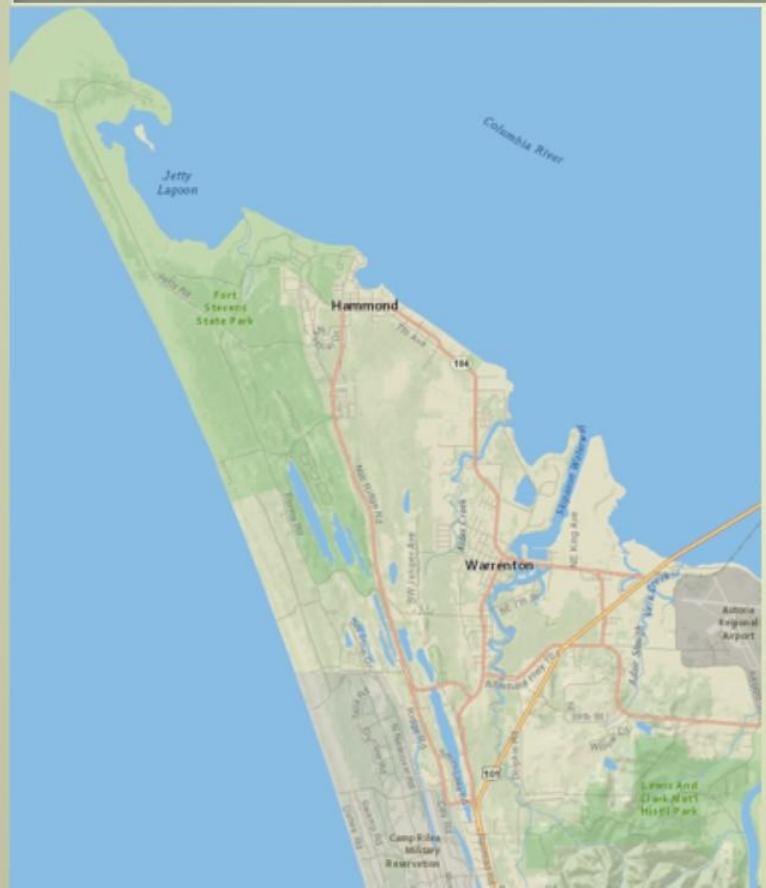
Geographic Information Systems at the City of Warrenton

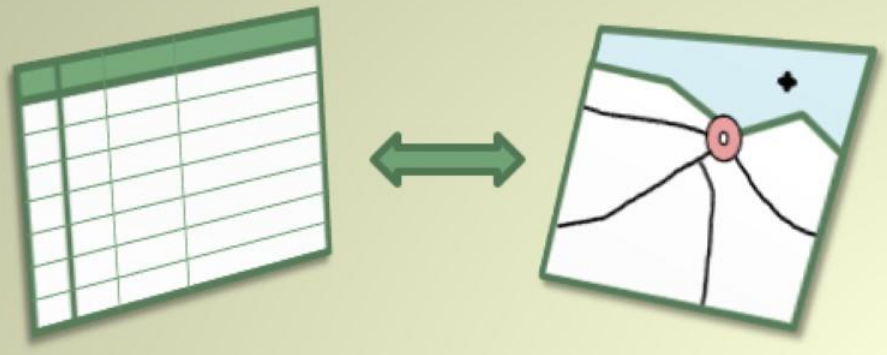


- Basics of GIS, why? … what?
- GIS Tools @ Warrenton
- Where we get the data
- Some things we do now
- Some things to do for the future

Presented to the Warrenton City Commission Work Session
Tue. Oct 8, 2013

Why we have GIS

- City manages lots of assets, including data.
- Virtually all these data have a geographic aspect
- GIS can store, retrieve, transform, and display data using spatial location, proximity, and coincidence.



Maps and Data

- In a GIS database, things are represented as point features, line features, area features, or surfaces.
- Facts about things are located in a linked data table.

Examples:

pts.	- catch basins	→ position + attributes
lines	- storm drains	→ length + attributes
areas	- tax lots	→ area + attributes
surfaces	- elevations	→ spot heights/ c-lines

Example: Catch Basins

Select records of certain catch basins based on some criterion.

Display a map of the result.

The database can access a map AND a map can access the database!

OR

Select the features from the map display.

Retrieve the data about them from the table.

													OUTCLOCK
612	Point	152	STREET DRAIN	WARRENTON	0	0	18 X 24	27		OTHER	2GP1		3 - 8
613	Point	153	FIELD DRAIN	WARRENTON	0	0	18 X 24	0		OTHER	2GP1	12 - 12;9 - 8	6 - 12
614	Point	154	STREET DRAIN	WARRENTON	0	0	18 X 24	32		OTHER	2GP2	CAN'T SEE	
151	Point	160	STREET DRAIN	WARRENTON	0	0	8 X 12	12		CLOGGED			
158	Point	167	STREET DRAIN	WARRENTON	0	0	16 X 24	18		CLEAN			
159	Point	168	CURB INLET	WARRENTON	0	0	12 X 16	8		OTHER	3GP2		
169	Point	179	CURB INLET	WARRENTON	0	0	16 X 33	16	12	DRY	3GP1	7 - 12	4 - 12
197	Point	207	STREET DRAIN	WARRENTON	0	0	16 X 24	24		CLEAN			
212	Point	222	DITCH INTAKE	WARRENTON	0	0	16 X 24	0			3GP1		
216	Point	226	AREA DRAIN	WARRENTON	0	4.9	30 X 34	0	18	CLEAN	2AB2	8 - 18	3 - 12
217	Point	227	AREA DRAIN	WARRENTON	0	4.4	20 X 26	34	18	CLEAN	3GA2	12 - 12; 9 - 18	3 - 24
251	Point	261	CURB INLET	WARRENTON	25.15	22.57	2.5 X 4	18					
252	Point	262	CURB INLET	WARRENTON	25.71	22.21	2.5 X 4	18					
253	Point	263	CURB INLET	WARRENTON	0	0	2.5 X 4	18					
254	Point	264	CURB INLET	WARRENTON	0	0	2.5 X 4	18					
257	Point	267	CURB INLET	WARRENTON	21.39	17.89	2.5 X 4	18					
258	Point	268	CURB INLET	WARRENTON	21.39	17.39	2.5 X 4	18					
259	Point	269	FIELD DRAIN	WARRENTON	20.53	18.3	1.5 - 2 dia	18					
260	Point	270	CURB INLET	WARRENTON	16.6	13.94	2.5 X 4	18					
261	Point	271	CURB INLET	WARRENTON	16.6	13.79	2.5 X 5	18					
355	Point	367	STREET DRAIN	WARRENTON	0	0	28 X 28	26	12	DRY	3GP2		3 - 12
356	Point	368	STREET DRAIN	WARRENTON	0	0	28 X 28	22		DRY	3GP2	9 - 12	3 - 12
357	Point	369	PAVEMENT DRAIN	WARRENTON	0	0	28 X 28	14	6	OTHER	3GO3	9 - 6	3 - 6
358	Point	370	OTHER	WARRENTON	0	0	3FT PLATE	0		UNKNOWN	2GP0	9 - 6	
374	Point	386	CURB INLET	WARRENTON	44.51	42.01	28 X 28	24					
375	Point	387	CURB INLET	WARRENTON	44.22	41.72	28 X 28	24					

