

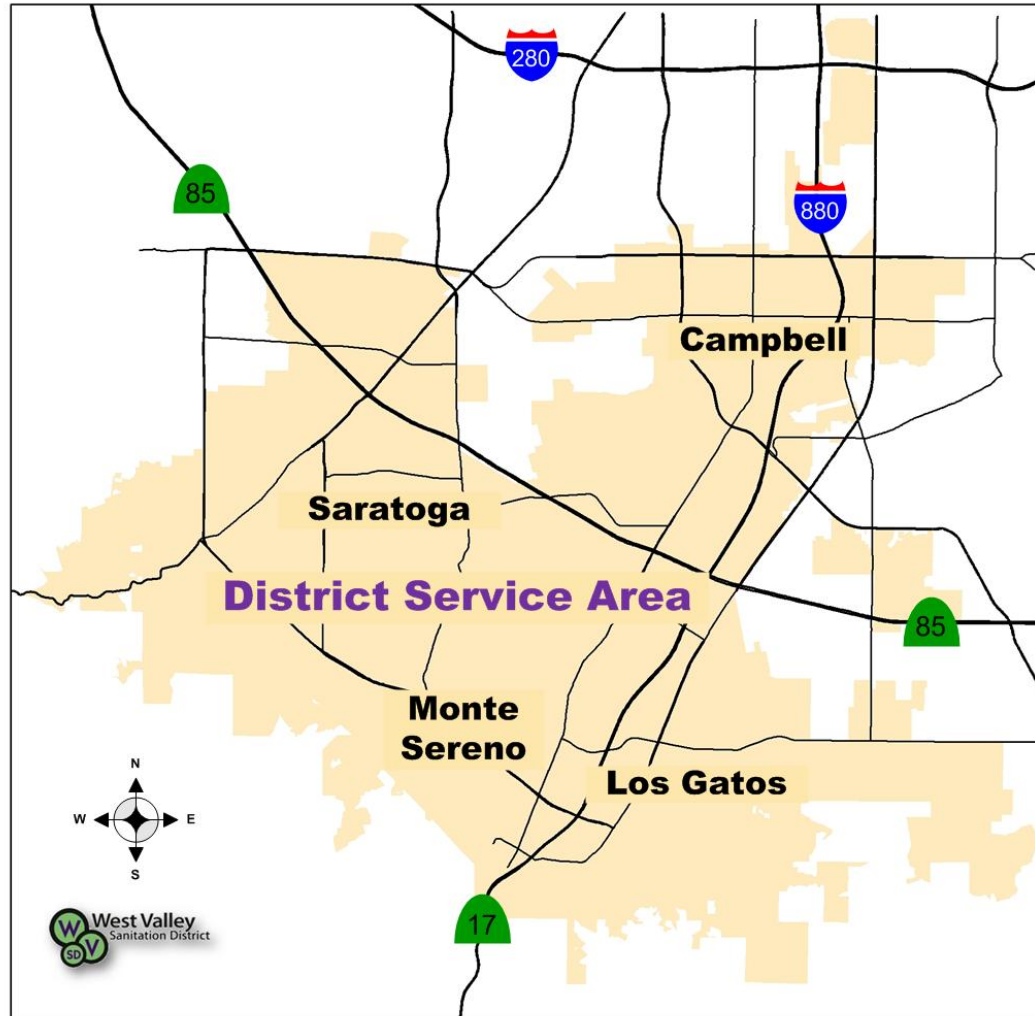


BAYWORK
South Bay Workshop
June 4, 2014

Implementation of CMMS/GIS, and Field Integration Technology

Edward H. Oyama, P.E.

Map of WVSD





System Info

- ❖ Total Service Area: 28.4 sq. miles
- ❖ Population Served: 108,000
- ❖ Sewer Mains: 415 mi.
- ❖ Laterals: 210 mi.



CMMS/GIS Milestones

Pre-1983

Spreadsheet tracking and paper map work orders

1983-2002

COSMO (Computerization of Sewer Maint Operations)

CCTV Inspections and Condition Assessment (VHS)

2003

Lucity (formerly GBA Master Series)/GIS

CCTV Inspections and Condition Assessment (DVD)



CMMS/GIS Milestones

2006

Initiated Geozone Cleaning (1st application of GIS)
GIS mapping & scanned paper maps used in office

2008

Acquired GIS Analyst
Implemented Lateral Maint Program (expanded use of GIS)
Corrected GIS mapping/lateral mapping began

Post-2008

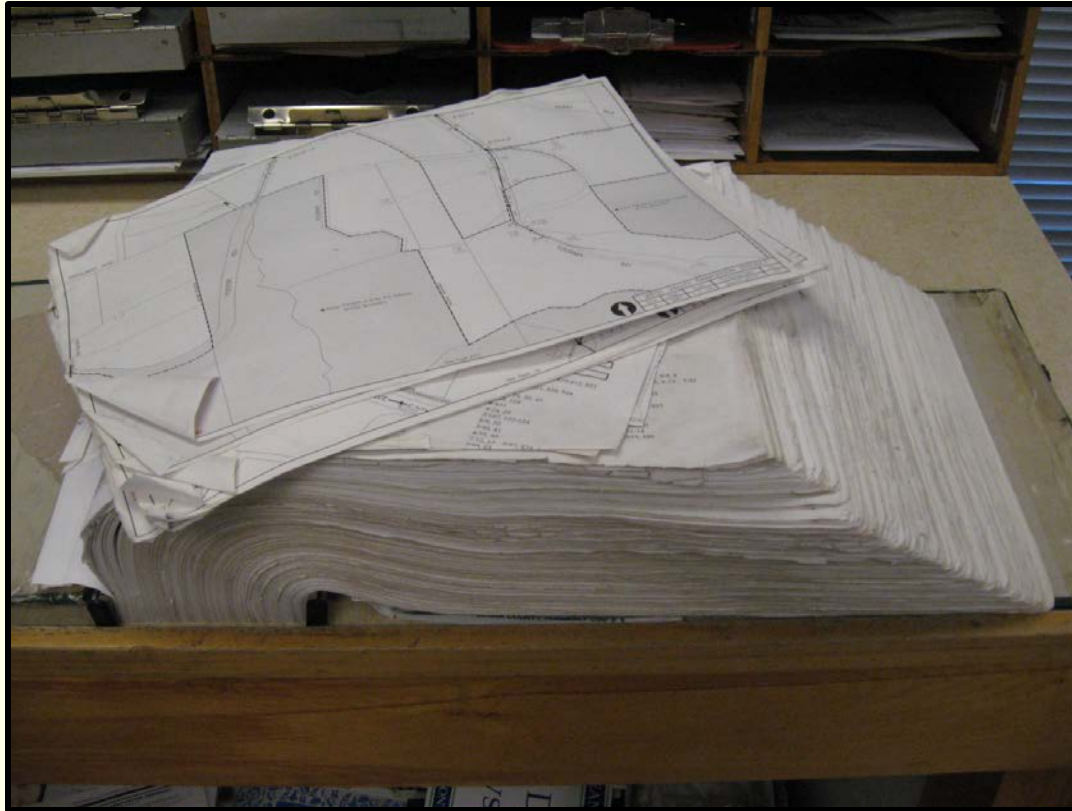
Use of GIS w/ Risk Model, Hydraulic Model, & other uses
InfraMap – Field Accessible WO & GIS Mapping
NO MORE paper maps (almost)



