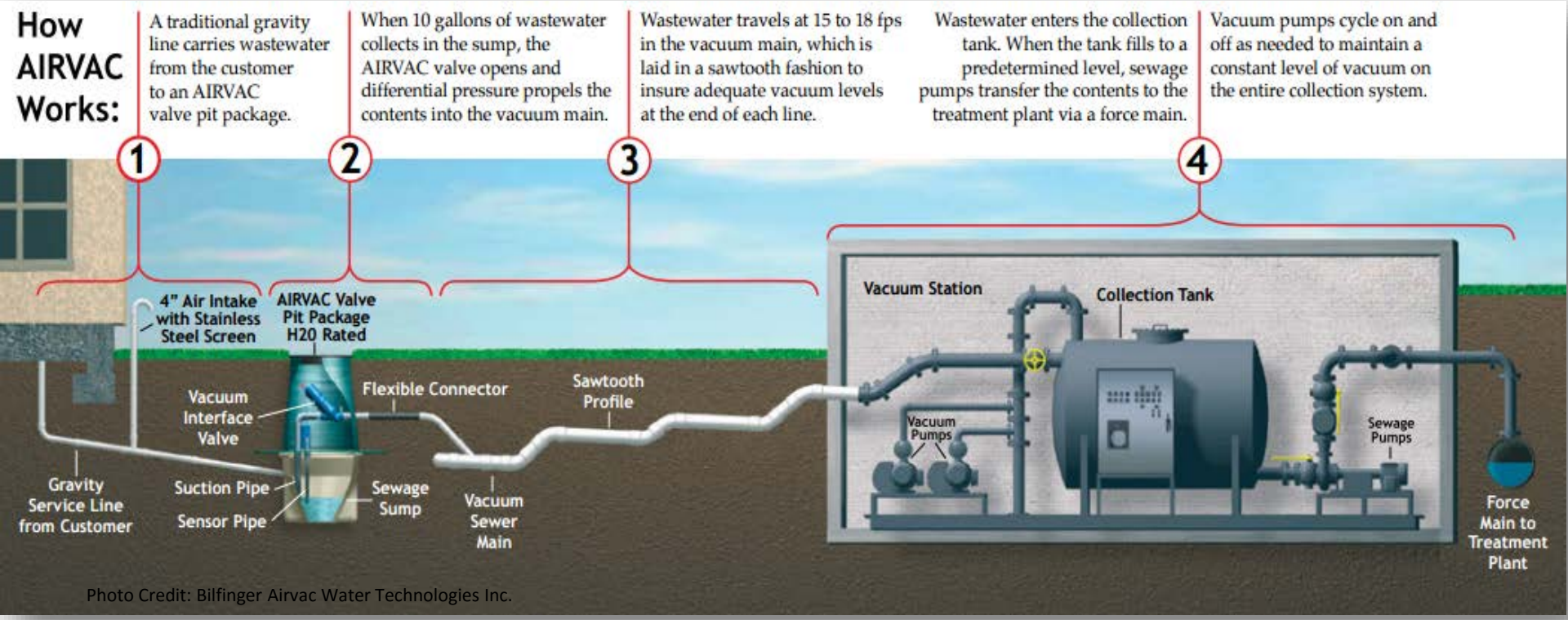
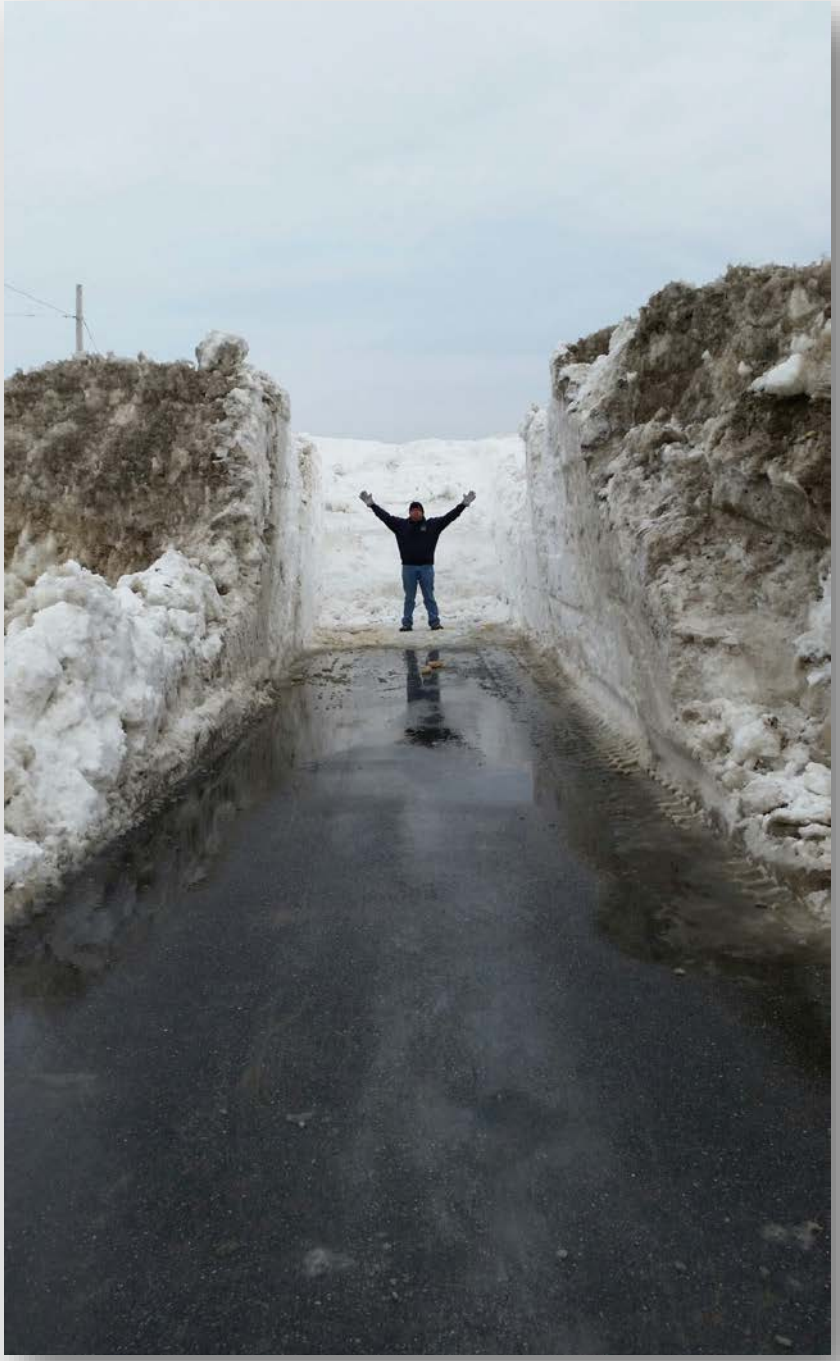