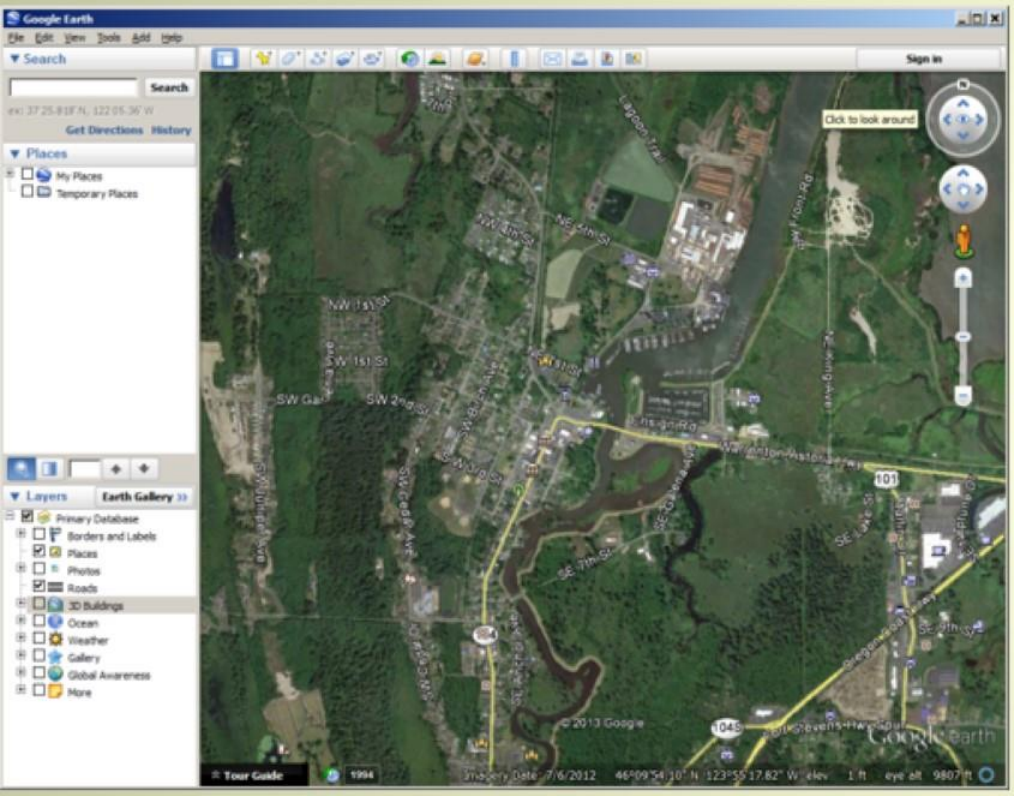
Power of GIS

- ✓ Database ← → Map two-way link.
- ✓ Manage information about mapped features.
- ✓ Ability to query and retrieve with spatial conditions.
- ✓ Perform analysis based on those spatial conditions.
- ✓ Integrate various forms of data (layers, photos, etc.)

… and, oh yes

- ✓ Make maps for everyday and special uses.

GIS Tools at Warrenton



Google Earth – Google Maps…
A geographical browser

Uses:

- Navigate around to see aerial photos of any area worldwide!
- Find & zoom to any address.

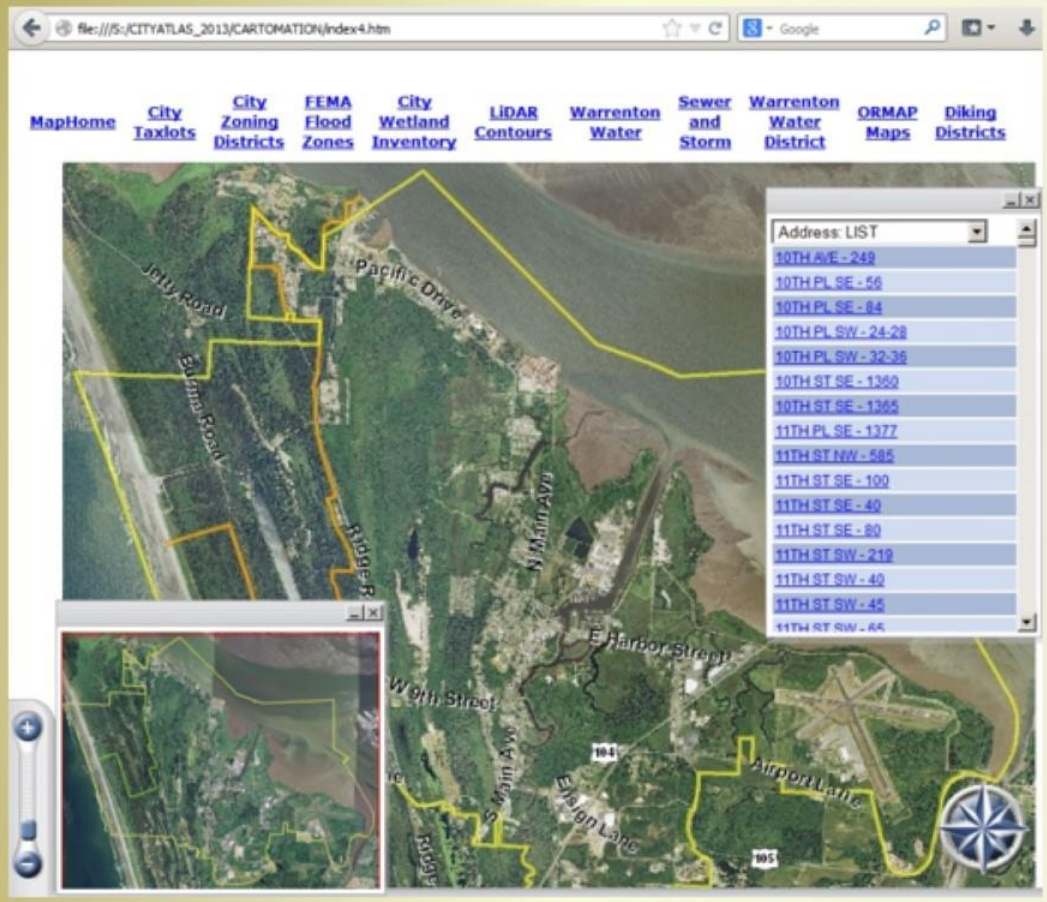
Pros:

+ Familiarity, ease of use.
+ Free.

Drawbacks:

- Cumbersome to add, edit information
- Not a GIS… no database, no analysis

GIS Tools at Warrenton



"City Atlas"
In house GIS data retrieval tool

Uses:

- Review Data specific to city of Warrenton
- See connections b/w data layers and air photo

Pros:

+ Customized for typical queries
+ Intranet + internet versions
+ Parcel-based lists, views.

Drawbacks:

- Inflexible organization is preset
- Relies on cached tiles of premade maps
- Good link to static databases but no analytical capability.