Conversion of Paper Maps

Elimination of Paper Maps

- ▶ Too cumbersome



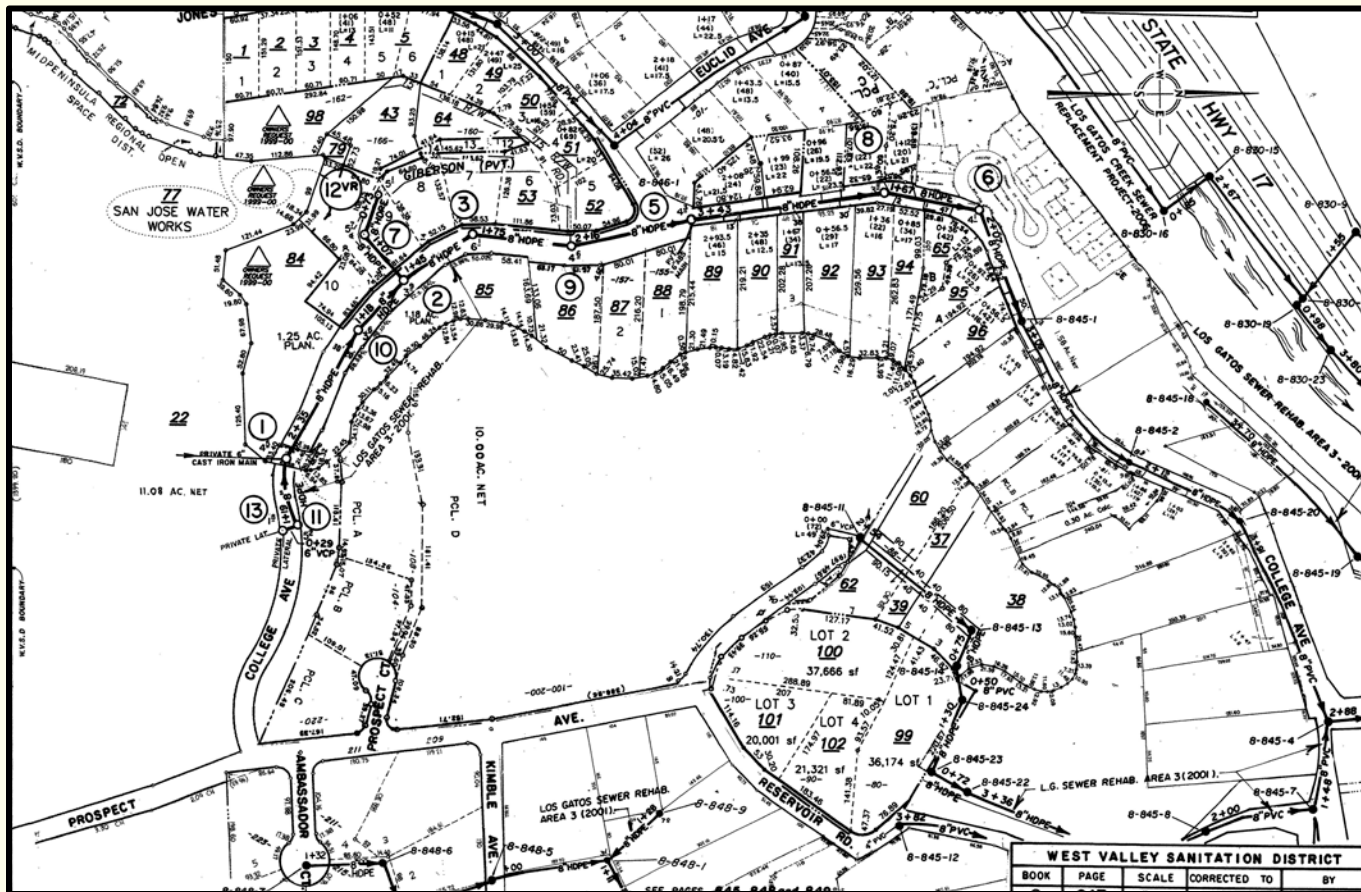
Elimination of Paper Maps

- Updating is infrequent and time intensive



Elimination of Paper Maps

- Difficult to read





Applications of CMMS/GIS



The map displays the City of San Jose divided into 24 numbered regions. The regions are color-coded and outlined as follows:

- Region 1:** Light blue, outlined in blue.
- Region 2:** Light green, outlined in blue.
- Region 3:** Light blue, outlined in blue.
- Region 4:** Light blue, outlined in blue.
- Region 5:** Light green, outlined in blue.
- Region 6:** Light green, outlined in blue.
- Region 7:** Light blue, outlined in blue.
- Region 8:** Light green, outlined in blue.
- Region 9:** Light blue, outlined in blue.
- Region 10:** Light green, outlined in blue.
- Region 11:** Light green, outlined in blue.
- Region 12:** Light blue, outlined in blue.
- Region 13:** Light green, outlined in blue.
- Region 14:** Light green, outlined in blue.
- Region 15:** Light blue, outlined in blue.
- Region 16:** Light green, outlined in blue.
- Region 17:** Light green, outlined in blue.
- Region 18:** Light green, outlined in blue.
- Region 19:** Light green, outlined in blue.
- Region 20:** Light green, outlined in blue.
- Region 21:** Light green, outlined in blue.
- Region 22:** Light green, outlined in blue.
- Region 23:** Light green, outlined in blue.
- Region 24:** Light green, outlined in blue.

Other labels on the map include 'CAMPBELL', 'MOUNTAIN VIEW', 'SAN JOSE', and 'UNINCORPORATED'. A legend in the bottom left corner indicates that areas outlined in red are 'UNINCORPORATED' and areas outlined in blue are 'CAMPBELL'.