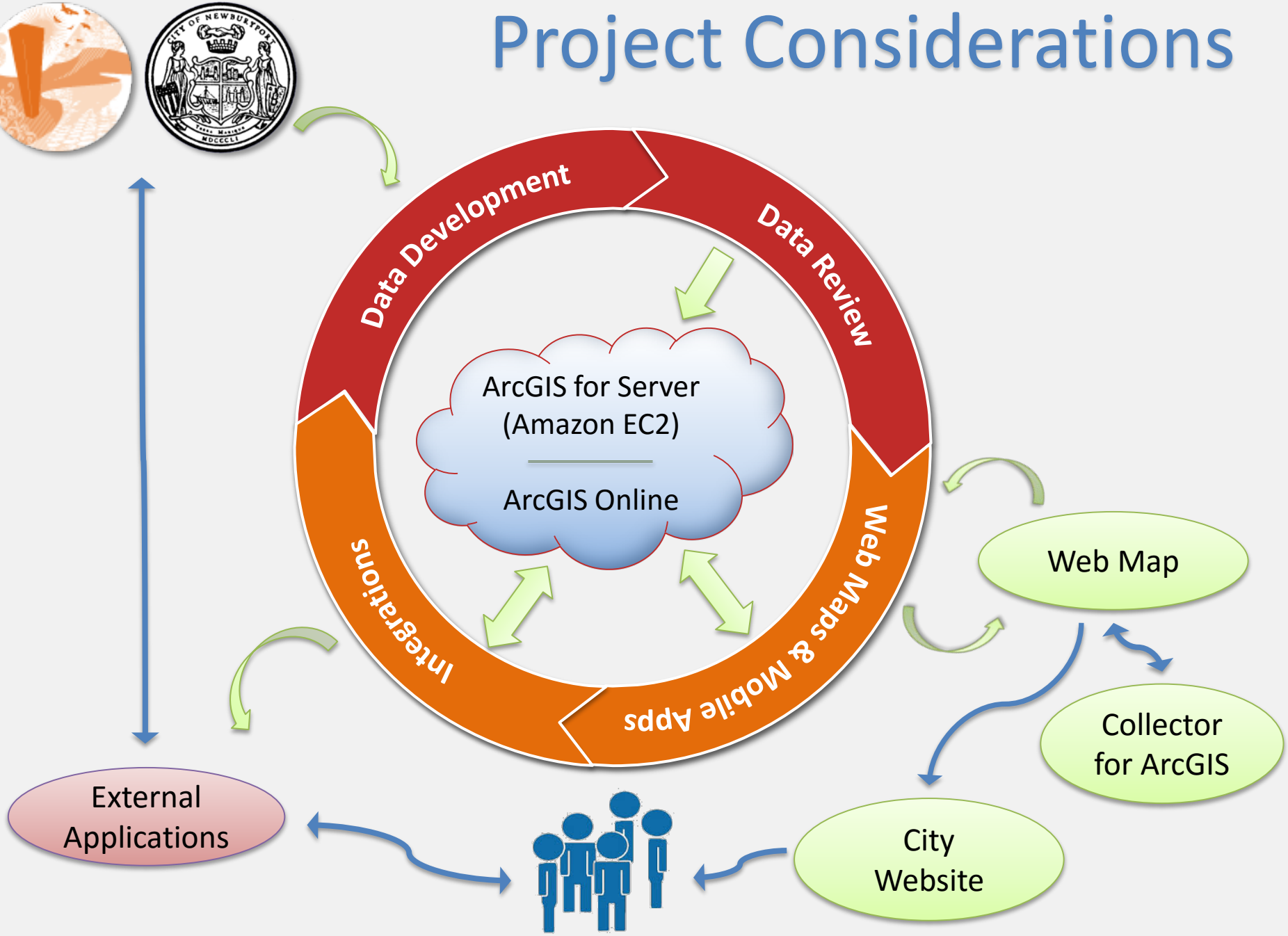
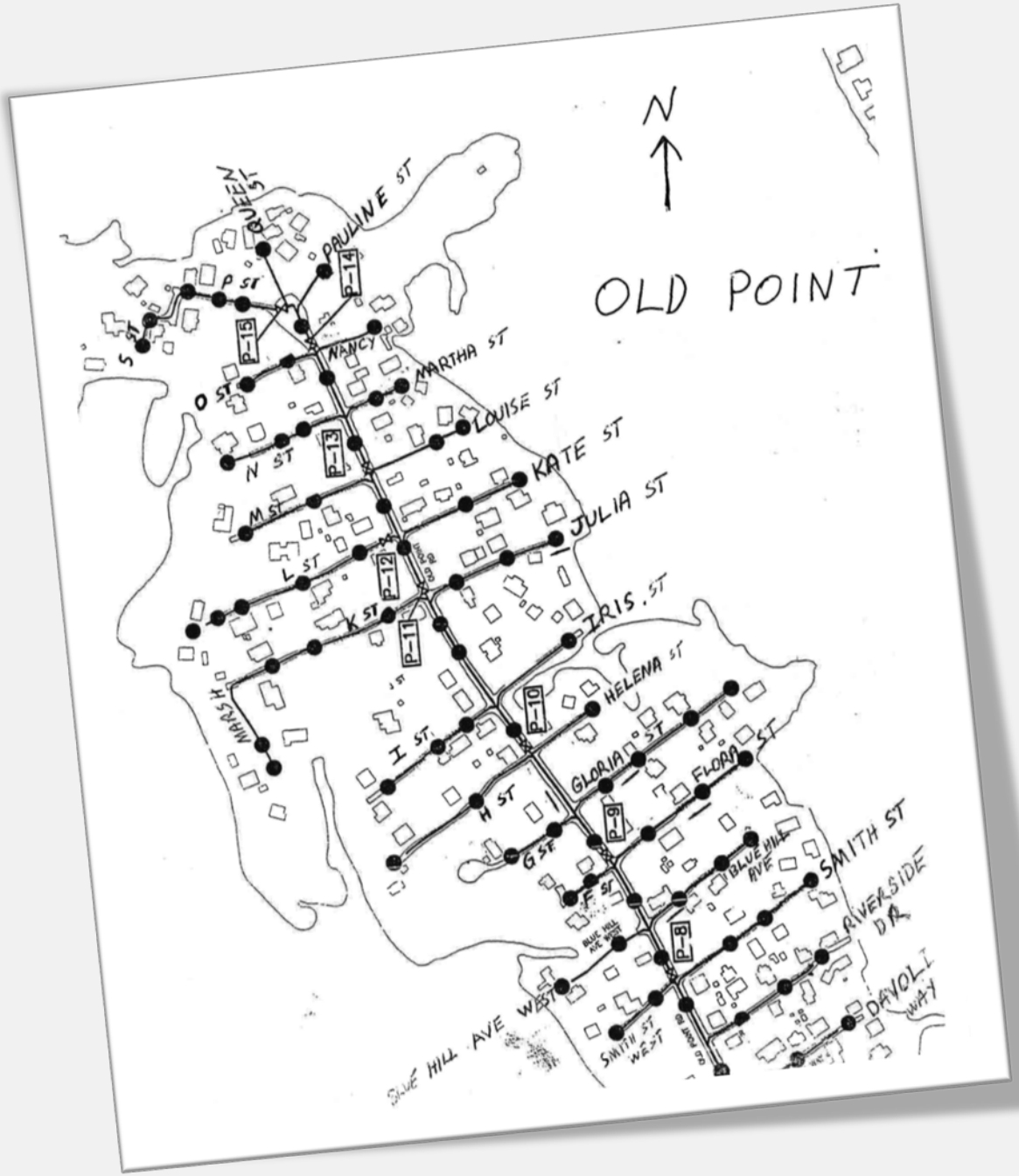