GIS Tools at Warrenton

Welcome to the City of Warrenton's GIS

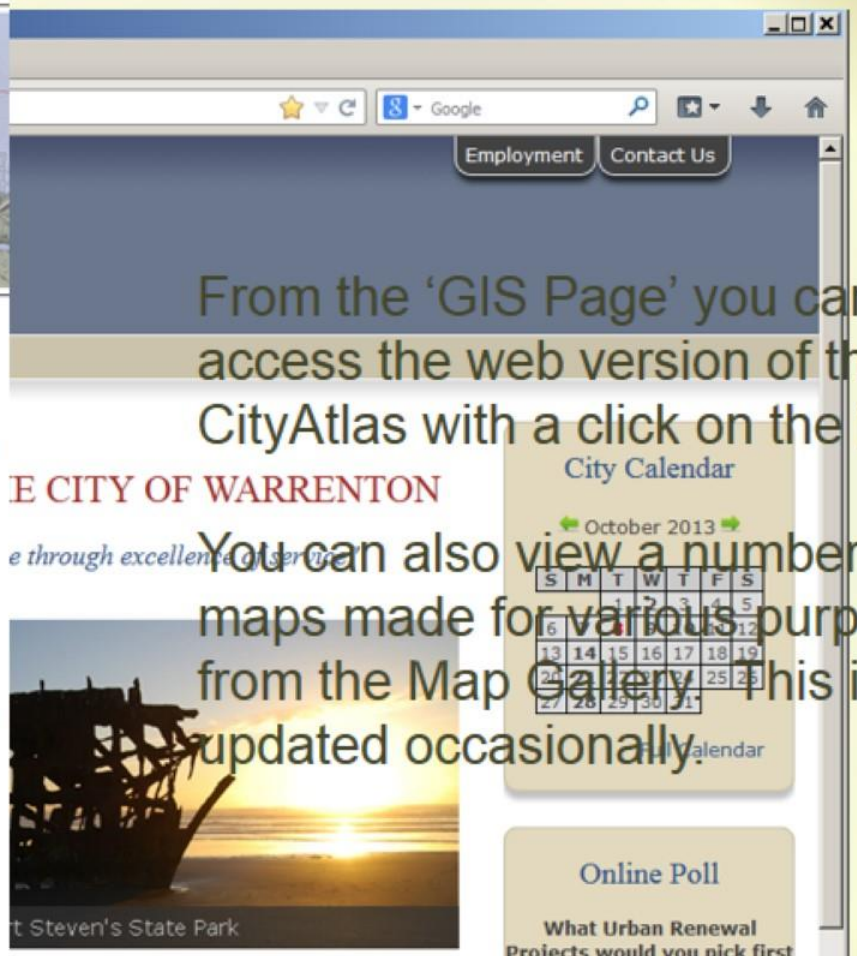
Modern Geographic Information Systems (GIS) enable cities and other organizations to manage and communicate information. Using the power of computer mapping and database technology, a GIS combines map layers and data sources to portray relationships hard to understand without a graphic perspective. Users include departments and managers who need to make decisions about managing the city's resources, as well as the public, interested in understanding zoning and environmental conditions in the community.

Our GIS is managed in the Department of Public Works. Data on streets, dikes and levees, tide gates, public utilities, property parcels and zoning are used by that department and by planners and city administrators. Many map layers, especially those relating to water, sewer, and storm drainage are developed from in-house sources. Other data, such as tax lot mapping, are supplied by Clatsop County. Still other data come to us from various state and federal sources. For detailed information on the city's GIS contact Ric Vrana, GIS Coordinator, or Don Snyder, Director, Public Works at 503.861.0912

A word about data. Care is taken to provide the best information available but users should remember that the essential nature of GIS as a powerful integrator of data sources inevitably means some data are of a higher quality than others. Information used by Warrenton's GIS is what we use to conduct the business of the city and, subject to our ability to maintain current updates, the best we've got. Some map layers are in an ongoing process of development. This is particularly true of the city's public utility infrastructure which is being developed over time from planning and engineering documents as well as locating GPS coordinates of features such as water valves, manholes, and water meters in the field. At any given time the GIS is a useful tool to describe and visualize the known state of the city of Warrenton. For precise locations and legal requirements, however, the GIS should not be substituted for professional surveying and engineering studies.

WEB City Atlas. Click on the icon or text to be directed to the City of Warrenton's Interactive on-line GIS application. This application comes to you from CARTOMATION Mapping Systems. It features selectable map features on several layers with background aerial photography and search functions for finding individual addresses and tax lots.

Browse our **Warrenton Map Gallery** to view a number of previously compiled maps in .pdf format requested by city officials or created for publication on themes such as zoning, public utlities, urban renewal and other topics. Check back for periodic updates.



Clatsop County, on the beautiful
rdered by the Pacific Ocean on the west and
north. It was platted in 1889, and
aws of Oregon in 1899. The City of Warrenton
t) Warren, as an early settler. Clara Cynthia
ıton in 1913 was the first woman mayor in

unicipal services, including two marinas that
mmercial fleet. Current population is 5,050.

From the 'GIS Page' you can access the web version of the CityAtlas with a click on the icon.

You can also view a number of maps made for various purposes from the Map Gallery. This is updated occasionally.