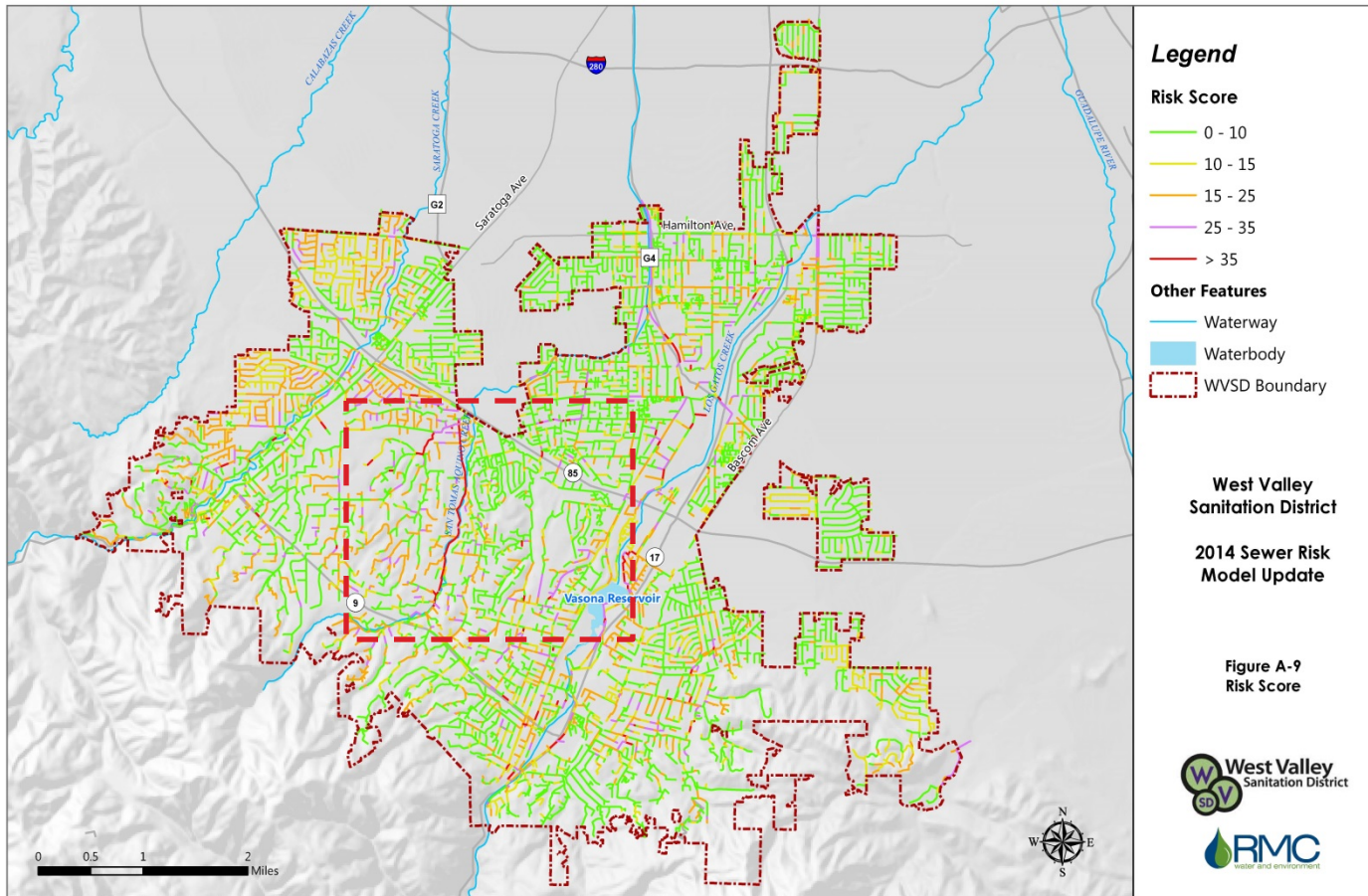
GIS Utilization for Risk Model

District Risk Model is used to help
prioritize CIP projects

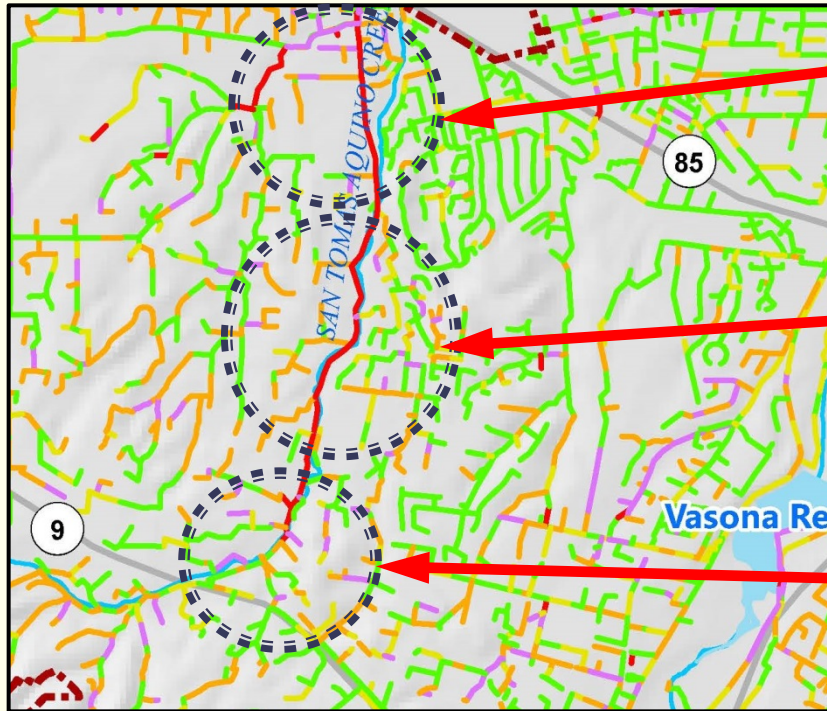
Risk =
Likelihood of Failure (LoF) x
Consequence of Failure (CoF)

CONSEQUENCE OF FAILURE	Severe	10	20	30	40	50	60	70	80	90	100
	Moderate	9	18	27	36	45	54	63	72	81	90
		8	16	24	32	40	48	56	64	72	80
		7	14	21	28	35	42	49	56	63	70
		6	12	18	24	30	36	42	48	54	60
		5	10	15	20	25	30	35	40	45	50
	Low	4	8	12	16	20	24	28	32	36	40
		3	6	9	12	15	18	21	24	27	30
		2	4	6	8	10	12	14	16	18	20
	Negligible	1	2	3	4	5	6	7	8	9	10
		Negligible	Possible			Likely			Very Likely		
		LIKELIHOOD OF FAILURE									