Photo Credit: Bilfinger Airvac Water Technologies Inc.



Project Considerations




N
OLD POINT
QUEEN ST
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KATE ST
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JULIA ST
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IRIS ST
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HELENA ST
P-10
I ST
GLORIA ST
FLORA ST
H ST
P-9
G ST
F ST
BLUE HILL AVE
SMITH ST
RIVERSIDE DR
P-8
BLUE HILL AVE WEST
SMITH ST WEST
DANVOLI WAY
BLUE HILL AVE

State of the Data

Vacuum Pit:

- Provided with “as builts”
- Incorrect locations
- Unknown Quantity
- Don’t know which home is connected to which vacuum pit

State of the Data

Vent Pipe (Candy Cane) :

- No existing dataset
- No record of which homes tied in

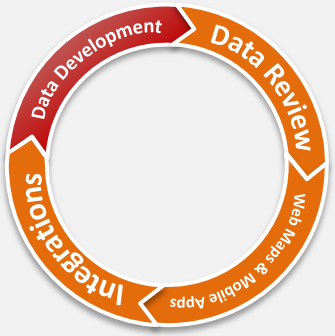
Data Development

Develop a plan to collect pertinent features to the island's sewer system

Mobile Collection

- Divided island into 4 sub areas for ID scheme
- Worked with knowledgeable DPS staff member
- Collected approximately 1800 features
- Two months

Attributes



Vent Pipe:

- Height
- Obstruction
- Angled
- Broken
- Building Adjacent

Trimble GeoExplorer6000

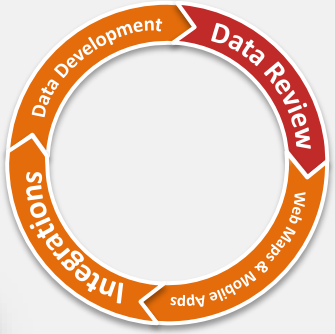
Vacuum Pit:

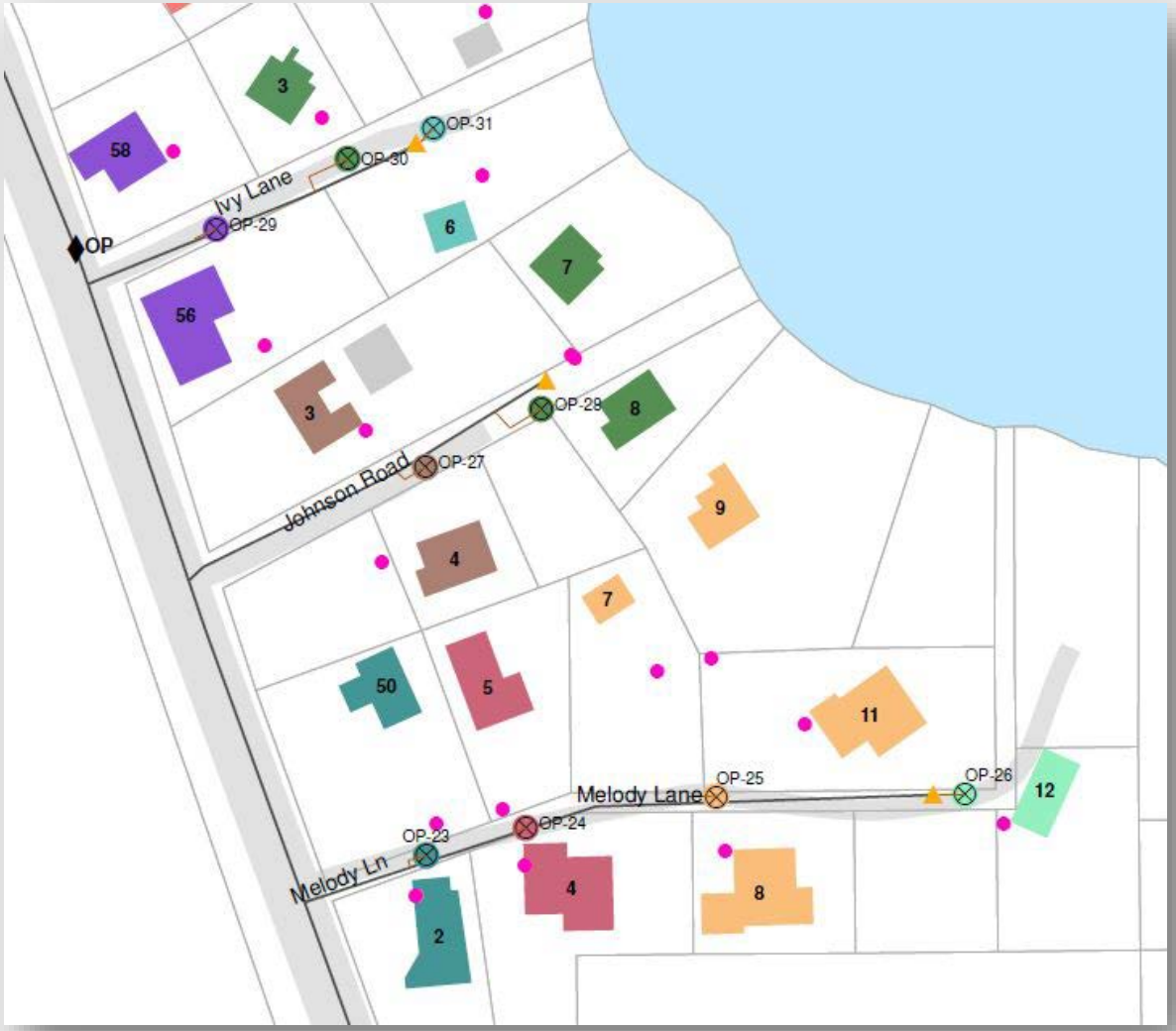
- Vacuum pit ID
- Street name
- Last maintenance
- Controller status
- Condition