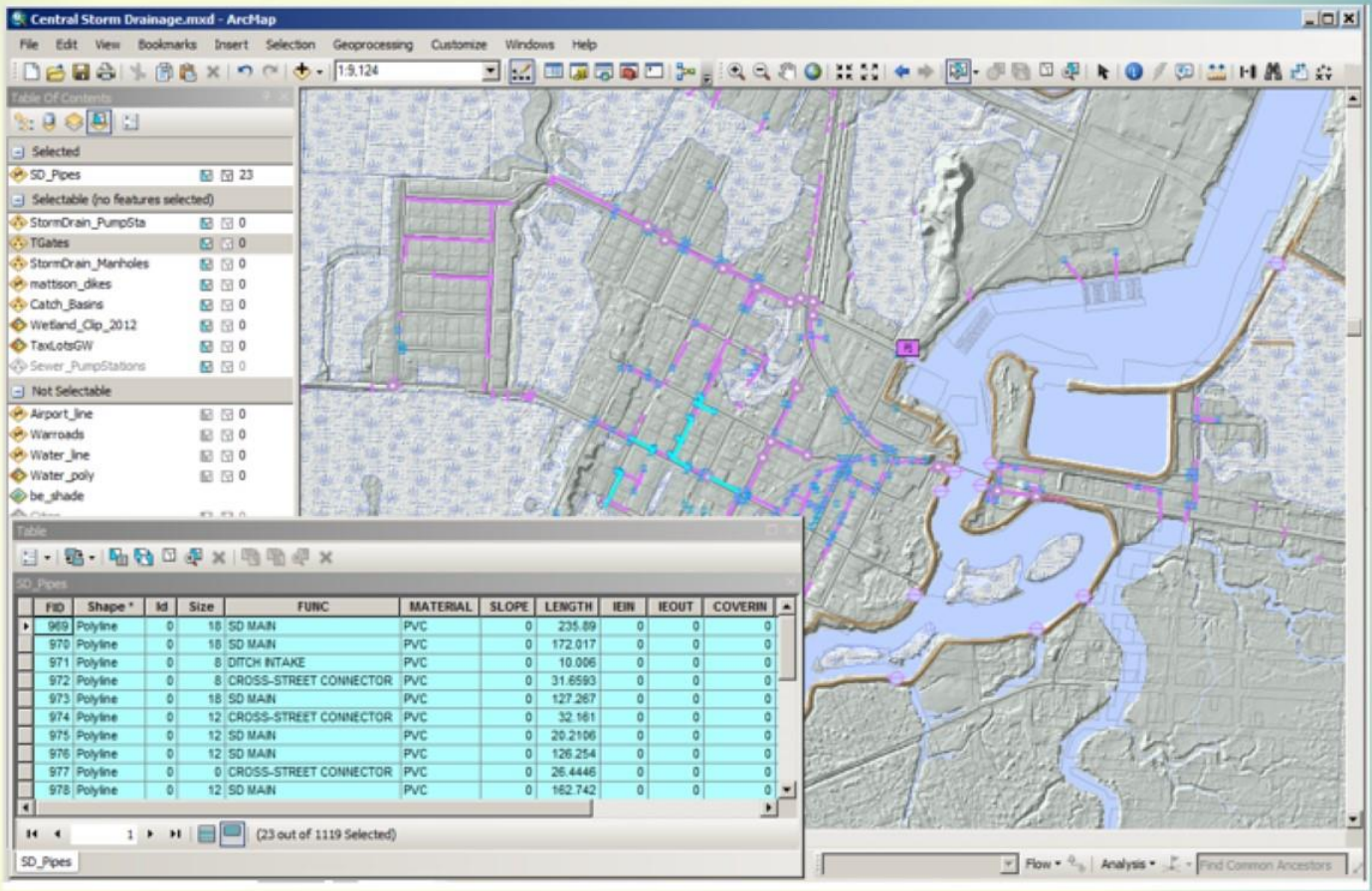
GIS Tools at Warrenton

ArcGIS

GIS software

Uses:

- Develop &
- Manage geo-data
- Analyze relationships
- Maps
- Everything else…?



Pros:

+ Work horse GIS platform
+ Industry standard
+ Wide range of operations
+ Flexible, extensible…
+ Plays well with other kids

Drawbacks:

- Learning curve. Not for everyone?
- Expensive. Annual maintenance $

Where we get data

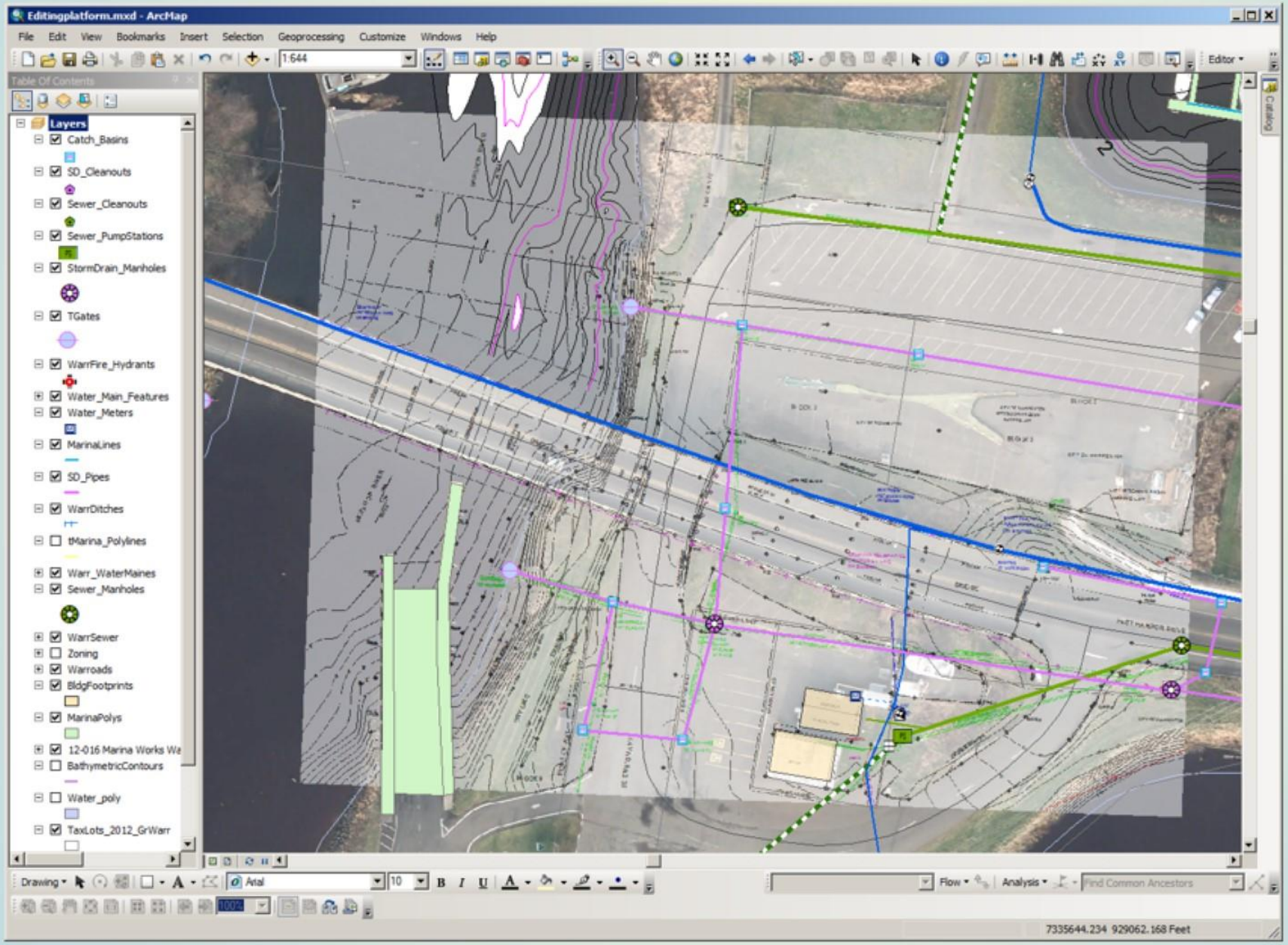
OUTSIDE SOURCES:

- ✓ Clatsop County — Tax Lots, Initial Road Base, others…
- ✓ State and other Agencies — Wetland delineation, Flood Zones, etc.