Risk Model Map



Risk Model Map

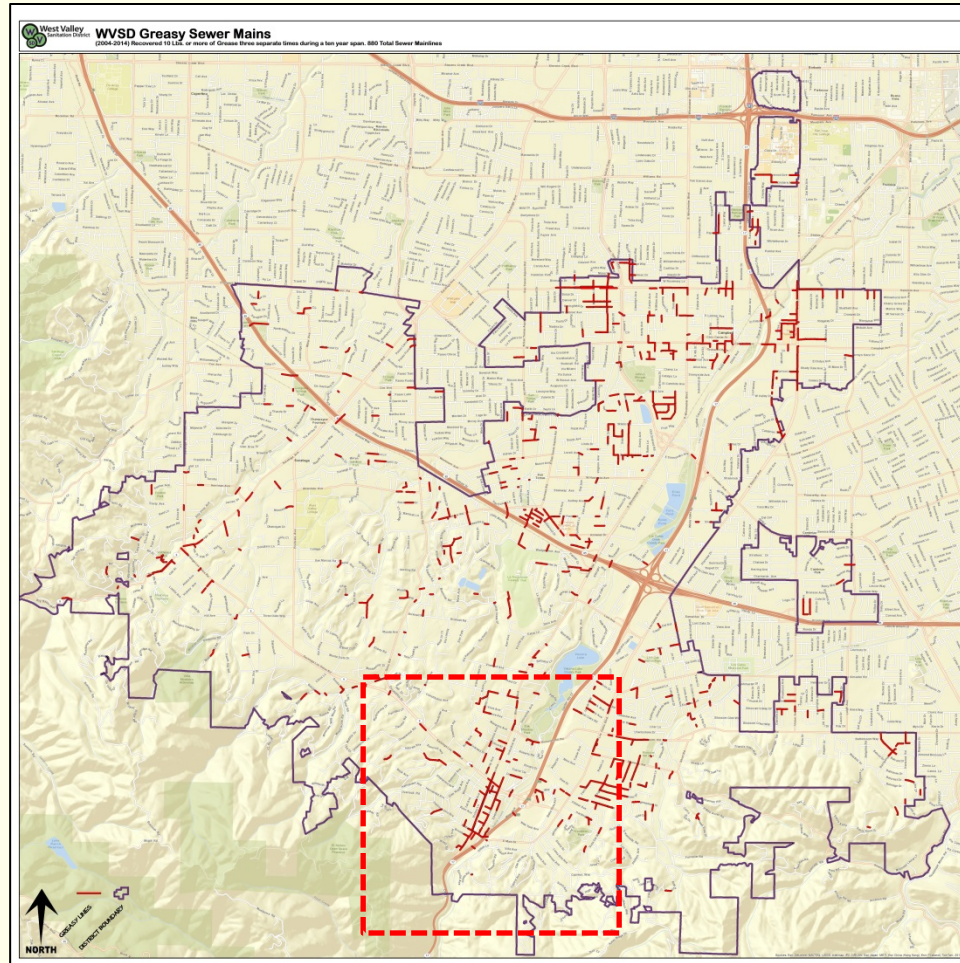


Quito Basin 7, Area 3&4

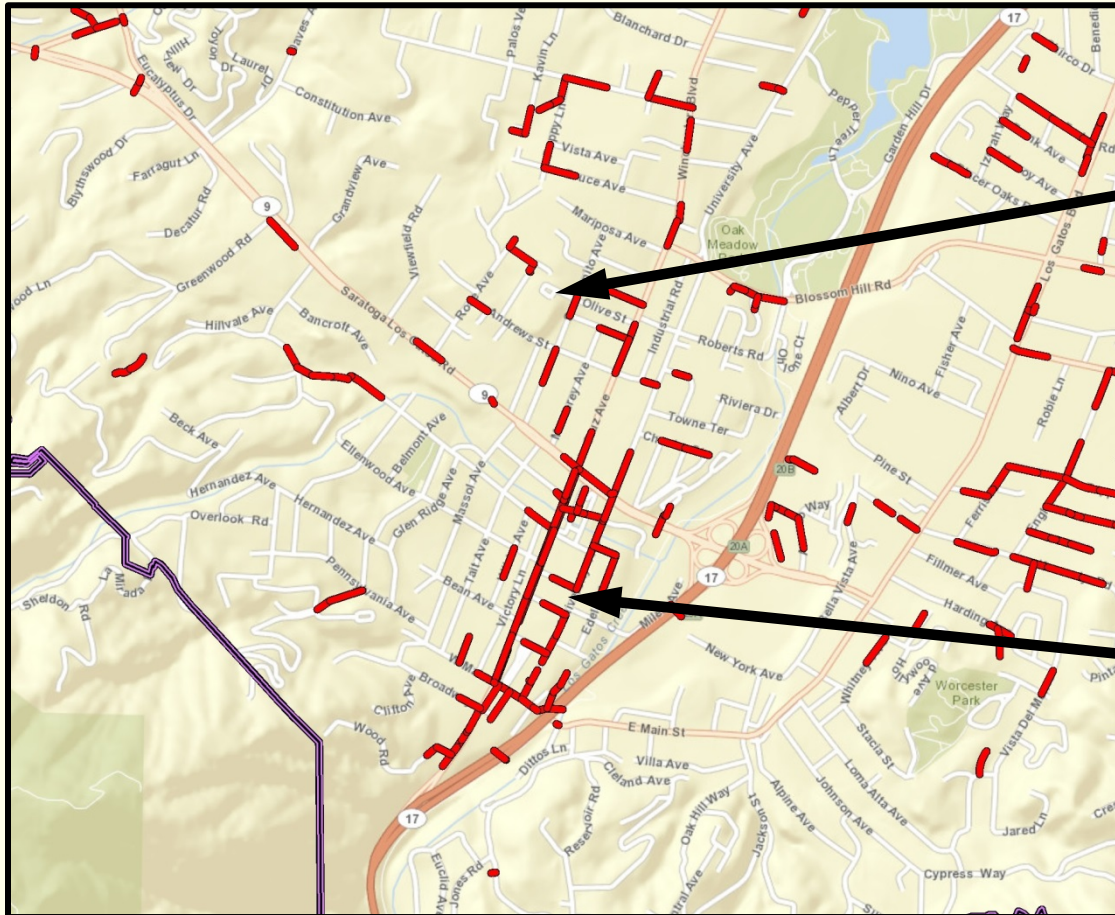
Quito Basin 5&7, Area 1

Quito Basin 7, Area 1

FOG Program



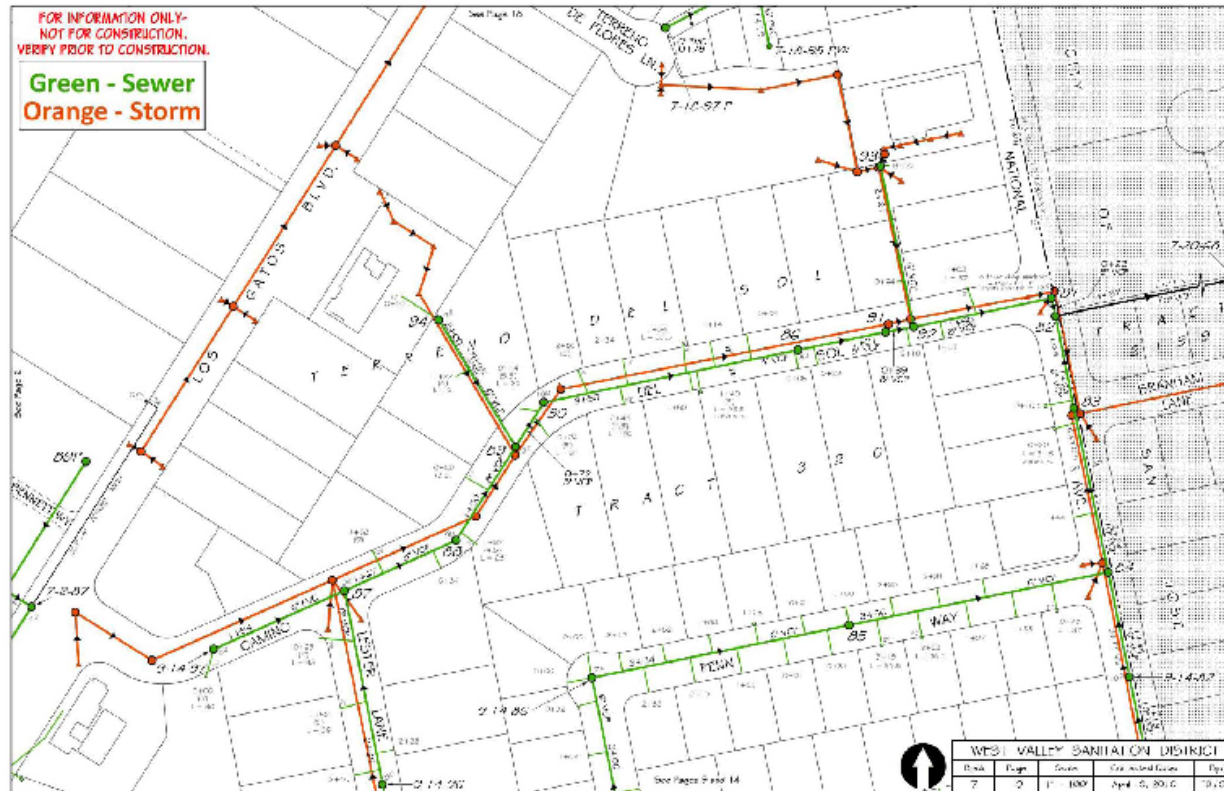
FOG Program



Facilitates Focus of
Residential FOG
Outreach Program

Provides Visual Map
of Restaurant (FSE)
related FOG

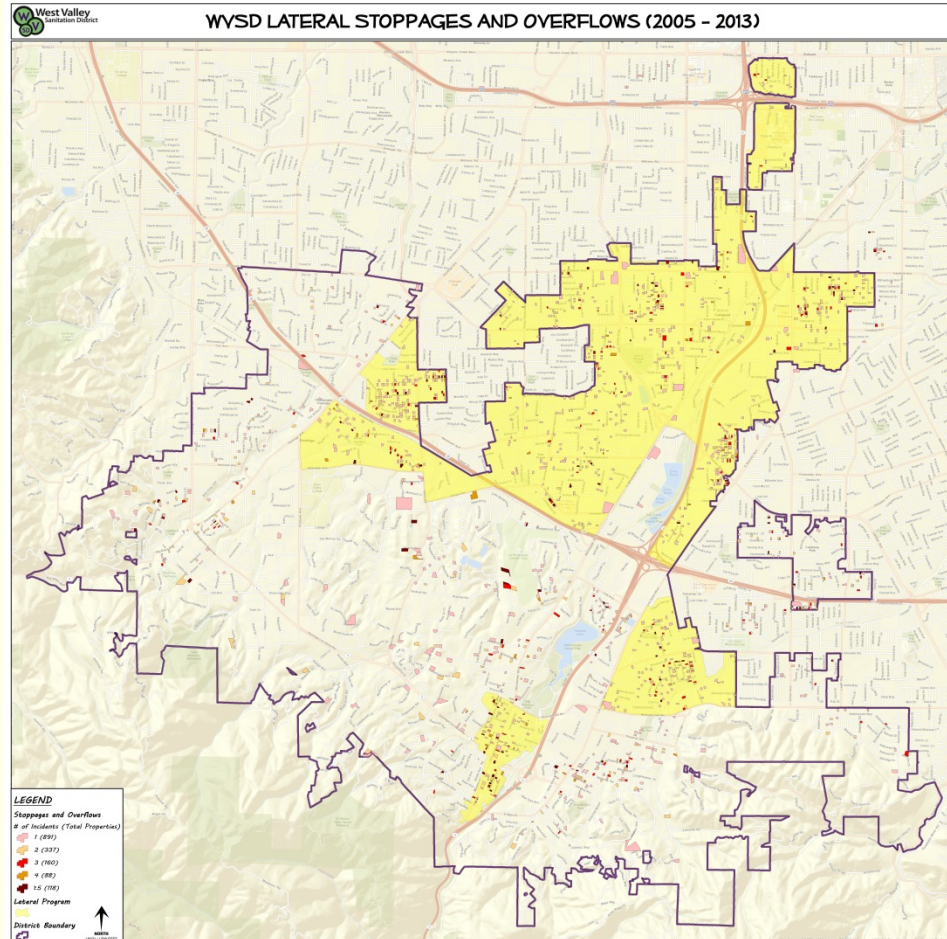
Spill Response



GIS Mapping – Sewer and Storm Systems

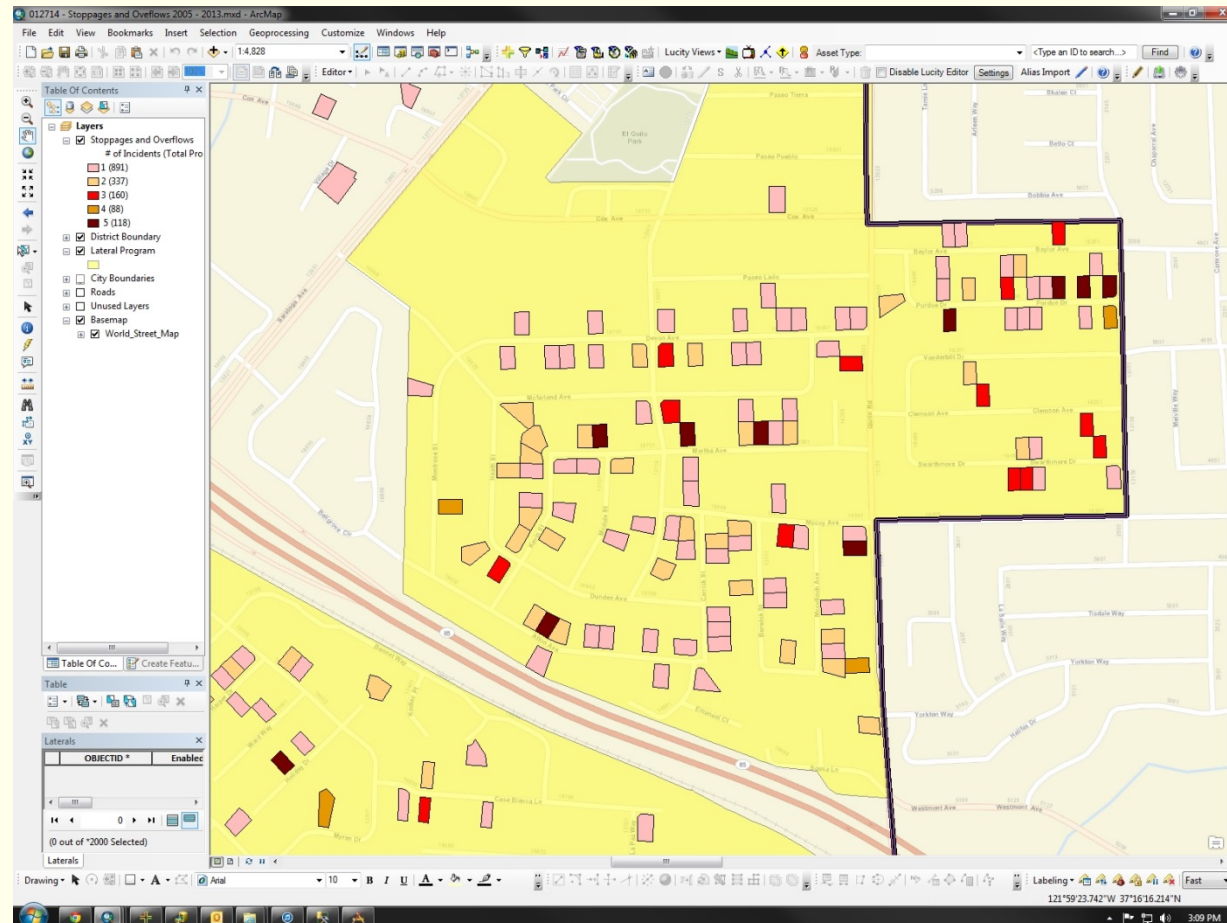
Lateral Maintenance Program

Lateral Cleaning & Mapping



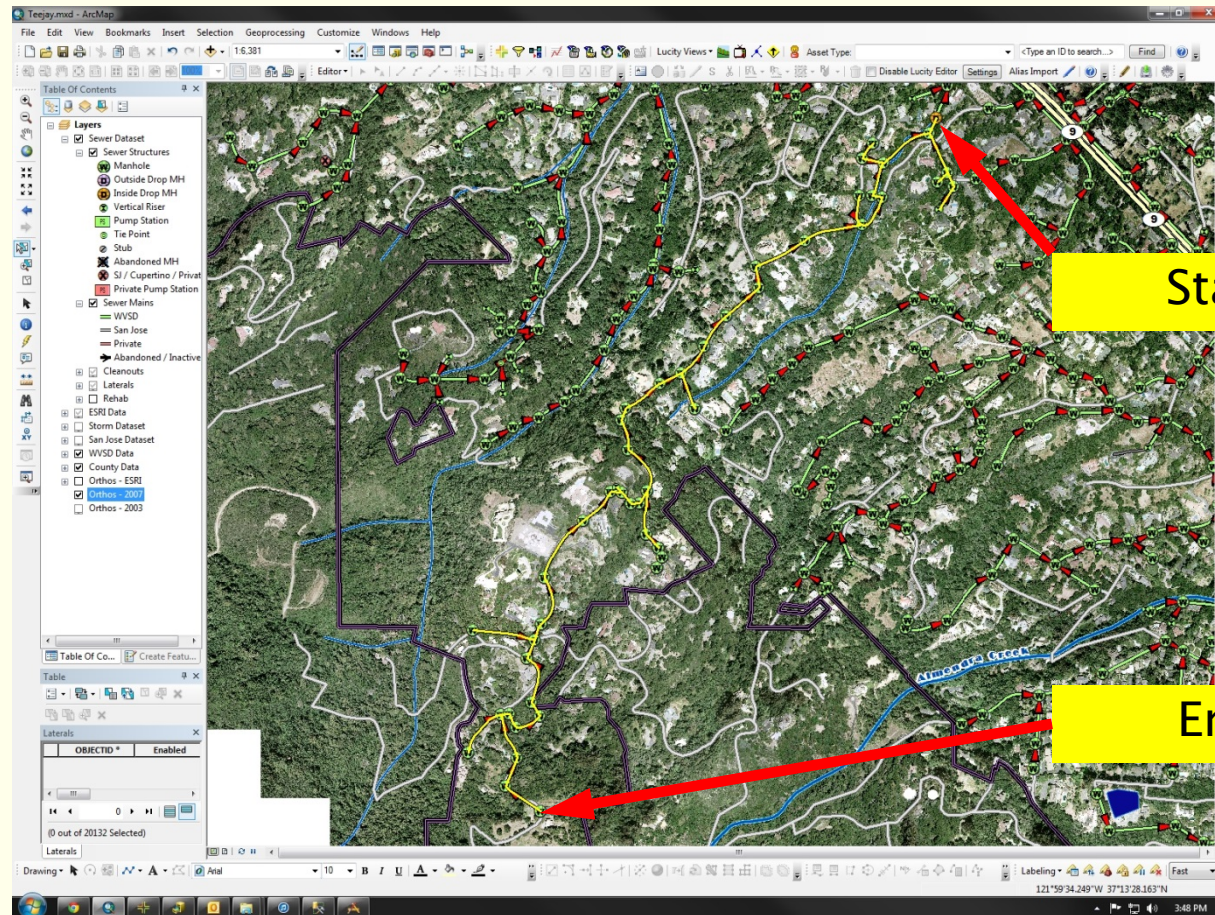
Lateral Maintenance Program

Lateral Cleaning & Mapping



Other GIS Utilization

Sewer Main Tracing Tool



Start Trace

End Trace



Field Integration Technology



Increase Information Access

- ❖ Collection system map and property lines always current
- ❖ Access to addresses, owner's names
- ❖ Access to maintenance history/pipe defect
- ❖ Field notes & redlines available to all
- ❖ Aerial views provide familiar benchmarks



Increase Information Access

Feedback from the Operations Staff:

“Having all of this information readily available puts the less experienced Maintenance Worker on the same playing field as the seasoned worker. From manhole locations, gate codes, low pressure lines, property access, etc.”