Mobile Collection Challenges

Data Review

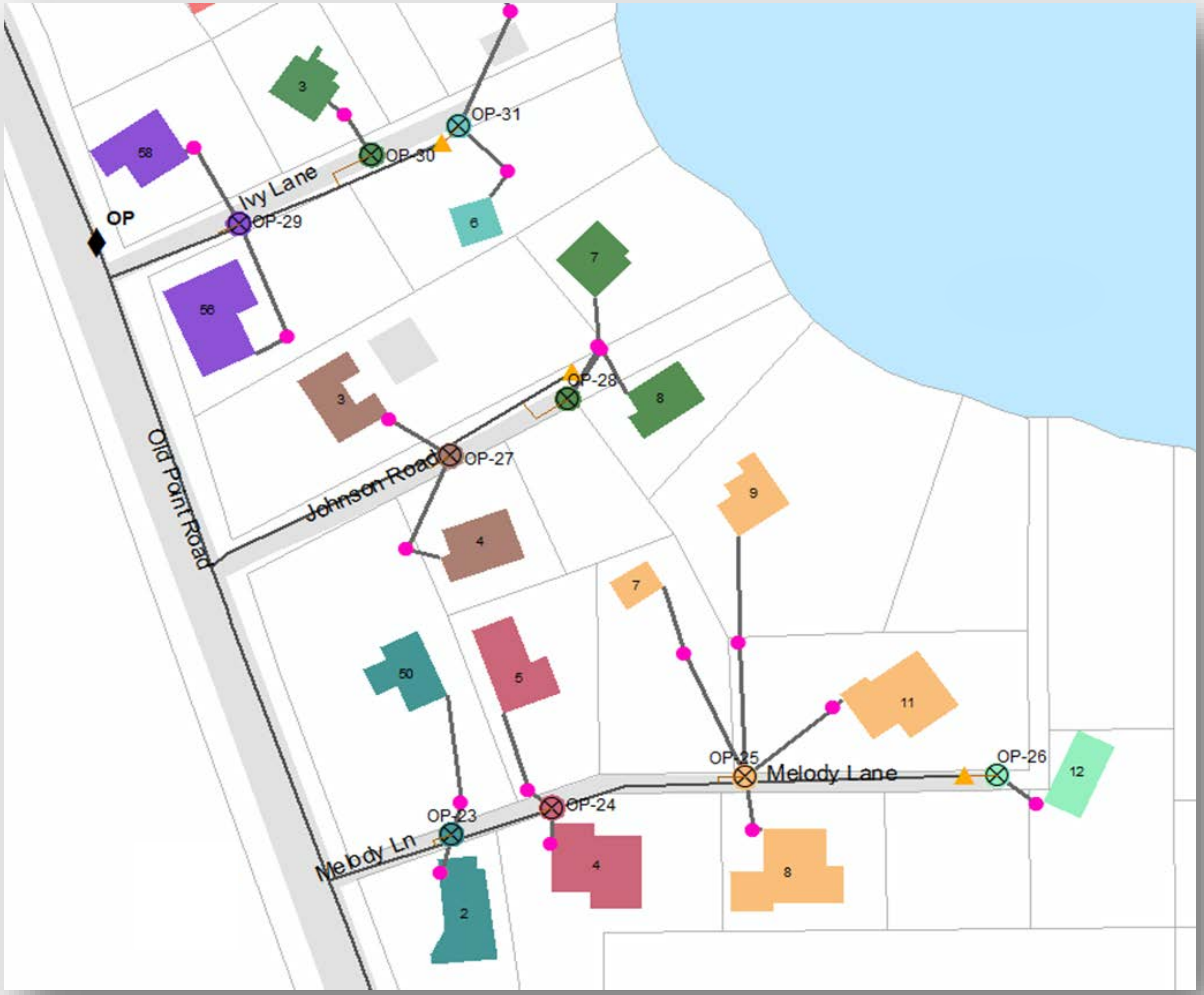
The “Fruity Pebble” Map





Data Review

Drawing the Connections

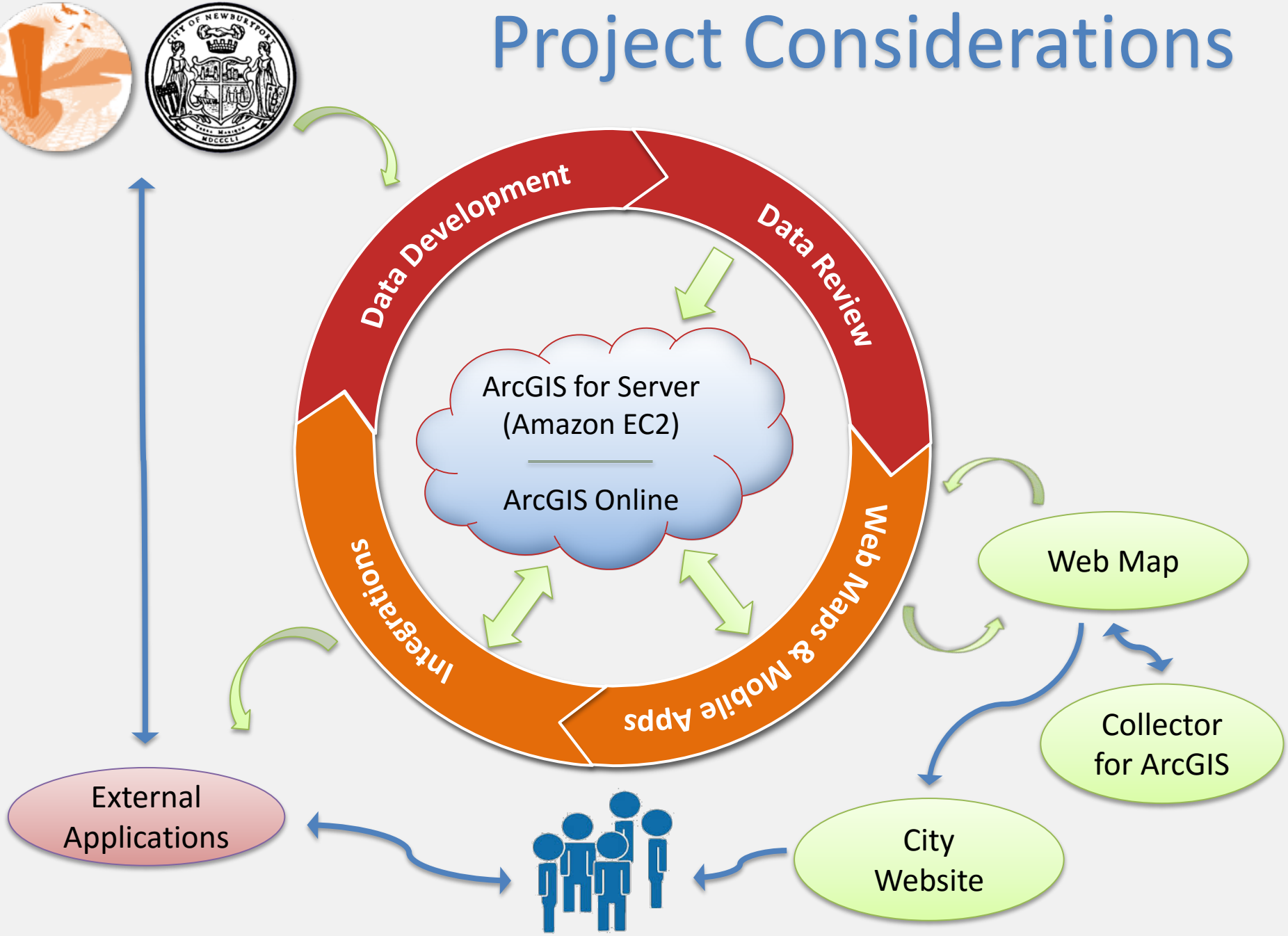


Verification Process

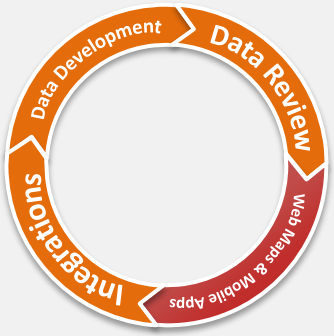
Annual AirVac testing:

- Test timing of system
- City confirmed home & vacuum connections at the same time