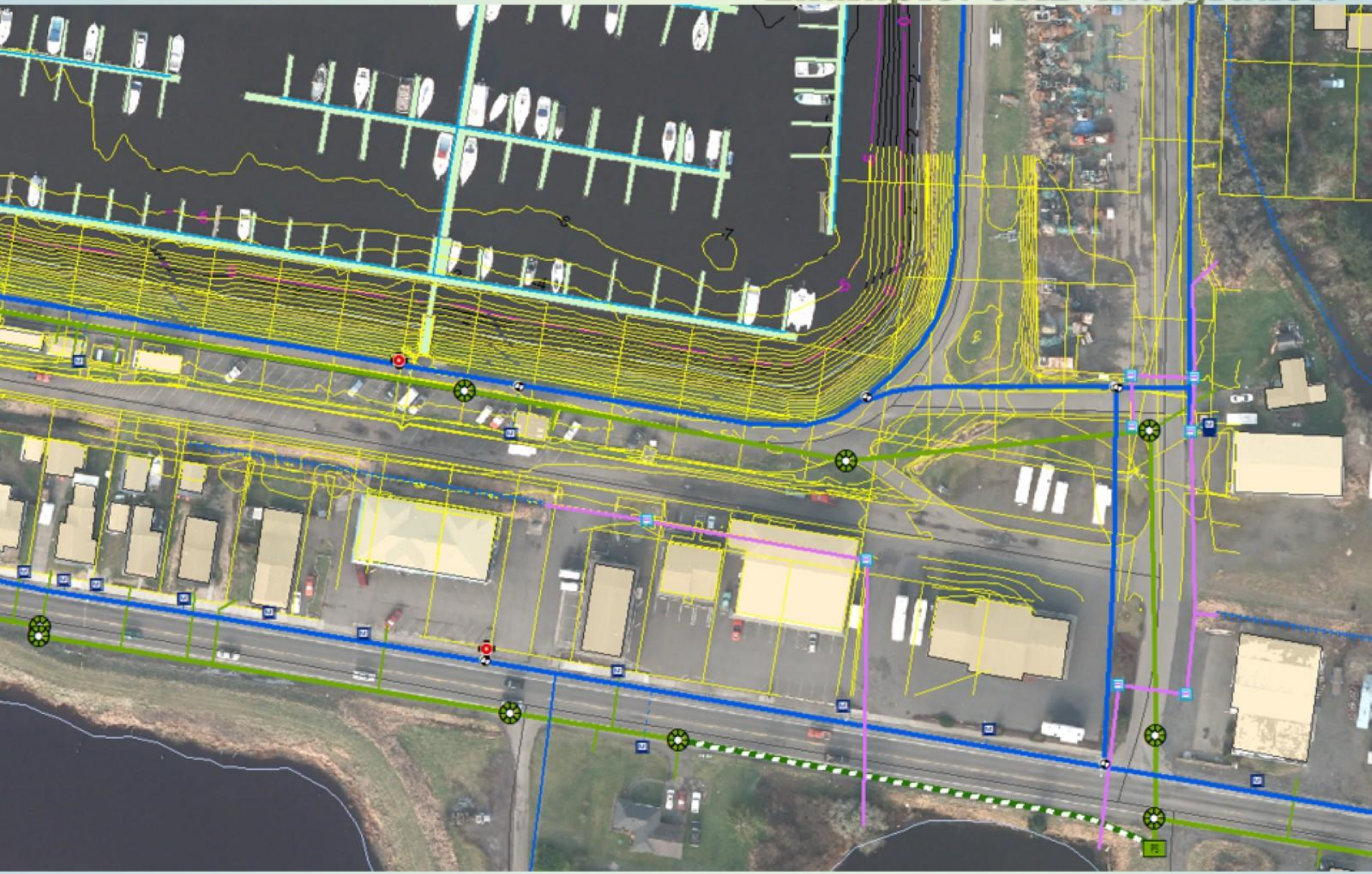
IN HOUSE DEVELOPED:

- ✓ Heads up digitizing (using editing tools in ArcGIS)
  directly measured off hundreds of paper documents
  traced from superimposed geo-rectified digital maps
- ✓ Import from CAD As-Built engineering drawings
  provided engineer works in our coordinate system!
- ✓ GPS data collection in field.

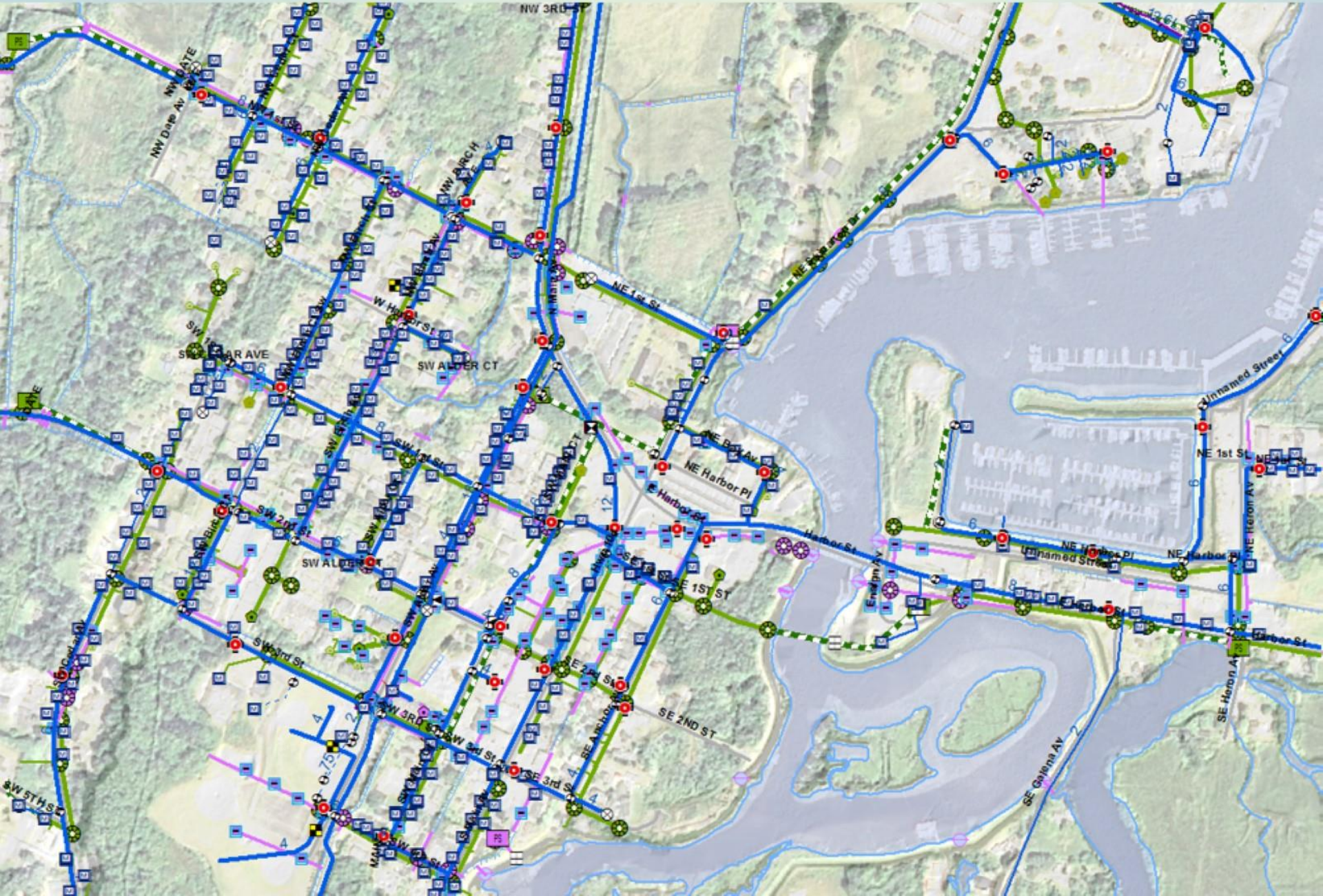
Example: Superimposed graphic & trace



Example: CAD integration



Example: GPS data gathering



Projects and 'One-Ups'

- Utility Development
- Zoning and Land Use
- Urban Renewal District & Marina
- Routine requests for maps & data
- ODOT Road Inventory
- Water Meter Routing