Increase Maintenance Efficiency

- ❖ All WOs auto loaded on laptop before shift
- ❖ Cleaning data filled out using pull-down menu
- ❖ Field data auto downloaded to CMMS at end of shift
- ❖ GIS Map used to plan out cleaning route
- ❖ Structures/properties locatable w/ GPS enabled laptop

Streamlined Input Screens

Sewer Gravity Mains

HVC

Date	Description
2/5/2013	HVC
10/2/2012	HVC

Save **Cancel**

Map

Sewer Main

US Manhole: 8-046-03 | Diameter: 6 | Length: 333

DS Manhole: 8-046-82 | Material: ACP

Specialty Cleaning: 3 Mo Main - HVC | Street/Address: VINELAND AVE

Nozzle: Warthog | Install Date: 1/1/1952

GeoZone: 24

Debris

Type	Severity	Lbs
Grease or Soap	Mild	10
Clean or N/A		
Egg Shells or Ground		
Grease or Soap		
Paper or Rags		
Grit		
Foreign Objects		
Roots		
Mud		
Other		
Roaches		

Comments

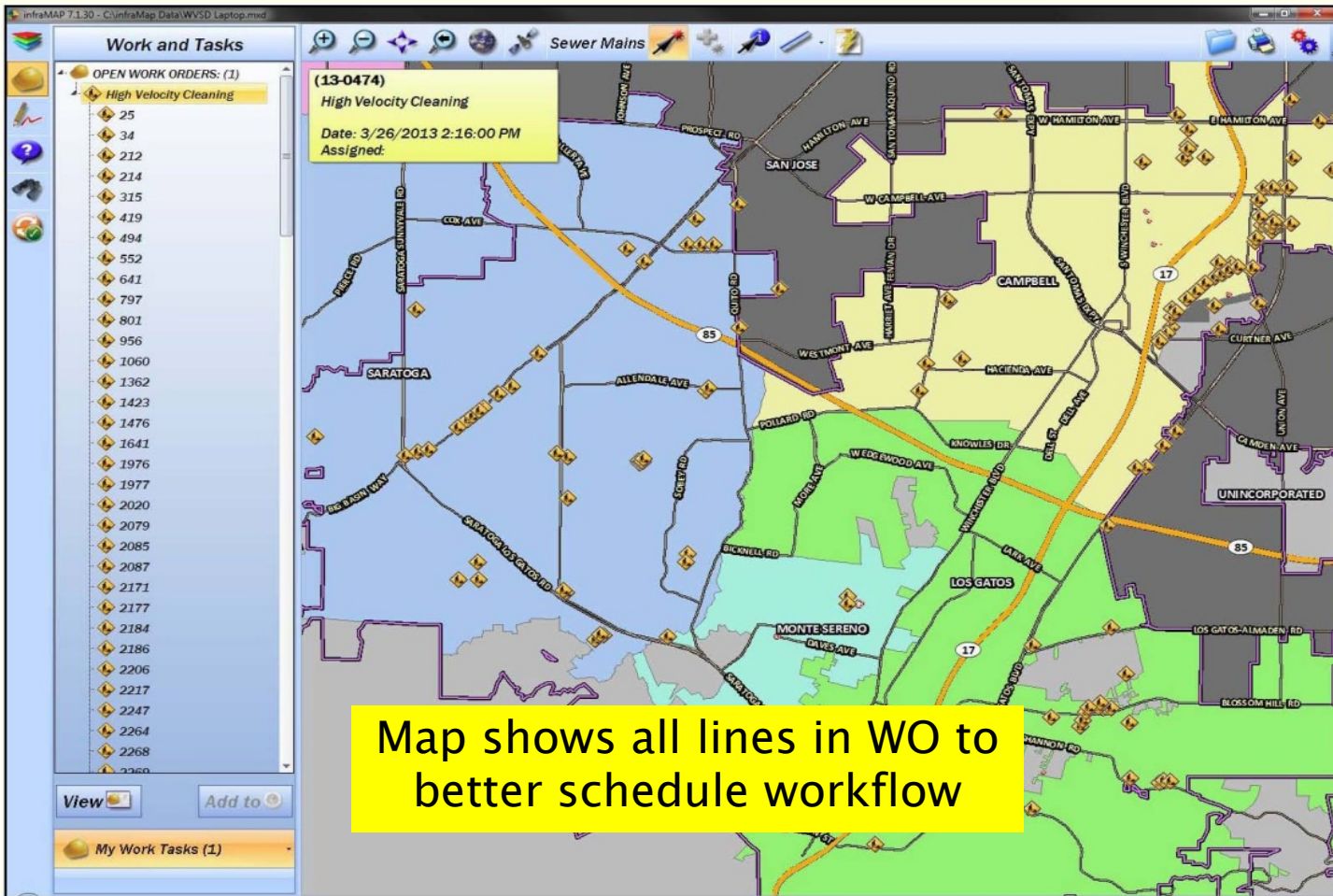
Auto-filled Main Info

Green Highlights Shows Fields with Data

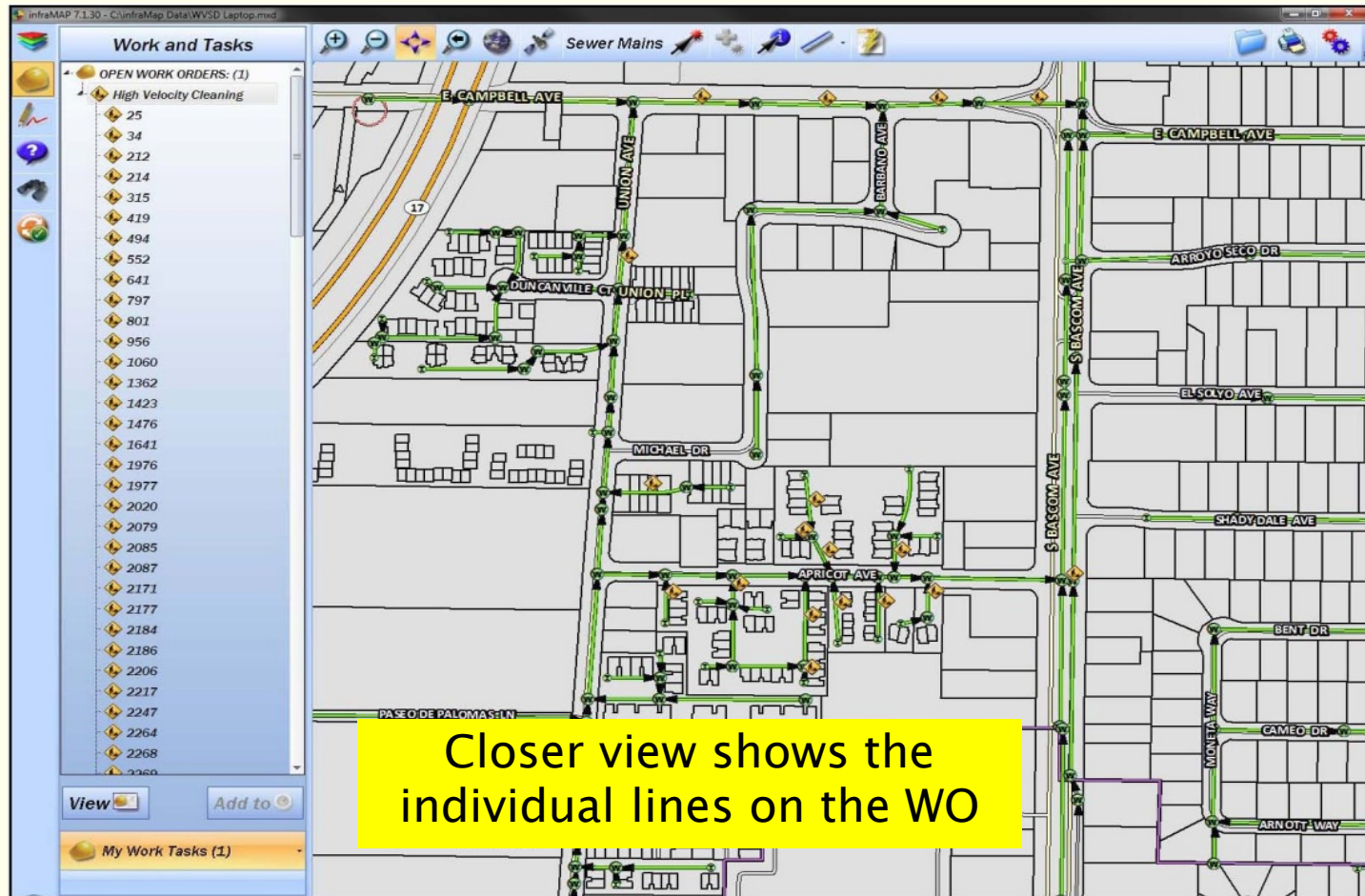
Yellow Highlights Shows Fields Requiring Input