Project Considerations

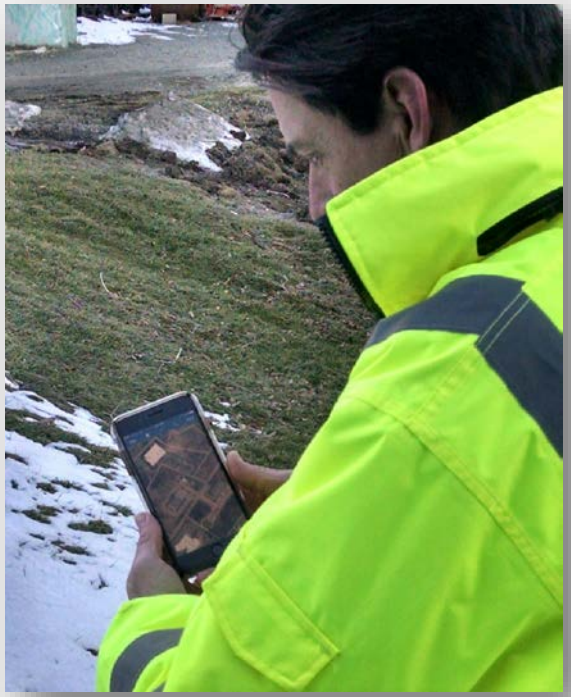


Web Maps & Mobile Apps

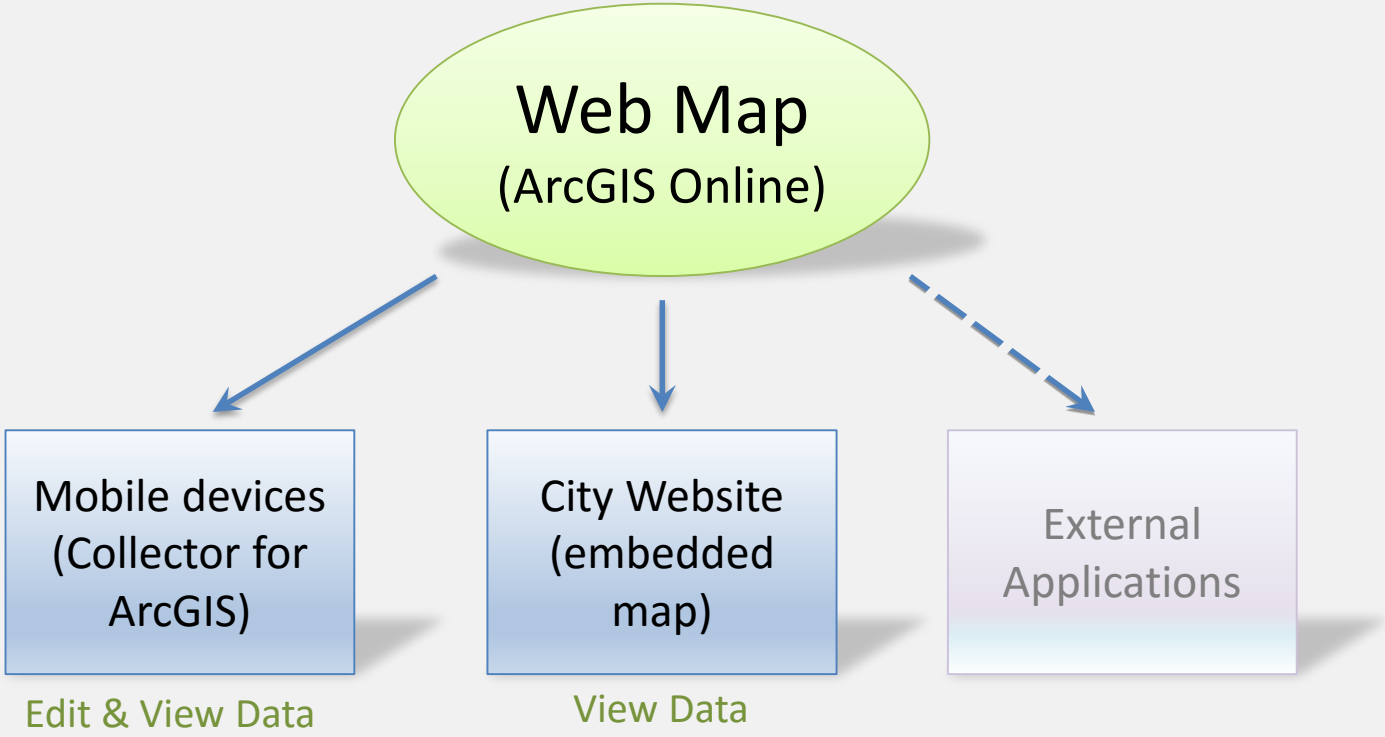


Defining the objectives:

- Who will use the application(s)?
- How will the application(s) be used?
- What do(es) the application(s) need to accomplish?