On going Utility Development

Major public works GIS initiative

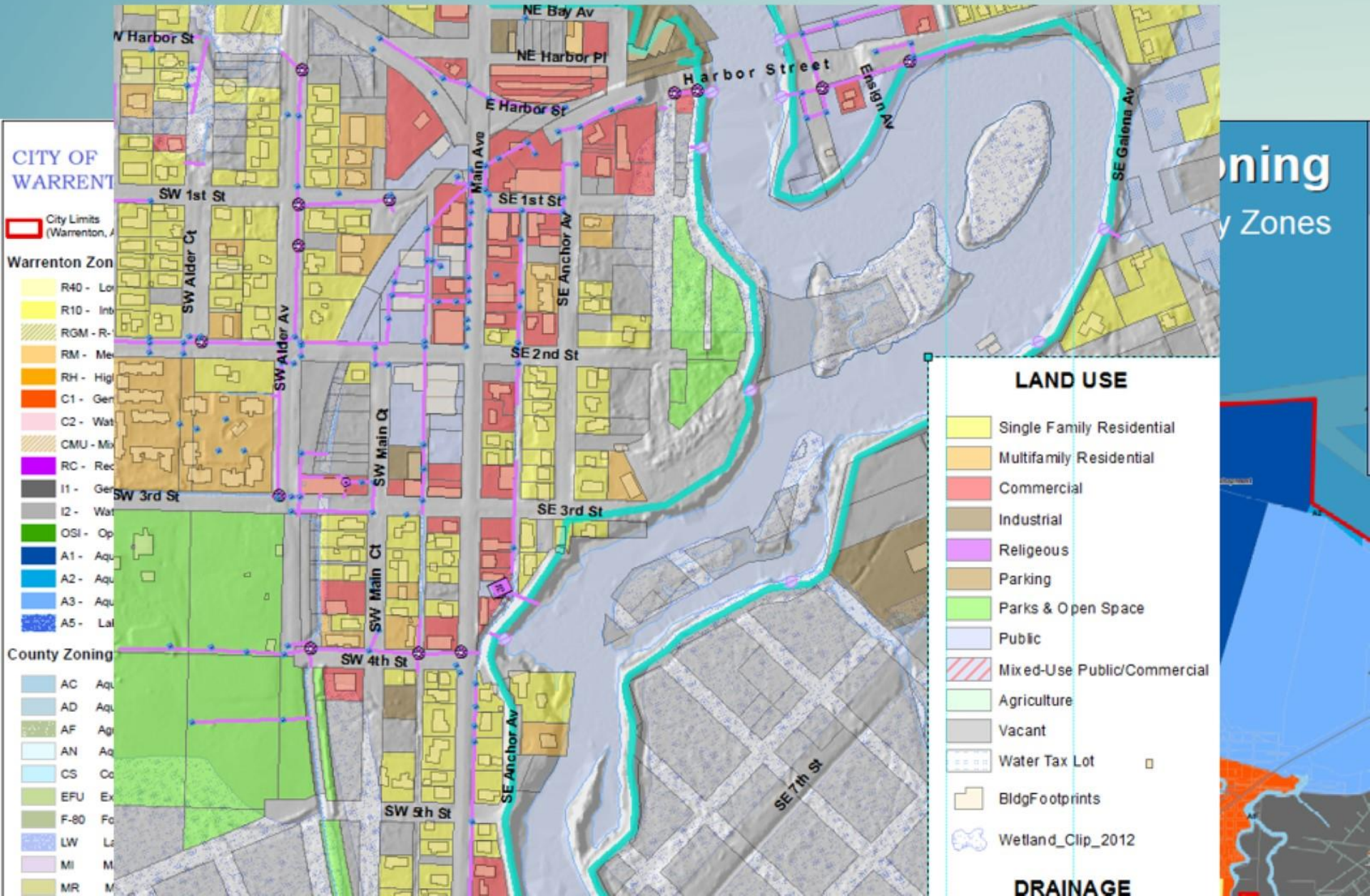
- Water mains, valves, meters, and other point features
- Sewer mains, manholes, cleanouts
- Storm drain mains, culverts, catch basins, manholes