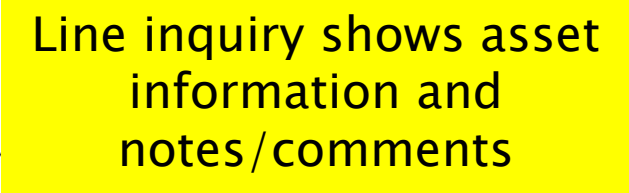
Generous Use of Pulldowns reduces typing time

Screen Shots

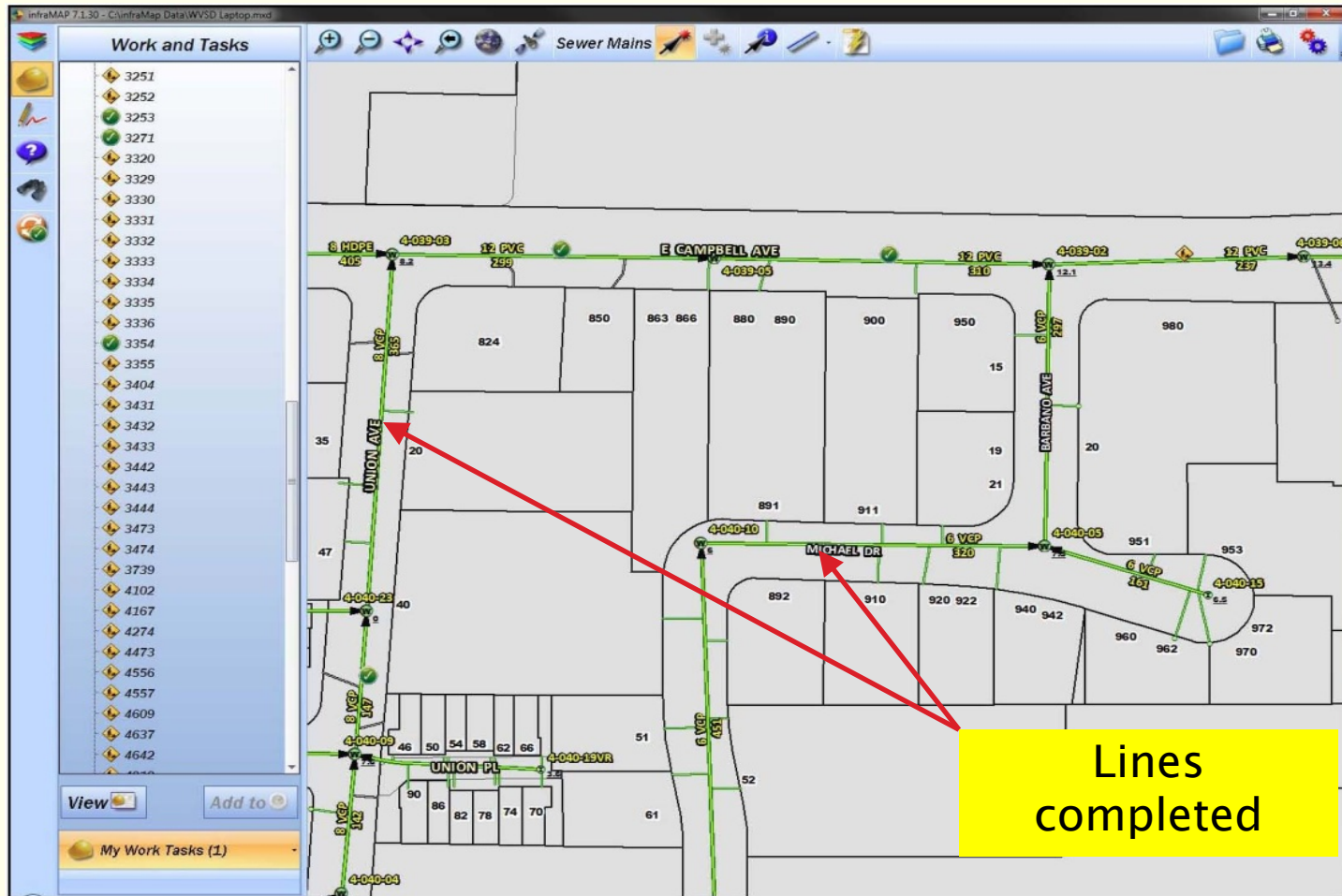


Screen Shots

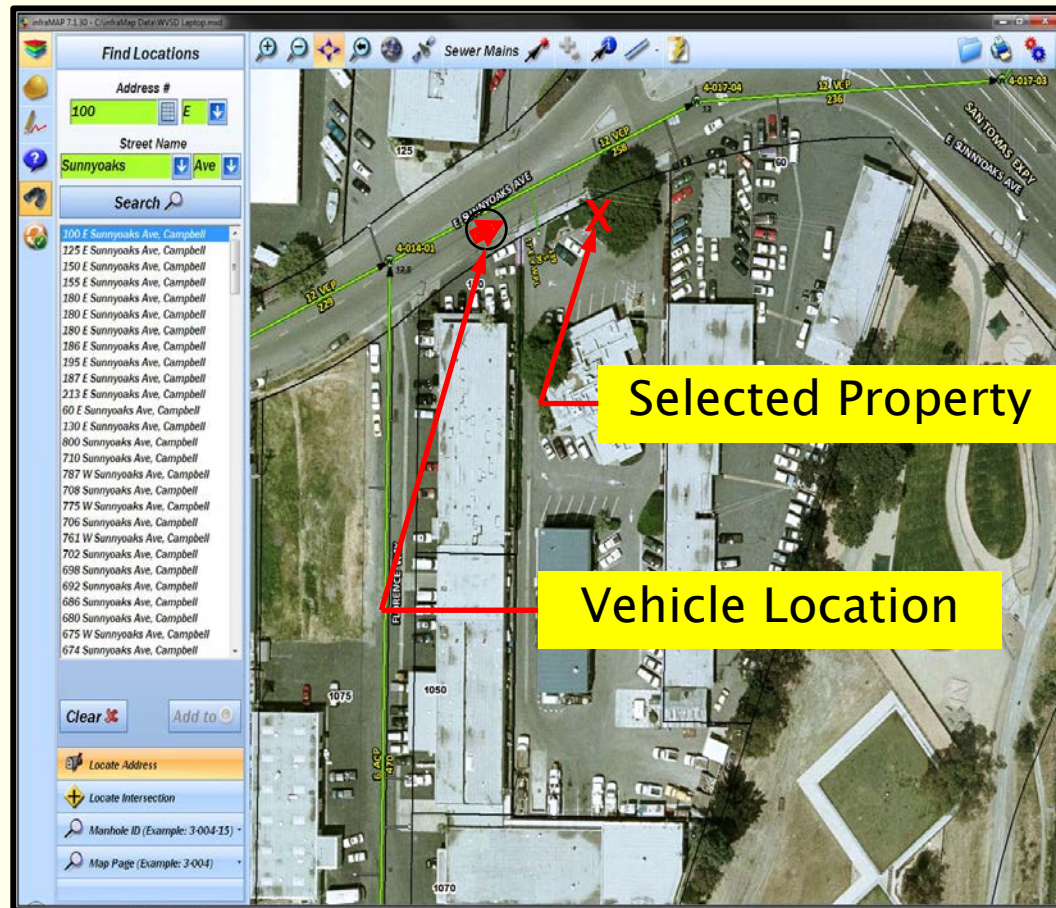




Screen Shots



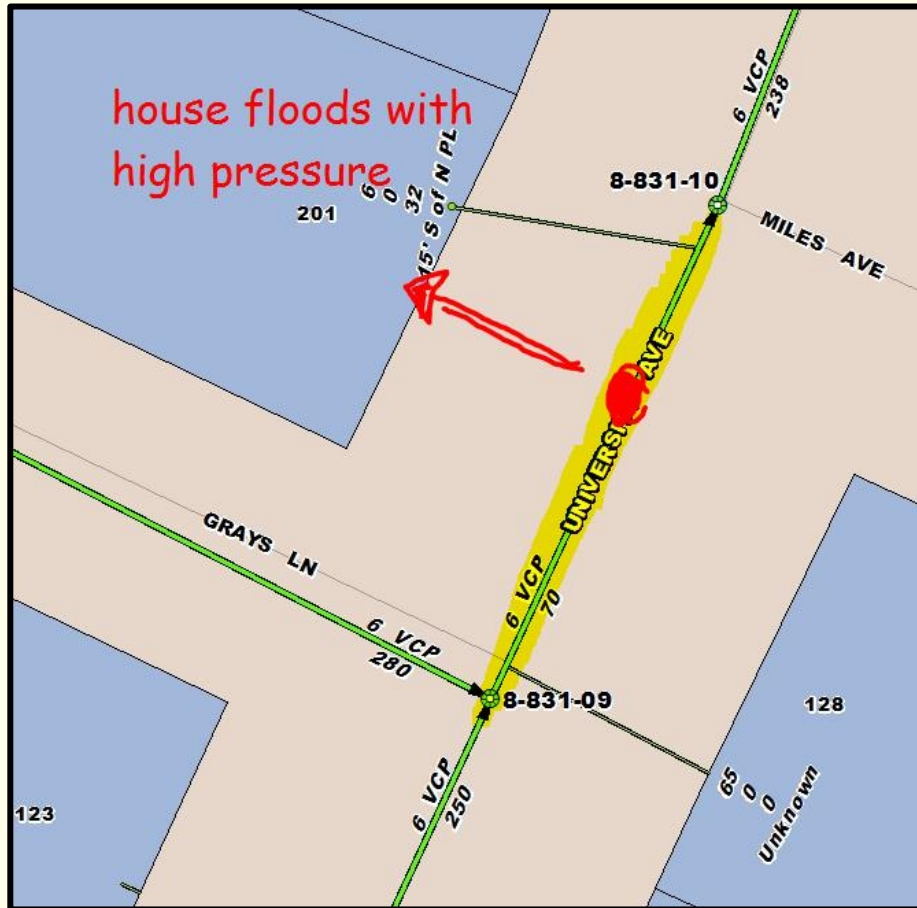
Aerial View & Redline Edits



Use of Aerial View

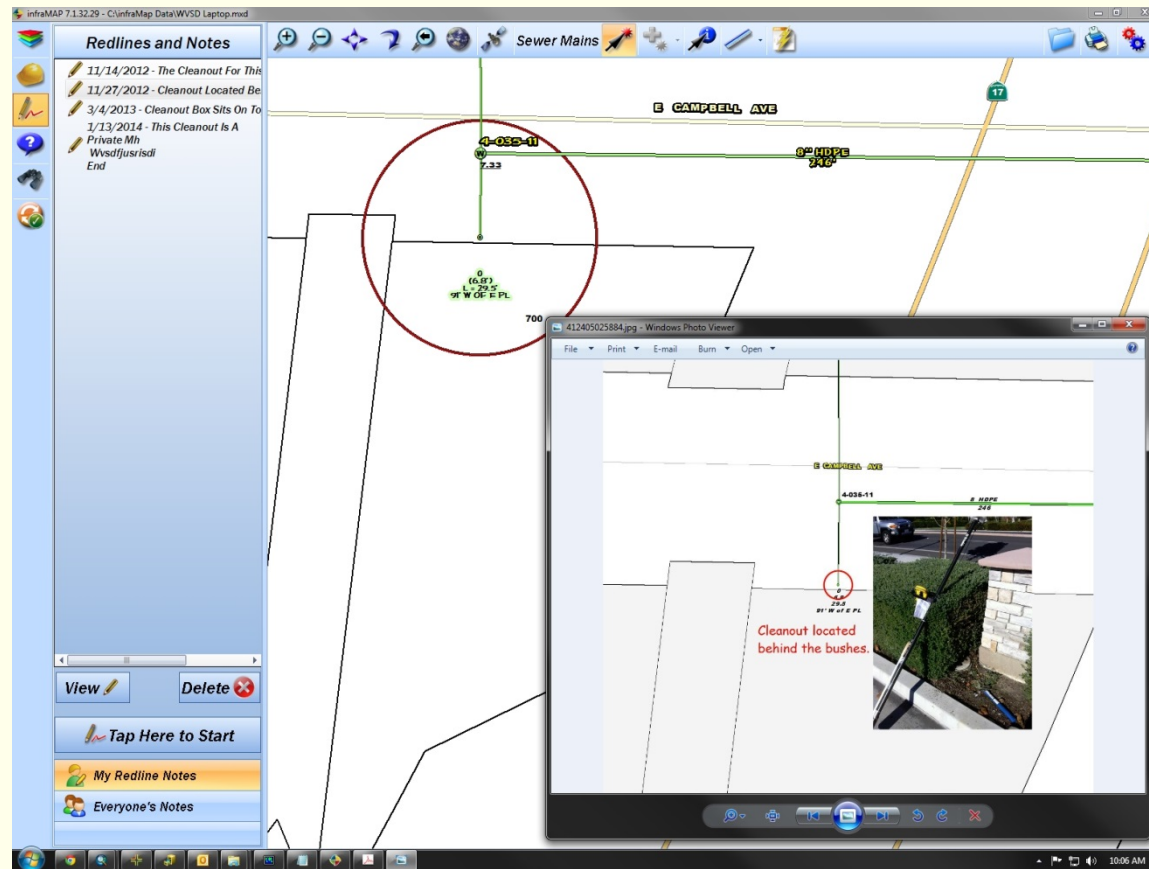
Provides MW w/
Reference Point to Find
Manholes & Locate
Property (especially on
stormy nights)

Aerial View & Redline Edits



Field crews can provide edits and comments as they encounter them which are incorporated in system within a matter of days

Aerial View & Redline Edits





Contact Information

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End of
Presentation