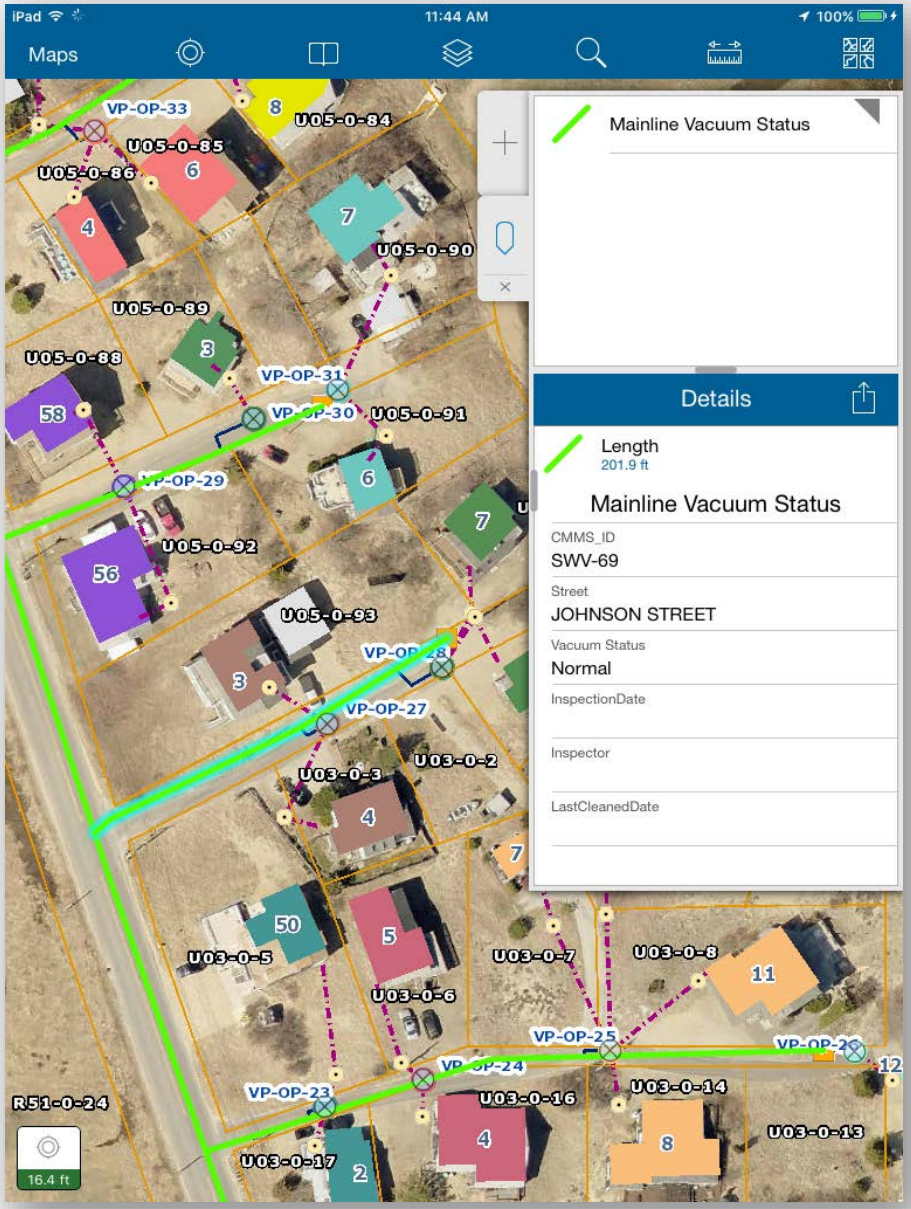
Web Map



Why use a web map?

- Simple to create
- Easy interaction
- Dynamic data
- Delivered via multiple platforms

Mobile Application



Why use Collector?

- Existing infrastructure
- Cost
- Easy to configure / Easy to use

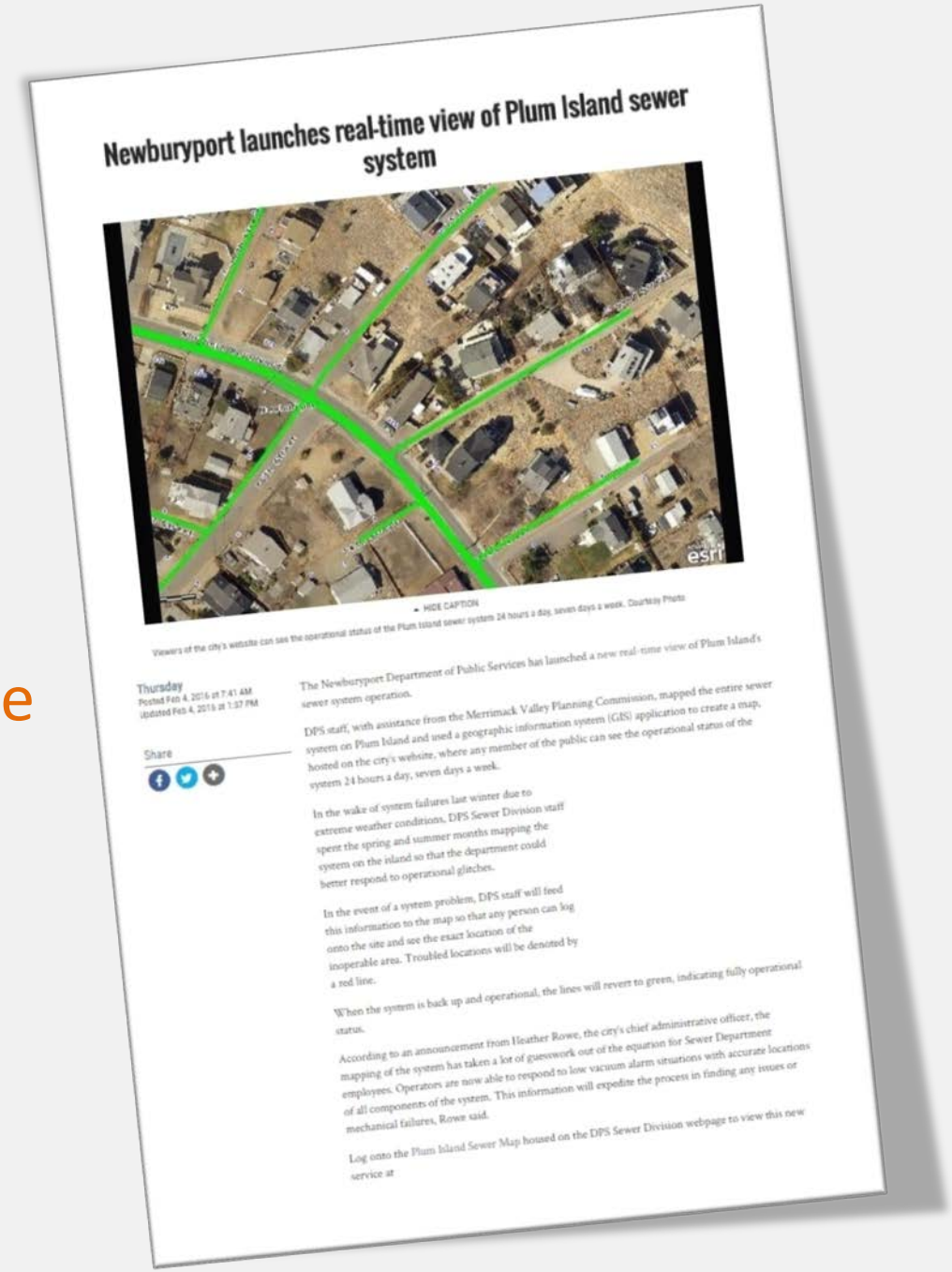
Benefits to staff?

- View system in field
- Edit data on the fly
- Same map is available in other applications

City Website
(embedded map)

How do residents benefit?

- Integrated in city website
- Search for data
- Receive real-time updates



Newburyport launches real-time view of Plum Island sewer system

HIDE CAPTION

Viewers of the city's website can see the operational status of the Plum Island sewer system 24 hours a day, seven days a week. Courtesy Photo

Thursday
Posted Feb 4, 2016 at 7:41 AM
Updated Feb 4, 2016 at 1:37 PM

Share

The Newburyport Department of Public Services has launched a new real-time view of Plum Island's sewer system operation.