City of Warrenton Water Shoreline Sanitary District

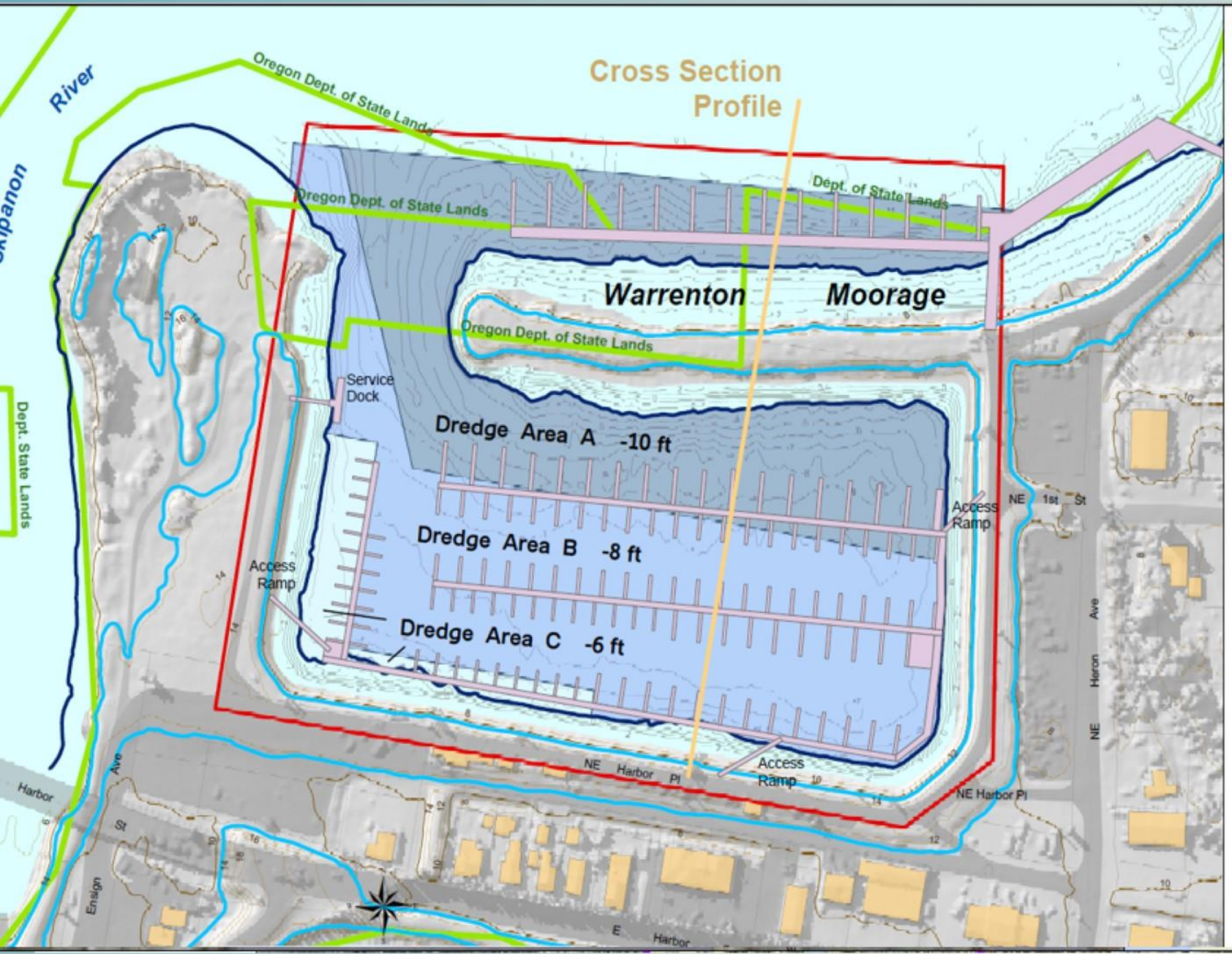
CITY OF WARRENTON GIS

Zoning and Land Use

Zoning Layer Improvements and Changes



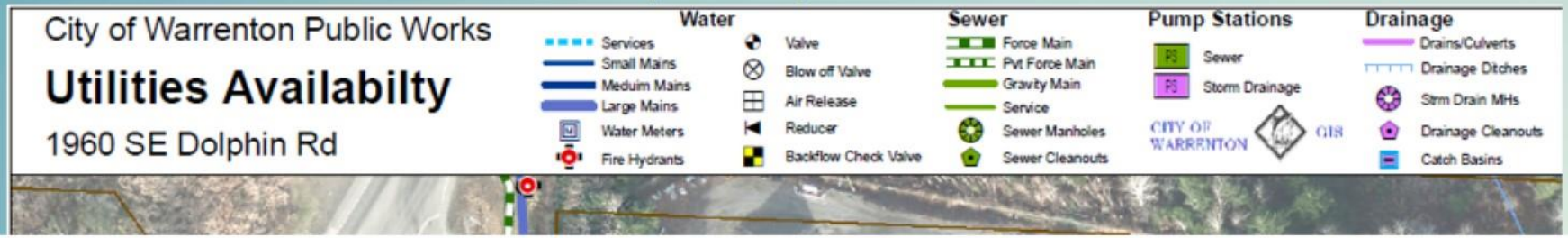
Urban Renewal and the Marina

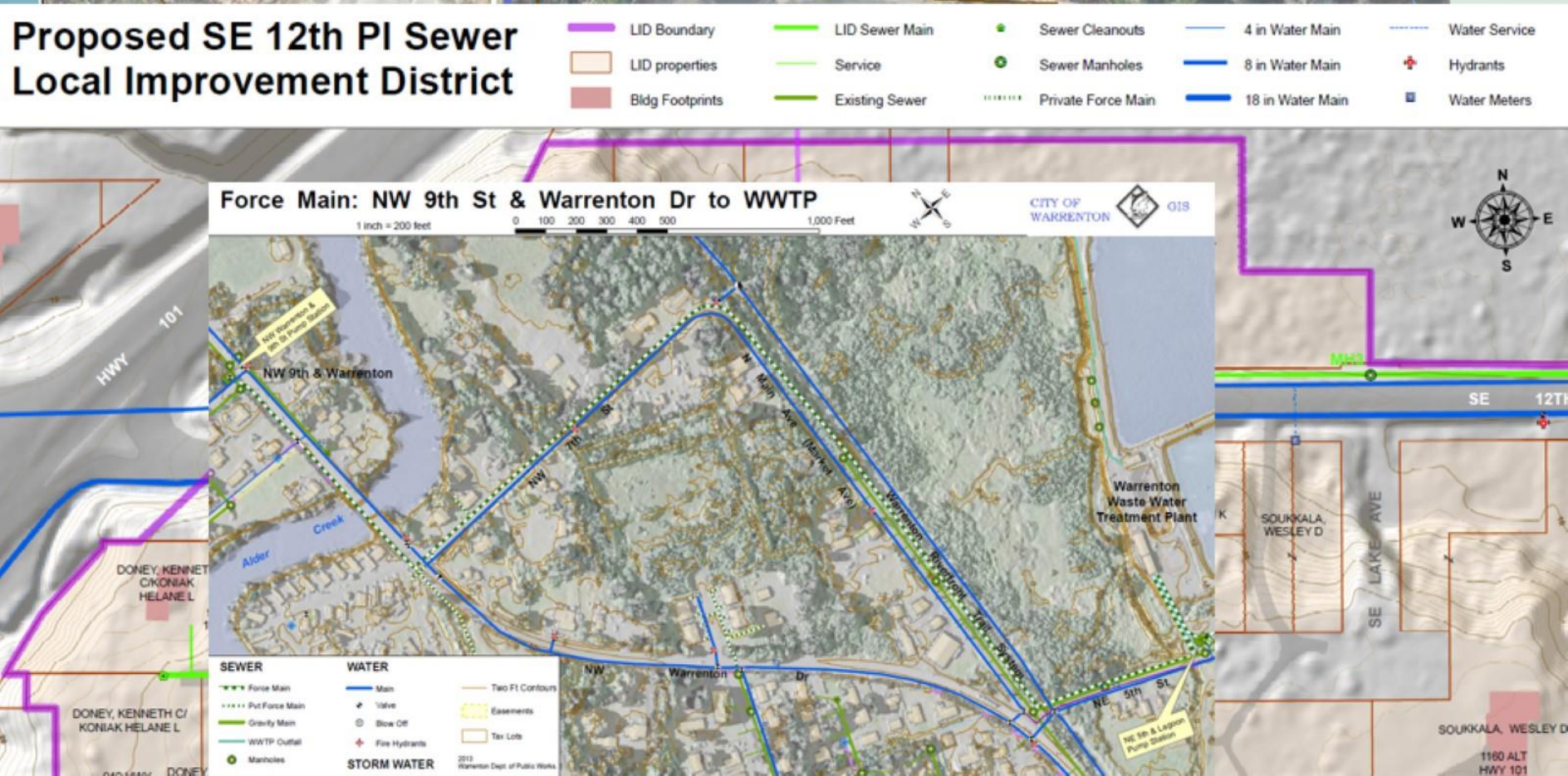


Routine Requests for maps and data

Utility Availability

Save a template map to show utilities within certain distance of tax lots

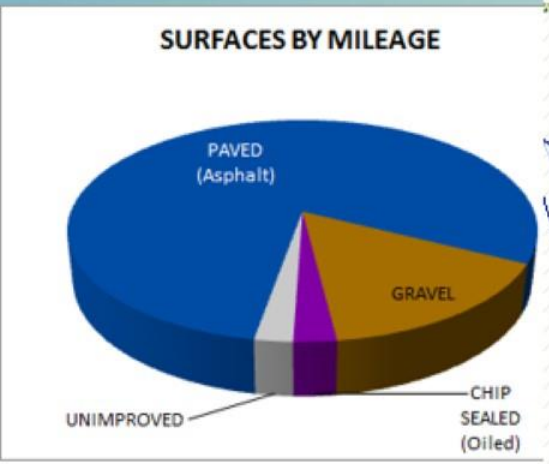


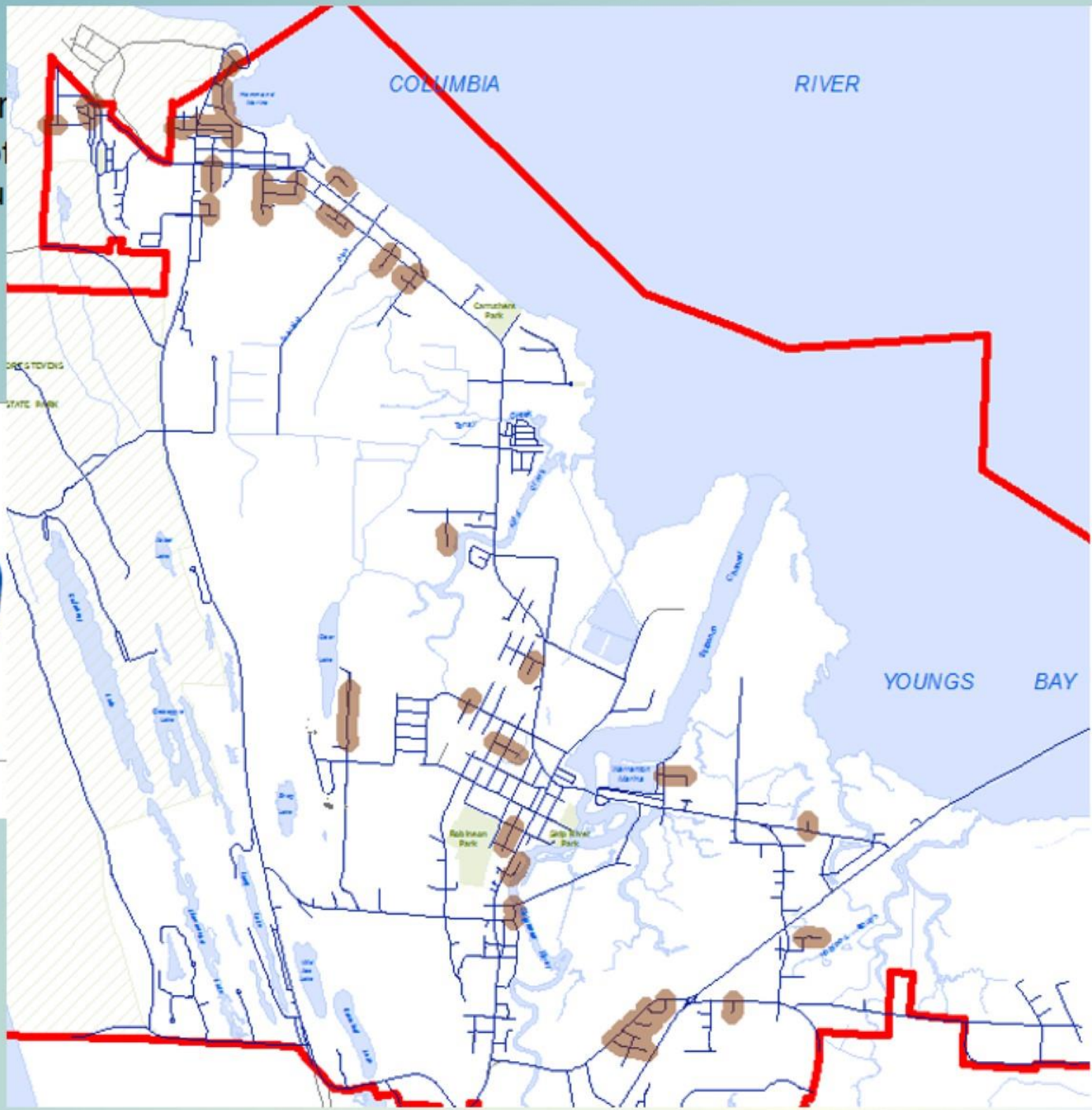


Example of a mandator

Yearly update of

Also an opportu





Water Meter Routing

Table - Water_Meters

ReadRoutes

FID	Shape *	Id	RTE
3	Polyline ZM	0	10
4	Polyline ZM	0	10
5	Polyline ZM	0	10
6	Polyline ZM	0	10
7	Polyline ZM	0	10
8	Polyline ZM	0	10
9	Polyline ZM	0	10
10	Polyline ZM	0	10
11	Polyline ZM	0	10

1 (1 out

ReadRoutes

Water_Meters

MeterNo	SitusAdd
65210889	88952 DELLMOOR LP
81632165	33758 LOUNSBERRY LN
65210886	88987 DELLMOOR LP
65210802	89052 DELLMOOR LP
65210805	89111 DELLMOOR LP
65210804	89123 DELLMOOR LP
65210801	89163 DELLMOOR LP
65210803	89164 DELLMOOR LP
65210800	89207 DELLMOOR LOOP RD
65210845	89224 DELLMOOR LOOP RD
65210846	89248 DELLMOOR LOOP RD
65210843	89255 DELLMOOR LP
65210842	89276 DELLMOOR LOOP RD
65210844	89279 DELLMOOR LOOP RD
65210816	89300 DELLMOOR LOOP RD
65210813	89307 DELLMOOR LOOP RD
65210817	89308 DELLMOOR LOOP RD
65210814	89310 DELLMOOR LOOP RD
61963792	89324 DELLMOOR LOOP RD
61963790	89326 DELLMOOR LP RD

Meter reading Route 10
"South End"

LEG 1
Begin Southbound @ 90504 Highway 101 (small drive right) - 1 water meter
SB on 101 just past Cullaby Lake Ln to 90422 - 1 water meter
Cross Creek SB 101 - 6 meters, all on right side, end with Reed & Hertig
SB on 101 to old Reed Homestead, isolated meter @ 90126 HWY 101

LEG 2
Southbound on 101 to West Lake Ln across from Dellmoor Loop Rd
Right onto West Lake Ln - 3 meters
Turn NB onto Seales Rd - 3 meters incl. one on corner
Veer left up steep Dune Rd - 4 meters near dead end.
Turn back to 101.

LEG 3
Right onto SB 101 for short hop to West Lake Acres Dr - 6 meters
Return to 101.

LEG 4
Southbound 1¾ miles to Highlands Ln.
Right 0.4 mile to Pinehurst Rd. - 1 meter (Gearhart connection) in vault, right.
Proceed to just before Pinehurst Gatehouse - 1 meter + empty box
Right at stop sign onto Northbound Pinehust Rd - 6 meters + 10 empty boxes
Veer N onto Stellar Rd - 1 meter + 1 test port box
Return to Pinehurst Rd go right - 2 meters on left
Right @ unnamed dead end (NW extreme of Pinehurst) - 3 empty boxes for now
Heading southbound on Pinehurst - 13 meters + 5 empty boxes
Right onto Surfsands Rd - 3 meters + 1 empty box
Return to Pinehurst, right onto Schroeder Rd - 3 meters
Return to Pinehurst, across corner - 1 meter
Exit Pinehurst ghetto. Return to 101 Southbound.

LEG 5
Left at Pacific Way in Gearhart. East 0.3 mile to McCormick Gardens Rd.
Left 0.1 mile to access road on right to meter house at end of supply line from Water Plant.
South Gearhart connection. - 1 meter in building
Northbound on McCormick Gardens Rd - 16 water meters
At Hillila, continue NB on McCormick Gardens - 7 water meters.
Turn around at dead end and backtrack to Hillila.
Westbound on Hillila - 3 meters, third on left.
Northbound on driveway across street from last meter approx. 400ft N - 2 meters

Q	RTSTREET	LOC
156	DELLMOOR LP	EB L
157	DELLMOOR LP RIGHT TURN	EB R
158	DELLMOOR LP	NB R
159	DELLMOOR LP	NB L
160	DELLMOOR LP	NB R
161	DELLMOOR LP	NB R
162	DELLMOOR LP	NB R
163	DELLMOOR LP	NB L
164	DELLMOOR LP	NB R
165	DELLMOOR LP	NB L
166	DELLMOOR LP	NB L
167	DELLMOOR LP	NB R
168	DELLMOOR LP	NB L
169	DELLMOOR LP	NB R
170	DELLMOOR LP	NB L
171	DELLMOOR LP	NB R
172	DELLMOOR LP	NB L
173	DELLMOOR LP	NB L
174	DELLMOOR LP	NB L
175	DELLMOOR LP	NB L

CITY OF WARRENTON GIS

Things we have still to do…

- Day to day installations and changes
- Drainage and storm sewers
  - Find elevations and slopes to model flows and floods
- Dikes and tide gates
  - Spatial precision and status updates
- Sign Inventory
  - Where did we put what?
- Calibrate water modeling
  - Updated water mains and attributes
- Parks and Trails
  - No precisely defined park boundaries
  - Link to info about parks and trails

- Another Public Browser
  - Open source software
  - Access near real time utility and other layers