DPS staff, with assistance from the Merrimack Valley Planning Commission, mapped the entire sewer system on Plum Island and used a geographic information system (GIS) application to create a map, hosted on the city's website, where any member of the public can see the operational status of the system 24 hours a day, seven days a week.

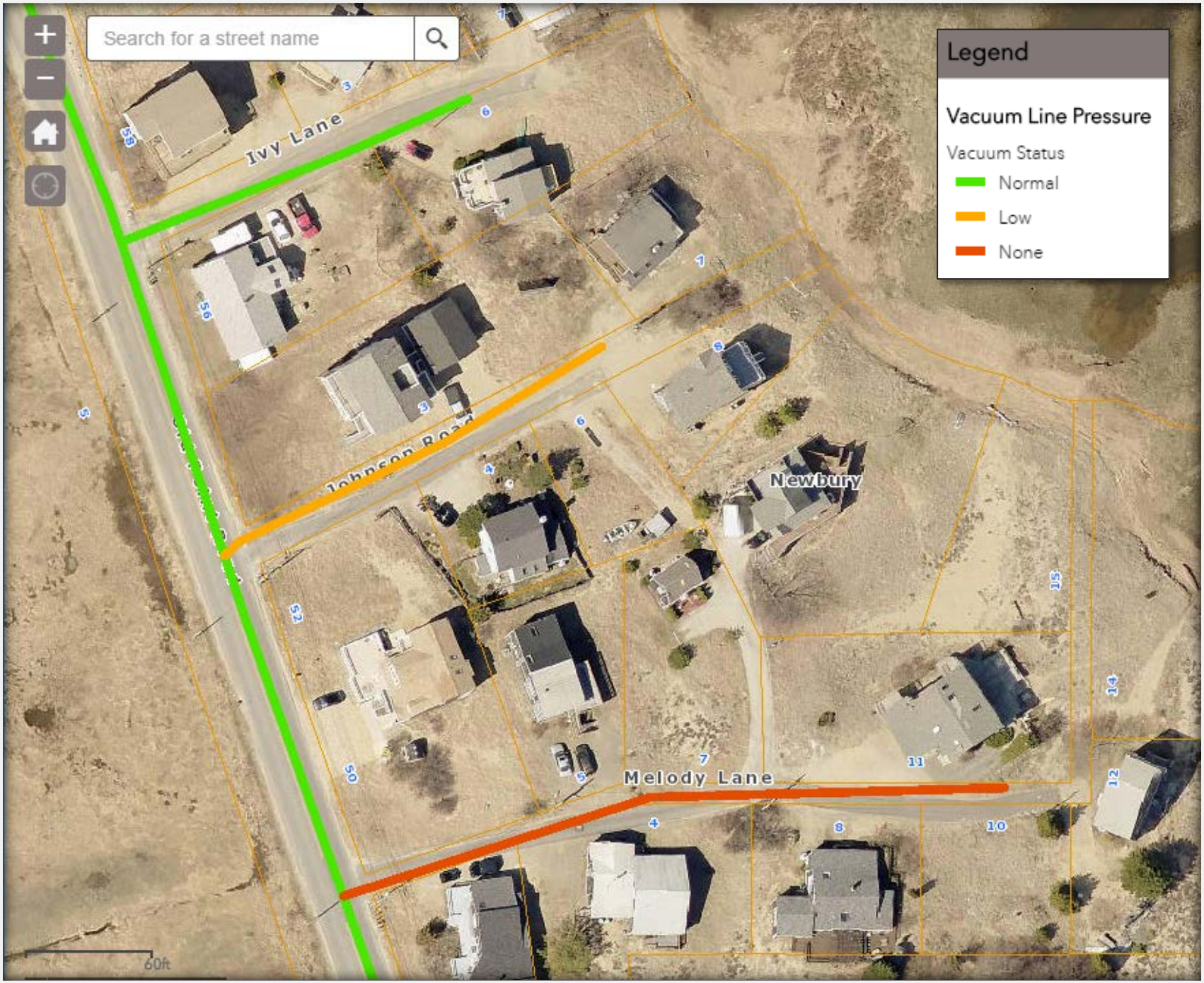
In the wake of system failures last winter due to extreme weather conditions, DPS Sewer Division staff spent the spring and summer months mapping the system on the island so that the department could better respond to operational glitches.

In the event of a system problem, DPS staff will feed this information to the map so that any person can log onto the site and see the exact location of the inoperable area. Troubled locations will be denoted by a red line.

When the system is back up and operational, the lines will revert to green, indicating fully operational status.

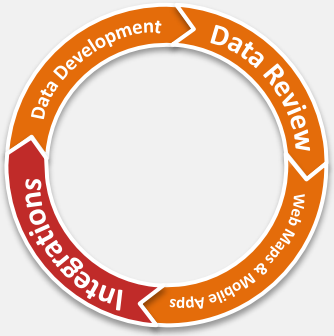
According to an announcement from Heather Rowe, the city's chief administrative officer, the mapping of the system has taken a lot of guesswork out of the equation for Sewer Department employees. Operators are now able to respond to low vacuum alarm situations with accurate locations of all components of the system. This information will expedite the process in finding any issues or mechanical failures, Rowe said.

Log onto the Plum Island Sewer Map housed on the DPS Sewer Division webpage to view this new service at


Search for a street name
Legend
Vacuum Line Pressure
Vacuum Status
Normal
Low
None
Ivy Lane
Johnson Road
Newbury
Melody Lane
60ft

Integrations

& future considerations…



- Integrated with AirVac SCADA
- Evolve systems as technology advances
  - ex. Migration from Green App to Collector
- Ongoing operation of apps
- Expand maintenance attributes & training

Questions?

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Technology Utilized

- Trimble GeoExplorer6000
- Trimble Pathfinder Office
- ArcGIS ArcMap 10.3.1
- Collector for ArcGIS
- Amazon Web Services (Elastic Cloud Compute)
- ArcGIS Server 10.4
- ArcGIS Online
- Android & IOS enabled devices

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